

School Nurse Emergency Care Course

School Nurse Manual

Fourth Edition

Illinois Emergency Medical Services for Children



is a collaborative program between the
Illinois Department of Public Health
and
Loyola University Medical Center



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Illinois Emergency Medical Services for Children is a collaborative program between the Illinois Department of Public Health and Loyola University Medical Center.

The *School Nurse Emergency Care Course* is based on the course *School Nurse Emergency Medical Services for Children (SNEMS-C)*, which was developed by the University of Connecticut in 1995 to 1996. This course has been substantially revised and updated to reflect current practice.

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Illinois EMSC has made every effort to ensure that the information presented in this manual is accurate and represents current accepted practice in the United States. However, the recommendations in this manual are not intended to indicate an exclusive course of treatment or to be applicable in all circumstances. We recommend that you use this manual as a guide for developing local school policies and protocols.

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Background

The *School Nurse Emergency Care Course (SNEC)* is derived from a curricular program called *School Nurse Emergency Medical Services for Children (SNEMS-C)*, which was developed in 1995 at the University of Connecticut. The original program was the collaborative product of professionals across the country who shared their expertise and gave willingly of their time to create an emergency care program for school nurses.

In December 1995, Illinois Emergency Medical Services for Children sent 4 nurses to Connecticut to participate in an *SNEMS-C* Train-the-Trainer workshop. Nineteen teams of instructors representing 16 states underwent training at this workshop, then brought the program back to their own states for replication.

Illinois EMSC began sponsoring the course locally in 1996 under the name *School Nurse Emergency Care Course*. From the beginning, the course has been well received by school nurses throughout the state. A strong partnership between the emergency nurses and school nurses who teach the course has contributed to its success, as each lends a unique perspective to the course.

In an ongoing effort to ensure that all materials remain consistent with current clinical practice, the course was completely revised and updated in 2003 and 2009, and enhanced with additional appendixes and resources at the beginning of 2010. The product of a committee comprising both emergency nurses and school nurses, this fourth edition of the *School Nurse Emergency Care Course* will continue to help school nurses develop the essential skills and knowledge base they need to provide optimum care during pediatric emergencies within the school environment. The Illinois EMSC Advisory Board supports inclusion of the course into primary and continuing education for all school nurses.

NOTE | Illinois EMSC has made every effort to ensure that the information presented in this manual is accurate and represents current accepted practice in the United States. However, the recommendations in this manual are not intended to indicate an exclusive course of treatment or to be applicable in all circumstances. We recommend that you use this manual as a guide for developing local school policies and protocols.

Introduction

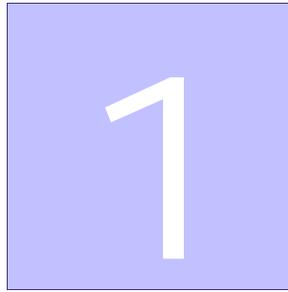
For many years, our emergency medical services systems focused primarily on adult care, with little attention to the needs of the critically ill and injured child. In time, there grew greater recognition that the emergency care needs of the pediatric population were not being adequately addressed. Beginning in 1985 with the establishment of the national Emergency Medical Services for Children (EMSC) program, federal funding has supported states in their efforts to address the unique needs of children, resulting in the development of numerous emergency care guidelines, standards, educational materials, and other resources—including this *School Nurse Emergency Care Course (SNEC)*.

The *SNEC* recognizes that the field of school nursing is unique in that nurses in the school environment are called on to fulfill multiple roles while serving a diverse population. The intent of this course is to provide nurses who work in the school setting with emergency care education and guidelines that they can integrate into their current practice and use to deliver care to the ill or injured student. In addition, information and resources specific to disaster/terrorism preparedness are also included to support school nurses in this evolving field. We hope that this manual becomes a valuable addition to the nursing practice resources already available to school nurses.

Because schools provide services to students throughout the childhood and adolescent years, school nurses must be cognizant of pediatric developmental stages and able to provide age-appropriate services and information. A baseline understanding of pediatric developmental characteristics and a general knowledge of appropriate approaches in the assessment and management of these varied age groups is beneficial. The assessment and treatment approach nurses will use when dealing with an injured or ill kindergartner is quite different from that they will need to treat a high school student, requiring different degrees of student participation in the decision-making process, different educational information, and a different level of parental involvement.

The school nurse has a key role not only in providing emergency care to students, but also in developing prevention strategies. Many emergencies are avoided in the schools each day because school nurses have educated parents/guardians and staff members in prevention and early intervention techniques and have established individualized health care plans for students who have special needs.

Working collaboratively with school administrators and staff, medical advisers, local EMS agencies, local health care providers, and parents/guardians, school nurses can be instrumental in establishing effective, comprehensive school emergency care programs that reduce student morbidity and mortality.



Your Role in Emergency Care

On completing this chapter, you will be able to

- Describe the key steps in planning for individual health emergencies.
- Identify unique challenges in the emergency care of students with special needs.
- Discuss the importance of nursing protocols, written procedures, and individual care plans in the delivery of optimal care.
- Explain the function of triage in determining disposition.
- Describe telephone triage techniques.
- Describe communication during an emergency.
- Discuss the role of documentation, data collection, and postincident evaluation in maintaining and improving your emergency care program.

Defining Your Role in Emergency Care

Emergency care is a focal and highly visible aspect of the school health program. On any business day, about a quarter of the US population is in school; some students spend as much as 10 hours in this setting. And in many cases, when sudden illness or injury arises, you will be the only health professional on hand to provide or supervise immediate care.

Although recent attention has focused increasingly on large-scale disasters, individual emergencies of every description continue to occur each day in schools across the country; and the importance of your role in meeting the challenges they represent continues unabated.

The emergency care program comprises a continuum of activities, and your expertise is essential in every phase:

Planning for any emergency that is likely to arise

Before an incident arises, your participation in planning and preparation activities can ensure the smoothest possible response and the best clinical outcome.

Responding swiftly and appropriately when an incident occurs

During an emergency incident, you coordinate immediate care, with direct responsibility for triage decisions, activation of EMS as warranted, and communication with parents/guardians, other health professionals, and school administrators.

Documenting the event immediately afterward

After an emergency, you must see that necessary documentation and incident reports are completed to satisfy legalities and ensure continuity of care through the student's recovery.

Maintaining the program through regularly scheduled review

Ongoing maintenance of the emergency care program ensures that it continues to meet the changing needs of your student population. Information gathered during postincident evaluation sessions and data collection informs necessary prevention measures and program revisions as you return to the planning phase of the continuum.

This chapter reviews the elements of a comprehensive health care program for individual emergencies in the school setting. (Broader emergencies are discussed in Chapter 15: *School Emergency Response and Crisis Management*.) In school districts with nursing supervisors, some of these tasks may be conducted at the administrative level; but it is essential to be aware of all factors that affect emergency care delivery within your assigned school.

NOTE | Although the term “students” is generally used throughout this book when referring to your patients, the information applies to all whose care falls within your scope of practice. This usually includes teachers, other school employees, volunteers, and visitors.

Planning for Emergencies

Planning for individual emergencies is a collaborative process. The planning team may include school administrators and other staff members, the school medical adviser where applicable, and representatives from local EMS agencies and hospital emergency departments. Planning helps to form the basis for specific preparedness activities, which are the foundation of a measured emergency response. This phase encompasses

- Assessing the potential for emergency incidents, including hazards within the school and surrounding community
- Meeting with representatives from local EMS agencies and emergency care facilities to review and evaluate response capabilities
- Developing written protocols and procedures for clinical care and transport
- Coordinating staff training in approved emergency procedures
- Ensuring that essential skills and certifications are properly maintained
- Identifying equipment and supplies that must be stocked, readily accessible, and in good order at all times

These elements are further described below.

Assessing the Potential for Emergency Incidents

Getting started

If you are embarking on a comprehensive overhaul of your school's emergency plan, the following questions provide a starting point for discussion.

WHO are your potential patients?

Students constitute the largest population of potential patients, but the needs of staff, administrators, other school employees, and visitors must be factored in as well.

WHAT types of injury or illness could occur?

Develop a comprehensive list of potential injuries, illnesses, and other health emergencies. Group the items into categories for easier analysis.

WHERE could injuries or illness take place?

The location of an ill or injured student is critical in planning for care. Assess each school building to identify factors that put students or staff at risk. Cover every possible location within the school, as well as outside locations, such as playgrounds, school buses, sports events, and field trips. (See Chapter 15 for a discussion of hazard assessment at school and in the community.)

WHEN could an injury or illness occur?

Planning should encompass before-school and after-school programs. Consider the broad range of populations and activities found at different school sites throughout the district.

Once you've answered these questions, discuss the additional considerations summarized below to develop a basis for your school's emergency action plan.

The *School Emergency Plan Evaluation Checklist* in *Appendix B* can also help you with this planning phase.

Additional considerations

A number of factors may affect the types of emergencies that arise within your school or influence the way emergency care is delivered in specific cases. Careful consideration of these factors allows you to prepare for them before an emergency occurs. They include

- Cultural diversity within the school community
- Students with special needs
- The age range of the student population
- Availability of health care services outside of the school setting

Cultural diversity

Each school district is a microcosm. The students within the district embody a unique mix of races and religions, socioeconomic status, ethnicity, language, and culture reflecting the makeup of the surrounding community. You must take these factors into consideration when planning for emergency care. Procedures and guidelines may need to accommodate

- Cultural beliefs regarding causes of illness
- Traditional remedies and rituals
- Decision-making within the extended family

Ignoring these factors or stereotyping the members of any ethnic group can lead to inappropriate assessment and care.

Two tables on cultural competence—*Cultural Awareness and Clinical Assessment* and *Cultural Diversity and Health Care*—appear in *Appendix B*.

Students with special needs

Increasingly, children with a wide array of chronic illnesses, congenital disorders, physical disabilities, or mental disabilities—often referred to as *children with special health care needs*—are attending regular classes with their peers. Caring for them requires a broad knowledge base and expanded clinical skills, especially for students who depend on medical technology. To meet these students' needs, individualized care plans must be developed with the input of the parent/guardian and medical providers. See Chapter 14: *Planning for Students With Special Needs* for details.

Age and developmental level of students

When planning for emergency care, consider the ages and developmental levels of all those present within the school.

Age ranges have become much broader; many schools provide preschool programs for 3- to 5-year-olds, and even infant daycare is not unusual in this setting. Providing adequate care for infants and very young children requires a different assessment approach, age-specific interventions, and appropriate supplies and equipment.

At the other end of the spectrum, special or alternative education programs may accommodate students up to 23 years old whose developmental levels are consistent with infancy. These students may have vital signs and physiologic responses appropriate to their age in years, but your assessment approach to such students should be matched to developmental level.

Health care access

Depending on the location of health services and the availability of transportation and health insurance, some families may have limited access to health care within the community. You may be, in essence, the primary care provider for students from these families; for example, you may be called on to assess and treat injuries that were sustained during a fall at home.

Working With EMS and the Community

Your school's emergency capabilities are ultimately dependent on the community's response to emergency calls from your school. Foster relationships with your EMS responders, law enforcement agencies, hospitals, public health services, social services, mental health organizations, and faith-based organizations. All of these entities are important in the continuum of emergency preparedness, response, and follow-up. (See *Emergency Medical Services: Overview* in *Appendix B* for more information on EMS operations.)

It's particularly important to familiarize yourself with the competencies, limitations, and functions of your local EMS agency. Meet with agency representatives to discuss strategies for improving student outcomes when health-related emergencies arise. Develop a data sheet that summarizes EMS response information, as this is an important indicator of your program's adequacy. The sheet should include the following information:

Names, locations, and telephone numbers of EMS response coordinators for the school area

More than 1 EMS system may be involved.

Telephone number for EMS dispatch if 911 is not universally available

There may be separate numbers to call for different types of emergencies. Find out how wireless phone calls are handled and familiarize yourself with your local dispatch system's capacity for handling emergency calls.

Projected time before rescuers arrive

Note both the typical response time and the longest projected arrival time.

Certification and skill levels of designated responders and general actions each may perform

Not all responders are licensed to start IVs, administer medications, or perform emergency intubations as well as other advanced procedures. Be familiar with the level of care that your local EMS responders can provide.

Names of the nearest hospitals and the nearest pediatric trauma center, with distance and transport time

Note EMS protocols for transport to designated hospitals or trauma centers.

Protocols for transporting a student with special needs to a different hospital at the family's request

Make advance arrangements if a student with special needs must be transported to an alternative hospital or other medical facility.

Developing Written Guidelines

The nursing care you provide must conform to national standards for school nursing practice as well as guidelines for registered nurses under your state Nurse Practice Act. The emergency care provided by other key personnel should adhere to relevant written procedures or protocols as well as physician orders from students' emergency care plans.

KEY POINT

Developing plans and protocols for health-related emergencies that may arise at school is the key to ensuring appropriate care and preventive action.

Developing plans and protocols for health-related emergencies is the key to ensuring appropriate care and preventive action.

Written guidelines, including nursing protocols, procedures for others to follow, and individual student care plans, provide a framework for emergency interventions in the school setting; as such, they are essential to minimizing student morbidity and mortality. They allow you to manage emergencies efficiently and consistently while maintaining a standard of care. They also provide direction for others who may respond to emergencies. Consider them the backbone of your emergency plan, and make sure all written instructions are clear and understandable.

NOTE **Standing orders** may be part of the emergency care program in areas that have a school medical adviser, who reviews and signs the orders annually. Increasingly, however, standing orders have been replaced by individual physicians' orders for students with special needs.

Nursing protocols

Written protocols must incorporate standards of practice established by professional nursing organizations, such as the American Nurses Association, the National Association of School Nurses, and your local School Nurses Association.

Telephone triage protocols

Specific protocols must be in place if you expect to perform *telephone triage*. This allows you to make a disposition decision by telephone when

- An emergency arises at another site
- You aren't immediately available to respond to a call

More information appears in the section on *Responding to Emergencies*.

Transport procedures

All protocols must include a section that provides clear, consistent instructions for transporting ill or injured students in accordance with triage category and school policies. This section should specify any criteria that dictate whether transportation will be provided by EMS ambulance, school bus, the student's parent/guardian, or a school staff member using a business or private vehicle. Financial responsibility for transportation costs should be spelled out as well. Work with your health care team to correct any omissions or inadequacies in the transport plans, and make sure that staff, students, and parents/guardians understand the plan's provisions. Chapter 2: *Legal Issues in Nursing* includes a discussion of insurance issues to consider before providing private transportation.

Procedures for others to follow

If you're responsible for several schools within a district, it is especially important to have clear, written procedures for emergency situations that arise at another site. When preparing for such contingencies, be aware of issues regarding care that can legally be delegated to others. (See Chapter 2 for more information.)

Emergency care plans

KEY POINT

The emergency care plan should incorporate physicians' orders authorizing necessary interventions and medications that the student may require at school.

A student with special needs may be at greater risk for medical emergencies. Work with the student, parents/guardians, primary care provider, school staff, and your EMS agency to develop an emergency care plan (ECP) that addresses potential emergencies and provides for resources to treat them. The ECP should incorporate physicians' orders authorizing necessary interventions and medications that the student may require at school. See Chapter 14 for details about ECPs and other planning devices.

Coordinating and Training Key Personnel

During life-threatening emergencies, immediate on-site interventions often make a crucial difference in outcome. You cannot always be the first person on the scene when an emergency arises; therefore, it's essential to identify key personnel who can provide immediate care. Include not only those whose roles in emergency care are mandated by their job descriptions, such as health office aides and special education teachers or therapists, but also school staff members who are willing and able to take on such a role. Recruit additional personnel as needed to ensure that you are adequately covered on and off campus.

Organize your resources

Develop a roster of everyone who has a role in providing emergency care to students. Each listing in the roster should include

- Contact information
- Work schedules

- Qualifications and certifications
- Specific responsibilities or capabilities (immediate or emergency care, cardiopulmonary resuscitation, automated external defibrillation, special assistance for students who have disabilities)

Coordinate appropriate training

Everyone on your roster should be familiar with established protocols and procedures and able to carry them out.

KEY POINT

Be sure to maintain current CPR/AED skills and see that other school staff members receive CPR/AED training.

Coordinate appropriate training for key personnel in

- Principles of scene-safety assessment
- Following standard precautions to prevent exposure to body fluids
- Communicable disease precautions, including procedures for reporting potential exposure to infectious or dangerous substances and obtaining a medical evaluation following such an exposure
- Basic first aid, cardiopulmonary resuscitation (CPR), and appropriate use of an automated external defibrillator (AED)

Be sure to maintain your own CPR and AED skills as well.

NOTE | Key staff members should be vaccinated against hepatitis B as outlined in your school exposure control plan.

Ensuring the Availability of Equipment and Supplies

During assessment and planning sessions, consider **what** equipment and supplies should be available and **where** they may be needed. For example, students who have special needs may require specific medical supplies or equipment to manage an emergency event, and these items should be readily available in classrooms or at any intramural functions these students may attend. See *Emergency Equipment/Supplies: Health Office* in *Appendix B* for a suggested supply list.

KEY POINT

Make sure emergency supplies and portable emergency kits are stocked and placed in easily accessible locations.

In general, make sure emergency supplies, portable emergency kits, and classroom go-kits (see *Appendix B*) are stocked and placed in appropriate locations where they are easily accessible during an emergency. Decide where to place specialized equipment, such as AEDs.

Special considerations regarding automated external defibrillators

AEDs have become increasingly common in public buildings, schools, and other areas where large groups may gather. Schools in Illinois, as well as many other states, are required to have them. AEDs make it possible for first responders or trained lay rescuers to deliver defibrillation before EMS personnel arrive.

It's important to understand, however, that AEDs come with significant responsibilities and liabilities. A position statement from the National Association of School Nurses urges schools to investigate the following factors before adopting a policy requiring AEDs:

- Federal, state, and local laws and regulations
- Safety and cost of the device
- Training requirements and guidelines for using the AED
- Placement, ease of access, and availability of AEDs throughout the school
- Identification and resolution of liability issues
- Current data regarding the effectiveness of AEDs in the school setting

NOTE It is important to remember that CPR certification and emergency response skills remain essential even after acquiring AEDs. CPR and AED courses are provided regularly through the American Red Cross, the American Heart Association, and local hospitals.

See “State laws on cardiac arrest and defibrillators” at the National Conference of State Legislatures Web site(www.ncsl.org/programs/health/aed.htm) for the latest information.

Responding to Emergencies

Assessing the Situation

When an emergency arises, your first step will be a level-headed assessment of the situation: How serious is the incident? Where is it taking place? Is more than 1 person involved?

This information can help you distinguish an isolated incident you can manage with the help of designated key personnel from a situation that may require activation of the school's emergency and crisis response plan (see Chapter 15).

Forming a Triage Decision

When an individual student is involved, physical assessment findings and focused history information provide the basis for your *triage* decision, using objective criteria to determine additional actions. Assigning the student to 1 of 3 triage categories—**emergent** (most severe), **urgent**, or **nonurgent** (least severe)—allows you to make a transport decision and initiate appropriate interventions (see Table 1-1).

TABLE 1-1. STANDARD TRIAGE PROTOCOLS

Triage Category	Assessment	Suggested Protocol
Emergent	The illness or injury requires immediate medical attention	Activate EMS to provide rapid hospital transport with continual monitoring and care. Major trauma may require air transport as determined by EMS. Notify the parent/guardian regarding the student's condition and destination.
Urgent	The illness or injury requires medical intervention within 2 hours	Notify EMS or the parent/guardian as appropriate to provide prompt transport to an emergency facility. If EMS provides transport, make sure the parent/guardian is aware of the student's condition and destination.
Nonurgent	The illness or injury may require referral for routine medical care	Notify the parent/guardian to seek medical attention for the student within 24 hours if a medical diagnosis, treatment, or consultation is needed. Consider telephone consult with the student's primary care provider. The student may be transported by bus, by parent/guardian, or by EMS, depending on circumstances: <ul style="list-style-type: none"> ▪ In situations requiring basic first aid, the student may stay in school and ride home on the bus. ▪ If a contagious condition is suspected, isolate the student from other children and notify the parent/guardian to transport the student home.

If EMS is activated, you will continue to make care decisions and provide or oversee interventions until EMS responders arrive. It is important to remain with the student until care has been transferred in case your help is needed.

Chapter 3: *Assessment and Triage* details these processes, while the clinical chapters of this book describe nursing interventions for specific emergencies. Telephone triage, a special contingency, is discussed below.

Special Situations: Telephone Triage

KEY POINT

Unless you have specific protocols in place for ordering interventions, you will not be able to direct medical care by phone.

As previously mentioned, you must have specific protocols in place to perform telephone triage. Note as well that unless you have additional protocols in place for ordering interventions, you will not be able to direct medical care by phone: Making the triage determination will be your only action. Recommending specific interventions (such as giving clear liquids to a student who is vomiting) may be construed as exceeding your scope of practice, potentially leaving you liable for

charges of negligence and action against your license. (More information about liability in nursing practice appears in *Chapter 2*.)

Taking the call

In situations that appear emergent or potentially emergent, staff members should activate EMS **before** they call you. Therefore, your first objective during telephone triage is to determine whether the situation may be urgent or emergent. Unless you are completely confident that the situation is **not** potentially life- or limb-threatening, see that EMS is activated before proceeding with further questions.

NOTE | Staff members in any location should understand **how** and **when** to contact EMS.

Communicating effectively

Telephone triage involves unique challenges. You may be communicating with someone who has limited medical knowledge. You must frame your questions to elicit the clinical information you need to make a rapid triage decision. Ultimately, your control of the situation is limited, making it essential to use effective communication techniques while asking questions and providing instructions. The following tips may prove helpful:

Don't rely on the caller's assessment

To make sure you understand the nature of the emergency, ask multiple questions phrased in different ways, avoiding medical jargon that the caller may not understand.

Gather all of the information you need to make an assessment

Keeping the nursing process in mind, ask questions that will elicit all of the assessment information you would normally rely on as the basis for an accurate triage decision.

Learn to rely on your sense of hearing

Practice interpreting auditory cues and visualizing conditions you cannot see or touch. Develop and trust your intuition.

Speak with the student

Whenever possible, speak with the student directly. Important details and subtle nuances can be lost in translation when they are conveyed to you through a well-meaning caller. **Evaluate subjective responses as seriously as objective findings—don't discount them.**

Document the call

Remember to document telephone triage calls carefully so that others will be aware of what took place. The importance of good documentation cannot be overstated. **Remember, if it isn't documented, it didn't happen in the eyes of the law.**

Determining isoposition

KEY POINT

If you have any doubt about the urgency of a student's condition, always have the student transported to the nearest medical facility.

Once you have conducted your telephone interview, if you are completely confident that the student's condition is nonurgent, the student can be transported by the parent/guardian to an appropriate health care provider or home. If you are left with any doubt about the urgency of the student's condition, however, always have the student transported to the nearest medical facility.

Essential Communications

KEY POINT

You are an important agent in maintaining communication among all those involved in an emergency incident.

During an emergency incident, maintaining communication among all those involved is an important aspect of your responsibilities. Communication-related tasks include

Notifying the student's parent/guardian

When a student experiences illness or injury at school, you must notify the parent/guardian. If the emergency requires activation of EMS, notify the family once help is on the way, and be prepared to deal with any resultant emotional reactions. Skillful communication and diplomacy will be required as you explain the nature of the emergency, request consent for further treatment as indicated, and establish a basis for efficient continuity of care.

Notifying the student's primary care provider

Your background and training make you the most capable person to report an injury or illness to the student's primary care provider. Make sure you have a consent form for release of information on file so that you can discuss the situation and request further direction if necessary.

Communicating with school administrators and teachers

It is important to inform the administrator in your building if EMS is activated.

Documenting the Incident

KEY POINT

Postincident activities, such as documentation, data collection, and evaluation sessions, are essential to the continuing improvement of the school's emergency health care program.

Documentation, data collection, and postincident evaluation sessions provide a basis for ongoing analysis and improvement of the school's emergency health

care program. As such, these activities should be considered essential components of the program itself.

Documentation of Nursing Care

KEY POINT

If it isn't documented, it didn't happen in the eyes of the law.

Good documentation is essential in establishing and maintaining credibility. It provides valuable information for continuity of care as well as legal protection for you and for the school. Develop a format that allows you to record information quickly and efficiently. Keep in mind that even brief notes can validate your nursing actions if questions arise or a complaint is filed later on. Remember: If it isn't documented, it didn't happen in the eyes of the law.

Document the nursing process, all communications, and the outcome of the event. A sample *Documentation and Referral Form* can be found in *Appendix B*.

Nursing process

Include

- Subjective and objective data that formed the basis for your nursing assessment and plan of action
- The interventions you performed
- The student's response to these interventions

NOTE | Develop a reliable method for sending your initial nursing assessment information with the parent/guardian or EMS responders to receiving personnel.

Communication

Note all telephone calls made to family members, the student's primary care provider, and outside agencies, such as EMS. Document telephone triage as well. Include the following information:

- The name of the person who was called
- The date and time of the call
- A summary of the conversation

Outcome

Every incident that requires referral for treatment or diagnosis should be followed through to its outcome. This keeps the student's health record up to date and encourages continuity of care as the student moves from the school environment to other health care providers, and finally to the parents/guardians who provide care at home.

Incident Reports

Incident reports are required in most school districts when an injury occurs on school grounds, during school transport, or at off-campus school functions. This report is separate from documentation of nursing care.

The staff member who provided care should complete the incident report promptly, recording the outcome of the incident and the affected student's status. A copy of your nursing documentation should either be attached to the report or briefly summarized with a note that the original nursing documentation is in the student's health record.

Analyze incident reports regularly to identify preventive action. A sample *Student Incident Report* appears in *Appendix B*.

Postincident Evaluation

An essential step in maintaining emergency preparedness is the follow-up review. After every emergency incident, meet with your health care team to identify both strengths and weaknesses in your emergency response procedures.

Per school protocols, schedule a staff debriefing session to review and critique the emergency incident and its outcome. Discuss whether the overall response plan was effective and identify areas for improvement. Evaluate the adequacy and appropriateness of written procedures or nursing protocols that came into play. Identify any special equipment or supplies that were needed and note whether any problems were encountered involving these resources.

Summarize the discussion and use the information to identify opportunities for improvement, so that protocols and procedures can be modified accordingly.

Maintaining the Program

The emergency health care program is a complex system of interrelated roles and responsibilities. Meticulous attention to maintenance can ensure that the program continues to meet changing needs and legal obligations.

Analyze incident reports and aggregate data from health office operations. Identify specific activities or recurring situations that can be targeted for preventive measures. Information on student needs, illnesses, and injuries provides a basis for appropriate risk-management policies.

The most important step in your review is follow-through. Use your findings to create a mitigation program, listing written goals and action steps to address identified problem areas, such as hazards, procedural changes, and preventive education activities. Include target dates for accomplishing these steps.

The Importance of Data Collection

Data tracking is essential to the ongoing improvement of your school's emergency care program. Collection, compilation, and analysis of data can help you identify trends involving injury or illness so that you can take corrective action.

For example, information on the nature, frequency, and outcome of injuries is essential to risk management. It helps you to identify hazards and provides a basis for planning, implementing, and evaluating injury-prevention activities.

Information about illnesses affecting students at your school can help you analyze how school health services are being used. It also highlights the prevalence of specific illnesses or conditions within the school, at various grade levels, or in particular classrooms.

In addition, aggregate data on the volume, acuity, and characteristics of emergency care provided through the school health office can be used by decision-makers to

- Review and revise policy and protocols
- Evaluate staff assignments
- Allocate budgeted expenses
- Develop in-service programs for staff
- Consider alterations to the physical environment

Developing a consistent format

To aggregate data across schools or districts, essential information must be

- **Collected** consistently (each time you perform an assessment in the health office or anywhere else in the school) **and**
- **Recorded** consistently (capturing the same data points each time, using consistent standards and terms)

Used appropriately, computer-based record-keeping systems provide a tremendous advantage in data collection activities. They allow participating schools throughout the district to capture data in a standardized format that facilitates compilation and aggregate analysis. In paper-based systems, data must be extracted from source records and entered into a networked computer using a consistent format.

Data sources include individual student health records, a daily confidential census of health office visits, nursing documentation, and incident reports. The sample *Confidential Health Office Daily Census* in *Appendix B* illustrates an efficient means of categorizing the data under 4 main headings:

- Student (demographics)
- Type of visit or assessment
- Interventions
- Disposition

Information to collect

The following information permits a concise analysis of health-related emergencies within a school system. Examples are listed in parentheses.

In all cases

Record the following information any time a student receives health care:

- Reason for visit (new illness or injury, follow-up visit)
- Demographic data (age, grade, sex)
- Nursing assessment (mild exacerbation of asthma, injury to hand, toothache)
- Nursing interventions (medication, emergency care, counseling, teaching)
- Triage category (emergent, urgent, nonurgent)
- Outcome/disposition (referral to primary care provider, ED treatment and release, hospital admission)
- School time missed due to incident (hours, days)

In cases involving illness

The following additional information applies to incidents involving illness:

- Signs and symptoms that brought the student to the health office (difficulty breathing, rapidly spreading rash, abdominal discomfort)
- Date and time of onset
- Relevant health history (chronic illness or contributing disability)

In cases involving injury

The following additional information applies to incidents involving injuries:

- Where the injury took place (playground, gym, classroom)
- Date and time of injury
- Type of injury sustained (laceration or abrasion; sprain or dislocation; suspected fracture)
- Apparent cause of injury (a fall down the stairs; sports activity; assault)
- Contributing factors (a particular piece of equipment; a playing surface; intentional harm)
- Protective equipment in use (goggles, helmet, padding)
- Level of supervision (name of responsible adult or absence of normal supervision)

Additional Program Maintenance Activities

Keeping protocols and procedures current

Meet with the other members of your health care team at regularly scheduled intervals to evaluate the adequacy of existing protocols and procedures, revising them as necessary. Create additional protocols and procedures as indicated to address contingencies or problem areas. This will help to ensure that your emergency care program continues to meet current needs.

Staying on top of certifications

Maintain a tickler file or other reminder system so that you will know when certifications are up for renewal or specialized qualifications must be updated.

Keeping your roster up to date

Contact all individuals in your emergency roster at regular intervals to ensure that they are still willing and available to carry out their roles. Make any necessary revisions to scheduling and contact information at this time.

Maintaining equipment and supplies

Develop mechanisms for routine maintenance of equipment and restocking of emergency supplies. Be sure to check expiration dates as applicable.

Summary

You play a pivotal role in providing optimal care for urgent and emergent illness and injury among students attending your school. Work collaboratively with school administrators, staff, the local EMS coordinator and EMS providers, other health care providers, and parents/guardians to establish a comprehensive program of emergency care that reduces morbidity and mortality among students.

School policy and protocols, data collection, communication, documentation, and ongoing evaluation are all part of the emergency care program. An organized system for data collection permits analysis of illness and injuries within the student population so that you can identify actions to reduce both incidence and risk.

Keeping abreast of current statutes and standards of practice will help you ensure continued compliance as you review your program's procedures and protocols.

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2

Legal Issues in Nursing

On completing this chapter, you will be able to

- Describe how nursing and the law interact for appropriate delivery of emergency care.
- Define your legal liabilities when providing emergency care to students.
- Incorporate your knowledge of medicolegal issues as you develop care plans and interventions for emergency situations.
- Discuss legally defensible documentation strategies.
- Describe students' legal rights within the school as they apply to health-related issues.
- Understand the protections that HIPAA and FERPA regulations provide.
- Identify unique challenges in emergency care of students with special needs.

NOTE | Information in this chapter is not intended to take the place of legal counsel. Seek professional advice on any legal matter of specific concern.

Emergency Care and the Law

Emergency situations often create a stressful environment, particularly in the school setting, where true emergencies arise infrequently. Faced with the need to make immediate, complex decisions, you'll hardly want to add to your stress by contemplating the legal ramifications of your actions.

Yet we live in a litigious society, and one in which lawsuits, trials, and jury awards are intensively publicized by the media. Influenced by dramatic television portrayals of emergency care, the public has developed idealized perceptions of the type of care that can be delivered. This combination of high expectations and legal consequences can be a source of tremendous concern, potentially affecting your ability to make careful decisions under pressure.

Cultivating your understanding of the legal issues that affect your work will enable you to provide appropriate emergency care that benefits students, the school system, and you. Ultimately, you will find that simply practicing conscientious, reasonable nursing care should satisfy legal requirements.

NOTE The issues covered in this chapter can be applied in most areas throughout the United States; however, statutory law and case law differ from state to state, and every case is fact-specific—that is, changing a single fact can result in an entirely different outcome. Always seek guidance from the legal counsel for your school district or from your state board of nursing.

Liability Issues

Understanding Your Accountability

All nurses—including licensed practical nurses, registered nurses, nurse practitioners, and nurse anesthetists—must be licensed in the state in which they practice. Licensure is a protective mechanism to ensure that basic competencies are met. (In addition to licensure, certification programs provide a way to enhance your competence and your practice within the specialty of school nursing. See *Appendix B* for a discussion of how the duties of a certificated school nurse compare with those of a registered nurse in Illinois.)

The public legislature in each state grants the nursing profession the right and responsibility to regulate its own practice. Typically, this is accomplished by a state board of nursing that regulates the licensure process and develops a *Nurse Practice Act*, which defines the nurse's scope of practice. Through these mechanisms, the state regulatory board demands that professional nurses take responsibility for their nursing actions.

KEY POINT

As a school nurse, you are accountable for all actions and judgments you make in the course of your practice. Neither the school's policies nor a physician's orders relieve you of this responsibility.

As a school nurse, you are accountable—and therefore liable—for all actions and judgments you make in the course of your practice, whether the occasion is a routine activity or an emergency. Neither the school's policies nor a physician's orders relieve you of this responsibility. (See the *Recommended Job Descriptions* in *Appendix B* for more information about the duties and responsibilities of registered nurses and other health office staff.)

Understanding Your Liability

Nurses can be held liable for their actions under *tort law*, a branch of civil law that deals with personal injury committed by one individual against another. From the Latin word *tortus*, meaning *wrong*, it provides a means of obtaining compensation when wrongful acts result in damages.

Negligence is the particular tort of concern in nursing liability cases. Negligence can be **either** of the following:

- Conduct that fails to meet a standard of care established by law for the protection of others.
- Failure to exercise such care as a reasonable person would use under similar circumstances.

Professional negligence in nursing is synonymous with malpractice. In a lawsuit alleging negligence, 4 elements must be proven by the plaintiff:

1 *Duty to act*

The existence of a nurse-client relationship creates a mandate, or *duty*, for the nurse to provide health care in accordance with the applicable standard of care.

2 *Breach of duty*

If the nurse fails to act within this standard of care, there may be a breach of duty.

3 *Causation*

If a breach of duty exists, it must have a causal connection with a resultant injury.

4 *Damages*

Actual loss or injury must have occurred; otherwise, there is no liability.

As a school nurse, you have a duty to provide care to the students in the school or district to which you are assigned—thus, duty to act is established as part of your role. However, a plaintiff must prove all 4 elements in order to recover against you.

Standard of Care

KEY POINT

Maintain familiarity with emergency care standards. If you should render care that is not reasonable or not within the applicable standard of care, you may be liable for negligence.

The *standard of care* dictates that every nurse must exercise a reasonable degree of care and skill such as other members of the nursing profession would use

under similar conditions and circumstances. This is pivotal in establishing breach of duty. It is assumed that you are able to provide competent emergency care that is reasonable and that adheres to the standard of care. If you should render care that is **not** reasonable or **not** within the applicable standard of care, you may be liable for negligence. Therefore, it is critical that you maintain familiarity with emergency care standards.

The standard of care you must meet is drawn from

- Your state's Nurse Practice Act
- The National Association of School Nurses
- The American Nurses Association's *Standards of Care for School Nurses*
- Your state health department
- Your state board of education
- Policies and procedures established by local schools, school boards, or the agency that employs you
- School code

Depending on your certification, basic life support standards for cardiopulmonary resuscitation established by the American Heart Association or the American Red Cross may also apply.

Immunity Under State Tort Claims Acts

As mentioned earlier, tort law deals with matters of civil liability, including medical malpractice. Individual states can amend their tort laws with *Tort Claims Acts*, which define and limit the claims that can be filed under tort law and provide for various types of immunity.

Nurses employed by public school systems are generally considered government employees, and as such they may be afforded some protection by their state Tort Claims Acts. This dates back to a time when government employees were granted *sovereign immunity* based in English common law, which stated that the king (and thus, the king's representatives in government) could do no wrong. While these immunity provisions have been lifted for the most part, some states have established immunities that apply specifically to public school employees.

For example, in the past, one state's educational code indicated that professional employees of the school district could not be held personally liable for acts of judgment that arose in connection with their specified duties, **except** in cases involving excessive force while disciplining students **or** in cases of negligence that resulted in bodily injury to students. At first glance, this implied that employees **could** be held liable for negligence that resulted in bodily harm. However, the state's Supreme Court interpreted the phrasing to mean that employees were liable **only** in circumstances involving the use of excessive force or negligence in disciplining students. Hence, the immunity afforded to these school employees, including its school nurses, was very broad.

Another state extended legal immunity to school nurses who provided services that were regulated under a School Nurses Act, including examinations for hearing and physical defects, scoliosis examinations, lectures delivered to

teachers, and actions related to excluding ill students from attending school. General nursing care and care provided during an emergency situation were not included in the stated provisions, however; presumably, school nurses in this state would need to investigate their immunity in these circumstances.

It is essential to become familiar with statutes that apply in the state where you practice. You can obtain this information from your school board's legal counsel. Do not presume immunity; liberal exemptions, such as the statutes noted above, are the exception rather than the rule. Understand as well that statutory immunity does not prohibit a plaintiff from filing a lawsuit, but rather serves as a defense to a suit that has been filed.

Private transportation of ill or injured students

Transporting a student in a private vehicle raises its own liability issues. State Tort Claims Acts may include contingencies addressing the use of motor vehicles by government or public employees, including public school nurses. For example, a Tort Claims Act may restrict liability to cases in which negligent driving leads to injuries during an automobile crash.

Check your school's policy about transporting students in your personal vehicle. Policies vary, and schools may require, permit, or prohibit this. Your specific responsibilities regarding transporting students should be outlined in your job description.

If you operate a motor vehicle for work-related reasons, such as transporting a student, you may be covered by your school board's or employment agency's insurance policy, even if you are driving your personal vehicle. The key question in this case is whether you are acting within the scope of your employment as outlined by your job description. Since insurance policies vary, it is imperative to know the extent of coverage afforded an employee during student transport. Obtain a copy of the policy for your own records.

KEY POINT

In general, it is best to activate EMS when transport is needed for a student whose condition is emergent.

In general, it is best to activate EMS when transportation is needed for a student whose condition is emergent. Should it appear necessary to provide private transportation because you cannot contact an ambulance service, enlist someone to drive while you attend to the student.

If a crash should occur during transportation, report the incident to the vehicle owner's automobile insurance carrier as well as to the school. In the event of a lawsuit, insurance policies for all of the vehicles involved will be in play until the court determines which policy is applicable.

Liability Protection Under Good Samaritan Laws

Most states have enacted legislation referred to as *Good Samaritan laws*. (Illinois's Good Samaritan Act is outlined in Civil Immunities Statute 745 ILCS49/). These statutes extend certain liability protections to physicians and nurses who render medical care to strangers at the scene of an emergency. The

laws may also be extended to other health care professionals, such as EMTs and paramedics, or to laypeople. Notably, the laws apply only when care is given without charge. Accepting compensation may leave the provider open to litigation.

In essence, most Good Samaritan statutes provide liability protection against ordinary negligence or malpractice; acts of gross negligence or willful or wanton misconduct are excluded from this protection. Such acts are generally defined as those showing reckless disregard—that is, a complete lack of care that goes well beyond simple inattention. This charge must be proved by the plaintiff.

KEY POINT

Good Samaritan statutes generally do not apply when there is a preexisting duty to respond, as in your duty to render emergency care to students.

Good Samaritan statutes generally do not apply when there is a preexisting duty to respond to the emergency, as in your duty to render emergency care to students. The Good Samaritan statutes could apply, however, when you render emergency care to other individuals at your school, as long as you do not have a prior nurse-client relationship. This means, for example, that if you provide care to a faculty member and this is **not** included in your job responsibilities, the Good Samaritan statute may offer you liability protection. Any duty to respond should be defined in your job description or employment contract.

Good Samaritan laws differ widely from state to state, so you need to be familiar with your state laws. Although suits are rarely brought against Good Samaritans, it is a good idea to keep abreast of changes in local legislation.

Informed Consent

As the prominent legal scholar Justice Cardozo said many years ago, “Every human being of adult years and sound mind has a right to determine what shall be done with his own body.” This philosophy is legally defined under the terms of *informed consent*, which must be obtained before you treat any student. To obtain informed consent, you must explain the risks, consequences, and alternatives to medical or surgical treatment. In many cases, understanding and acceptance are acknowledged through a signed consent form. During an emergency situation, however, the student may be unconscious or severely injured and unable to consent. Recognizing this, the law presumes *implied consent* so that lifesaving care may be rendered without delay.

In most instances, informed consent for medical treatment of a minor child must be provided by the parent/guardian. The standard in most school systems is to obtain this authorization in advance through a written document that is signed by the parent/guardian and kept in the student’s file. The legal term for this document is *in loco parentis*, meaning *in place of the parent*. The authorization allows emergency treatment if you cannot contact the parent/guardian. A copy of the authorization should accompany the student on all school-related activities and should be made available to prehospital and emergency personnel. Note, however, that even without this authorization, true emergency care can be rendered under the tenets of *implied consent*, which assumes that parents/guardians would authorize whatever treatment is best for their child.

If the parent/guardian cannot be reached, a school administrator or staff person who knows the student should accompany the student to the hospital. This person then acts *in loco parentis* and also provides details of the student's health history and other nursing documentation to the hospital health care team.

KEY POINT

During an emergency, *always* provide necessary care to students, regardless of whether you have a written authorization form on file.

During an emergency, **always** provide necessary care to students, regardless of whether you have an authorization form from the parent/guardian on file.

Your school should have a policy in place indicating that a licensed health professional cannot be overruled by a school administrator or parent/guardian when activating EMS services. Parents/guardians who choose to refuse treatment can discuss this option with EMS personnel on the scene or at the hospital.

Be sure to familiarize yourself with your local hospital's policies regarding treatment of minors without parental consent.

NOTE A minor is generally defined as someone who is younger than the legally recognized age of majority (usually 18 years) within the state of residence. Exceptions to this definition may occur, however; some states allow minors to give their own consent for treatment related to a pregnancy, drug or alcohol problems, or sexually transmitted diseases. Many states also recognize *emancipated minors* who, because of marriage, parenthood, economic independence, or a degree of self-sufficiency, may consent to their own treatment.

Abandonment

In legal terms, *abandonment* occurs if a health care provider begins to treat a student, then stops or leaves the student without transferring care to another qualified provider. This means that once you begin to render emergency care—or if you simply observe a situation in which a student requires emergency care—you cannot leave that situation before other emergency personnel arrive except at the risk of abandoning the student. To avoid even the appearance of abandonment, remain with the student and provide all possible care until further medical help arrives and the student is transported from the scene of the emergency.

Your school policy should indicate who will accompany a student to the hospital and who will remain at the school to provide health care service to other students. As a school nurse, you cannot leave the school unless you delegate your responsibilities to someone else who is capable of fulfilling them. This need not be a nurse unless special circumstances—such as the presence of a student with special needs—requires it. For example, if a student who is fully dependent on a ventilator is present in a regular classroom, a nurse must be on the premises at all times.

Substance Abuse

Drug overdose

The prevalence of drugs and alcohol in today's society leads to many emergency situations caused by substance abuse, especially in middle school and high school settings. Such emergencies often require you to act rapidly, and some states have enacted legislation that protects you from liability in these circumstances, as long as the treatment you provide is reasonable and conforms to the requisite standard of care. In many cases, however, definitive treatment involves administering a narcotic antagonist. Your only recourse in such cases is to sustain the student using basic life support skills until the antagonist can be given.

Good-faith reporting

Many states have legislation that provides immunity for public employees, including school nurses, who report drug dependency to school officials *in good faith*, meaning that the report is motivated out of concern for the affected person's well-being. The spirit behind this legislation is to encourage efforts to combat drug use among our youth. This protection may extend to nurses in private schools as well.

Drug testing

Generally, school officials cannot require students to undergo testing for alcohol or other drugs. Students who are involved in extracurricular activities, which are considered voluntary, may be excepted from this rule.

Documentation Strategies for Liability Protection

KEY POINT

Documentation can be the key to preventing malpractice lawsuits or defending against litigation. A detailed student health record substantiates exactly what took place when you rendered care.

Nurses often fail to realize that documentation can be the key to preventing malpractice lawsuits or defending against litigation. A detailed student health record substantiates exactly what took place when you rendered care, decreasing the risk that your practice could be judged negligent. Legally speaking, anything that wasn't documented wasn't done. Therefore, careful and concise documentation is one of your best defensive actions.

NOTE | School nurses who do not have emergency care plans and individualized health care plans on hand for students with special needs carry a liability. It is essential to develop these plans proactively for each student in the school who has special medical needs. Specific health care plans are discussed further in Chapter 14: *Planning for Students With Special Needs*.

Helpful Documentation Strategies

Document all student health records in a timely, accurate manner. During the emergency, quickly and carefully record the time of occurrence, your assessment findings, interventions provided, and outcome. More detailed documentation should be completed as soon as the emergency is resolved. Records must be clear, comprehensive, objective, and professional. Review all charts for the following elements:

Are all entries legible?

Watch for poor penmanship. If you can't read it, neither can anyone else.

Are there grammatical or spelling errors?

Accurate written language skills convey competence; poor skills convey the opposite.

Are entries signed?

A signature must follow every chart entry.

Are the time and date included in all entries?

Timed entries are essential in determining chronologic events.

Is the chart free of erasures and alterations?

Alterations cast doubt on the writer's credibility.

Are all entries made in ink that copies well?

Refer to school policy regarding specific colors of ink to use on documents.

Are known allergies highlighted?

This helps to protect students from exposure to allergens, particularly medications or latex, during treatment.

Retaining and releasing student health records

Inappropriate maintenance and release of personally identifiable health records can also pose liability issues. Student health records often contain confidential information; therefore, they should never be accessible to anyone who is not authorized to view them.

As a school nurse, you are responsible for keeping student records confidential. Do not release student health records without written authorization that complies with both the Family Educational Rights and Privacy Act (FERPA) and Health Insurance Portability and Accountability Act (HIPAA). This authorization must come from the student's parent/guardian (in the case of a minor) or from the student who has attained the legal age of consent.

Legislation Affecting Health Records and Privacy

Family Educational Rights and Privacy Act

The federal Family Educational Rights and Privacy Act protects the confidentiality of student health records. FERPA regulations place civil liability on the intentional **or unintentional** release of health information to any

individual, agency, or organization **unless** prior written consent is obtained from the student’s parent/guardian.

An exception, however, is the release of student health records to teachers and school officials within the educational institution or local educational agency, providing they have a legitimate educational interest in the student **and** they require the information to protect the student’s welfare. School officials can also share student health records and emergency care plans with prehospital providers and emergency personnel when a health or safety emergency exists, and with laypeople or school staff who have a necessary role in the emergency response.

Many states have privacy policies regarding student health records as well. Be sure to familiarize yourself with them.

Health Insurance Portability and Accountability Act

The Health Insurance Portability and Accountability Act encompasses a series of regulations that address numerous issues in health care administration. Perhaps the furthest reaching aspect of the Act is the implementation of measures designed to safeguard the confidentiality of records containing personally identifiable health information. HIPAA restricts the ways that *covered entities*—including insurers, physicians, hospitals, pharmacies, and any vendors whose services they employ—can share client information. These covered entities must establish policies and procedures that meet stringent standards for safeguarding identifiable information in any form, from paper records to electronic files to oral communication.

Although student health records in public schools and most private schools are not legally subject to the HIPAA regulations, they may be indirectly affected by the law. For example, there may be additional procedures, paperwork, or approvals involved in obtaining information about a student’s health history, special needs, or immunization records from primary health care providers or local clinics. Be sure to investigate whether your school district has implemented any HIPAA regulations so that you can ensure compliance. Note also that health information collected from adults who receive emergency treatment at the school may be subject to HIPAA.

Keeping Documents Confidential

Whether student health records are electronic or paper-based, keeping them confidential is a priority. Keep computer-based student health records separate from the school’s administrative database. Adopt a school district policy with specific safeguards for sensitive information, such as mental health issues, child maltreatment, HIV, and pregnancy. The student’s record may note that certain information is being kept in a **separate** confidential file.

For electronic records

- Use a secure individual password.
- Do not share your password with others.
- Ensure that **only** school officials with a legitimate educational interest have access to your computer.

- Use a time-initiated, password-protected screen saver to conceal information on the screen.
- Log off the computer whenever you leave the office.

For paper-based records

- Mark all files *confidential*.
- Store files in a locked, fireproof cabinet.
- Ensure that **only** school officials with a legitimate educational interest have access to these files.
- Return files to a locked cabinet immediately after reviewing them. Do not leave them on your desk.
- Use blank cover sheets to conceal information when files are in use.

Students' Rights Within the School

Both the US Supreme Court and the state courts have widely debated students' rights within the schools and how they correlate with the Fourth Amendment, which guarantees certain protections against unreasonable search and seizure by the government or its agents. Whether and how these protections apply to students within the school setting is still being questioned.

Most courts have taken the position that law enforcement officers who wish to search a student must show probable cause; but school officials seeking to ensure school safety may search students for weapons or other illegal items without showing probable cause. In some states, including Illinois, school officials are permitted to search a student's belongings, such as a book bag or purse, in the course of searching school property, such as vehicles, desks, or lockers. Such searches can be conducted without notification, consent, or a search warrant, on the grounds that school officials have a right to search the school's own property. Therefore, reasonable suspicion is not a prerequisite. According to the Illinois statute,

[t]o maintain order and security in the schools, school authorities may inspect and search places and areas, such as lockers, desks, parking lots, and other school property and equipment owned or controlled by the school, as well as personal effects left in those places and areas by students, without notice to or the consent of the student, and without a search warrant.

In Illinois, law enforcement officers can assist in student searches. Illegal items found during the search can be confiscated by school officials and given to the law enforcement agency for further investigation.

Other states may require either reasonable suspicion or reasonable grounds of infraction before a student search is conducted. Reasonable suspicion occurs when school officials suspect student infraction based on a tip from another student or other factors that raise suspicion. In reasonable grounds, school officials must have reason to believe, beyond mere suspicion, that a school policy or law has been violated.

KEY POINT

The laws governing search and seizure are subject to change and vary from state to state. Keep abreast of all legal ramifications that affect your practice.

The laws governing search and seizure are subject to change and vary from state to state. Keep abreast of all legal ramifications that affect your practice. Make sure you are familiar with your school's or school district's policies regarding student searches. If you are involved in a student search, keep detailed documentation of the events that preceded it.

Special Issues

While it's beyond the scope of this chapter to examine every legal issue that may arise in school nursing practice, the following areas merit special discussion.

Delegation of Duties

KEY POINT

Delegation is defined as “transferring the responsibility of performing a nursing activity to another person *while retaining accountability for the outcome.*”

The American Nurses Association and other nursing organizations have defined delegation as “transferring the responsibility of performing a nursing activity to another person **while retaining accountability for the outcome.**” There is a presumption that when you delegate a task, you have greater knowledge and experience than the person to whom you delegate; therefore, it is crucial to consider carefully whether delegation is appropriate.

What can and cannot be delegated by a school nurse? Some of the guidelines established by state boards of nursing appear below:

- A licensed nurse must take ultimate responsibility for managing any student's care.
- A licensed nurse must be accountable for all policymaking and practices regarding the delegation of care.
- A licensed nurse **cannot delegate responsibility for assessment or evaluation of a student** to unlicensed personnel. Unlicensed personnel can assist **but never replace you.**
- Unlicensed personnel cannot in turn delegate a task that you have delegated to them.

School administrators and parents/guardians may want to decide which nursing tasks can or cannot be delegated; however, since you retain responsibility for the outcome of any task you delegate, the decision must be yours. Your state's Nurse Practice Act is a good source for delegation guidance. Generally, there are 5 aspects to consider:

1 Right task?

Determine what task or procedure is appropriate to the circumstances.

2 Right circumstance?

Is there adequate time, space, and privacy for the staff to do the task competently?

3 Right person?

Among the available staff, who is qualified and willing to take on the task? Will this person request help or ask questions if a problem arises? Is the person capable of documenting the task knowledgeably?

4 Right direction?

Assess the competency of the person to whom you're delegating, then provide appropriate direction that the individual can understand and follow.

5 Right supervision?

Is there someone who can supervise the person to whom you have delegated the task? If there's no direct supervision, how will you document what occurred?

Guidelines for delegation

In 2000, the National Association of State School Nurse Consultants identified the following steps for safely delegating nursing care to others. **These steps must be performed by a registered nurse:**

- Validate the necessary provider orders, check parent/guardian authorization, and validate legal documentation.
- Conduct an initial assessment of the student's needs.
- Determine what type of care is required in keeping with your state Nurse Practice Act.
- Determine the level of training necessary for the delegated individual in keeping with state board of nursing regulations.
- Ensure that the person to whom you are delegating is competent.
- Ensure that a written plan is in place for the unlicensed individual to follow. This plan must clearly state when to notify you, how often and in what manner the student should be reassessed, and what interventions should take place.
- Decide how much supervision the unlicensed individual requires.
- Train all unlicensed personnel to document accurately and consistently.
- **You must also document all activities** as appropriate and as listed above.

Reporting Child Maltreatment

In every state, there are designated individuals who are required by law to report any suspicion or evidence of child maltreatment (any form of abuse or neglect). In Illinois, these *mandated reporters* include physicians, school personnel, directors or staff assistants of nursery schools or child daycare centers, law enforcement officers, social workers, psychologists, paramedics, and others—as well as nurses.

The Illinois Department of Children and Family Services (DCFS) maintains a hotline referral service for suspected maltreatment at 800-25-ABUSE (22873). In Illinois, call the Child Abuse Hotline if you suspect **either** that a student has

been injured or neglected by a caregiver **or** that the risk for injury or neglect exists. The law provides you with immunity for mandated reporting.

When you call the hotline, be prepared to answer specific questions about indications of physical or sexual abuse, including what you have observed and what the student has told you. You will need to prepare a written report for your files that documents the incident that precipitated the phone call. Include the date and time you called. There may be situations in which a caseworker is assigned to the student.

More information appears in the *Child Maltreatment* protocol in *Appendix A*. A form for reporting your suspicions in writing to DCFS is included in *Appendix B*.

Other Special Issues

Do not resuscitate orders

As noted earlier, you have a legal right to provide appropriate treatment to minor students whose condition is urgent or emergent without consent from a parent or guardian. In most cases, this right obtains even if the parent/guardian has religious objections to medical treatment, so long as you are delivering care that will safeguard the life and health of the child.

An exception to this arises if the child carries a “do not resuscitate” (DNR) order, which overrides certain emergency measures for a student who is in danger of respiratory or cardiac arrest. It is important to familiarize yourself with state laws that specify your responsibilities in such situations.

KEY POINT

A DNR order does not prohibit all care, but rather provides for comfort measures while limiting resuscitative interventions.

Keep in mind that DNR orders generally do not prohibit all care, but rather provide for comfort measures while limiting resuscitative interventions. Check your district policy about providing comfort measures to students who have DNR orders. Additional perspectives regarding DNR orders appear in Chapter 14.

Automated external defibrillators

Automated external defibrillators (AEDs) pose additional responsibilities and liabilities that can affect emergency care. Be sure to familiarize yourself with state laws and regulations regarding AED use. See Chapter 1: *Your Role in Emergency Care* for additional information about this issue.

Students With Special Needs

Today more than ever, students with a broad range of complex health care needs are attending school with their peers. You must manage the extensive array of specialized services these students require, from ensuring wheelchair access, to providing feedings for a student who has a gastrostomy tube, to coordinating complex medical regimens.

The unique needs and health considerations of students with chronic conditions can challenge you and, potentially, pose greater legal risk. With this population, it is particularly important to incorporate into your everyday nursing practice the fundamental liability protection strategies outlined in this chapter.

Familiarize yourself with your state Nurse Practice Act to ensure that the care you provide and the procedures you perform do not exceed your designated scope of practice. If you wish to delegate any component of this care to others within the educational system, you must first develop policies that delineate the specialized skills needed to deliver each service, then specify the personnel who are capable of performing such procedures.

Summary

It is essential to have an intrinsic understanding of the legal issues that can affect your practice and to employ methods that address these issues. Always maintain current awareness of the Nurse Practice Act within your state. Contact state and national school nurse organizations as well as other professional nursing organizations to secure the latest guidelines and position statements related to current best practices.

In the face of an emergency, always act in a reasonable manner, following protocols or standing orders and using the most appropriate resources available. Keep in mind that the best emergency care plans will not work in every situation; your primary goal is simply to deliver the best possible care that is reasonable for the student. As long as you adhere to these tenets, your actions should satisfy legal requirements and prevent successful litigation against you.

Emergency care is an essential part of your knowledge and of your job. Unless a physician or prehospital provider is present, you are responsible for emergency care until the student is transported to a medical facility. You are accountable for your actions as in any other clinical incident; the law makes no allowances for emergency situations.

No matter how painstakingly you practice, you may one day be forced to defend your actions in court. Individuals who believe they have been harmed may seek redress within our legal system, and statutes that provide immunity do not necessarily prevent these lawsuits from being filed. Fortunately, such cases are rare. Keep in mind that **practicing in a reasonable, professional manner** and **documenting your judgment and actions** are the best defenses against litigation.

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3

Assessment and Triage

On completing
this chapter, you
will be able to

- Discuss the importance of performing a systematic, prioritized assessment.
- Describe 5 components of a systematic assessment process.
- Compare and contrast the 3 categories of triage.
- Apply systematic assessment techniques to make accurate triage decisions in selected case studies.
- Discuss the unique issues involved in assessment and triage of students with special needs.

Assessment as a Lifesaving Tool

To the students in your school, your importance as a health care provider cannot be overstated. Each day, you may treat 5% to 10% of the total student population for problems ranging from mild stomach aches, or minor lacerations to life-threatening asthma or traumatic brain injury. Over the course of a typical career as a school nurse, you will alleviate pain and prevent suffering on a daily basis; and in all likelihood, you will save lives.

When a student experiences emergent illness or injury, your actions can, in some cases, make the difference between permanent disability and full recovery. With so much in the balance, it is essential to assess the student's condition swiftly and accurately, without overlooking important physical and historical findings. These findings provide the basis for selecting and prioritizing interventions, evaluating the student's response, and determining disposition.

A systematic, consistent approach is key to this process.

Five Components of a Systematic Assessment

A systematic assessment can be broken down into 5 major components, each of which has a specific role in emergency nursing care:

Scene safety assessment

Ensure that it's safe to approach, or call for backup assistance as necessary.

Across-the-room assessment

Immediately activate EMS if the situation is obviously emergent.

Initial assessment (ABCDE)

Identify and treat problems that threaten life, limb, or vision.

History

Gather background information essential to your triage decision.

Focused physical examination (FGHI)

Measure and record vital signs; inspect, auscultate, and palpate to identify or investigate additional problems.

These components can be adapted to virtually any situation you may face in the course of a day, giving you a safe, consistent basis for clinical decision-making and nursing interventions. The culmination of the systematic assessment is an accurate triage determination, appropriate interventions, and final disposition.

NOTE | During an actual emergency, you'll go through these 5 components almost simultaneously, in far less time than it takes to describe them.

Additional actions

Once the emergency is over, it's also important to attend to

- Documentation, including data collection

- Evaluation and follow-up
- Planning and prevention

This chapter provides an overview of the steps needed to complete each of these components, from assessment to triage to postincident activities. Additional details and examples of how you'll use these tools in specific situations are the focus of the chapters that follow. Your own experience and common sense are what bring the steps together into a congruent whole.

Three key points

Three of the techniques that foster a successful approach to assessment are briefly noted below. You may find it helpful to keep them in mind as you visualize applying these steps in your own practice.

Use developmentally appropriate language

KEY POINT

Remember to use developmentally appropriate language when addressing students, especially younger children.

It's important to talk to the student throughout the assessment process, explaining your actions and providing reassurance. Be sure to use developmentally appropriate language and techniques as you interact and communicate. You must also try to attune yourself to the various ways a child could interpret your meaning. For example, the phrase *take your blood pressure* could be interpreted to mean that you are literally about to take away something having to do with blood. To prevent misunderstandings, say instead, *I'm going to **measure** your blood pressure*, or for younger students, *I'm going to give your arm a hug*.

NOTE | Language, culture, technology, and environment may affect the assessment process. Enlist special resources as needed to help you communicate effectively with the student.

Gather history information throughout the process

KEY POINT

If possible, gather focused history information as you perform each step of the assessment.

As you talk to the student and explain what you're doing, it's natural to ask questions about the injury or illness you're assessing. Use this technique to gather as much of the focused history information as possible while you perform the initial assessment and provide interventions, as this will help you to evaluate your findings more accurately. If the student is unable to respond to your questions, query others who were present when the incident arose.

Treat significant problems as you go

KEY POINT

It is essential to take any necessary actions before moving on to the next step of the assessment.

As you progress through the assessment components, it is essential to take any necessary actions **before** moving on to the next step. Immediately treating such life-threatening problems as airway obstruction or inadequate ventilation will help to ensure optimal outcome.

Similarly, although triage is presented as the end result of a complete assessment, in practice you will activate EMS at the earliest sign of an emergent situation.

Scene Safety Assessment

Hazards

Before rendering aid, you must ensure your own safety as well as that of the student and others present. Even within the health office, maintain a constant awareness of circumstances that could affect your own safety or that of others present. To determine whether you can safely approach the student, look for the following hazards:

Substances

Blood or other body fluids, noxious fumes, toxic chemicals.

Situational dangers

An armed perpetrator, hostages, weapons.

Environmental dangers

An unstable structure, fire, electrical hazards, or other potential mechanisms of injury.

KEY POINT

Never place yourself in danger. If you cannot control a hazard, do not approach the student.

Never place yourself in danger. If you cannot control hazards, **do not** approach the student—call 911 or your local emergency number to activate backup assistance.

Resources

If the situation does not appear hazardous, you may find it useful to consider briefly whether you have the equipment and resources you need to manage the incident at this time. For example, you might send for

- Additional personnel to help you with interventions or to manage bystanders
- Personal protective gear or specialized equipment (such as an automated external defibrillator, backboard, cold packs, or splints) that isn't in your portable emergency kit

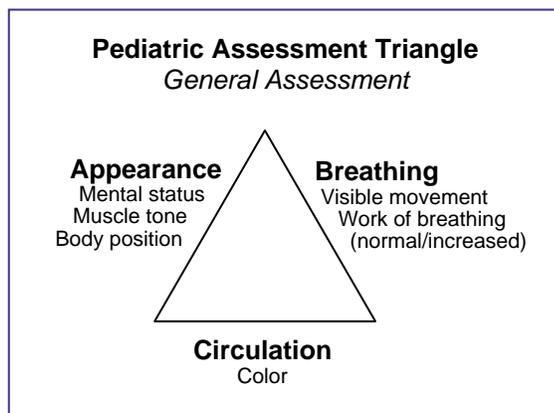
NOTE Always be prepared for unexpected emergencies. Carry disposable gloves and a resuscitation mask at all times, and make sure these items are available in key locations for anyone who might need them.

Across-the-room Assessment

KEY POINT

The across-the-room assessment is a quick overall appraisal of the student's condition based on appearance, breathing, and circulation.

FIGURE 3-1. PEDIATRIC ASSESSMENT TRIANGLE



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The across-the-room assessment is a natural continuation of the scene safety assessment as you focus your attention on the student. Briefly evaluate the student's appearance, breathing, and circulation as illustrated in the Pediatric Assessment Triangle (Figure 3-1). This allows you to decide in a few moments how quickly you must proceed with further assessments and interventions.

During the initial assessment that follows, you will revisit these areas to perform a hands-on evaluation with interventions. At this point, you simply want to form an overall impression of vital functions.

Appearance

Appearance refers to **mental status**, **muscle tone**, and **body position**.

Mental status, in turn, is based on both **level of consciousness** and the student's **interactions with others**. Ask yourself the following questions:

- Does the student appear to be awake and aware of surroundings? Is the student aware of the injury or illness?
- If awake, what is the student's emotional response to the current situation? (calm, confused, anxious, agitated, angry, depressed)
- Does the student seem appropriately responsive to others present (looking around, responding to questions) or dull and apathetic?
- Is there evidence of normal muscle tone (sitting or standing upright, able to walk), or does the student appear limp?
- How is the student positioned? (sitting normally, maintaining a tripod position, lying supine)

Breathing

Breathing refers to the presence or absence of **visible movement** at the chest or abdomen and **work of breathing**:

- Can you confirm at a glance that the student is breathing?
- Is there evidence that the student is working hard to maintain adequate ventilation? (flaring nostrils, retractions, difficulty speaking)

Circulation

Circulation refers to **visible skin color**, an indication of perfusion to vital organs.

- Does the student's color appear normal?
- If not, does it appear pallid, dusky, mottled, cyanotic, or flushed?

Conclusions

Combine the evidence of your observations with your intuition and experience to form a first impression of the student's level of distress: Compared with baseline, does this student look well, ill, or seriously ill? Take into account any clearly visible signs and symptoms of illness or injury, such as emesis, bleeding, deformities, or expressions of pain.

Next steps

If the student's condition is clearly emergent—for example, the student is struggling to breathe, turning dusky or cyanotic, exhibiting seizure activity, bleeding profusely—activate EMS **immediately**, then approach the student and proceed with the initial assessment and interventions.

Initial Assessment

The initial (**ABCDE**) assessment focuses on **A**irway, **B**reathing, **C**irculation, **D**isability (neurologic status), and a brief physical **E**xposure to examine parts of the body directly related to the chief complaint. Table 3–1 provides an overview of the process.

TABLE 3–1. INITIAL (ABCDE) ASSESSMENT

	Assessment	Interventions
A	Airway <i>Position, sounds, obstruction</i>	Stabilize cervical spine if trauma is possible or mechanism of injury is unknown. Open airway if necessary, using jaw thrust or chin lift as appropriate. Position student to maintain airway patency. Look and listen for signs of obstruction. Perform airway-clearing maneuvers as indicated.
B	Breathing <i>Rate, depth/pattern, symmetry, sounds, work of breathing, odors, injuries</i>	Position student for maximum ventilatory ability. Give oxygen as tolerated if available. Provide mouth-to-mask ventilation if needed.
C	Circulation <i>Heart rate and quality of pulses, capillary refill time, skin color, temperature, and moisture, bleeding</i>	Initiate CPR if needed; control bleeding with pressure dressings and elevation of the affected limb.
D	Disability (neurologic status) <i>Level of consciousness via AVPU; pupillary response</i>	Provide reassurance; position to maintain comfort; give oxygen if available.
E	Exposure with Environmental control to prevent heat loss <i>Observe and inspect for additional emergent problems</i>	Treat wounds or other findings as appropriate. Treat as necessary to maintain normothermia.

As you interpret your assessment findings, keep in mind that many factors besides illness or injury can contribute to deviations from the norm. It is important to be aware of these factors so that you can take them into account. For example:

- Certain medications can cause the breathing rate and heart rate to be fast or slow
- A cold ambient temperature can delay capillary refill and affect other skin findings
- Fear, fever, and pain typically increase the respiratory rate and heart rate
- Students with certain chronic conditions may have baseline vital signs that fall outside the normal range for age

Also note that, since children’s vital signs vary by age, subtle abnormalities are easily overlooked. During the initial assessment, however, you are looking primarily for overt discrepancies compatible with severe conditions. If none are present, you’ll have time to assess for less obvious signs during the focused physical examination.

KEY POINT

The goal of the initial assessment is to identify and treat life-threatening emergencies. Activate EMS as soon as the need becomes evident.

The goal of the initial assessment is to identify and treat life- or limb-threatening emergencies. As you progress through the assessment, provide interventions as necessary to maintain the airway, breathing, and circulation **before** continuing on to the next step. If at any time the student cannot maintain airway patency,

adequate ventilation, or adequate perfusion, **immediately** activate EMS. Notify the parent/guardian as soon as you are able to do so.

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

Spinal stabilization

If there is any possibility of injury to the head or spine, provide manual stabilization of the cervical spine before you begin the airway assessment. Note that you will need to maintain spinal stabilization until EMS personnel arrive. See Chapter 4: *Trauma* for details.

Airway

Look, listen, and feel for signs of patency:

- Can you **see** movement of the chest or abdomen?
- Can you **hear** airway sounds, such as stridor, wheezing, or coughing?
- Can you **feel** air exchange at the mouth or nose?

Open the student's mouth and inspect for sources of airway obstruction.

Interpreting your findings

- Drooling or inability to talk may indicate upper airway edema from infection or anaphylaxis
- Stridor (a crowing sound) indicates upper airway obstruction
- Facial injuries can compromise the airway

See Chapter 5: *Respiratory Emergencies* for details.

Breathing

- Note the respiratory rate (normal, fast or slow, apnea), the depth and pattern of breathing (shallow, gasping, irregular), and bilateral symmetry of chest movement
- Listen for adventitious breath sounds, such as wheezing or grunting
- Watch for signs indicating increased work of breathing (retractions, nasal flaring, difficulty speaking)
- Note any unusual breath odors (fruity; reminiscent of petroleum products, tobacco, or alcohol)
- Evaluate chest wall integrity, noting any obvious injuries

Interpreting your findings

- Increased work of breathing and audible breath sounds indicate respiratory compromise
- Fast breathing is an early compensatory mechanism for hypoxia; breathing slows as hypoxia worsens
- Decreased, absent, or unequal breath sounds may indicate airway obstruction, a

pneumothorax, hemothorax, or atelectasis

- Grunting is a late sign of severe respiratory distress that is worsening into respiratory failure

Circulation

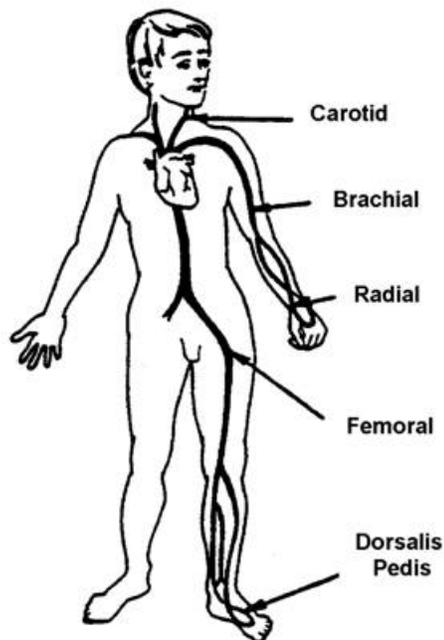
During the **Circulation** assessment, you will

- Assess heart rate and quality of pulses
- Evaluate perfusion by assessing
 - Capillary refill time (normally less than 2 seconds)
 - Skin color (normal, pallid, dusky, mottled, cyanotic, flushed)
 - Skin temperature and moisture (warm, dry, cool, clammy)
- Look for active bleeding (none, minor, moderate, profuse; controlled or uncontrolled)

Heart rate and quality of pulses

Measure the heart rate by palpating the pulses. Evaluate the quality of the pulses and note discrepancies between the central and peripheral pulses at the same time. Pulse points are shown in Figure 3–2.

FIGURE 3–2. PULSE POINTS



Although you won't actually measure the student's blood pressure until after the history and pain assessment, the pulses can be roughly correlated with blood pressure as follows:

- If you can palpate the carotid pulse, the systolic blood pressure is at least 60 mm Hg.
- If you can palpate the femoral pulse, the pressure is at least 70 mm Hg.
- If you can palpate the radial pulse, the pressure is at least 80 mm Hg.

Perfusion

Capillary refill time

Assess capillary refill at the distal extremities with the limb positioned so that it is level with the heart. Firmly press and release the skin to blanch the underlying capillary bed. Color should return in less than 2 seconds.

Color

Inspect skin color at the lips and tongue. Note whether skin color seems normal, pale or flushed, mottled or cyanotic.

NOTE | To assess skin color in students with dark skin pigmentation, check the nail beds, palms, or mucous membranes

Temperature

Feel skin temperature at the extremities and compare with temperature at the more central body regions. It may be significant if skin is either unusually hot or cold.

Moisture and quality

Note dryness or clamminess. Pinch gently to check for normal elasticity.

Bleeding

Look for profuse external bleeding.

Interpreting your findings

- Tachycardia is usually the earliest sign of developing shock in children; tachycardia combined with a fast respiratory rate is a strong indicator of compensated shock (see Chapter 6: *Shock*)
- Thready or weak pulses, cool, clammy extremities, and delayed capillary refill time are also associated with shock
- A discrepancy between the central and peripheral pulses may be an early sign of decreasing stroke volume
- Hypotension with bradycardia is a late, ominous sign of decompensated shock
- Skin that is inelastic and prone to tenting usually signifies dehydration

Disability

The **Disability** assessment is a brief evaluation of neurologic function. Assess level of consciousness using the **AVPU** Scale (Table 3–2), then evaluate pupil size and reactivity.

TABLE 3–2. AVPU SCALE

	Mnemonic	Associated Findings
A	Alert	The student is awake and able to speak or interact spontaneously
V	Verbal (responds to verbal stimulus)	A verbal stimulus elicits some response; for example, the student's eyes may open when you call loudly, or agitation may lessen in response to a command
P	Painful (responds to painful stimulus)	The student responds to a painful stimulus by moaning, crying, or withdrawing from pain
U	Unresponsive	The student shows no response to verbal or painful stimuli

Interpreting your findings

Level of consciousness is an important indicator of adequate perfusion. A significant reduction in responsiveness is an ominous sign in a student who has a mechanism that may cause respiratory compromise or shock.

See Chapter 7: *Neurologic Emergencies* for interventions.

Exposure

Remove clothing as needed to briefly assess specific factors related to the presenting problem, such as injuries, rashes, bites, or stings. Watch for signs of internal hemorrhage. Control ambient temperature if possible or drape the student with coverings as necessary to prevent heat loss. Replace clothing as soon as you are able to do so.

History

Information gathered from the health history helps you form a plan of care. You may already be familiar with the student's history from information supplied by the parent/guardian, primary health care provider, and school staff or from previous interactions with the student. Make sure your understanding of current health issues is up-to-date, and get specific details relevant to the incident at hand.

NOTE | In younger students, obtain the history from the parent/guardian, if available, or from the student's health record as time permits.

Some of the useful mnemonics for the health history include **SAMPLE** (Table 3–3), **PQRST** (Table 3–4), a pain assessment tool, and **CIAMPEDS** (pronounced *see I am peds*), which appears in *Appendix B*.

TABLE 3–3. SAMPLE HISTORY

	Topic	Questions
S	Symptoms <i>Ask the student to describe current symptoms, particularly pain.</i>	<ul style="list-style-type: none"> ▪ What problem brings the student to the health office? ▪ How long has the problem persisted? ▪ If an injury, how and when did it occur? ▪ Is the student having pain, apprehension, or guarding? ▪ What is the location, quality, and duration of the pain? ▪ Does positioning make the pain better or worse? ▪ What strategies make other symptoms better or worse? ▪ What is the student's impression of his or her condition?
A	Allergies	<ul style="list-style-type: none"> ▪ Does the student have any known allergies to food, medications, latex or other materials, or environmental elements, such as bee stings?
M	Medications <i>List medications the student takes regularly, including dosage regimen and time of the last dose.</i>	<ul style="list-style-type: none"> ▪ Is the student using any prescription, over-the-counter, home, herbal, or cultural remedies? For what reasons? When was the last dose taken? ▪ Did the student take any medications before coming to the health office? What was the result? ▪ Has the student used any illicit drugs?
P	Past health history <i>Note preexisting physical or psychological disabilities, previous trauma, and chronic conditions. Check immunization status, including tetanus prophylaxis.</i>	<ul style="list-style-type: none"> ▪ Does the student have a chronic illness? (asthma, diabetes, hemophilia, seizure disorder) ▪ Does the student have special health care needs?^a ▪ Does the student rely on a medical device? (oxygen, tracheostomy, nebulizer, central venous line, gastrostomy tube) ▪ Are immunizations up to date? ▪ Is isolation necessary? (pediculosis, varicella exposure, immunosuppression)
L	Last meal <i>Document when and what the student last ate or drank.</i>	<ul style="list-style-type: none"> ▪ Is the student able to eat? ▪ When was the last meal? ▪ Has there been any nausea, vomiting, diarrhea? ▪ Are bowel and bladder function normal?
E	Events <i>Ask the student to describe events that led up to the illness or injury.</i>	<ul style="list-style-type: none"> ▪ When did the problem begin? ▪ Were there precipitating factors? ▪ If an injury occurred, were there witnesses? What did they report?

^aYou may need to modify your evaluation of assessment findings for students with special needs, as their baseline findings may vary from accepted averages.

Pain Assessment

Pain has been referred to as the fifth vital sign because of its significance in assessing pathophysiology. The **PQRST** assessment tool (Table 3–4) outlines a detailed, systematic interview that covers many clinically significant aspects of pain.

TABLE 3–4. PQRST HISTORY FOR PAIN ASSESSMENT

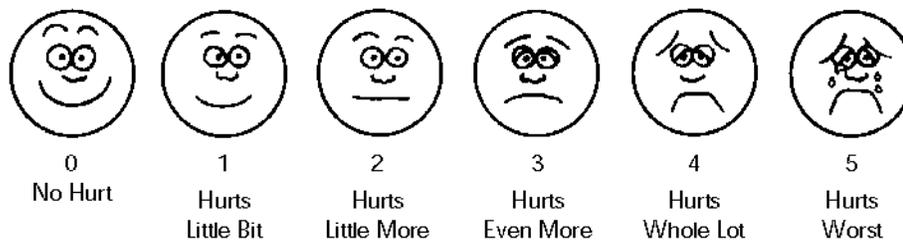
Assessment Points	
P	<ul style="list-style-type: none"> ▪ Problem: How does the student describe the chief complaint? ▪ Provoke: What makes the pain worse? ▪ Palliate: What makes the pain better?
Q	<ul style="list-style-type: none"> ▪ Quality: What is the quality or character of the pain?
R	<ul style="list-style-type: none"> ▪ Radiate: Does the pain or discomfort seem to travel or move?
S	<ul style="list-style-type: none"> ▪ Severity: Using a developmentally appropriate assessment tool (eg, numeric or FACES^a scale), how does the student rate the severity of pain or discomfort? ▪ Signs: What clinical signs accompany the problem? ▪ Symptoms: What subjective problems does the student report?
T	<ul style="list-style-type: none"> ▪ Timing: When did the pain start? Was the onset sudden or gradual?

^aFACES indicates Wong-Baker FACES Pain Rating Scale

Severity may be the most challenging aspect of pain to assess, since it is largely a subjective determination. Various assessment tools can help students quantify the severity of their pain; it’s important to select one that is suitable to the student’s age, cognitive development, and cultural background. For example, school-aged children with average developmental abilities can often rate their pain using a simple numeric scale (*On a scale of 0 to 10, if 0 is no pain at all and 10 is the worst pain you’ve ever felt, tell me how bad the pain is right now*).

For younger students (aged about 3 years and older), those who are less comfortable with numbers, and those who lack the cognitive skills to think about pain in relative terms, the Wong-Baker FACES Scale may be useful (Figure 3–3). The scale allows a student to point to a cartoon face with an expression that reflects the student’s pain experience.

FIGURE 3–3. WONG-BAKER FACES PAIN RATING SCALE



From Hockenberry MJ, Wilson D: *Wong’s Essentials of Pediatric Nursing*. Ed 8. St. Louis, MO: Mosby; 2009. Used with permission. Copyright Mosby.

Pain may be assessed in infants and those with developmental impairment or other impediments to verbal communication by observing behavioral cues, such as facial grimace, and physiologic parameters, such as heart rate.

Interventions

Comfort measures for pain may include applying a cold pack, stabilizing suspected fractures, or dressing wounds.

Focused Physical Examination

The focused physical examination may be limited or complete (head-to-toe) depending on the circumstances, the student's health status, and applicable protocols. At minimum, you will measure and document a full set of vital signs. Table 3-5 provides a mnemonic to help you remember steps you may perform.

TABLE 3-5. FOCUSED (FGHI) PHYSICAL EXAMINATION

	Assessment	Comments
F	Full set of vital signs	Measure and document baseline vital signs, including blood pressure, heart rate, respiratory rate, and temperature. If possible, note weight and blood glucose level as well.
G	Give comfort measures	Perform interventions to alleviate pain, such as applying a cold pack, immobilizing a suspected fracture, or dressing a wound.
H	Head-to-toe assessment <i>Inspect, palpate, auscultate—limited or complete</i>	Perform specialized assessment procedures as indicated, such as cranial nerve assessments, abdominal palpation, or range of motion assessments.
I	Isolate; Injuries; additional Interventions	Assess the potential for communicable disease and isolate as indicated. If you find injuries in varying stages of healing, consider the possibility of child maltreatment. Provide additional interventions according to your findings.

Baseline vital signs

During the initial assessment, your goal was simply to identify clearly abnormal vital signs suggestive of an emergent condition. At this point, establishing baseline vital signs is essential to both the *triage* determination (discussed in the following section) and ongoing reassessment. It is also an important element in continuity of care if the student is referred for further medical evaluation.

Normal vital signs vary with the student's age (Table 3-6). As noted earlier, other factors that can affect normal vital signs include certain chronic medical conditions or physical disabilities, medications, environmental conditions, and the student's emotional state.

TABLE 3-6. PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (birth-30 days)	30-60	100-180	50-90
Infant (1-12 months)	24-50	100-160	60-100
Toddler (1-3 years)	24-40	90-150	80-105
Preschooler (3-5 years)	20-30	80-140	95-105
School-aged (5-12 years)	18-30	65-120	95-120
Adolescent (12 years and older)	12-20	60-100	100-128

BP indicates systolic blood pressure (mm Hg); HR, heart rate; RR, respiratory rate

Measuring blood pressure

To measure blood pressure accurately, use a cuff that is two-thirds as wide as the student's upper arm from the elbow to the axilla. If you do not have a table of normal blood pressure rates, you can use the following formula to approximate the **lowest** acceptable limit for systolic blood pressure:

$$BP=70+(2\times\text{age in years})$$

This formula is appropriate for children older than 2 years.

NOTE Do not rely solely on blood pressure to indicate the severity of the student's condition. Children can maintain normal blood pressure until decompensated shock is imminent.

Temperature and other measurements

Note the student's temperature; if possible, include weight and blood glucose levels as well.

Temperature conversion

Use the following formulas to perform temperature conversions between Fahrenheit and centigrade:

To convert centigrade to Fahrenheit: $(1.8\times^{\circ}\text{C})+32=^{\circ}\text{F}$

To convert Fahrenheit to centigrade: $(^{\circ}\text{F}-32)\times 0.556=^{\circ}\text{C}$

Alternatively, use the information in Table 3-7.

TABLE 3-7. TEMPERATURE EQUIVALENTS

$^{\circ}\text{C}$	$^{\circ}\text{F}$	$^{\circ}\text{C}$	$^{\circ}\text{F}$
34.2	93.6	38.6	101.5
34.6	94.3	39.0	102.2
35.0	95.0	39.4	102.9
35.4	95.7	39.8	103.6
35.8	96.4	40.2	104.4
36.2	97.2	40.6	105.1
36.6	97.9	41.0	105.8
37.0	98.6	41.4	106.5
37.4	99.3	41.8	107.2
37.8	100.0	42.2	108.0
38.2	100.8	42.6	108.7

C indicates centigrade; F, Fahrenheit

Orthostatic vital signs

Orthostatic vital signs can help you assess for dehydration or volume depletion. Record the student's blood pressure and heart rate while the student is supine and again 1 minute after the student sits up or stands. If the blood pressure falls

by more than 20 mm Hg, or if the heart rate increases by 20 bpm, orthostasis is present.

Additional assessments

Inspect, palpate, and auscultate for additional problems as time permits. Look for bleeding, abrasions, wounds, hematomas, or ecchymoses, as well as rashes, petechiae, edema, or pupura.

Reassess the student's activity level (talking or silent; walking or immobile; sitting or supine) and emotional state; compare with your observations from earlier assessments to detect possible trends. Assess orientation to time, place, and person as indicated.

Triage

Principles of Triage

School nursing practice is unpredictable. There may be times when you have several students as well as staff or visitors waiting in the health office, some reporting for scheduled interventions, others presenting with unexpected problems. You must also respond to episodes of acute illness or injury arising elsewhere around the facility. Consequently, you must be able to determine quickly who needs immediate interventions and who can wait. You will not always treat your students in order of arrival—rather, you must treat them according to the seriousness of the presenting illness or injury, placing those whose condition is most critical ahead of others. *Triage*—derived from the French word meaning *to sort*—provides an objective way to do this.

Through your initial assessment findings, you can “sort” 1 or more students into *emergent*, *urgent*, or *nonurgent* categories according to whether a condition exists that has the potential to threaten life, limb, or vision. Treatment priorities and disposition are associated with each triage category.

If the student's condition changes during ongoing monitoring and reassessment, the triage category may be changed as appropriate.

Remember that it's better to overtriage than to undertriage, particularly if your intuition tells you that there is a significant underlying problem. Experience can also help you decide to upgrade your triage determination. For example, if a student who has a history of severe asthma presents with mild dyspnea, you might immediately consider this student's condition emergent and activate EMS transport, knowing that in the past, the student has developed respiratory distress very quickly.

KEY POINT

Do not delegate tasks related to the initial assessment and triage. Only an experienced registered nurse has the expertise to categorize ill and injured students.

While you may delegate tasks associated with ongoing health care, do not delegate tasks related to the initial assessment and triage. Only an experienced

registered nurse has the requisite knowledge and expertise to quickly recognize and categorize ill and injured students.

Performing Triage

Table 3-8 describes the 3 commonly recognized triage categories (*emergent, urgent, nonurgent*) with examples of problems that fall within each category.

TABLE 3-8. TRIAGE CATEGORIES AND DISPOSITION

Category	Examples	Disposition
Emergent <i>Student requires immediate medical attention. Condition is acute and has the potential to threaten life, limb, or vision.</i>	<ul style="list-style-type: none"> ▪ Cardiopulmonary arrest ▪ Altered LOC ▪ Burns, severe/major ▪ Caustic chemical exposure ▪ Childbirth, imminent ▪ Head injury, history of loss of consciousness ▪ Pain, severe or significant location (eg, chest) ▪ Poisoning/drug overdose ▪ Respiratory distress, severe, or respiratory failure ▪ Shock, any type ▪ Spinal cord injury, suspected ▪ Status epilepticus or first-time seizure ▪ Threatens harm to self or others ▪ Trauma, severe or trauma to limb, no distal pulse 	<ul style="list-style-type: none"> ▪ Monitor^a in health office ▪ Transport to emergency care facility via ground or air EMS
Urgent <i>Student requires additional medical intervention within 2 hours. Condition is acute but not severe or life-threatening.</i>	<ul style="list-style-type: none"> ▪ Burns, minor ▪ Deformity/suspected closed fracture without circulatory compromise ▪ Febrile illness (T exceeds 100°F/37.8°C) ▪ GI symptoms (nausea, vomiting, diarrhea) ▪ Lacerations requiring sutures without excessive blood loss ▪ Pain, moderate, after abdominal trauma ▪ Seizure, atypical, in student with history of seizures ▪ Wheezing 	<ul style="list-style-type: none"> ▪ Monitor in health office ▪ Transport to emergency care facility via EMS, parent/guardian, or other adult as appropriate
Nonurgent <i>Student may require referral for routine medical care. Minor or nonacute condition.</i>	<ul style="list-style-type: none"> ▪ Essentially well; S/S of mild noncommunicable illness or URI ▪ Headache without fever/abnormal findings ▪ Injury, minor (abrasions/ecchymoses, muscle sprains/strains) ▪ Pain, mild (eg, abdominal or menstrual pain, headache or toothache) 	<ul style="list-style-type: none"> ▪ Monitor in health office ▪ Contact parent/guardian ▪ Return student to class or send home as indicated

^aMonitoring should be performed by school nurse. EMS indicates emergency medical services; F, Fahrenheit; GI, gastrointestinal; LOC, level of consciousness; S/S, signs/symptoms; T, temperature; URI, upper respiratory infection

Ongoing Monitoring and Reassessment

Ongoing monitoring and reassessment are an essential part of nursing care. Your initial triage decision allows you to formulate a nursing diagnosis and develop the plan of care; you may need to adjust the triage category as well as disposition,

however, after you have evaluated the student's response to interventions and determined whether health status has improved or worsened. A student whose condition initially appeared nonurgent may abruptly deteriorate, requiring immediate attention. This means that you must conduct frequent reevaluations and arrange for ongoing monitoring and observation while you are busy elsewhere.

Follow applicable protocols regarding appropriate monitoring.

Completing the Process

Documentation and Data Collection

Document your assessment findings and triage category in the student's health record. List interventions and the student's response. Record the final disposition as well. Be sure relevant information, such as permission to treat the student, allergies, medications, immunizations, and contact information, is passed on to prehospital care providers so that they can include it in their report to emergency department personnel.

Collect and analyze data to identify injury and illness patterns so that you can monitor and prevent recurrences.

Follow-Up

If possible, follow up any student health care incident with the student's primary health care provider, the emergency department physician, the prehospital care professionals, or the parent/guardian. Document the outcome in the student's health record and incident report, as appropriate.

Prevention

Prevention should be considered the final component in any health care visit. You have an instrumental role in initiating and maintaining measures to minimize the effects of injury or illness and reduce the risk of inaccurate triage decisions, such as

- Establishing written triage guidelines or protocols
- Designating experienced registered nurses to perform triage
- Maintaining knowledge and practice requirements related to triage and decision-making skills
- Knowing which students have emergency care plans on file and reviewing the necessary interventions with others who may have a responsibility for carrying them out.
- Developing and maintaining individualized health care plans and emergency care plans for students with special needs.
- Ensuring that critical information from these care plans is shared with teachers, aides, coaches, and lunchroom or playground monitors as appropriate.

NOTE Under the Family Educational Rights and Privacy Act, parent/guardian consent is not required in order to share student health records with school personnel **provided** they have a legitimate educational interest in the student or a need to know the information to protect their welfare before releasing the information. See Chapter 2: *Legal Issues in Nursing*.

Students With Special Needs

Although the pediatric assessment techniques outlined in this chapter are equally applicable to students who have special health care needs, you must adjust these techniques to accommodate the student's developmental age, rather than basing them on chronologic age. Note also that baseline vital signs for a student with a chronic condition may be outside the range of same-age peers who do not have special needs.

As a school nurse, you see the day-to-day variations among your school's students and are often the first to notice changes in a student's condition. With special needs students, it's particularly important to become familiar with the student's baseline status so that you can tell when the student's condition has changed.

Use developmentally appropriate language, gestures, and techniques when communicating with a student who has cognitive impairment or developmental delay. When assessing students who depend on technologic assistive devices, don't allow yourself to be distracted by the specialized equipment they use. Your focus should always be directed toward the student.

Summary

One of your primary responsibilities as school nurse is to recognize severe illness or injury among the students in your school. It is best to do this using a systematic, consistent assessment schema. Your initial assessment findings give you a basis for determining the urgency of each student's condition through triage. Triage categories allow you to treat students according to acuity of need. Written triage protocols and policies are important in facilitating this process.

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4

Trauma

On completing this chapter, you will be able to

- Discuss how mechanism of injury affects your evaluation of an injured student and may help to identify potential injuries.
- Describe special assessment considerations for injured students of various ages.
- Based on assessment findings, develop and prioritize a plan of care for selected injuries.
- Describe specific traumatic injuries and appropriate emergency care.
- Discuss the unique challenges in assessment and treatment of injuries sustained by students with special needs.

Introduction

In the United States, injury represents a greater threat to children’s health than any disease. It is the foremost cause of death among children older than 1 year and a major cause of morbidity and long-term disability. Motor vehicle crashes (MVCs), drowning, fires or burns, and suffocation are prominent causes of lethal injuries over the span of childhood and adolescence; the specific incidence of injury from any given cause varies by age group in concert with children’s changing developmental abilities and activities.

Not surprisingly, injury is the most common problem seen by school nurses.

When you consider that for every childhood death due to injury, there will be dozens of hospitalizations, hundreds of emergency department visits, thousands of visits to private health care providers and school nurses, and an unknown number of injuries that are treated at home—you can begin to appreciate the tremendous consequences of injury in our daily lives. These factors help to highlight the importance of your role in caring for injured students at school and facilitating injury prevention.

Mechanism of Injury

The term *mechanism of injury* refers to the means by which transferred energy causes damage to tissues, resulting in injury. Transferred thermal energy, for example, heats tissues, resulting in burns. Additional mechanisms of injury are listed below:

- **Kinetic force** causes injuries through motion, such as blunt impact, crushing, acceleration or deceleration, and penetration.
- **Electrical energy** is converted to heat that travels through the body, resulting in thermal injury.
- **Chemical energy** can cause injury through tissue necrosis, in the case of caustic chemicals, or thermal burns if chemicals are converted to heat.
- **Radiant energy** can burn tissues. Exposure to radiant energy can come from the sun, nuclear radiation, or therapeutic radiation.
- **Asphyxiation** associated with drowning/submersion or strangulation causes hypoxic injury to tissues.

KEY POINT

It is important to identify the mechanism of injury, as this will allow you to focus your assessment on potential problems.

It is important to identify the mechanism involved in an injury, as this will allow you to focus your assessment on specific problems it is likely to cause. Additionally, the mechanism itself may affect your triage decision: A significant mechanism of injury is reason to place a student who shows only minor signs of injury into a higher triage category.

In the school setting, injuries are most likely to occur during sports activities or physical education classes, in applied technical classes, and on playgrounds. The prevalent mechanism associated with these injuries is kinetic force, which is the focus of this chapter. (Injuries due to the other mechanisms listed above are discussed in Chapter 9: *Environmental Emergencies*.)

Kinetic-force Injuries

Kinetic force is the energy of motion; in fact, motion and energy are equivalent. Neither is created or destroyed—they merely change forms.

Sir Isaac Newton's First Law of Motion states that a body at rest remains at rest, and a body in motion remains in motion, until acted on by an outside force. When a standing pedestrian is hit by a car, the energy of the moving car acts on the pedestrian, resulting in acceleration motion. The motion continues until the pedestrian strikes another object or the ground, which acts to stop the motion, resulting in deceleration energy. A person who falls from a height is subject to the gravitational force of the earth and will free-fall until motion abruptly stops on impact. These mechanisms usually result in injury.

Kinetic-force injuries fall into 4 broad categories: blunt, penetrating, crush, and acceleration-deceleration.

Blunt-force Injuries

Blunt force accounts for 80% to 90% of traumatic injuries in children. Common mechanisms of blunt-force injury include falls and motor vehicle crashes.

KEY POINT

It is important to maintain a high index of suspicion for internal injuries associated with significant blunt force.

In children, injuries to the skin and soft tissues may not be obvious on initial inspection, making it difficult to extrapolate the degree of injury to underlying structures. It is important to **maintain a high index of suspicion** for internal injuries associated with significant blunt force.

Penetrating Injuries

The kinetic energy delivered by projectiles (such as bullets) or sharp objects (such as knives or broken glass) can cause penetrating injuries. These injuries are often obvious on visual inspection, making them easier to evaluate than blunt injuries.

Crush Injuries

In the school setting, a crush injury can occur in a machine shop or gymnastics class. Crush injuries direct energy toward a focused area, resulting in damage to local tendons, nerves, vessels, muscle, and other underlying tissue.

Acceleration-Deceleration Injuries

When a body that is moving forward rapidly strikes an unyielding object, the body stops suddenly, but the internal organs briefly continue their forward motion until stopped by the inner walls of the abdominothoracic cavity. This type of injury is common among unrestrained children in motor vehicle crashes. The resulting impact energy can tear the organs and blood vessels from their attachment points. The aorta and liver are often affected by this type of injury.

Similarly, whiplash injury of the cervical spine may occur on impact when a child is restrained by a seat belt. The head, which is not restrained, continues forward, then snaps back, causing the injury.

Table 4-1 identifies kinetic mechanisms of injury commonly seen in children and lists specific injuries associated with each mechanism.

TABLE 4-1. KINETIC MECHANISMS AND ASSOCIATED INJURIES

Mechanism	Associated Injuries
MVC as unrestrained occupant, speed exceeding 20 mph	<ul style="list-style-type: none"> ▪ Head injury, closed ▪ Facial trauma ▪ Cervical spine trauma ▪ Blunt trauma to chest and abdomen
MVC as restrained occupant, speed exceeding 40 mph	<ul style="list-style-type: none"> ▪ Acceleration-deceleration injury to the cervical spine ▪ Lap-belt injuries to the abdomen ▪ Spinal fractures ▪ Dislocations
MVC as pedestrian struck at speeds exceeding 25 mph	<ul style="list-style-type: none"> ▪ Fractures of the lower extremities or pelvis ▪ Deep lacerations with significant blood loss ▪ Waddell and Drucker triad (resulting in injuries to the head, thorax and abdomen, and lower extremities) ▪ Blunt chest and abdominal trauma, rib fractures, pneumothorax, and pelvic fractures
Fall from height of more than 10 feet	<ul style="list-style-type: none"> ▪ CNS trauma, skull fracture, spinal injuries ▪ Fractures of long bones and feet ▪ Blunt abdominal trauma, including injuries to the liver, spleen, and kidneys
Penetrating trauma, gunshot/stab wounds	<ul style="list-style-type: none"> ▪ Disrupted arterial or venous blood supply ▪ Pneumothorax
Child maltreatment	<ul style="list-style-type: none"> ▪ Fractures of ribs, skull, long bones ▪ Ecchymoses, lacerations ▪ Sphincter tears (sexual abuse) ▪ Shaken impact syndrome

CNS indicates central nervous system; **mph**, miles per hour; **MVC**, motor vehicle crash

Systematic Assessment of Kinetic Injuries

Assessment

The 5 components of a systematic assessment are described in Chapter 3: *Assessment and Triage*. As you assess the injured student, collect essential information about the mechanism of injury, either from the student or from others who were on the scene. **It is crucial to ascertain the following points:**

- Source of kinetic force (mechanism of injury)
- Anatomic point of impact (the point where force was applied to the body)
- Object or surface of impact (the place where the body landed or stopped)
- Distance or force involved in impact (such as distance fallen or speed of vehicle)

This information helps you accurately focus your assessment on potential injuries.

KEY POINT

Any time a student sustains a major kinetic injury to a single area, assume that multiple injuries are present.

If the student is conscious, explain your actions and interventions throughout the assessment process while providing reassurance and emotional support. Be prepared to treat or stabilize life-threatening conditions as you identify them. **Any time a student sustains a major kinetic injury to a single area, assume that multiple injuries are present.** Activate EMS at the first indication of an emergent situation: Do not wait to complete the entire assessment. In severe trauma, a quick, systematic approach to assessment and intervention followed by rapid transport is the key to the student's survival.

Scene Safety

When responding to the site of an injury, assess the scene for potential hazards that might endanger you, the student, or others present. Call for additional help if indicated. Do not approach until you have determined that is safe to do so.

At the same time, be alert for clues regarding the mechanism of injury. Direct observation of the scene will help you maintain the appropriate index of suspicion as you proceed with your assessment.

Across-the-room Assessment

The across-the-room assessment is a quick overall appraisal of the student's condition based on appearance, breathing, and circulation. Combine your observations with past experience intuition to form an initial impression of the student's vital functions.

Initial Assessment

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

Begin your initial (**ABCDE**) assessment of the injured student by stabilizing the cervical spine, then evaluate the airway, breathing, circulation, and disability (neurologic status) as described in Chapter 3.

Spinal stabilization

Manually stabilize the cervical spine with the head in a neutral, midline position as illustrated in Figure 4-1. **Never allow hyperextension or flexion of the neck.**

FIGURE 4-1. MANUAL CERVICAL SPINE STABILIZATION

- Position student supine
- Place both hands along the lateral aspect of student's head
- Position the head so that the neck is in neutral alignment with the spine
- Place 2 or 3 fingers under each side of the mandible, lifting it upward and forward
- Continue to support the head to maintain neutral cervical alignment



Proper method of simultaneous cervical spine stabilization during airway opening in the student with multiple injuries.

NOTE | You must continue to maintain the airway in the neutral position until EMS personnel arrive. They will be able to provide suctioning and insert an airway adjunct as necessary.

Airway

Listen for stridor, an indicator of airway obstruction. Inspect for sources of airway obstruction, including debris in the oropharynx, emesis, loose teeth, small objects, edema, or displacement of the tongue into the hypopharynx (a common problem in unconscious children).

Interventions

If assistance is available, logroll the student to the side for removal or drainage of emesis, always maintaining neutral alignment.

Breathing

Observe for spontaneous respiration and note the rate, depth, and symmetry of chest movement while listening for breath sounds. Evaluate chest wall integrity, noting any obvious injuries.

The following signs indicate respiratory compromise:

- Use of accessory muscles
- Nasal flaring
- Distended neck veins
- Tracheal deviation
- Audible breath sounds, such as wheezing or stridor

Interventions

If the student exhibits apnea or ineffective respiration, immediately begin mouth-to-mask ventilation.

Circulation

Assess heart rate and quality of pulses, capillary refill time (normally less than 2 seconds), skin color, and skin temperature. Note any external hemorrhage and be alert for signs of hypovolemic shock due to internal or occult hemorrhage.

Interventions

Initiate CPR if circulation is absent. If circulation is present but ineffective due to external hemorrhage, apply direct pressure to the wounds, observing standard precautions. Depending on certification level, EMS responders may be able to begin fluid resuscitation and advanced life support measures on arrival.

Disability

Determine the level of consciousness and evaluate pupil size and reactivity. Use the **AVPU** assessment tool (alert, verbal, painful, unresponsive) to rapidly evaluate mental status (see Chapter 3).

Exposure

Loosen or remove the student's clothing as necessary to inspect briefly for injuries, being careful to maintain body heat. Replace the clothing if you can do so without exacerbating injuries; otherwise, cover the student with a blanket or coat, or something similar.

History and Pain Assessment

History

Obtain a **SAMPLE** history as described in Chapter 3.

Pain assessment

Assess and monitor pain using a visual or numeric pain scale appropriate to the student's developmental abilities (see Chapter 3). Physical signs of pain include

crying, facial grimace, tachycardia, pale, moist skin, and restlessness. Provide comfort measures for pain as permitted by applicable protocols.

Triage

Determine the student's overall condition and assign an initial triage category, keeping in mind that this category may change as you continue your assessment. The *Assessment Tools: Trauma* in *Appendix B* may be helpful in ascertaining the severity of the student's condition. See the *Trauma* protocol in *Appendix A* for a general overview of triage and interventions.

Emergent

The student requires immediate medical attention due to airway or ventilatory compromise, inadequate circulation, neurologic deficit, or suspected cervical spine injury. Any student experiencing a significant traumatic injury in the school setting should be transported by EMS to an emergency department for evaluation.

Urgent

The primary assessment reveals no deficits, but injuries require evaluation or medical intervention within 2 hours. A student with minor traumatic injuries may be transported by EMS or the parent/guardian after you have completed your assessment and initial interventions.

Nonurgent

The student is awake and alert. No immediate intervention is needed. Monitoring and transport may be necessary.

Focused Physical Examination

The focused physical examination involves documentation of vital signs, including temperature, weight, and blood glucose level as available. This is followed by inspection, palpation, and auscultation of the injured area.

If the student's condition is sufficiently stable, you may perform a more complete head-to-toe assessment as permitted by applicable protocols (Table 4-2). During the process, you will reassess some of the areas previously covered during the across-the-room assessment and initial assessment.

Begin with the student supine, then logroll the student into a lateral position and examine posterior surfaces while continuing to maintain spinal stabilization. Explain your actions to the student. Continue to provide reassurance and emotional support.

TABLE 4-2. HEAD-TO-TOE ASSESSMENT FOR TRAUMA

Assessment	Observation Points
General appearance	<ul style="list-style-type: none"> ▪ Reaction to caregiver ▪ Unusual odors (alcohol, chemicals, gasoline) ▪ Body position (alignment) ▪ Stiffness, fidgeting
Head, face, neck	<ul style="list-style-type: none"> ▪ Loose teeth or foreign objects in mouth ▪ Facial symmetry ▪ Pupillary reaction to light ▪ Bilateral periorbital ecchymoses (raccoon eyes) ▪ Cerebrospinal fluid drainage from nose or ears ▪ Ecchymosis at the mastoid area (Battle sign) ▪ Bony deformities ▪ Tracheal deviation ▪ Distended neck veins ▪ Subcutaneous emphysema ▪ Open or closed soft tissue injuries
Chest	<ul style="list-style-type: none"> ▪ Rate and depth of respiration ▪ Symmetry of chest movement during respiration ▪ Use of accessory and abdominal muscles ▪ Breath sounds, heart sounds
Abdomen	<ul style="list-style-type: none"> ▪ Open or closed soft tissue injury ▪ Bowel sounds in all 4 quadrants ▪ Rigidity, tenderness, guarding, distention, ecchymoses
Pelvis and genitalia	<ul style="list-style-type: none"> ▪ Instability and tenderness over iliac crest and symphysis pubis ▪ Blood at the urethral meatus or vagina ▪ Bruising of the scrotum
Extremities	<ul style="list-style-type: none"> ▪ Angulation or deformity ▪ Crepitus ▪ Symmetry and quality of distal pulses ▪ Skin color and temperature ▪ Open or closed soft-tissue injuries ▪ Motor and sensory responses ▪ Capillary refill time
All skin surfaces	<ul style="list-style-type: none"> ▪ Open or closed soft-tissue injuries ▪ Impaled objects ▪ Edema ▪ Scars
Posterior ^a	<ul style="list-style-type: none"> ▪ Obvious bleeding, abrasion, major wounds, impaled objects, hematomas, ecchymoses ▪ Tenderness or deformity of the spine

^aMaintain cervical spine stabilization and logroll student to examine the back

Interventions

Remove jewelry or other personal items that impinge on an area of bleeding or increasing edema. Label them and secure them in a safe place.

Apply sterile dressings to open wounds.

Splint or immobilize suspected fractures, elevate them, and apply cold packs.

Stabilize any impaled object—**do not remove it.**

NOTE | Do not give the student anything to eat or drink while awaiting EMS.

Ongoing Monitoring

Breathing and circulation

Monitor the signs listed in Table 4-3 to assess the ongoing adequacy of respiration and perfusion. Provide appropriate interventions if problems develop.

TABLE 4-3. MONITORING THE INJURED STUDENT

Desired Outcome	Indicators
Effective respiration	<ul style="list-style-type: none"> ▪ Symmetrical chest expansion ▪ Clear bilateral breath sounds ▪ Normal respiratory rate, depth, and pattern ▪ Normal vital signs ▪ Normal work of breathing, without nasal flaring, grunting, or use of accessory muscles
Adequate oxygen intake	<ul style="list-style-type: none"> ▪ Warm extremities ▪ Normal skin color ▪ Normal respiratory rate
Adequate circulatory function	<ul style="list-style-type: none"> ▪ Normal vital signs and capillary refill time ▪ Warm extremities ▪ Normal skin color
Maintenance of cerebral perfusion	<ul style="list-style-type: none"> ▪ Alert and oriented mental status ▪ Spontaneous and equal bilateral movement of extremities ▪ No signs of increased intracranial pressure

Documentation and Data Collection

Detailed documentation of assessment findings and interventions is an important step in the care and treatment of injured students. Begin with the scene survey and across-the-room assessment; include the time of EMS activation and on-site arrival (as indicated) as well as final disposition and transport information. The following data are important for EMS providers and hospital personnel:

- Mechanism of injury, including specific details, such as the distance the student fell or was thrown and the object or type of surface involved in impact
- Time that the injury occurred
- Student's position immediately after the injury occurred
- Student's level of consciousness immediately following injury, including whether loss of consciousness occurred
- Body areas affected
- Student's position at initial nursing assessment

- Names of witnesses and their reports
- Student's health history, including allergies, medications, chronic health conditions, baseline vital signs, and immunization status

It's important to track school injuries. The data will help to support injury prevention efforts and guide revisions to the school's emergency health care program.

Follow-Up

Rehabilitation begins at the time of injury. All interventions should be directed toward returning the student to maximal function on recovery. Many students recover quickly from traumatic injuries, but if long-term disability occurs, you must be prepared to help the student, the family, and the student's peers adapt to lifestyle changes. Familiarize yourself with the support systems that are available through the school and the community and be prepared to assist the family with appropriate resource referrals on an ongoing basis.

Once the student has returned to the school setting, work with the family to update the student's health records. List medications the student must take along with their side effects. Describe unique health problems or special considerations. A plan of care that addresses the student's physical, emotional, intellectual, and spiritual well-being will promote successful reintegration into the school setting.

Prevention

Epidemiology studies have correlated the incidence and severity of pediatric injuries with the following factors:

- The child's developmental level
- Availability and proper use of safety equipment, such as bicycle helmets and seat belts
- Availability of responsible adult supervision
- Prevalence of hazards in the community, such as backyard swimming pools or street gangs

Where risk factors can be controlled, injury can be reduced or prevented.

KEY POINT

Injury prevention should be one of your top priorities. Focus your efforts on injuries that are common, severe, and readily preventable.

As a school nurse, you should make injury prevention one of your top priorities. Preventive measures that can reduce morbidity and mortality associated with pediatric trauma include education, legislation, and rigorous enforcement of regulations and safety laws. Focus your efforts on injuries that are common, severe, and readily preventable. Support existing programs designed to reduce the incidence and severity of these injuries, and introduce new programs within your school to educate students about the hazards of careless or reckless behavior.

Assist other caregivers, including parents/guardians, in the following areas:

- Teaching students to resist peer pressure
- Encouraging structured activities at school
- Encouraging proper use of seat belts and other restraint devices
- Teaching proper use of safety equipment
- Teaching how and when to call law enforcement or rescue personnel
- Teaching rules of traffic and bicycle safety
- Establishing guidelines for water safety
- Facilitating violence prevention programs
- Promoting gang prevention programs

Investigate the many local and national injury prevention programs, activities, and resources that are accessible through the Internet, such as the Emergency Nurses Association's Injury Prevention Institute, Safe Kids USA, and the National Fire Protection Association's Risk Watch injury prevention curriculum. (Web site listings appear in the *References and Information Sources* section at the end of this chapter.)

Selected Mechanisms of Injury

The following paragraphs describe some of the assessment considerations associated with falls, motor vehicle crashes, gunshot wounds, and penetrating injuries.

Falls

Factors that affect injuries associated with falls include distance, surface, and position.

Distance

If the distance fallen is 3 times the individual's height **or** more than 10 feet, significant injury is likely.

Surface

A fall onto an unyielding surface, such as cement or pavement, will have a higher risk for significant injury than a fall onto a yielding surface, such as snow.

Position

When assessing a student who fell, it's important to find out what parts of the body struck the ground first, as this helps to identify body systems that are likely to be affected.

Motor Vehicle–Pedestrian Crashes

A student who is hit by a motor vehicle may experience a predictable pattern of injuries to the femur, thorax or abdomen, and head (Waddell and Drucker triad).

The bumper usually strikes the student first, potentially fracturing the femur. The student is subsequently thrown onto the fender or hood, causing internal injuries to the midsection. The head is the final point of impact as the student hits the windshield or the pavement, making traumatic brain injury (TBI) and spinal injury likely. Always suspect multisystem trauma in any motor vehicle–pedestrian crash.

NOTE | In students younger than 10 years, the head is significantly larger in proportion to the body and therefore tends to strike first when the body comes to rest. Therefore, head injury is likely; spinal injury is also possible.

Unrestrained Passenger in a Motor Vehicle Crash

Head injury is common among students who are unrestrained passengers in a motor vehicle crash. A young student who is traveling as a passenger in the front seat of a car may hit the dashboard head-on with a force as significant as that of a major fall.

Most states have laws mandating that all children younger than 12 years be placed in the back seat of the vehicle and properly restrained with an appropriate safety device, including child safety seats as appropriate. However, monitoring, enforcement, and compliance with these laws continues to be problematic.

Gunshot Wounds

Several factors can influence the type of injuries associated with gunshot wounds.

Bullet

The larger the caliber of the bullet, the greater the potential damage. The type of bullet influences the resultant injury as well. For example, hollow-point bullets—commonly used in handguns—are designed to mushroom on impact, causing greater tissue damage.

Tumble

Some bullets, such as those fired from M-16 assault rifles, tumble as they pass through tissue. The bullet's cone shape places the center of gravity toward the rear of the bullet, so that as it enters the body, it travels "head over heels."

Yaw

Yaw refers to a wobbling motion that a bullet may develop as it travels. Significant yaw may potentiate tissue destruction.

Fragmentation

The bullet may break apart as it tears the tissues, causing additional damage. Some bullets are designed to fragment on impact.

Cavitation

This term refers to rapid displacement of tissues caused by pressure waves radiating from the bullet's path. Together with the bullet's expansion on impact,

this action contributes to the larger size of exit wounds compared with entrance wounds.

Range

Air resistance (*drag*) slows the velocity of the bullet. A bullet fired at long range has diminished velocity at impact, lessening the degree of injury. If fired at close range, injury will be more severe.

Weapon

Rifles and shotguns typically fire higher velocity ammunition than handguns, with the potential for greater damage. As noted above, however, the size of the projectile and distance traveled are also factors.

NOTE | In an incident involving a violent assault, be careful to preserve any evidence for law enforcement officials. If possible, do not disturb the scene at all; if you must remove an object, place it in a paper bag rather than a plastic one, and label the contents with the student's name.

Sharp Objects

Knives, ice picks, or other sharp objects can cause penetrating injuries. Knife wounds are of a lower energy than gunshot wounds, causing damage only in the direct path of contact.

A penetrating object should be stabilized and left in place, as removing it is likely to exacerbate hemorrhage and tissue damage. **Maintain a high index of suspicion** when evaluating these wounds, as they may be more serious than they initially appear. Be sure to factor in multiple wounds as well as entrance and exit wounds during your assessment of stab wounds.

Selected Traumatic Injuries

Head Injury

Epidemiology

Head injury is the most common type of pediatric trauma. It is frequently seen in motor vehicle crashes, falls, assaults, and sports injuries. Damage to the brain secondary to head injury (*traumatic brain injury*) is the leading cause of morbidity and mortality in children and adults aged 1 to 44 years (Langlois et al, 2006).

KEY POINT

Even a mild traumatic brain injury may lead to long-term problems that impinge on quality of life.

Although approximately 75% of the traumatic brain injuries sustained by children each year are mild, even these mild injuries may lead to

long-term problems that can impinge on academic performance and quality of life. Potential sequelae include

- Persistent headaches, confusion, or memory impairment
- Vision or hearing deficits
- Sleep disturbances or listlessness
- Mood changes

Exact incidence rates for these problems are not known, since the injuries may not be treated within the hospital system.

Until the age of 5 years, the incidence of head injury is similar among boys and girls; after age 5, however, the incidence is higher among boys.

Anatomic and physiologic considerations

Young children are vulnerable to head injury because the head is heavier in proportion to the body, making it the most likely point of impact if the child falls or is thrown; while the cranium is thinner and more pliable, offering less protection and transferring more kinetic energy to underlying brain tissues on impact. A child's scalp is very vascular, increasing the risk of complications due to bleeding. Children are also at risk for increased intracranial pressure, intracranial hypertension, and excess blood in the brain.

Assessment**KEY POINT**

Whenever a head injury occurs, suspect spinal injury as well.

Mechanisms that cause head injury are likely to cause spinal injury as well. Always initiate spinal stabilization before beginning your hands-on assessment. Be alert for bradycardia during the initial (**ABCDE**) assessment, and pay close attention to level of consciousness and pupillary response during the disability segment. Other signs to watch for include slurred speech, posturing, and sensory motor deficits. A rapid neurologic assessment may be indicated (see Chapter 7: *Neurologic Emergencies*).

It is important to obtain an adequate history of the incident, including whether there was

- Loss of consciousness
- Temporary amnesia or inability to recognize familiar people
- Lethargy
- Nausea or vomiting
- Seizure activity
- Abnormal behavior for the student's age and developmental abilities

Table 4-4 lists specific head injuries together with typical findings.

TABLE 4-4. HEAD INJURIES

Injury	Description	Signs/Symptoms
Linear skull fracture	Nondepressed fracture in any cranial bone; may not be palpable.	Pain or tenderness; cephalohematoma over fracture site.
Basilar skull fracture	Fracture of any bone at the base of the skull.	Headache, decreased LOC, hemotympanum, ecchymoses over mastoid area, bilateral periorbital ecchymoses, hypotension, tachycardia, respiratory irregularity.
Depressed skull fracture	Associated with a direct blow from a solid, heavy object.	Decreased LOC, palpable depression; laceration possible.
Concussion	Closed head injury resulting in transient neurologic changes, usually associated with a blow to the head or rapid deceleration.	Nausea, vomiting, headache, dizziness, brief change in LOC.
Contusion	Bruising of brain tissue characterized by hemorrhage and edema, commonly caused by direct blow to head, with coup contusion at site of impact, contrecoup contusion opposite.	Transient or permanent neurologic deficits, transient amnesia.
Epidural hematoma	Caused by arterial disruption, often involving the middle meningeal artery; usually associated with blunt trauma.	May have initial brief loss of consciousness, then transient consciousness, then persistent unconsciousness; ipsilateral pupil dilation; paralysis.
Subdural hematoma	More common than epidural hematoma; associated with trauma or violent shaking, venous bleeding. Suspect child maltreatment/shaken impact syndrome.	Deterioration of consciousness.
Subarachnoid hemorrhage	Caused by arterial disruption; consider shaken impact syndrome.	Stiff neck, headache, irritability, seizures.

LOC indicates level of consciousness

Interventions

Activate EMS as indicated (the protocol on *Head/Spinal Cord Trauma* in *Appendix A* provides an overview of triage indications) and notify the parent/guardian. Perform the following interventions as necessary, providing reassurance at all times:

- Apply direct pressure to control bleeding **except** over a depressed skull fracture.
- Apply a cold pack to swollen areas.

NOTE | Do **not** pack the nose or ears if drainage occurs.

Constantly monitor the ABCDs, including vital signs, level of consciousness, and pupillary response, while maintaining the cervical spine in a midline position. Consider placing a blanket or towel rolls on either side of the head to prevent or minimize lateral head movement.

Spinal Cord Injury

Epidemiology

Each year in the United States, about half a million people sustain brain and spinal cord injuries. School-aged children and teens are at high risk for these devastating injuries, which are often incurred during MVCs and sports activities; the risk is lower among toddlers. In many cases, injury could have been prevented through basic precautions, such as proper use of safety devices.

Anatomic and physiologic considerations

Although less common than head injuries, spinal cord injuries may occur with any mechanism that causes hyperextension, flexion, or compression of the spinal column. One type of spinal cord injury that is almost exclusively limited to children is *spinal cord injury without radiographic abnormality* (SCIWORA), in which traumatic hyperextension, flexion, and traction cause spinal cord elongation and injury without vertebral damage.

Assessment

To prevent further injury, it is critical to position and stabilize the cervical spine before beginning the initial (**ABCDE**) assessment. **Do not** hyperextend the neck. In the absence of appropriate equipment for spinal stabilization (cervical collar, backboard, and tape), you must manually maintain this position until EMS providers arrive.

Interventions

KEY POINT

If an injured student complains of pain in the head, neck, or back, or paresthesia or numbness in the extremities, assume that the student has sustained a spinal injury.

If the student is unconscious, open and maintain the airway using a jaw-thrust maneuver. If the injured student is conscious and complains of pain in the head, neck, or back or paresthesia or numbness in the extremities, assume that the student has sustained a spinal injury.

In either case, the triage category is **emergent**. Immediately activate EMS. Maintain the ABCs while continuing to stabilize the neck.

Chest Injury

Epidemiology

Chest trauma is not as common in children as it is in adults. Younger children are more likely to be injured by blunt trauma to the chest; penetrating trauma is more common in adolescents.

Anatomic and physiologic considerations

In infants and younger children, the chest wall is twice as compliant as that of an adult, making rib fractures less common. The risk of mortality increases in students with multiple injuries.

Assessment

Assess the student for respiratory distress, paradoxical chest wall movement during respiration, open chest wounds, and distended neck veins. Tracheal deviation, a late finding, may be difficult to detect in younger children.

In suspected blunt cardiac injury, auscultate the heart to assess for cardiac dysrhythmias. Have an AED readily available.

Table 4-5 describes specific chest injuries together with typical findings.

TABLE 4–5. CHEST INJURIES

Injury	Description	Signs/Symptoms
Pneumothorax	Air accumulation in the pleural space following blunt or penetrating injury.	Fast breathing rate, tachycardia; bilaterally unequal chest expansion; diminished or absent breath sounds on the injured side.
Tension pneumothorax	Air trapped in the pleural space compresses the lung and mediastinum toward the opposite side of the chest.	Significant respiratory distress, diminished peripheral pulses, distended neck veins, tracheal deviation, bradycardia, altered level of consciousness.
Hemothorax	Blood accumulation in the pleural space.	Tachycardia, hypotension, pallid or cyanotic skin, delayed capillary refill, dyspnea, fast breathing rate, diminished or absent breath sounds on the injured side.
Pulmonary contusion	Ecchymosis of pulmonary tissue with alveolar capillary damage. Edema and hemorrhage decreases lung compliance, impairing ventilatory exchange.	Respiratory distress, localized rales or wheezes, hemoptysis, hypoxemia.
Blunt cardiac injury	Ecchymosis of the myocardium caused by blunt trauma.	Chest pain, weak peripheral pulses, hypotension, tachycardia, muffled heart tones, dysrhythmias.
Rib fractures	Fracture of 1 or more ribs.	Chest pain, crepitus, ecchymosis, decreased respiratory effort.

Interventions

The triage category is **emergent** for any of the findings listed above. Immediately activate EMS and notify the parent/guardian.

Your initial priority is to maintain the ABCDs with simultaneous stabilization of the cervical spine. If you suspect an open pneumothorax, apply a nonporous dressing and tape it on 3 sides; monitor for signs of tension pneumothorax. ED

management of pneumothorax, tension pneumothorax, and hemothorax includes needle thoracostomy, chest tube insertion, or both.

The *Chest Trauma* protocol in *Appendix A* provides an overview of triage and intervention.

Abdominal Injury

Epidemiology

Most abdominal injuries in children involve blunt trauma due to MVCs or motor vehicle–pedestrian crashes; however, the incidence of penetrating injuries is increasing among school-aged children.

Anatomic and physiologic considerations

Children have certain physiologic and anatomic characteristics that increase the risk of severe abdominal injuries: Their abdominal muscles are thin and weak, while the chest wall is very pliable, so that the abdominal organs are not well protected. The liver and spleen are particularly susceptible to injury.

Assessment

During the initial (**ABCDE**) assessment, observe the respiratory pattern, noting expiratory grunting.

Determine the mechanism of injury while gathering information for the history. Perform a pain assessment to determine the location, quality, and severity of the pain and whether it radiates to another area (see Chapter 10: *Abdominal and Genitourinary Emergencies*).

Perform a focused physical examination to inspect for evidence of soft tissue injuries. Assess for rigidity, guarding, and abdominal distention as well.

Laceration of the liver

Assessment findings that indicate hepatic laceration include abrasions or contusions to the right upper quadrant, abdominal distention, signs of rib fracture on the right side of the chest, guarding, tenderness, rigidity on palpation, and dullness on percussion. This type of injury is associated with high morbidity and mortality in children.

Injuries to the spleen

KEY POINT

Pain in the left upper quadrant that radiates to the left shoulder indicates potential injury to the spleen.

Splenic injuries are often caused by blunt impact sustained during a sports activity or a fall from a bicycle in which the student's abdomen hits the handlebars. Maintain a high index of suspicion for splenic injury if there is trauma to the left upper quadrant or the lower left side of the chest. **Pain in the left upper quadrant that radiates to the left shoulder is an important clinical finding associated with injury to the spleen.** Hypoactive or absent bowel sounds and dullness on percussion support this suspicion. If the diaphragm is ruptured as well, you may auscultate bowel sounds in the chest.

Interventions

The triage category is **emergent** for potential intra-abdominal injuries. Immediately activate EMS.

Maintain the ABCs with simultaneous stabilization of the cervical spine if there is any potential for spinal injury. Cover open abdominal wounds with a sterile dressing moistened with sterile saline, if available. If abdominal contents have extruded through the wound, **do not** attempt to push them back in.

Musculoskeletal Injury

Anatomic and physiologic considerations

School-aged children are susceptible to musculoskeletal injuries incurred during play and sports activities. Musculoskeletal injuries to the long bones frequently damage the epiphyseal plate where growth takes place, as this area is weaker than the adjacent bone and connective tissue. This damage may inhibit growth of the bone, causing deformities. In children with multiple injuries, musculoskeletal trauma can contribute to hypovolemic shock.

Assessment

Obtain an adequate history, including the mechanism of injury. Note any deformity, edema, or tenderness on palpation. Inspect for abrasions, contusions or lacerations, and bleeding. To assess neurovascular status, evaluate the **5 Ps** (**P**ain, **P**ulse, **P**allor, **P**aresthesia, **P**aralysis) as described in Chapter 11: *Musculoskeletal Emergencies*.

Interventions

The triage category depends on the severity of the injury. Interventions include measures to optimize tissue perfusion and prevent neurovascular compromise. More information appears in Chapter 11 and in the *Musculoskeletal Injury* protocol in *Appendix A*.

Amputation

Amputation is an **emergent** situation requiring **immediate** activation of EMS. Time is of the essence, as successful replantation depends on

- Appropriate care of the amputated part
- Minimizing the time between amputation and surgery

Control bleeding

An unconscious student should be kept supine. Provide constant reassurance if the student is conscious.

Use a sterile dressing to apply direct, firm pressure to the affected extremity. Once applied, the dressing **should not** be removed to assess bleeding; if necessary, apply a clean dressing on top of the existing one.

NOTE Vasoconstriction may occur, particularly in guillotine-type amputations, which will help to curtail blood loss.

Elevate the injured limb above the level of the heart and continually monitor vital signs and level of consciousness. Apply a tourniquet only as a last resort to control profuse hemorrhage, as nerve and tissue damage may occur distal to the point of constriction.

Preserve the amputated part

It is critical to locate the amputated part and prepare it for transport according to applicable protocols.

- Wrap the amputated part in sterile gauze that has been slightly moistened with sterile saline.
- Place the wrapped part in a plastic bag, seal the bag tightly, and place the bag on cold packs for transport. **Never** place the amputated part directly on the cold packs, as this may exacerbate tissue damage.
- Label the bag with the student's name, the date and time of injury, and the time that the part was secured in the bag and chilled.

An overview of wound management appears in the *Lacerations/Abrasions* protocol in Appendix A. Amputation interventions are included in the *Trauma* protocol.

Special Issues: Intentional Injury

KEY POINT

Consider the possibility of child maltreatment whenever an injured student reports to the health office.

Every time a student reports to the health office with an injury, consider the possibility that the injury might have resulted from an intentional act, either committed by another person or self-inflicted by the student.

To determine whether further investigation is warranted, assess whether the history of the incident is consistent with the injury and with your knowledge of the student's abilities.

Child maltreatment is illegal. You are mandated to report even a suspicion of maltreatment to the appropriate state agency. You may need to request intervention from a child protection agency as indicated.

See *Appendix B* for a copy of the reporting form issued by the Department of Children and Family Services in Illinois.

Students With Special Needs

It is increasingly common for students with special needs to attend the public school system. These students may have a variety of disabling or chronic

conditions that can complicate assessment or treatment following a traumatic injury. For example, a student who cannot hear or who has difficulty communicating may not be able to tell you what has occurred or where it hurts.

If possible, consult the student's health record for information about the student's level of function and means of communication. It is helpful to ask a teacher or other staff member who has worked closely with the student to assist you.

Regardless of the physical or developmental limitations of the injured student, however, your approach to assessment and interventions remains the same:

- Explain your actions and provide reassurance, no matter what the student's level of understanding.
- Gather as complete a history as possible, since there may be a variety of medical conditions that affect baseline findings.
- Evaluate level of consciousness according to the student's normal baseline. Focus on what the student is able to do.
- Management priorities include maintenance of ABCs with simultaneous stabilization of the cervical spine.

When assessing a student who depends on an assistive device, you must work around the device to complete a thorough examination. Medical devices should be transported with the student if possible; otherwise, secure them for a family member to collect.

Students with cerebral palsy assume characteristic positions that make assessment challenging. Never forcibly manipulate the student's posture. These students may wear braces or splints to prevent muscle contraction. Braces can help to splint or stabilize injuries unless respiratory or circulatory impairment warrants their removal.

Summary

Injuries are the leading cause of death in school-aged children. Appropriate assessment and treatment of student injuries is one of your more important roles. In all cases, it is crucial to determine the mechanism of injury involved and use that information to direct your assessment toward potential trauma. Be sure to pass this information along to EMS providers and hospital personnel.

Track school injuries and use the resulting data as part of your injury prevention efforts. Educate students and other school personnel about common injuries and how to avoid them. Seek to improve professional skills that will help you manage traumatic injuries. Actively promote safety and injury-prevention programs.

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Respiratory Emergencies

On completing this chapter, you will be able to

- Define the most common types of respiratory emergencies in school-aged children.
- List the steps in assessing a student who is experiencing respiratory distress.
- Discuss appropriate interventions for selected respiratory emergencies.
- Identify unique issues that may arise during respiratory emergencies involving students with special needs.

Respiratory Illness in Children

Respiratory illnesses are common among school-aged children, constituting a major cause of morbidity and mortality. Respiratory distress leading to respiratory failure is the most common cause of cardiopulmonary arrest in children.

Epidemiology and Demographics

Communicable diseases account for most pediatric respiratory illness. The demographics of respiratory infection vary with age: Infants younger than 3 months have a lower infection rate, presumably due to the protection afforded by maternal antibodies. The rate of viral infection increases between the ages of 3 to 6 months as maternal antibodies disappear, and remains high during the toddler and preschool years. By the time the child reaches the age of 5, viral infections decrease and bacterial infections, including infections from *Mycoplasma pneumoniae* and group A beta-hemolytic streptococci, begin to rise. Common respiratory tract pathogens appear in epidemics during the winter and spring months, coinciding with the typical school year.

Some chronic respiratory diseases, notably asthma, are increasing in prevalence. Asthma is the most common chronic disease of childhood, responsible for more hospital admissions, emergency department visits, and school absences than any other, according to the Centers for Disease Control and Prevention, which estimated that 6.8 million school-aged children had the disease in 2006. While the causes of asthma are still being studied, genetic disposition and environmental triggers are known contributors to its development and severity.

The incidence of pertussis is also increasing, possibly due to inadequate immunization programs or failure to seek immunization. While the disease commonly affects young children, the incidence in older children is rising. In addition, tuberculosis has reemerged as a worldwide public health hazard. While TB is typically seen in adults, its incidence is increasing in children as well.

KEY POINT

Management of respiratory emergencies is a critical aspect of school nursing practice; failure to recognize and treat respiratory distress can lead to cardiac failure and death.

Management of respiratory emergencies is a critical aspect of school nursing practice; failure to recognize and treat respiratory distress can lead to cardiac failure and death. This chapter discusses common respiratory illnesses and emergencies you are likely to encounter in the school setting, emphasizing assessment and immediate interventions to prevent deterioration.

Anatomic and Physiologic Considerations

Anatomic and physiologic differences between children and adults affect both assessment and treatment of pediatric respiratory problems. Children have increased susceptibility to certain types of respiratory complaints and often respond differently to respiratory distress. Additionally, any pediatric condition

that affects the respiratory tract can increase the child's risk of infection. Such conditions include allergies, asthma, cardiac anomalies, cystic fibrosis, and any type of immunocompromise. Note as well that exposure to second-hand smoke exacerbates respiratory illness in children with pulmonary conditions.

Some of the factors that influence a child's susceptibility and response to respiratory illness are listed below.

CNS control of respiration

Infants possess fewer peripheral chemoreceptors than older children and adults. Therefore, they initially respond to hypoxemia with hyperpnea. Slow respiration develops subsequently, followed by apnea.

Airway structures

In infants and young children, the airway is smaller and narrower than in older children and adults, increasing susceptibility to respiratory distress. The supporting cartilage and muscles of the airway are incompletely developed until the school-age years, so laryngospasm and bronchospasm are more likely to cause airway obstruction.

Chest wall

The chest wall in infants and children is twice as compliant as in adults, making rib fractures less common. Because the chest wall is thin, breath sounds are easily transmitted throughout the thoracic cavity; extra care is needed during auscultation to locate the source of abnormal breath sounds.

Respiratory muscles

The diaphragm is the chief muscle of respiration; in children, it becomes fatigued more readily during respiratory distress, contributing to the development of respiratory failure. Any mechanism that impedes diaphragmatic contraction or movement, such as abdominal distention, will exacerbate respiratory distress.

In adults, the intercostal muscles help the chest wall expand during respiration. In children, these muscles are not well developed and serve only to stabilize the chest.

Pulmonary tissue

Lung compliance is low in the neonate, but increases during childhood. Children and infants have a smaller tidal volume than adults, decreasing oxygen reserves.

Gas transport

In a child, pallor, restlessness, and an altered level of consciousness are evidence of hypoxemia. Because young children are relatively anemic compared with adults, cyanosis is a late sign of respiratory compromise. About 50% of the child's blood must be deoxygenated before cyanosis is evident.

Health office equipment for management of respiratory emergencies

Besides standard equipment and supplies (such as a stethoscope for auscultating breath sounds, basic first aid equipment, and personal protective gear), it is useful to stock the health office with peak flow meters for assessing the severity of an asthma attack. Ensure that epinephrine is on hand for treating anaphylaxis and status asthmaticus as permitted by applicable protocols and individual physicians' orders.

NOTE | A student who may require specialized medical interventions at school should have an emergency care plan (ECP) on file that describes the steps to carry out the interventions, together with a physician's orders approving the procedures. Regularly review ECPs to ensure that they are up-to-date. See Chapter 14: *Planning for Students With Special Needs* for information on developing ECPs.

Students with special health care needs may require oxygen, oral or tracheal suctioning equipment and supplies, and specific medications. Be sure to maintain your skills in suctioning and replacing a tracheostomy tube so that you will be prepared to meet these students' needs.

Systematic Assessment of Respiratory Distress

Assessment

Refer to Chapter 3: *Assessment and Triage* for a detailed discussion of the 5 components of a systematic assessment. The information below outlines the assessment steps as applied to respiratory illness. Information about specific respiratory emergencies follows in a separate section. See the *Respiratory Distress* protocol in *Appendix A* for an overview of assessment, triage, and treatment.

Remember that it is essential to perform interventions for significant problems **before** moving on to the next step of the assessment. Be prepared to activate EMS at the earliest sign of an emergent situation.

Scene Safety

When responding to the scene of an illness or injury, check for potential hazards that might endanger you, the student, or others present. Call for additional help if indicated. Do not approach until you have determined that is safe to do so.

Across-the-room Assessment

Perform an across-the-room assessment of the student's general appearance as outlined in Chapter 3. Watch for *tripod* positioning, a mechanism to reduce work of breathing. The student will be seated, leaning forward with extended arms; the hands are usually resting on the knees. Students with congenital heart disease may also adopt this position increase venous return.

Always allow the student to maintain the position that is most comfortable.

Initial Assessment

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

Proceed with a rapid initial (**ABCDE**) assessment of the airway, breathing, circulation, disability (neurologic status), and exposure as described in Chapter 3. If possible, gather history information as you go. If the student is unable to respond to your questions, you may be able to get this information from a teacher or another student who observed the precipitating incident or onset of illness.

Airway

Look, listen, and feel for signs of a patent airway.

Interventions

Provide positioning and open the airway as necessary, observing cervical spine precautions if head or spinal injury is possible (see Chapter 4: *Trauma*).

Breathing

Assess for significant abnormalities in the respiratory rate, breath sounds, and work of breathing. Be alert for profuse bleeding or other signs of injury.

Interpreting your findings

Respiratory rate

KEY POINT

In a student with signs of respiratory distress, a slow breathing rate indicates deterioration rather than improvement.

In children, a fast breathing rate is an early compensatory mechanism for hypoxia and respiratory distress. Slow respiration follows as hypoxia increases. It is important to be aware that a slow breathing rate in a student with signs of respiratory distress indicates worsening distress or imminent respiratory failure rather than clinical improvement.

Breath sounds

Wheezing is the hallmark sign of lower airway obstruction. Bilateral wheezing occurs in asthma and bronchiolitis. Unilateral wheezing may indicate airway obstruction by a foreign body.

Stridor (a high- or low-pitched crowing sound) is the hallmark sign of upper airway obstruction. Acute stridor is most commonly caused by aspiration of a foreign body. High-pitched stridor may accompany croup or foreign body obstruction; low-pitched, muffled stridor occurs in epiglottitis.

Decreased, absent, or unequal breath sounds can be caused by airway obstruction, pneumothorax, hemothorax, or atelectasis. Unilateral obstruction may change the pitch of breath sounds rather than affecting their intensity.

Grunting is caused by early closure of the glottis during exhalation and is generally accompanied by active chest wall contraction. **This is a late sign of severe respiratory distress.**

Work of breathing

Nasal flaring, retractions, and use of accessory muscles indicate increased work of breathing.

Circulation

Check the heart rate and quality of the pulses. Assess perfusion by evaluating capillary refill time, followed by skin color, temperature, and moisture.

Interpreting your findings

Abnormal skin findings include pallor, diaphoresis, a cool temperature, and clamminess. Cyanosis is a late sign indicating severe and increasing respiratory distress. Note, however, that students with certain chronic conditions, such as congenital heart disease, may have cyanosis as a baseline finding. This information should appear in the student's health record.

Disability

Perform a brief evaluation of neurologic function by assessing level of consciousness using the **AVPU** scale (see Chapter 3), then evaluate pupil size and reactivity.

Interpreting your findings

Restlessness and agitation are early signs of hypoxia. Lethargy and somnolence are late signs associated with increasing hypoxia and severe respiratory distress.

Exposure

Keeping the student as warm as possible, open or remove clothing briefly to check for additional signs, such as retractions, rashes, injuries, or asymmetric movement of the chest wall.

History and Pain Assessment

Refer to the **SAMPLE** mnemonic (Table 5-1) to complete the history. Be sure to ask about medications the student is taking and preexisting illness or injury that may have contributed to the current problem. If the student is injured, ask about the mechanism of injury. Review the student's school health record as well, noting allergies, chronic conditions, and current medications.

TABLE 5-1. SAMPLE HISTORY FOR RESPIRATORY DISTRESS

	Topic	Questions
S	Symptoms	<ul style="list-style-type: none"> ▪ What problem brings the student to the health office? ▪ How long has the problem persisted? ▪ Was the onset sudden or gradual? ▪ Does the student have any associated complaints, such as pain, apprehension, or dizziness? ▪ What is the student's self-assessment of the distress? ▪ What makes the symptoms better or worse? Does positioning help?
A	Allergies	<ul style="list-style-type: none"> ▪ Does the student have any known allergies to food, medications, latex or other materials, or environmental elements (smoke, pollen, stings)?
M	Medications	<ul style="list-style-type: none"> ▪ Is the student taking any medications? For what reason? ▪ When was the last dose taken? What was the result?
P	Past health history	<ul style="list-style-type: none"> ▪ Are immunizations up to date? ▪ Has the student been exposed to a respiratory infection? ▪ Is anyone else at home ill? ▪ Does the student have a chronic or preexisting illness that would increase susceptibility to respiratory distress? ▪ Is there an individualized health care plan or emergency care plan? ▪ Has the student previously required emergency care or hospitalization for the current complaint?
L	Last meal	<ul style="list-style-type: none"> ▪ Is the student able to drink or swallow? ▪ When was the last meal? ▪ Has there been any nausea or vomiting? ▪ Are bowel and bladder function normal?
E	Events preceding the problem	<ul style="list-style-type: none"> ▪ When did the problem begin? ▪ Were there precipitating factors, such as exercise or exposure to chemicals or cold air? ▪ Was an injury involved?

Follow the history with a pain assessment, using a suitable numeric or visual pain scale (Chapter 3).

Interpreting your findings

Chest pain may be related to injury or muscle strain from coughing. A student with a pneumothorax will complain of sharp pain. In some cases, a student with pneumonia may complain of abdominal pain.

Focused Physical Examination

The focused physical examination may be limited or complete (head-to-toe) depending on the circumstances, the student's health status, and applicable protocols.

At minimum, measure and document the student's heart rate, respiratory rate, and blood pressure. If possible, measure temperature as well. (Omit this step if it causes the student any distress.)

If the student's condition permits, remove clothing as necessary to inspect, palpate, and auscultate for additional findings. Observe for asymmetrical movement of the chest wall, depth and pattern of breathing, and retractions.

NOTE | Since the chest wall is thin in children, breath sounds are easily transmitted throughout the thoracic cavity. Be sure to auscultate breath sounds in all lung fields.

Interventions

Form a plan of care based on the student's health record, the history of the incident, and the presenting signs and symptoms. Your main goals are to support the airway, relieve distress, and triage the student appropriately. The following interventions are indicated for any degree of distress:

- Allow the student to maintain a position of comfort.
- If oxygen is available and the student tolerates it, administer oxygen as permitted under applicable protocols or individual physician's orders.
- Avoid procedures that might agitate the student, such as temperature measurement or examination of the oropharynx. Agitation can exacerbate respiratory distress.
- Provide reassurance that you will contact the parent/guardian and stay with the student until help arrives.
- Administer medications as directed in the student's individualized health care plan (IHP) or ECP.

If signs of distress are more severe, provide basic life support measures as indicated and activate EMS for **immediate** transport to the nearest hospital.

Triage

Determine the triage category based on the following guidelines:

Emergent

The student requires immediate medical attention based on signs and symptoms of severe respiratory distress or impending respiratory failure, including severe retractions, tripod positioning, airway compromise; rapid, slow, shallow, or absent respiration; stridor, wheezing, grunting, decreased or absent breath sounds; cyanosis, tachycardia, hypotension; decreased level of consciousness (lethargy or restlessness).

Immediately activate EMS to transport the student to the nearest hospital. Notify the parent/guardian as soon as possible.

Urgent

The student has a chronic respiratory condition **or** signs and symptoms of mild respiratory distress, such as decreased air movement or mild retractions.

KEY POINT

Activate EMS if you have any doubt about the student's condition.

Disposition for students in this category must be considered case by case. Unless you have a record of normal baseline data, it may be difficult to evaluate a student with a chronic condition. When appropriate, consult with the parent/guardian, the primary health care provider, or both to determine changes in the baseline. **Activate EMS if you have any doubt about the student's condition.**

Nonurgent

There are no indications of distress. The student's breath sounds and color are normal.

The student may require monitoring at school or referral to the primary health care provider. Complete your focused physical examination and notify the parent/guardian.

Documentation and Data Collection

Record the incident on a confidential health office daily census (see *Appendix B* for an example). Document it in more detail in the student health record. Note both subjective and objective information, assessment findings, and your plan of care.

Keep the detailed record of the incident in the student's file along with any EMS forms. If you transfer the student to the emergency department, send the following information with EMS personnel:

- A copy of the nursing form with documentation of your assessment and interventions as well as the student's response
- Information from the school health record, including age and weight, health history, medications, allergies, and immunizations
- Contact information for the parent/guardian and the primary health care provider
- Normal baseline findings for students with special health care needs
- The time that the student last ate or drank

If the student has an ECP, send a copy to the hospital with the student.

Evaluation

After each incident, evaluate the effectiveness of emergency treatment, including

- The student's response to interventions
- Adequacy of protocols, including the ECP, for dealing with respiratory emergencies of this nature
- Whether the incident could have been prevented

Review student records, daily documentation forms, and injury reports to evaluate the care that was rendered and the student's response. Investigate any trends in illness or injury that become evident, whether they affect a single student or the school as a whole. For example, a student with asthma who experiences repeated attacks may benefit from medication adjustments,

evaluation of school activities, or reevaluation by the primary health care provider or specialist.

Follow-Up

If the student was referred to the hospital, complete the following activities:

- Contact the student’s parent/guardian for release of information about the incident so that you can develop appropriate preventive and follow-up measures. Also request permission to share treatment and outcome information with the student’s teacher, particularly if a contagious condition is involved.
- When appropriate, review recommendations or changes in the treatment plan with the teacher and student.

Selected Respiratory Emergencies

Table 5-2 lists some of the more common causes of respiratory emergencies in school students.

TABLE 5-2. ETIOLOGY OF PEDIATRIC RESPIRATORY DISTRESS

Upper Airway	Lower Airway
<i>Infections</i>	
<ul style="list-style-type: none"> ▪ Croup ▪ Epiglottitis ▪ Bacterial tracheitis ▪ Peritonsillar or retropharyngeal abscess 	<ul style="list-style-type: none"> ▪ Bacterial or viral pneumonia ▪ Bronchiolitis
<i>Trauma</i>	
<ul style="list-style-type: none"> ▪ Neck injury ▪ Laryngeal paralysis ▪ Foreign body aspiration ▪ Smoke inhalation 	<ul style="list-style-type: none"> ▪ Pneumothorax ▪ Submersion injury ▪ Spinal cord injury ▪ Foreign body aspiration ▪ Smoke inhalation
<i>Congenital causes</i>	
<ul style="list-style-type: none"> ▪ Structural airway anomalies associated with Down syndrome or Pierre-Robin syndrome (such as cleft palate with absent gag reflex) 	<ul style="list-style-type: none"> ▪ Cystic fibrosis
<i>Allergenic causes</i>	
<ul style="list-style-type: none"> ▪ Spasmodic croup ▪ Anaphylaxis 	<ul style="list-style-type: none"> ▪ Asthma ▪ Bronchospasm ▪ Anaphylaxis

Upper Airway Emergencies

Upper airway emergencies are commonly caused by infections, such as croup or epiglottitis, or by aspiration of a foreign body.

Croup and epiglottitis

Croup

Croup is characterized by upper airway edema associated with laryngotracheobronchitis. It is usually caused by the parainfluenza virus and occurs primarily in children aged 6 months to 3 years, but it may be seen in older children. The disease is most prevalent during late autumn and winter.

Epiglottitis

A life-threatening bacterial infection of the epiglottis and surrounding tissue, epiglottitis is usually caused by *Haemophilus influenzae* type b (Hib). The Hib vaccine has significantly reduced the incidence of epiglottitis in children aged 2 to 6 years; the disease still occurs in older children and adults.

Table 5-3 lists signs and symptoms that help to distinguish these diseases.

TABLE 5-3. SIGNS/SYMPTOMS OF CROUP AND EPIGLOTTITIS

Croup	Epiglottitis
Gradual onset	Sudden onset
Late night seal-bark cough	Muffled cough (not a prominent finding)
Low-grade fever	High fever
Inspiratory stridor	Inspiratory stridor
Hoarse voice	Dysphagia
Other signs and symptoms depending on degree of distress	Sore throat
	Drooling (sometimes noted)
	Tripod position (facilitates air movement)

NOTE | **Spasmodic croup** is different from viral croup and is thought to be caused by an allergic reaction. It occurs in previously healthy children and is characterized by the sudden onset of dyspnea with a barking cough and stridor, usually arising in the middle of the night. Exposure to humidity is therapeutic. This type of croup is unlikely to occur in the school setting.

Interventions for croup

If distress is mild, notify the parent/guardian, the student's primary health care provider, or both. Observe for signs of worsening.

If respiratory distress is moderate to severe, expose the student to a cold-water vaporizer or, weather permitting, take the student outside into the cold air. If this is not possible, take the student into the bathroom and turn on the hot water faucets to create steam. Call for EMS transport; notify the primary health care provider and parent/guardian.

Interventions for epiglottitis

If you suspect epiglottitis, consider the student's condition **emergent**. Call EMS and arrange for immediate transfer. Notify the parent/guardian and the hospital.

Try to calm and reassure the student. Do nothing to upset or agitate the student. Do not measure the student's temperature or examine the oropharynx. Allow the student to maintain a position of comfort, usually sitting. If the student tolerates it, administer oxygen, if available, as permitted by applicable protocols or physician's orders.

Foreign body airway obstruction

Assessment

Aspiration of food, small toys, or other objects can cause airway obstruction, accounting for many instances of sudden respiratory distress. The aspirated foreign body may cause mild or severe obstruction.

In mild airway obstruction, the student may appear anxious. You may note wheezing or stridor. Gagging, choking, and coughing are common.

Signs of severe airway obstruction include increased difficulty breathing, silent cough, or inability to cough or make any sound. Cyanosis quickly develops with loss of consciousness. Findings and interventions are summarized in Table 5-4.

TABLE 5-4. FOREIGN BODY AIRWAY OBSTRUCTION

Condition	Findings	Interventions
Emergent <i>Severe airway obstruction</i>	<ul style="list-style-type: none"> ▪ Choking, silent cough or ▪ Unable to speak or cough ▪ Pallor or cyanosis ▪ Loss of consciousness 	<ul style="list-style-type: none"> ▪ Initiate AHA/ARC airway clearing maneuvers ▪ Activate EMS ▪ Notify parent/guardian
Remember: CPR is ineffective without a patent airway!		
Urgent <i>Mild airway obstruction</i>	<ul style="list-style-type: none"> ▪ History of aspiration ▪ Fast respiration ▪ Intermittent wheezing or stridor ▪ Gagging, choking, coughing ▪ Pink skin color ▪ Mild to moderate dyspnea 	<ul style="list-style-type: none"> ▪ Encourage forceful cough ▪ Monitor for worsening distress, weak, ineffective cough, inspiratory wheezing, labored breathing, tachycardia, cyanosis (a late sign)

AHA indicates American Heart Association; ARC, American Red Cross

Interventions

Follow current foreign body obstruction interventions outlined by the American Heart Association or American Red Cross. Additional information, including airway clearing maneuvers, appears in the *Foreign Body Airway Obstruction* protocol in *Appendix A*.

Artificial airway obstruction

Airway obstruction may arise in students who rely on artificial airways, making it essential for you to maintain your skills in suctioning and replacing these devices. If respiratory distress arises in a student with a tracheostomy, immediately call EMS and consult the student's ECP. Assess for a mucous plug obstructing the

tracheostomy tube. If possible, use a suction catheter to remove the plug. If you are unable to pass the catheter into the tracheostomy tube, remove the entire tube.

If these measures do not resolve the problem, suction the tracheal stoma in case there is a mucous plug in this area; administer oxygen if available. If the student's condition improves after suctioning, continue monitoring until the student is completely stable. Notify the parent/guardian and primary health care provider or specialist physician for follow-up care.

Lower Airway Emergencies

Common causes of lower airway emergencies include foreign body obstruction, asthma, bronchiolitis, pneumonia, and pneumothorax. Anaphylaxis, which can also cause lower airway obstruction, is discussed in Chapter 13: *Medical Emergencies*.

Foreign body airway obstruction

A foreign body lodged in the right or left main bronchus can obstruct the lower airway. The primary episode may cause coughing or gagging that subsequently subsides. History is very important in lower airway obstruction.

Follow foreign body obstruction interventions outlined by the American Heart Association and American Red Cross. Additional information, including airway clearing maneuvers, appears in the *Foreign Body Airway Obstruction* protocol in *Appendix A*.

Bronchitis and bronchiolitis

Assessment

Acute inflammation of the bronchi (bronchitis) occurs most commonly among school-aged children, often arising when an upper respiratory infection, such as a cold or sinus infection, spreads to the bronchial tree. Bronchitis therefore tends to be more prevalent during the winter and early spring.

Findings associated with bronchitis include fever with chills, muscle aches, nasal congestion, and a sore throat. There is usually a cough, which may be either productive or nonproductive. Mild respiratory distress may arise as symptoms progress. Among otherwise healthy children the disease is self-limiting, usually resolving within 10 to 14 days, although the cough may persist beyond this period.

Acute inflammation of the bronchioles (bronchiolitis) is usually restricted to infants and children younger than 2 years. This disease is often associated with a respiratory syncytial virus. The history usually includes a runny nose and cough of several days' duration, sometimes accompanied by poor fluid intake. There may be vomiting, irritability, and marked respiratory distress. As respiratory distress increases, you may note nasal flaring, suprasternal retractions, grunting, and a fast breathing rate. Cyanosis is a late sign indicating impending respiratory failure. Very young infants and those with underlying congenital heart disease, pulmonary disease, or immunocompromise are more severely affected.

Interventions

Appropriate interventions depend on the severity of the illness. If distress is mild, with good air movement and normal skin color, give plenty of fluids and monitor vital signs and respiratory status. Isolate the child from other students. Watch for signs of increased distress.

In students with more severe findings, such as wheezing, decreased air movement, poor color, irritability, and refusal to take fluids, arrange for EMS transport to the hospital and notify the parent/guardian. Monitor respiratory status. If the student tolerates it, administer oxygen (if available) as permitted by applicable protocols and individual physician's orders.

Pneumonia

Assessment

Pneumonia can be caused by a virus, bacterium, parasite, or fungus. Pneumonia in infants and preschoolers is usually viral; in school-aged children, bacterial infection with *Mycoplasma pneumoniae* is more prevalent. Tuberculous pneumonia has begun to reappear in some areas. Especially at risk are recent immigrants, those who are homeless or living in poor conditions, and those with AIDS.

In viral pneumonia, the history includes an upper respiratory infection of gradual onset. Bacterial pneumonia has a more sudden onset; the student will usually appear ill, with fever, chills, cough, and chest pain.

The signs and symptoms that accompany pneumonia in older students include a nonproductive cough, fever, pleural pain, dyspnea, and an elevated respiratory rate. Younger students may exhibit fever and irritability with a history of poor feeding, vomiting, and diarrhea. Apnea may occur.

Students with lower lobe pneumonia may report gastrointestinal symptoms, including abdominal pain and tenderness. Abdominal distention may be evident.

Interventions

Treat suspected pneumonia based on the degree of distress. If severe respiratory distress is present, contact EMS for transport. If the student is experiencing mild distress, contact the parent/guardian to take the student for evaluation by the primary health care provider. Monitor the student's condition. Pneumonia is usually treated with antibiotics and palliative care.

Pneumothorax

Assessment

A pneumothorax is usually caused by trauma to the chest (see Chapter 4), but it can also occur spontaneously or with asthma, pneumonia, or cystic fibrosis. A simple pneumothorax results when air enters the pleural space. The resultant loss of negative pressure causes partial or total atelectasis on the affected side. A spontaneous pneumothorax is a simple pneumothorax caused by rupture of a pulmonary bleb. It occurs primarily in adolescents and young adults aged 16 to 21 years.

In pneumothorax associated with respiratory illness, the history may reveal sudden onset of chest pain. Additional signs may include dyspnea, decreased breath sounds on the affected side, and agitation. Tracheal deviation and jugular vein distention are late signs of tension pneumothorax.

Interventions

If these signs are present, attempt to keep the student calm. Help the student into a position of comfort. If the student tolerates it, administer oxygen (if available) as permitted by applicable protocols and individual physician's orders. Activate EMS to transport the student to the hospital for evaluation and treatment. Notify the parent/guardian.

Hyperventilation

Assessment

Hyperventilation is characterized by fast breathing, which may be accompanied by dyspnea or a sense of suffocation. There are many potential causes of hyperventilation, but the most common is a reaction to stress or anxiety. Signs and symptoms arise from hypoxia and hypercapnia, and may include restlessness, dizziness, lightheadedness, paresthesia, headache, or chest pain. Syncope may result from prolonged hyperventilation.

Interventions

Students with a known history of hyperventilation or anxiety attacks may need only to be reassured in a quiet, safe environment. Since hyperventilation may be perpetuated by overinflation of the upper lungs with incomplete exhalation, it's important to encourage the student to breathe out slowly and completely, using the diaphragm muscles. Demonstrate how to do this while slowly counting to 10. The goal should be to achieve a respiratory rate of 10 to 12 breaths per minute and maintain it until symptoms subside. A stopwatch may be a helpful adjunct in timing this.

Note that apparent hyperventilation may have an urgent or emergent organic cause. It's important to perform a complete assessment and weigh all findings, particularly if the student reports chest pain and has no history of hyperventilation or previous anxiety reactions.

Lower Airway Emergencies: Asthma

As previously noted, asthma is the most common chronic disease in children. Associated morbidity and mortality are increasing despite advances in treatment.

During an asthma attack, the bronchial mucosa becomes swollen and inflamed. Hypersecretion of thick mucus combined with bronchial smooth muscle contraction causes airway constriction and increased resistance to airflow, reducing ventilatory exchange. A prolonged, acute asthma attack that does not respond to treatment with bronchodilators is referred to as *status asthmaticus*, a life-threatening emergency.

Asthma appears to be a multifaceted disease with many causative factors. Triggers that can provoke an asthma attack include

- Exposure to allergens or organic irritants (dust, smoke, fumes, air pollution)
- Exercise, exposure to cold, or changes in humidity
- Viral infections
- Emotional stress
- Certain medications, such as aspirin and beta-blockers

Asthma is classified according to the frequency of attacks. In mild asthma, attacks are brief and infrequent. In moderate asthma, attacks occur more than twice a week. In severe asthma, attacks occur on a daily basis. See the *Asthma Attack* protocol (*Appendix A*) for an overview of asthma assessment and triage.

Be sure to obtain a thorough health history when assessing a student with asthma, as certain factors are associated with increased risk for asthma-related death, including

- Prior intubation
- Two or more hospitalizations for asthma within the past year
- Three or more visits to the emergency department for asthma within the past year
- Hospitalization or ED treatment for asthma within the past month
- Prior admission to an intensive care unit for asthma
- Past history of asthma-related syncope or hypoxic seizure
- Current or recent use of systemic corticosteroids
- Current use of steroids by any route
- Serious psychiatric disease or psychosocial problems

Some of this information may be available in the student's health record.

Ask about current medications, allergies, recent infections (especially upper respiratory infections), and the duration of the current episode.

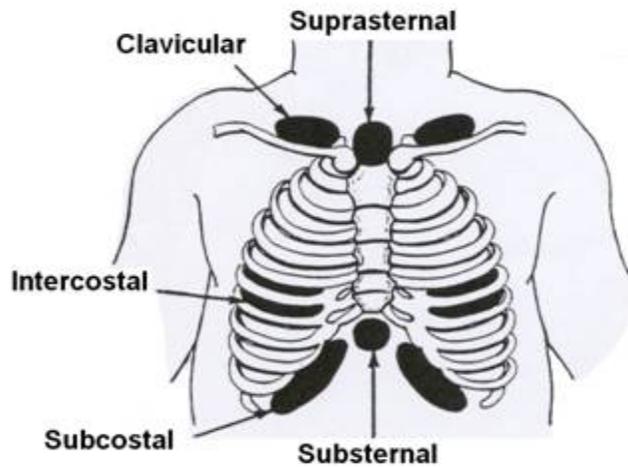
Assessment

The primary signs associated with asthma are difficulty breathing, expiratory wheezing, and coughing. Wheezing may disappear during severe attacks.

Warning signs of a severe asthma attack include

- Extreme anxiety; persistent irritability
- Severe dyspnea; inability to speak in full sentences
- Fast breathing rate and tachycardia
- Severe intercostal and suprasternal retractions, often accompanied by nasal flaring (see Figure 5-1)
- Decreasing level of consciousness

FIGURE 5-1. RETRACTIONS



Paradoxical pulse, in which arterial pressure fluctuates through the respiratory cycle, is a sign of severe respiratory distress. To assess for this during blood pressure measurement, stop the fall of mercury when you hear the first systolic sound and observe for variations in the mercury level. Paradoxical pulse is present if the pressure rises with expiration and falls with inspiration. The result is expressed as the difference in the fluctuation—that is, a difference of 30 mm hg indicates a paradoxical pulse measurement of 30.

Peak flow measurement as an adjunct to assessment

In students older than 5 years, you may be able to use a peak flow meter to determine the severity of an asthma attack and to evaluate the response to treatment. This device measures the peak expiratory flow rate (PEFR) in liters per minute. Students must establish a baseline value by measuring PEFR several times when symptoms of asthma are absent and pulmonary function is normal. It is recommended that the daily measurements be made in the morning and evening, about 12 hours apart.

The PEFR should be done both before and after administration of inhaled or nebulized medications. These baseline measurements are useful in determining the severity of an acute attack or exercise-induced asthma and in monitoring treatment of chronic asthma. Be sure to obtain a baseline PEFR for a student who has had a first-time asthma attack.

NOTE | Do not use peak flow reading as the sole determinant of severity, as some students may manipulate the result by deliberately withholding maximum expiratory effort.

Some students use a measurement system based on color-coded zones:

Green (80% to 100% of personal best)

All clear: No signs of asthma are present, and the student can follow the established plan for maintenance treatment. If PEFr results are consistently in the green zone, the physician may consider reducing the student's medications.

Yellow (50% to 80% of personal best)

Caution. An acute exacerbation of asthma may be developing. The physician may need to review the student's overall treatment plan and consider a temporary increase in medication.

Red (below 50% of personal best)

Medical alert. The student should be treated immediately with a bronchodilator, followed by close monitoring.

For accurate results, the student must learn how to use the peak flow meter correctly:

- Begin by moving the pointer on the meter to zero
- Make sure there is nothing in the student's mouth
- Have the student stand, holding the meter horizontally with the fingers away from the vent holes and pointer

Direct the student to

- Open the mouth and take a deep breath
- Close the lips tightly around the mouthpiece
- Blow out as hard and as fast as possible in a short, sharp blast (*huff*)

Note the result, then return the pointer to 0, wait 10 seconds, and repeat the test. Record the best result out of 3 tries. This will be the **fastest** rather than the longest huff.

NOTE | Coughing provoked by the PEFr test may indicate inadequate asthma management.

Good record-keeping is essential in peak flow measurement, as you must be able to compare the results obtained during an episode of distress with the student's baseline. Your records can also help the student's primary health care provider or specialist determine whether changes in treatment are warranted. It is important to maintain awareness of the frequency and severity of attacks in all students who have asthma. Have the parent/guardian fill out the *Asthma Assessment Form* in *Appendix B* and keep you updated about changes in the student's condition and treatment. Keep the teacher up-to-date as well. A sample log for recording daily PEFr results and other asthma resources are also included in *Appendix B*.

Table 5-5 summarizes typical assessment findings associated with mild, moderate, and severe exacerbations of asthma.

TABLE 5-5. ASSESSMENT FINDINGS IN ASTHMA

Assessment	Mild Asthma	Moderate Asthma	Severe Asthma
PEFR	70%–90% of predicted or personal best	50%–70% of predicted or personal best	less than 50% of predicted or personal best
RR	Less than 30% above mean	30%–50% above mean	More than 50% above mean
LOC	Normal	Normal	Normal or decreased
Dyspnea	Absent or mild; able to speak in complete sentences	Moderate; speaks in phrases or partial sentences	Severe; speaks only in single words or short phrases
Accessory muscle use	None or mild intercostal retractions	Moderate intercostal retractions, suprasternal retractions	Severe intercostal retractions, suprasternal retractions, nasal flaring during inspiration
Color	Normal	Pallid	Pallid or cyanotic
Auscultation	End-expiratory wheeze only	Wheeze throughout expiration and inspiration	Decreasing or absent breath sounds
O ₂ saturation	Exceeds 95%	90%–95%	Less than 90%

LOC indicates level of consciousness; O₂, oxygen; PEFR, peak expiratory flow rate; RR, respiratory rate

Interventions

The principal goals in treating exacerbations of asthma include rapid reversal of airflow obstruction, correction of significant hypoxemia, and reduction in the rate of recurrent severe asthma symptoms. It is important to recognize indications that a physician's help is warranted.

NOTE Frequent use of a rescue inhaler indicates that the student's asthma is not adequately controlled. In such cases, alert the parent/guardian to the need for reevaluation of asthma status by the student's physician so that maintenance medications may be considered.

Initiate the following interventions in all cases:

- Keep the student calm
- Assess peak flow if possible
- Administer oxygen if available under applicable protocols or physician's orders

If the student's color is normal and there is minimal wheezing with good air movement, the asthma attack is mild:

- Allow the student to take prescribed medications, if available
- Contact the parent/guardian or primary health care provider for further instructions

- Refer to the student’s health record for information on prior attacks occurring at school and the effectiveness of intervention
- If an ECP is available, follow the instructions

If there is decreased air movement, tachycardia, fast respiration, poor color, anxiety, and inability to speak, the attack is moderate to severe:

- Arrange for EMS transfer to a hospital
- Begin treatment with the student’s medications if available or follow the prescribed care plan
- Continually monitor vital signs, especially respiratory rate and heart rate

KEY POINT

Increasingly rapid breathing and tachycardia with retractions are ominous findings.

Remember that increasingly rapid breathing and tachycardia with retractions are ominous findings.

NOTE | In most areas, ambulance personnel can administer nebulized drugs to treat acute asthma attacks. Albuterol is generally considered the drug of choice; some EMS systems may use subcutaneous epinephrine 1:1000. Familiarize yourself with the standards and protocols in your area.

Drug treatment for asthma

It is important to be knowledgeable about medications used to prevent and treat asthma. In general, these are classified as either quick-relief (“rescue”) medications for acute exacerbations, or long-term (maintenance) medications for lasting control of persistent asthma. Some of the major pharmacologic agents are discussed below.

KEY POINT

Always attach a spacer when administering asthma medications with a metered dose inhaler, as it dramatically increases drug delivery into the lungs.

A spacer should **always** be attached when using a metered dose inhaler to administer asthma medications, no matter what the student’s age. The spacer dramatically increases drug delivery into the lungs and helps to decrease adverse effects associated with swallowing medicine that remains in the mouth or throat. Educate parents/guardians and students about the importance of using spacers with inhalers.

Quick-relief (“rescue”) medications

Short-acting beta₂-agonists

SABAs, including albuterol, levalbuterol, and pirbuterol, are bronchodilators that relax smooth muscle. This is the therapy of choice for relief of acute symptoms and for prevention of exercise-induced bronchospasm (EIB).

Anticholinergics

Anticholinergic agents inhibit muscarinic cholinergic receptors and reduce intrinsic vagal tone of the airway. They may be used as an alternative for students who do not tolerate SABAs. Ipratropium bromide provides additive benefit to an inhaled SABA in moderate-to-severe asthma exacerbations.

Systemic corticosteroids

Although not short-acting, oral systemic corticosteroids are used as adjuncts to SABAs in moderate and severe exacerbations of asthma to speed recovery and prevent recurrence of exacerbations.

Long-term (maintenance) medications**Long-acting beta₂-agonists**

LABAs, including salmeterol and formoterol, provide single-dose bronchodilation that lasts for 12 hours or more. They are the preferred adjunctive agents used with inhaled corticosteroids for children aged 12 years and older and adults. LABAs are not currently recommended for acute symptoms or exacerbations of asthma. They may be used to prevent exercise-induced bronchospasm, but the duration of action is reduced to 5 hours or less with regular use, and frequent use for this purpose may mask poorly controlled persistent asthma.

Corticosteroids

Corticosteroids are the most potent and effective anti-inflammatory medication currently available. They block late-phase reactions to allergens, reduce airway hyperresponsiveness, and inhibit inflammatory cell migration and activation.

- **Inhaled corticosteroids** deliver medication directly to the lungs, and are often used in long-term asthma management.
- **Oral corticosteroids** work systemically and are often used to gain prompt control of the disease when initiating long-term therapy; long-term use of oral corticosteroids is generally reserved for severe, persistent asthma.

Cromolyn sodium and nedocromil

These medications stabilize mast cells and interfere with chloride channel function. They are considered alternative, rather than preferred, agents for mild, persistent asthma. They can also be used preventively before exercise or unavoidable exposure to known allergens.

Immunomodulators

Omalizumab (anti-IgE) is a monoclonal antibody that prevents IgE from binding with high-affinity receptors on basophils and mast cells. It is used as adjunctive therapy for students aged 12 years and older who have allergies and severe, persistent asthma. Anaphylactic reactions to omalizumab are possible.

Leukotriene modifiers

Leukotriene modifiers, including leukotriene receptor antagonists (LTRAs) and the 5-lipoxygenase inhibitor zileuton, may be prescribed as alternative therapy for mild, persistent asthma; LTRAs are sometimes used as adjuncts with inhaled corticosteroids. Montelukast is approved for children older than 1 year; zafirlukast may be used in children aged 7 years and older. Zileuton may be prescribed for children aged 12 years and older; liver function must be closely monitored.

Methylxanthine

Sustained-release theophylline is a mild-to-moderate bronchodilator that may have mild anti-inflammatory effects. It is sometimes used as an alternative adjunct with inhaled corticosteroids. Serum concentration levels of theophylline must be closely monitored.

Prevention

Although many respiratory emergencies cannot be prevented, you can initiate measures to reduce their incidence and severity:

- Teach faculty and students about communicable conditions, including modes of transmission and methods to prevent or minimize the spread of disease. By observing such simple measures as basic hand washing, staying home from school when symptoms of illness are present, and learning the right way to cover the mouth when coughing, students can contribute substantially to their own wellness and that of those around them.
- Develop IHPs and ECPs for students with special needs or chronic conditions. Review and update them on a regular basis.
- Encourage parents/guardians to participate in immunization programs. Vaccinations against pertussis and Hib are particularly important.
- Educate parents/guardians about the connection between exposure to cigarette smoke and exacerbation of respiratory diseases. Ban smoking throughout the school.
- Assess for allergenic triggers within the school environment and find ways to alleviate them.
- Promote the use of medical bracelets and other identification devices in students with significant allergic or chronic conditions.
- Advocate mandatory CPR and first aid training for all teachers and staff members.
- Make sure resuscitation equipment and personal protective gear is readily available in convenient locations.
- Ensure that epinephrine is on hand for treating anaphylaxis and status asthmaticus as permitted by applicable protocols and individual physician orders.
- **Never leave a student unattended by any body of water.**
- **Exert special precautions for students with known seizure disorders.**

Students With Special Needs

Certain chronic conditions may predispose a student to respiratory emergencies. These conditions include seizures, congenital heart disease, cystic fibrosis, and immunocompromise (associated with oncologic treatment, HIV infection, or immunosuppressive drugs following organ transplantation). Respiratory problems are common in students who rely on artificial airways, those who require supplemental oxygen, and those whose conditions necessitate frequent

suctioning of secretions. Structural abnormalities that increase the likelihood of aspiration or interfere with maintenance of airway patency pose additional risks.

Any condition that affects the respiratory tract can increase the student's risk for infection. Such conditions include craniofacial anomalies, low tone conditions, such as Down syndrome, cerebral palsy, muscular dystrophy, and feeding/swallowing difficulties.

The student's health record should contain a complete history, including the following information:

- Baseline assessment findings, including normal color, vital signs, and activity level
- Special equipment needs and medications
- Location and contact information for the primary health care provider, the parents/guardians, and a secondary contact person
- Instructions for performing special procedures, such as suctioning and medication administration
- Factors that put the student at risk for complications
- Signs that indicate potential problems

Work with the parents/guardians and the primary health care provider to develop both routine and emergency protocols for managing the student's care. Incorporate these protocols into the ECP. Parents/guardians may need to demonstrate techniques used in special interventions. Make sure teachers are aware of signs and symptoms that indicate problems requiring assistance. Take advantage of educational opportunities to keep current with new techniques and equipment.

Summary

Respiratory illnesses are common among preschoolers and school-aged children. This is partly due to unique anatomic and physiologic factors that increase their susceptibility to respiratory problems.

Left untreated, respiratory distress can lead to respiratory failure and cardiopulmonary arrest; in children, cardiac arrest has a very poor prognosis.

It is essential to familiarize yourself with the signs and symptoms of respiratory distress so that you can treat it promptly. Recognition and immediate interventions are more important than determining the cause of the problem. Establish protocols and stock appropriate equipment so that you can readily treat respiratory emergencies when they arise.

Continually update your knowledge of prevalent pediatric respiratory conditions (such as asthma), including signs that indicate exacerbation and current interventions. Take special note of students in your school who have preexisting conditions that place them at greater risk for severe respiratory problems.

Prevention is always the best medicine; educate other school personnel so that they will recognize respiratory distress and initiate appropriate measures.

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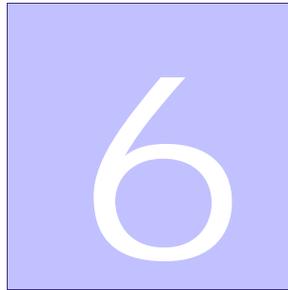
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Shock

On completing
this chapter, you
will be able to

- Define shock.
- Discuss the most common causes and types of shock seen in children.
- Describe key differences between the pediatric and adult circulatory system and how they affect assessment and treatment of shock in children.
- Explain how to assess for pediatric shock.
- List appropriate interventions for pediatric shock.
- Discuss the unique challenges in assessment and treatment of shock among students with special needs.

Pathophysiology of Shock in Children

KEY POINT

Maintain a high index of suspicion for shock in the presence of any mechanism likely to cause it.

Shock arises in the presence of decreased circulatory perfusion, which impairs both the delivery of oxygen and nutrients into the cells and the transport of toxins out of them. In children, shock contributes significantly to morbidity and mortality.

Early signs of pediatric shock are nonspecific and often subtle, making it difficult to identify; yet the longer shock goes unrecognized and untreated, the greater the likelihood of death or lasting disability due to irreversible hypoxic injury to the vital organs.

This makes it important to familiarize yourself with the signs of shock and understand its causes, so that you can assess for it vigilantly in the presence of any condition or mechanism likely to cause it, such as

- Internal or external hemorrhage
- Dehydration
- Burns
- Heat stroke
- Severe hypoglycemia
- Anaphylaxis
- Drug toxicity
- Sepsis
- A congenital heart defect
- Injury to the head or spinal cord

Cardiac Output and Shock

To understand the mechanisms that cause shock, it's helpful to review the concepts of circulation and cardiac output.

The heart, lungs, and blood vessels form a circulatory system that sends oxygenated blood and nutrients to cells throughout the body, removing toxic waste products at the same time. This is referred to as *perfusion*.

The adequacy of tissue perfusion depends on *cardiac output*—that is, the amount of blood pumped through the heart over the course of a minute. This figure is calculated by multiplying the heart rate (the number of times the heart beats in a minute) by the stroke volume (the amount of blood the heart pumps with each beat). Hence, the formula:

cardiac output = heart rate × stroke volume

If either the heart rate or the stroke volume decreases, cardiac output will also decrease, jeopardizing tissue perfusion. Many mechanisms can cause these problems. For example, stroke volume may decrease as a result of fluid deficit, weakening of the myocardium, or increased pressure on the heart (which may arise in cardiac tamponade), while heart rate may fall due to respiratory failure, drug toxicity, or many other causes. Impaired oxygenation of tissues at the cellular level leads to shock.

Anatomic and Physiologic Considerations

The predominant causes of shock in children, as well as its physiologic progression, differ from that of adults for a variety of reasons.

Cardiovascular health

The circulatory system in children and adolescents tends to be healthier than in adults. Disease processes affecting the heart, lungs, or vessels are rare; if present, they are likely to be innate rather than acquired. This makes shock originating in the heart relatively rare in children.

While a healthy circulatory system is an advantage, it is offset by other differentiating factors, including muscle mass, metabolism, and overall circulating volume.

Cardiac muscle mass

The pediatric myocardium has less mass than an adult's. This means that children, particularly those younger than 5 years, do not have the cardiac muscle mass to increase their stroke volume significantly. Therefore, when cardiac output falls, an increased heart rate is usually the initial response. This is why tachycardia is usually the earliest sign of circulatory compromise; bradycardia, on the other hand, signals the failure of the child's primary compensation mechanism, an ominous sign.

Metabolism

Children have high metabolic rates, which increases their baseline demand for oxygen to the tissues. The heart must function close to its peak level to meet this demand. When metabolic demands increase due to illness, injury, or other types of physiologic stress, the heart has only a limited capacity to increase its response. These factors contribute to the abrupt deterioration seen in children when the heart's reserve capacity is exhausted.

Total circulating volume

Children depend on adequate circulating volume to maintain perfusion. While children have a greater circulating volume per kilogram than adults, their **total** blood volume is much less than that of an adult: A child weighing 20 kilograms has about 1.6 liters of circulating blood volume, which is not much more than the amount of liquid in 4 cans of soda. A child who loses 400 milliliters of blood—less than a single unit—has lost a quarter of the total circulating volume.

Physiologic Progression of Shock

Compensated shock

The initial stage of shock is referred to as *compensated shock*, meaning that the body's survival mechanisms are enabling it to compensate for the insult to the system.

- Since the pediatric myocardium cannot readily increase stroke volume, stimulation of the sympathetic nervous system increases the heart rate so that blood is pumped more rapidly. Therefore, tachycardia is often the earliest sign of shock in children. (This is a limited mechanism, however, as cardiac output will **decrease** if the heart rate exceeds 180 to 200 beats per minute, which compromises ventricular filling time.)
- Peripheral vasoconstriction decreases blood flow to the skin and extremities, making more blood available to the vital organs, especially the heart, brain, and kidneys. You may note weak peripheral pulses, delayed capillary refill, skin mottling, and cool skin at the extremities.
- The respiratory rate usually increases, maximizing oxygen distribution to body tissues.
- Fluid is drawn from the cells to augment the volume in the central circulation, and more water is retained in the kidneys.

KEY POINT

Hypotension and bradycardia are late, ominous signs of shock in children.

In children, these mechanisms can support normal or near-normal blood pressure and maintain perfusion of the vital organs well into the shock state. As a result, declining blood pressure—often a hallmark indicator of developing shock in adults—is not a reliable sign of compensated shock in children, as it is likely to remain normal until they are at the point of critical decompensation.

Hypotension and bradycardia are late, ominous signs of shock in children.

NOTE | Studies have shown that children can remain normotensive despite a loss of 25% of the total circulating volume. Even slight hypotension must be considered a serious sign and treated vigorously.

Decompensated shock

Decompensated shock sets in when the body's compensatory mechanisms begin to fail and the vital organs are no longer adequately perfused. In children, decompensation is signaled by a rapid, often drastic drop in blood pressure. Worsening perfusion increases oxygen demand, and respiratory distress evolves into respiratory failure. Decompensated shock combined with respiratory failure constitutes cardiopulmonary failure, which means that cardiopulmonary arrest is imminent. **Cardiopulmonary arrest is associated with a high mortality rate in all populations.**

KEY POINT

A significant reduction in the level of consciousness indicates advanced decompensated shock.

A significant reduction in the level of consciousness indicates that the body is no longer able to maintain perfusion of the brain, a sign of advanced decompensation.

Categories of Shock

Shock is classified into 4 broad categories (Table 6-1) according to the mechanism that decreases cardiac output.

TABLE 6-1. CATEGORIES OF SHOCK

Category	Mechanism	Causes	Signs/Symptoms
Hypovolemic <i>The most common type of pediatric shock</i>	Decreased circulating blood volume reduces stroke volume	<ul style="list-style-type: none"> ▪ Blood loss due to internal or external hemorrhage ▪ Plasma loss due to burn injuries with extravasation of serum into surrounding tissues ▪ Dehydration secondary to vomiting/diarrhea 	<ul style="list-style-type: none"> ▪ Rapid breathing ▪ Tachycardia ▪ Weak, thready pulses ▪ Hypotension ▪ Cool, moist skin ▪ Pale skin color ▪ Weakness ▪ Anxiety/agitation ▪ Confusion ▪ Other changes in mental status
Distributive	Massive vasodilation of capillary beds decreases blood flow to heart, which decreases stroke volume	<ul style="list-style-type: none"> ▪ Drug ingestion ▪ Anaphylaxis ▪ Brain or spinal cord injury ▪ Sepsis 	<ul style="list-style-type: none"> ▪ Respiratory distress ▪ Tachycardia ▪ Hypotension ▪ Pale or cyanotic skin ▪ Fatigue
Cardiogenic <i>Rare in children</i>	Functional inadequacy of myocardium, which decreases heart rate	Various types of congenital heart disease	<ul style="list-style-type: none"> ▪ Rapid breathing ▪ Tachycardia ▪ Weak pulses ▪ Cool, moist skin ▪ Pale or cyanotic skin color
Obstructive	Obstructed blood flow through the heart or great vessels, which affects stroke volume	Cardiac tamponade, pneumothorax	<ul style="list-style-type: none"> ▪ Anxiety ▪ Fatigue ▪ Weakness

Systematic Assessment of Pediatric Shock

Assessment

Throughout your assessment, be prepared to activate EMS for **emergency** medical transport as soon as you suspect or identify any shock state, especially if the student exhibits abnormalities involving the airway, breathing, circulation, or level of consciousness. Most students with shock will require rapid intravenous fluid replacement, which may be provided by EMS responders with advanced certification.

NOTE | Be aware of local rescuers' capabilities and response times.

Scene Safety

When responding to the scene of an illness or injury, check for potential hazards that might endanger you, the student, or others present. Call for additional help if indicated. Do not approach until you have determined that is safe to do so.

Across-the-room Assessment

Signs of compensated shock are subtle in children. You must maintain a high index of suspicion when assessing for shock, beginning with your across-the-room assessment. During this quick look at the student's general appearance, note the student's energy level, mood, and ability to walk unaided. Look for signs of increased work of breathing, and take special note of skin color.

Initial Assessment

NOTE | **When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.**

If head or spinal cord injury is suspected, stabilize the cervical spine as described in Chapter 4: *Trauma* before beginning the initial (**ABCDE**) assessment. Move quickly through assessment of the airway, breathing, circulation, disability (neurologic status), and exposure as described in Chapter 3: *Assessment and Triage*, providing interventions as you go.

Airway

Open the airway as necessary, using the jaw-thrust method if head or spinal injury is possible. Look, listen, and feel for signs of airway obstruction, such as stridor or objects in the mouth. If the student is unconscious, the tongue may obstruct the airway.

Interventions

Secure a patent airway as necessary.

Breathing

Note the respiratory rate, depth, and pattern; listen for abnormal breath sounds and watch for retractions, nasal flaring, or other indications of increased work of breathing. An elevated respiratory rate is associated with compensated shock, while slow breathing may indicate an advanced state of decompensated shock.

Interventions

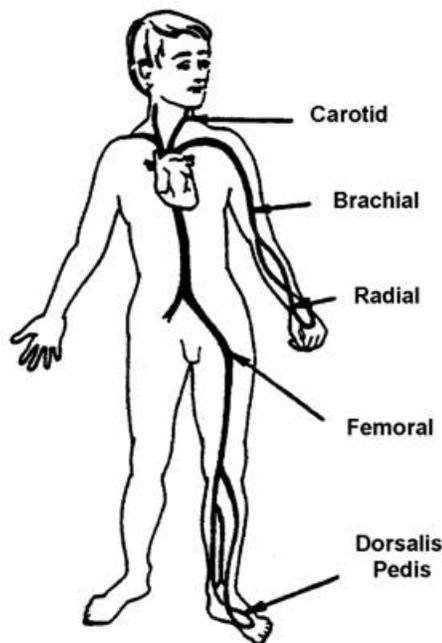
Giving oxygen, if available, can slow the progression of shock by augmenting the amount of oxygen available to the body's tissues.

Circulation

Heart rate and quality of pulses

Measure the heart rate by palpating the pulses. Evaluate the quality of the pulses and note discrepancies between the central and peripheral pulses at the same time. Pulse points are shown in Figure 6-1.

FIGURE 6-1. PULSE POINTS



KEY POINT

Tachycardia is often the earliest indicator of shock in children.

Since the pediatric physiology responds to decreasing cardiac output by increasing the heart rate, **tachycardia may be the earliest indicator of developing shock**. A weak, thready pulse is also associated with shock. A discrepancy in the quality of the central pulses compared with the peripheral pulses may be an early sign of decreasing stroke volume.

NOTE

It's easy to overlook abnormalities in a child's heart rate, since the normal rates vary with age. Be sure to familiarize yourself with normal ranges, or else keep a chart handy.

Perfusion

KEY POINT

The skin is one of the first organs affected by decreased perfusion during shock.

Skin findings are a focal point in suspected shock, as the skin is the largest organ of the body and one of the first to be affected by decreasing perfusion. Check capillary refill time and assess skin color, temperature, moisture, and quality as detailed below.

Capillary refill time

Capillary refill provides a quick way to gauge perfusion. It should be assessed at the distal extremities with the limb positioned so that it is level with the heart. Firmly press and release the skin to blanch the underlying capillary bed. Normally, color should return in less than 2 seconds. Delayed refill suggests shock.

NOTE | Capillary refill time may be delayed if the environment is cold or if the extremity is positioned so that it is higher than the heart.

Color

Shock is usually accompanied by pallid skin. Mottling and cyanosis appear as shock progresses.

NOTE | To assess skin color in students with dark skin pigmentation, check the nail beds, palms, or mucous membranes.

Temperature

As blood is shunted away from the skin during shock, the peripheral skin temperature falls. The process begins with the hands and feet and progresses proximally along the extremities. Temperature differences between the extremities and the central body regions may signify shock.

Moisture and quality

Note the moisture and quality of the skin. Gently pinch a fold to check for *tenting*, a sign of dehydration. (Dehydration can contribute to hypovolemic shock.)

Normally, the skin is warm and dry. In hypovolemic shock, the skin often feels cool and clammy. In distributive shock, however, the skin may be hot and flushed.

Bleeding

Look for obvious bleeding. Even a small loss of blood can seriously jeopardize a younger student.

NOTE | Children can lose a significant amount of blood from head wounds, intra-abdominal hemorrhage, or femur fractures.

Interventions

Treat or stabilize injuries. Control profuse bleeding as rapidly and effectively as possible. Be prepared to initiate cardiopulmonary resuscitation as recommended by current American Heart Association or American Red Cross guidelines.

Disability

Carefully monitor the student's level of consciousness, as it is an important indicator of perfusion and oxygenation. The **AVPU** mnemonic (see Chapter 3) is helpful in determining the student's neurologic status. Check pupil size and reactivity as well.

KEY POINT

In a student with signs of shock or a mechanism that could cause it, a deteriorating level of consciousness indicates the need for immediate lifesaving interventions.

The body will work hard to maintain perfusion to the brain. **In a student with signs of shock or a mechanism of illness or injury likely to cause it, a deteriorating level of consciousness indicates the need for immediate lifesaving interventions.**

Exposure

Pull back or remove clothing to inspect and palpate for signs of internal hemorrhage, being careful to keep the student warm, as children in shock cannot readily maintain a normal body temperature. Cover the student with a blanket if possible.

Summary

Table 6-2 summarizes initial assessment findings in pediatric shock.

TABLE 6-2. INDICATORS OF HYPOPERFUSION

Sign	Comment
Tachycardia	early sign
Increased breathing rate	
Decreasing level of consciousness	
Central pallor or cyanosis with cool skin	
Weak, thready, or absent peripheral pulses	
Delayed capillary refill time	
Bradycardia	late sign
Hypotension	late sign

History and Pain Assessment

Use the **SAMPLE** mnemonic to focus your history questions (see Chapter 3). Be sure to ask about medications the student is taking and preexisting illness or injury that may have contributed to the current problem. If the student is injured, ask about the mechanism of injury.

Follow with a pain assessment using a numeric or visual assessment tool according to the student's developmental ability (see Chapter 3).

History findings that often accompany shock include poor eating or drinking and decreased urination. (In infants, this may be noted as a decrease in the number of wet diapers.) A student exhibiting signs of shock may complain of thirst due to decreased circulatory volume. Behavior may be affected in subtle ways; friends or teachers may note that the student "just hasn't been acting normal."

Interventions

Do not give anything by mouth, even if the student complains of thirst. Fluid replacement must be done intravenously to reduce the risk of emesis and aspiration. This is especially important if emergency surgery may be required.

Focused Physical Examination

Vital signs

Measure and document the student's heart rate, respiratory rate, and blood pressure. Normal values for these vital signs are listed in Table 6-3. If possible, measure temperature as well.

TABLE 6-3. PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (birth-30 days)	30-60	100-180	50-90
Infant (1-12 months)	24-50	100-160	60-100
Toddler (1-3 years)	24-40	90-150	80-105
Preschooler (3-5 years)	20-30	80-140	95-105
School-aged (5-12 years)	18-30	65-120	95-120
Adolescent (12 years and older)	12-20	60-100	100-128

BP indicates systolic blood pressure (mm Hg); HR, heart rate; RR, respiratory rate

Tachycardia and an elevated breathing rate are early indicators of shock. Blood pressure and temperature provide a baseline for monitoring changes in the student's condition.

Interventions

Elevating the feet slightly may improve perfusion to the brain and central organs. This step is contraindicated, however, in 2 cases:

- In students with respiratory problems, elevating the feet may increase pressure on the diaphragm, further compromising breathing
- In students with head or spinal injuries, elevating the feet poses a risk for additional trauma and increased intracranial pressure

Triage and Transport

Any student who shows signs of shock should be categorized as **urgent** or **emergent**. Activate EMS as rapidly as possible. If possible, prehospital professionals with certification in advanced life support should provide transport, as they will be able to initiate appropriate interventions, such as intravenous fluid administration. EMS personnel will attempt to identify and eliminate the cause of shock, maintain oxygenation, and improve perfusion through fluid resuscitation and drug therapy.

Ongoing Monitoring

Carefully monitor the heart rate and other vital signs for evidence of deterioration. Watch for signs of worsening respiratory distress as well. Continuing tachycardia shows that the student is still compensating for shock. If bradycardia develops, compensatory mechanisms are failing, probably due to hypoxemia. **This is an emergent sign!**

Documentation and Data Collection

Document your assessment findings and observations, nursing interventions, and the student's response. Accurately recording these details, particularly those related to the history and immediate care, may help receiving emergency personnel determine and treat the cause of shock.

Be sure to give EMS responders information regarding the history, examination findings, vital signs, and nursing interventions so that they can pass these details on to ED personnel.

If an injury is involved, note any contributing factors, the mechanism of injury, and the severity of the injury. These details are important components of data collection for injury prevention efforts.

Prevention

The most effective intervention for shock is prevention. Injury prevention and effective treatment of chronic illness should be important aspects of the preventive education program at your school. The risks inherent in dehydration and prolonged illness are topics of special importance.

Students With Special Needs

While shock is a serious condition in any student, it can pose a significantly greater risk for students who have a history of chronic illness, congenital disorders, or surgical interventions. Carefully monitor students with special health care needs who exhibit signs of sepsis or dehydration.

Summary

Shock is a life-threatening condition, particularly in children. It is crucial to recognize shock early and initiate appropriate interventions. Students with developing shock may initially look well because of their effective compensatory mechanisms, but their condition can deteriorate rapidly. This makes it important to maintain a high index of suspicion when assessing a student who has an illness or injury that can lead to shock. Watch for tachycardia, which is often the earliest sign of compensated shock in children. You may also note weak peripheral pulses, cool skin at the extremities, and delayed capillary refill time due to

peripheral vasoconstriction. Blood pressure is not a good indicator of compensated shock in students.

Observe the usual order of a systematic assessment, providing appropriate interventions for abnormal findings as you go. Ensure a patent airway (after spinal stabilization if indicated), then adequate breathing and adequate circulation. A student believed to be in shock should be placed in the urgent or emergent triage category. Definitive treatment involves rapid administration of IV fluids as well as 100% oxygen; therefore, it is important to activate EMS promptly. Keep the student warm and comfortable while awaiting transport.

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Neurologic Emergencies

On completing this chapter, you will be able to

- Describe assessment considerations for a student who exhibits an altered level of consciousness.
- List assessment findings that indicate a neurologic problem requiring urgent or emergent care.
- Describe appropriate interventions for a student with abnormal neurologic findings.
- Discuss the unique challenges in assessment and treatment of neurologic emergencies involving students with special needs.

Neurologic Status in the Assessment Process

KEY POINT

An accurate neurologic assessment allows you to identify acute neurologic deficits, track changes in level of consciousness, and assess the student's risk for neurologic deterioration.

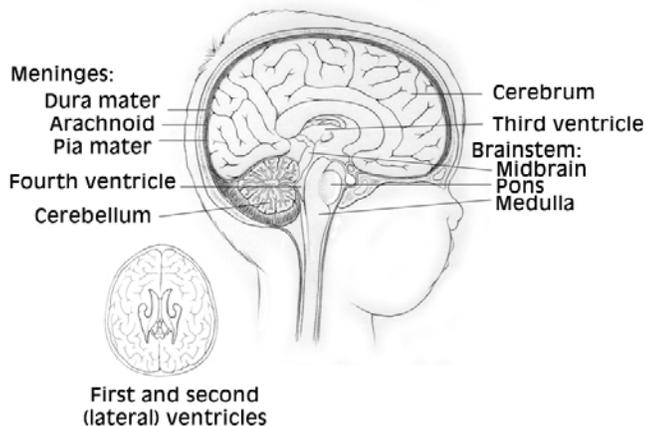
Evaluating neurologic status is a vital component of the assessment process, as it provides important indicators of the student's overall condition. Virtually every serious illness or injury affects the nervous system in some manner, and your ability not only to recognize alterations in neurologic function, but also to understand the implications of what you're seeing, is essential to every phase of emergency care—from your first across-the-room impression of the student's health status, through triage and disposition. An accurate assessment allows you to identify acute neurologic deficits, track changes in level of consciousness, and assess the student's risk for neurologic deterioration.

NOTE During the following discussion, you may find it helpful to review the major structures of the brain illustrated in Figure 7-1, below. Their functions are listed in Table 7-1 on the following page.

Structure and Function of the Brain

Acute neurologic dysfunction may be caused by a direct insult to any part of the central nervous system, such as a traumatic brain injury (TBI), or it may arise as a secondary effect of a systemic process, such as hypoglycemia. Often, the first indication of neurologic dysfunction is an alteration in the student's level of consciousness—that is, the awareness of self and surroundings.

FIGURE 7-1. MAJOR STRUCTURES OF THE BRAIN



Findings that indicate an altered level of consciousness can be as subtle as restlessness, irritability, confusion—or as overt as coma. Typical causes of an altered LOC include

- Traumatic injury or shock
- Vascular emergencies, such as cerebral thrombosis or an aneurysm
- A tumor that impinges on CNS structures
- Infection, either directly affecting the CNS (meningitis, encephalitis) or accompanied by high fever

- Metabolic imbalance, as in diabetic emergencies (hypoglycemia or diabetic ketoacidosis)
- Chemical toxicity, either deliberately induced by alcohol or other drugs, or subsequent to an inadvertent toxic exposure
- Anoxia
- Abnormal electrical activity in the brain resulting in seizure (in which case altered LOC may persist into the postictal state)

Whatever the cause, however, neurologic emergencies require rapid and accurate evaluation and intervention. This chapter reviews the components of the neurologic assessment and presents a selection of acute neurologic problems you may encounter in the school setting.

TABLE 7-1. FUNCTIONAL ANATOMY OF THE BRAIN

Structure	Description	Function
Meninges		
Dura mater	Two layers of tough, elastic membrane directly underlying the skull	Separates the 2 cerebral hemispheres and occipital lobe from the cerebellum
Arachnoid	Thin, avascular layer of tissue between the dura mater and pia mater	Cerebrospinal fluid circulates beneath the arachnoid layer in the subarachnoid space
Pia mater	Highly vascular membrane directly covering the brain	Supports blood supply to the brain and central nervous system
Ventricles	Four cavities containing the choroid plexus	Produces, stores, and circulates cerebrospinal fluid
Cerebrum	Four lobes with discrete functions located in both hemispheres	Involved in sensory impulse interpretation, voluntary muscle control, consciousness, and higher mental function
Cerebellum	Posterior portion of brain behind brainstem	Integrates motor function, coordinates muscle movement; spatial orientation, fine motor control
Brainstem		
Midbrain	Connects pons and cerebellum with cerebral hemispheres	Involved in visual and auditory functions; origin of cranial nerves III and IV
Pons	Area above medulla containing motor and sensory pathways	Contains reticular formation (consciousness); origin of cranial nerves V, VI, VII, VIII
Medulla	Lower portion of brainstem connecting peripheral CNS pathways to higher centers	Controls respiration, heart rate, and blood pressure; origin of cranial nerves IX, X, XI, XII

Systematic Assessment of Neurologic Emergencies

Assessment

Refer to Chapter 3: *Assessment and Triage* for a detailed discussion of the 5 components of a systematic assessment. The information below outlines the assessment steps as applied to neurologic dysfunction. Information about specific neurologic emergencies follows in a separate section.

Remember that it is essential to perform interventions for significant problems **before** moving on to the next step of the assessment. Be prepared to activate EMS at the earliest sign of an emergent situation.

Scene Safety

When responding to the scene of an illness or injury, check for potential hazards that might endanger you, the student, or others present. Call for additional help if indicated. Do not approach until you have determined that is safe to do so.

Across-the-room Assessment

Perform an across-the-room assessment as outlined in Chapter 3. The **Appearance** component of the Pediatric Assessment Triangle (muscle tone, body position, level of consciousness, interaction with others) provides your first insight into the student's neurologic status.

Initial Assessment

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

KEY POINT

Assume that any injury above the clavicle involves a concurrent c-spine injury!

If head or spinal cord injury is suspected, stabilize the cervical spine as described in Chapter 4: *Trauma* before beginning the initial **(ABCDE)** assessment. **Always assume that any injury above the clavicle involves a concurrent cervical spine injury!**

Proceed with a rapid evaluation of the airway, breathing, circulation, and disability (neurologic status), followed by a brief exposure as described in Chapter 3. If possible, gather history information as you go.

Airway

Look, listen, and feel for signs of a patent airway.

Interventions

Provide positioning and open the airway as necessary, using the jaw-thrust maneuver if head or spinal injury is possible. Maintain airway patency.

Breathing

Assess for significant abnormalities in the respiratory rate, breath sounds, and work of breathing.

Interventions

Ensure adequate breathing and ventilation. If equipment is available and protocols permit, provide oxygen and assisted ventilation with a resuscitation bag and mask as indicated.

Circulation

Check the heart rate and quality of the pulses. Assess perfusion by evaluating capillary refill time as well as skin color, temperature, and moisture. Be alert for profuse bleeding or other signs of life- or limb-threatening injury.

Interventions

Apply direct pressure to control profuse bleeding. Be prepared to initiate CPR as needed to maintain circulatory status.

Disability

Use the **AVPU** mnemonic to quickly evaluate the student’s level of consciousness (Table 7-2). Check pupil size and reactivity to light. You’ll gather more details about the student’s neurologic status during the history and focused physical examination.

TABLE 7-2. AVPU SCALE

	Response	Associated Findings
A	Alert^a	The student is awake and able to speak or interact spontaneously
V	Verbal <i>(responds to verbal stimulus)</i>	A verbal stimulus elicits some response; for example, the student’s eyes may open when you call loudly, or agitation may lessen in response to a command
P	Painful <i>(responds to painful stimulus)</i>	The student responds to a painful stimulus by moaning, crying, or withdrawing from pain
U	Unresponsive	The student shows no response to verbal or painful stimuli

^aKeep in mind that an alert student who appears to be mildly confused, restless, or irritable may be exhibiting an altered level of consciousness. If necessary, ask others who are familiar with the student whether current behavior is characteristic.

Exposure

Keeping the student as warm as possible, open or remove clothing briefly to check for additional signs of illness (rash, petechiae, edema) or injury.

History and Pain Assessment

The history can help you determine the seriousness of the student's condition so that you can plan an appropriate response. Use the **SAMPLE** mnemonic to guide your history questions (see Chapter 3). Note any chronic or recurring health problems that increase the student's risk for serious neurologic dysfunction (see the *Students With Special Needs* section later in this chapter).

Follow the history with a pain assessment, using a developmentally appropriate numeric or visual pain scale (Chapter 3.)

Focused Physical Examination

The focused physical examination may be limited or complete (head-to-toe), depending on the circumstances, the student's health status, and applicable protocols.

At minimum, measure and document baseline vital signs, including heart rate, respiratory rate, and blood pressure. If possible, measure temperature, weight, and blood glucose levels as well.

Follow with a more detailed neurologic survey, beginning with level of consciousness, orientation, and memory.

Level of consciousness

Reassess the level of consciousness using the **AVPU** scale or the Pediatric Glasgow Coma Scale (PGCS) shown in Table 7-3.

The PGCS score quantifies level of consciousness using 3 functional parameters:

- Alertness (eye opening)
- Major CNS motor pathways (best motor response)
- Mentation (best verbal response)

By using objective assessment criteria, the PGCS circumvents the ambiguous terms often used to describe an altered level of consciousness (such as *confused*, *lethargic*, *obtunded*). Calculating a baseline PGCS score and then reassessing the score as part of ongoing monitoring makes it easier to track changes in the student's neurologic state and transfer information to other health care providers.

TABLE 7–3. PEDIATRIC GLASGOW COMA SCALE

1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous	Spontaneous		4
	To verbal command	To shout		3
	To pain	To pain		2
	No response	No response		1
Best motor response	Obeys commands	Spontaneous		6
	Localizes pain	Localizes pain		5
	Flexion–withdrawal	Flexion–withdrawal		4
	Flexion–abnormal (decorticate rigidity ^a)	Flexion–abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity ^b)	Extension (decerebrate rigidity)		2
	No response	No response		1
Older Than 5 Yr		2–5 Yr	Younger than 2 Yr	
Best verbal response	Oriented	Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused	Inappropriate words	Cries, inconsolable	4
	Inappropriate words	Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds	Grunts	Grunts, agitated, restless	2
	No response	No response	No response	1
Total Score				

^aFlexion of elbows, wrists, and fingers with extension of legs and ankles, usually indicating ischemia or damage to cerebral hemispheres. ^bExtension of arms and legs with rigidity, usually indicating diffuse cerebral injury, ischemia, or damage to brainstem structures. See the *Glasgow Coma Scale, Adult* in *Appendix B* for diagrams of these postures.

Interpreting the PGCS score

KEY POINT

For an accurate assessment of a student’s condition, always interpret Pediatric Glasgow Coma Scale scores in conjunction with other clinical findings.

To determine the PGCS score, add the numbers from each component. The possible total ranges from 3 to 15 points.

- A score lower than 9 indicates severe impairment
- A score of 9 to 12 indicates moderate impairment
- A score of 13 to 15 indicates minor impairment or normal function

Note, however, that a student with a score of 13 to 15 may still have neurologic abnormalities that can progress to a life-threatening condition. Always interpret PGCS scores in conjunction with other neurologic assessment parameters as well as your overall clinical impression of the student’s condition.

Orientation

KEY POINT

Be sure to ask age-appropriate questions when assessing orientation to person, place, and time.

Be sure to ask age-appropriate questions when assessing orientation to person, place, and time. Younger students may not know the time or the day of the week, but they should know, for example, that it's a school day or that it's close to lunchtime. You can also evaluate orientation by ascertaining whether students recognize themselves, teachers, other familiar individuals, and familiar objects.

Memory

Types of memory include *auditory* memory, involving recollection of sounds (especially words); *visual* memory, involving recollection of shapes, faces, and the like; *spatial* memory, involving the orientation and spatial relationships of objects; and *short-term* memory, in which recent stimuli are briefly stored before they are either processed or discarded.

Short-term memory can be tested by asking the student to repeat a series of random numbers in a specific order.

Retrograde memory—the ability to recall experiences before a sudden cerebral event, such as neurologic trauma—should be assessed as well. Try asking, for example

- Which class were you in when this occurred?
- Can you tell me what happened?

Again, questions should be appropriate to the student's age and developmental level.

Focused neurologic assessments

The cranial nerves control the following functions:

- Facial symmetry
- Ability to swallow
- Pupil size and reactivity
- Extraocular movements (including the position of the eyes at rest and the presence of abnormal spontaneous eye movement)
- Motor function
- Sensory function
- Cerebellar function

Table 7-4 correlates the cranial nerves with their specific functions.

TABLE 7-4. CRANIAL NERVE FUNCTION

	Cranial Nerve	Function or Assessment
I	Olfactory	Smell
II	Optic	Visual acuity, color discrimination
III	Oculomotor^a	Symmetrical eyelid movement, pupil size and reaction to light, object tracking
IV	Trochlear^a	Eye movement
V	Trigeminal	Jaw movement (clenching, chewing) and facial sensations
VI	Abducens^a	Lateral eye movement
VII	Facial	Symmetrical facial movement, lacrimation
VIII	Vestibulocochlear	Hearing, balance
IX	Glossopharyngeal^a	Motor and sensory function of pharynx
X	Vagus^a	Coughing, gag reflex, swallowing, clear speech
XI	Spinal accessory	Motor function of trapezius and neck muscles (shrugging, upper extremity movements)
XII	Hypoglossal	Motor function of tongue

^aShould be evaluated in any student with an altered level of consciousness

Nerve functions that appear in **bold type** in the table above should be evaluated in any student who exhibits an altered level of consciousness. A detailed description of assessment techniques for the eye movement and visual acuity appears in Chapter 8: *Eye, Ear, Nose, Throat, and Dental Emergencies*. Motor and sensory assessment techniques are listed below.

Motor function

Observe for spontaneous movement and assess for postural abnormalities. To see whether movement and strength are bilaterally symmetrical, have the student

- Push the hands against your hands
- Push the feet against your hands
- Grip your hands or fingers
- Wiggle fingers and toes
- Flex the feet while you provide resistance

In students who are too young to follow these instructions, look for vigorous movement in the extremities and test withdrawal from touch.

Interpreting your findings

Asymmetric motor function or strength indicates neurologic dysfunction.

KEY POINT

Assume that any injury above the clavicle involves a concurrent c-spine injury!

Always assume that any injury above the clavicle involves a concurrent cervical spine injury!

Sensory function

Ask about numbness, tingling, burning, or other abnormal sensations. Check for sensation distal to the injury; for example, touch the lower legs and feet and ask whether the student can feel your touch. Proprioception—the ability to sense how parts of the body are positioned—can be evaluated in each hand and foot by moving one of the student’s fingers or toes up or down and having the student state the direction of the movement.

Cerebellar function

Observe the student’s gait, balance while standing or sitting, and performance of repetitive motions, such as touching a finger to the nose with alternating hands, once with eyes open and again with eyes closed.

Orthostatic vital signs

Orthostatic vital signs can help you assess for dehydration or volume depletion. Record blood pressure and heart rate while the student is supine and again 1 minute after the student sits up or stands. If the blood pressure falls by more than 20 mm Hg, or if the heart rate increases by 20 bpm, orthostasis is present.

Additional assessments

If time permits, inspect, palpate, and auscultate for additional problems as indicated. *Appendix A* includes protocols that summarize appropriate actions for specific neurologic problems.

Triage and Transport

Except for mild headaches and minor, asymptomatic head injury, **any** illness or injury with neurologic manifestations should be triaged as **urgent** or **emergent**. Table 7-5 describes triage categories associated with specific presentations.

TABLE 7-5. TRIAGE FOR NEUROLOGIC PRESENTATIONS

Category	Examples
Emergent <i>Requires immediate EMS transport to a medical facility</i>	<ul style="list-style-type: none"> ▪ Altered level of consciousness ▪ Acute neurologic deficit ▪ Generalized first-time seizure ▪ Status epilepticus ▪ Seizure with respiratory compromise ▪ Seizure following head injury ▪ Head injury with altered LOC/loss of consciousness, emesis, CSF or blood draining from ears or nose ▪ Mechanism of injury carries high risk for spinal cord injury ▪ Severe headache (“<i>worst headache of my life</i>”) ▪ Stiff neck with fever (signs of meningitis or encephalitis) ▪ Hypertension with other abnormal findings (eg, headache) ▪ Head injury in a student with hemophilia/other coagulopathy
Urgent <i>Requires medical intervention within 2 hours via EMS or parent/guardian</i>	<ul style="list-style-type: none"> ▪ Moderate headache with vomiting ▪ History of migraines ▪ No neurologic deficit ▪ Early signs of VP shunt dysfunction ▪ Syncopal episode
Nonurgent <i>May require referral for routine medical care</i>	<ul style="list-style-type: none"> ▪ Generalized mild headache ▪ Minor, asymptomatic head injury, no loss of consciousness ▪ S/S of upper respiratory tract infection ▪ S/S of sinus infection

CSF indicates cerebrospinal fluid; S/S, signs/symptoms; URI, upper respiratory infection; VP, ventriculoperitoneal

Reassessment and Ongoing Monitoring

KEY POINT

A PGCS score that decreases by 2 or more points indicates a significant change in condition, requiring reassessment of ABCDs.

Timely reassessment is particularly important in students with neurologic abnormalities. As indicated, monitor the student’s

- Activity level (talking or silent; walking or immobile; sitting or supine)
- Emotional state
- Orientation to time, place, and person
- PGCS score

Compare with your observations from earlier assessments to detect worsening or improvement in neurologic function.

Interpreting your findings

A PGCS score that decreases by 2 or more points indicates a significant change in condition requiring immediate reassessment of vital functions (**ABCD**), appropriate interventions for significant new problems, and a change in the

triage category. **Immediately** initiate EMS transport to an emergency care facility.

Documentation

Thoroughly document the emergency, including

- Chief complaint
- History of initiating incident and past health history
- Events that occurred at school
- Neurologic findings and PGCS score
- Baseline vital signs with blood glucose level, if available
- Head-to-toe assessment
- Identification of problem or nursing diagnosis
- Interventions initiated and student's response
- Ongoing reassessments and subsequent vital signs

If the student requires transport to an emergency care facility or physician's office, send a copy of your documentation. Consider calling in your report as well to facilitate the transfer of care.

Selected Neurologic Problems

Head and Spinal Cord Injury

Head injury

Head injury from blunt force impact is the most common type of pediatric trauma. Primary injury to the head may affect extracranial or intracranial structures, resulting in scalp lacerations and abrasions as well as encephalic contusions or hematomas. There may be no external evidence of intracranial trauma. Secondary injury may develop minutes or days after the primary event, arising either from the primary injury or from interventions related to its treatment.

Students who experience TBI secondary to head injury may have associated cognitive impairment involving concentration, memory, orientation, or attention. Even mild TBI can result in cognitive changes, so a thorough evaluation after any head injury is always necessary.

Cognitive impairment is sometimes subtle and may not become evident until days or weeks after the injury was incurred. Subtle impairment is easily overlooked in a student who appears well, even if the student reports a sense of feeling or acting different.

Spinal cord injury

KEY POINT

Assume that any student with a significant head injury has a cervical spine injury as well.

Although considered uncommon in children, injury to the spinal cord, particularly the cervical spine, occurs in all age groups. Younger children are more often injured in the upper cervical vertebrae (C1 to C3), while older children are more often injured in the lower cervical spine. **For assessment and triage purposes, assume that any student with a significant head injury has a cervical spine injury as well.**

The thoracolumbar region is also commonly injured, usually due to a high-speed motor vehicle crash in which the student was improperly restrained with a lap belt. Penetrating injury can also damage the spinal cord. Thorough assessment of neurologic status is critical in all students with suspected head or spine injury.

Interventions

KEY POINT

Initiate full spinal stabilization if there are signs of spinal cord injury or if the mechanism carries a high risk for spinal cord injury.

The triage category is **emergent**. Provide appropriate interventions as previously outlined. Stabilize the cervical spine before performing airway-opening procedures. Initiate full spinal stabilization if the student has signs and symptoms of spinal cord injury **or** if the mechanism of injury carries a high risk for spinal cord injury. See the *Head/Spinal Cord Trauma* protocol in *Appendix A* for an overview and Chapter 4 for detailed information on triage and treatment of head and spinal injury.

Syncope

Syncope (fainting) is caused by a transient decrease in cerebral blood flow. Most episodes are benign, but a thorough assessment is essential to investigate the possibility of a serious underlying condition.

Etiology

Most syncopal episodes involve orthostatic hypotension, which is generally benign. Suspect this etiology if the incident occurs on arising or while standing for long periods; if syncope occurs when a student is lying down or sitting, further evaluation is required, even if the student appears to have recovered completely. Other causes of syncope in students include

- Vasovagal reaction to anxiety or pain
- Cardiac dysrhythmia
- Cardiac outflow obstruction
- Anemia
- Hypoglycemia
- Dehydration
- Medications
- Vertigo

Table 7-6 lists the more common types and causes of syncope in school-aged children.

TABLE 7-6. SYNCOPE: TYPES AND CONSIDERATIONS

Type/Cause	Considerations
Intrapsychic	
<i>Hyperventilation (see Chapter 5: Respiratory Emergencies)</i>	<ul style="list-style-type: none"> Anxiety response involving rapid, deep respiration, paresthesia, and dyspnea Encourage student to relax and breathe slowly
<i>Hysteria</i>	<ul style="list-style-type: none"> More common in girls than boys Somatic symptoms and anxiety are absent Student is able to avoid injury on falling On AVPU scale, responds to verbal or painful stimulus
Vascular	
<i>Vasomotor</i>	<ul style="list-style-type: none"> More common in adolescents Precipitated by fear, pain, noxious stimulus Involves rapid drop in BP, nausea or vomiting, pallor, blurred vision, diaphoresis
<i>Orthostatic hypotension</i>	<ul style="list-style-type: none"> Follows standing or rising Caused by poor cerebral perfusion Check orthostatic vital signs as described in the <i>Focused Physical Examination</i> section
<i>Heart disease</i>	<ul style="list-style-type: none"> Caused by low cardiac output Signs include pallor, dyspnea, wheezing
<i>Dysrhythmia</i>	<ul style="list-style-type: none"> Follows exercise Involves poor perfusion, dizziness, irregular pulse

BP indicates blood pressure

Assessment

Stabilize the cervical spine if there is any potential for head or neck injury when the student fell. On initial assessment, you may note diaphoresis and cool, clammy skin. Try to get a detailed history of precipitating factors, signs, and symptoms before and during the episode to help you determine the potential for a serious cause. The student may report a history of nausea, dizziness or lightheadedness, blurred vision, and a flushed feeling before fainting. The student is usually flaccid during the brief period of unconsciousness, although clonic movements of the arms or face are occasionally noted. On awakening, the student is usually oriented and may complain of fatigue. Complete recovery within minutes is typical.

Interventions

Provide appropriate interventions as outlined earlier. EMS transport may be required. An overview of assessment and triage categories for syncope appears in the *Syncope* protocol in *Appendix A*.

Seizures

Seizures result from a sudden, excessive electrical discharge within the cerebral cortex. The specific manifestations of the seizure depend on the area of the cortex involved as well as the rate and progression of the discharge.

Types of seizures/assessment findings

Seizures are currently classified as partial or generalized, with subclassifications as summarized in Table 7-7.

TABLE 7-7. CLASSIFICATION AND CLINICAL MANIFESTATIONS OF SEIZURES

Classification	Clinical Manifestations
Partial	
<i>Simple</i>	<ul style="list-style-type: none"> ▪ No loss of consciousness ▪ Focal motor activity ▪ Somatosensory symptoms (headache, paresthesia, metallic taste) ▪ Autonomic reactions (flushing, diaphoresis, drooling) ▪ Psychic/sensory symptoms: sight (flashing lights); sound (buzzing) emotions (frightened when angry)
<i>Complex</i>	<p><i>Associated with focal lesions of the temporal lobe</i></p> <ul style="list-style-type: none"> ▪ Impaired consciousness ▪ Repetitive automatism ▪ Postictal confusion or sleep
Generalized^a	
<i>Absence</i>	<p><i>Abrupt onset in children aged 5 to 9 years</i></p> <ul style="list-style-type: none"> ▪ Brief lapse of awareness without loss of consciousness ▪ Minor motor movement (blinking) may be present
<i>Tonic-clonic</i>	<ul style="list-style-type: none"> ▪ Loss of consciousness ▪ Sustained muscle contraction and rigidity of extremities and trunk (tonic) alternating with rhythmic jerking and flexor spasm of extremities (clonic) ▪ May experience aura ▪ Urinary or bowel incontinence ▪ Postictal state may persist for hours
<i>Myoclonic</i>	<ul style="list-style-type: none"> ▪ Brief bilateral flexor jerking of arms and dropping of the head; legs may also be involved ▪ Usually no loss of consciousness
<i>Atonic</i>	<ul style="list-style-type: none"> ▪ Sudden collapse or loss of muscle tone

^aGeneralized seizure may also occur with only clonic or only tonic activity.

Partial seizures

Partial seizures may be simple or complex. Simple partial seizures may involve motor, sensory, autonomic, or psychic manifestations without loss of consciousness. Complex partial seizures involve impaired consciousness followed by automatism—purposeful but inappropriate motor movements, such as grimacing, fumbling, or running. This type of seizure is rare in children younger than 10 years.

Generalized seizures

Types of generalized seizures include absence, tonic-clonic, myoclonic, and atonic. They are differentiated primarily by the pattern of motor involvement.

Seizure syndromes

Two of the more prevalent pediatric seizure syndromes are *febrile seizures* and *status epilepticus*.

Febrile seizures

Febrile seizures are associated with a febrile illness and constitute about 30% of childhood seizures. This is the most common seizure disorder of childhood. Febrile seizures are typically benign and self-limiting, affecting infants and young children aged 6 months to 5 years. Seizure activity may last for only a few seconds or persist for more than 15 minutes.

Status epilepticus

Status epilepticus is defined as a generalized tonic-clonic seizure that persists for more than 15 to 20 minutes or an episode of repeated seizures and unconsciousness that persists for more than 30 minutes.

Etiology

Some seizure disorders are idiopathic. Acute causes of seizure include

- Fever
- Infection (meningitis, encephalitis)
- Trauma
- Intracranial hemorrhage
- Toxic exposure
- Metabolic disturbances
- Anoxia
- Tumors
- Congenital or degenerative disorder

Interventions

Provide appropriate interventions as outlined earlier in the chapter. The following factors are particularly important:

During the episode

- **Do not** place anything in the student's mouth. **Do not** restrict movement.
- **Note time of onset.**
- Protect the student from injury: for example, remove eyeglasses, move hard or sharp objects away from student; gently help student to the floor if sitting in a wheelchair or chair.
- Be prepared to suction the oropharynx, administer oxygen, and assist ventilation with a resuscitation bag and mask as resources and applicable protocols permit.
- Carefully note seizure activity for later documentation and evaluation.

After the episode

- Stabilize the cervical spine if head or spinal injury is possible.
- Open and maintain the airway as necessary, using the jaw-thrust maneuver as indicated.

- If there is no possibility of spinal trauma, place the student in the left lateral recovery position to prevent aspiration of secretions or emesis.
- Monitor for signs of respiratory compromise.

Triage and transport

KEY POINT

Immediately activate EMS for students with ▪ first-time seizure or no known history of seizure ▪ seizure or series of seizures persisting for more than 5 minutes ▪ seizure with respiratory compromise ▪ seizure following head injury ▪ unexpected or atypical seizure in a student with a known seizure disorder.

Immediately activate EMS for students with any of the following:

- First-time seizure or no known history of seizure
- Seizure/series of seizures persisting for more than 5 minutes
- Seizure with respiratory compromise
- Seizure following head injury
- Unexpected or atypical seizure in a student with a known seizure disorder

Documentation

If you witnessed the episode, carefully document time of onset, duration, and characteristics of the seizure. If you did not witness the episode, try to get a description from bystanders. Report this information to appropriate health care providers and the parent/guardian.

Follow-up/prevention

Develop an emergency care plan for any student with a known seizure disorder (see Chapter 14: *Planning for Students With Special Needs*). Also, ask the parent/guardian to fill out a seizure assessment form (see *Appendix B*). Stress the importance of informing you of changes in the student's condition or treatment regimen.

Additional considerations

Vagal nerve stimulator

A student with intractable epilepsy may have a vagal nerve stimulator (VNS) surgically implanted in the left anterior chest wall. The device delivers repetitive electrical pulses to the vagus nerve and helps to control seizures by a mechanism that is not clearly understood. Adverse effects, including hoarseness, pain or tingling in the throat or neck, cough, headache, or ear pain, may occur. These effects are generally related to stimulation settings and diminish over time or after reducing the stimulation. Dysphagia and, rarely, aspiration may occur in some students with a history of reflux or feeding difficulties. Although uncommon, damage to the VNS device and wound breakdown are potentially serious complications.

Diazepam

Rectal diazepam gel (Diastat) is used to treat occasional seizures in students whose seizure activity is generally well-controlled by a stable regimen of antiepileptic medications. Onset of action is about 5 minutes. To administer diazepam at school, you must

- Have a physician's order on file in the student's health record **and**
- Be a registered nurse

See the *Seizures* protocol in *Appendix A* for an overview of triage and treatment.

Shunt Dysfunction

The current treatment of choice for hydrocephalus involves placing a ventriculoperitoneal (VP) shunt, which drains excess CSF from the ventricles to the peritoneum via a pressure gradient. A 1-way valve in the shunt tubing prevents retrograde flow of CSF.

If shunt function is compromised due to obstruction, infection, or displacement as the child grows, intracranial pressure may increase. Indications of shunt dysfunction include nausea and vomiting, decreased activity, headache, irritability, changes in vision, and seizures. Fever may indicate that infection is present.

Interventions

Abnormal findings or any evident change in the student's baseline neurologic status is considered emergent or urgent, requiring prompt medical evaluation. Provide appropriate interventions as outlined earlier and in the *Increased Intracranial Pressure* protocol in *Appendix A*. Interventions for seizures may also be required.

If a student with a shunt attends your school, make sure teachers and other school personnel are aware of the student's special needs. This information can be shared at a scheduled meeting with the student, parents/guardians, and teachers. A form outlining potential complications and precautions for shunts is included in *Appendix B*.

Autonomic Dysreflexia

Autonomic dysreflexia is a hypertensive crisis that arises occasionally in students who have quadriplegia or spinal nerve damage at or above the sixth thoracic vertebra. The crisis is triggered by painful or noxious stimuli affecting areas where pain sensation is impaired. This causes vasodilation superior to the level of the spinal cord injury and vasoconstriction inferior to it. Bladder distention and fecal impaction are the most common causes.

Assessment

Signs include erythema of the upper body, acute hypertension, and bradycardia. The lower extremities will be cold. The student may complain of severe headache.

Interventions

Elevate the student's head and loosen tight clothing. Assess for the source of the noxious stimulus and attempt to correct it. Monitor blood pressure and heart rate.

If these interventions do not resolve the crisis, consider the student's condition **urgent**. Activate EMS to provide transport to the nearest emergency department. Notify the parent/guardian as well.

If blood pressure returns to normal levels following intervention, consider the student's condition nonurgent. Notify the parent/guardian.

Follow-up

Follow-up is important for this type of incident. Discuss the event with the parent/guardian. Talk to the student's primary health care provider or specialist about measures to prevent a recurrence.

Headaches

In most cases, the headaches that bring students to the health office are mild and transient, with a benign cause. Occasionally, however, a headache is a symptom of a more serious, even life-threatening condition. A careful evaluation is therefore mandatory for any student with headache. Table 7-8 summarizes types of headache, potential etiology, and associated findings.

TABLE 7-8. HEADACHE: TYPES, CAUSES, CHARACTERISTICS

Type	Etiology	Associated Findings
Inflammatory	Meningitis; encephalitis	<ul style="list-style-type: none"> Stiff neck, fever, altered LOC
	Sinusitis	<ul style="list-style-type: none"> Rhinitis, nasal congestion, maxillary pain Sphenoidal localized pain in most cases; may be frontal sinus in older students
	Dental infection	<ul style="list-style-type: none"> Localized pain and sensitivity in affected tooth or soft tissue
Vascular	Fever	<ul style="list-style-type: none"> Pharyngitis, signs of viral illness Frontal or bitemporal throbbing pain
	Migraine	<ul style="list-style-type: none"> Aura, visual disturbances, photophobia Transient motor deficits Nausea, vomiting Initial unilateral pain later becoming generalized
	Seizure disorder	<ul style="list-style-type: none"> May occur before a seizure, during postictal state, or as sole manifestation of seizure Variable characteristics
	CHF; hypertension; vaso-occlusive event with SCD; severe anemia	<ul style="list-style-type: none"> Throbbing anterior bitemporal pain (cerebral hypoxia associated with decreased cerebral perfusion results in arterial dilation)
Traction	Intracranial hemorrhage or hematoma; cerebral edema; hydrocephalus; brain abscess	<ul style="list-style-type: none"> Severe pain Signs of increased ICP Drowsiness Vomiting Diplopia
Muscle contraction	Tension; fatigue	<ul style="list-style-type: none"> Sensation of tightness or pressure in back of head or neck Occasionally generalized

CHF indicates congestive heart failure; ICP, intracranial pressure; LOC, level of consciousness; SCD, sickle cell disease

History and pain assessment

The history is particularly important in headache assessment. It provides crucial information that can help you assess the severity of the student's headache and select appropriate interventions. The following information is essential:

- History and chronology of the current complaint
- Recent food and fluid intake
- Duration and frequency of headaches
- Physician has diagnosed a specific headache condition
- Location and quality of pain
- Measures that relieve the pain (position, medication)
- Factors that make it worse

- Associated symptoms

The **SAMPLE** mnemonic (Chapter 3) provides a systematic approach to the history; an adaptation of the **PQRST** mnemonic, as shown in Table 7-9, can be particularly helpful in assessing pain.

TABLE 7-9. PQRST HISTORY FOR HEADACHES

Assessment Points	
P	<ul style="list-style-type: none"> ▪ Problem: How does the student describe the chief complaint? ▪ Provoke: What makes the headache worse? ▪ Palliate: What makes the headache better?
Q	<ul style="list-style-type: none"> ▪ Quality: What is the quality or character of the headache?
R	<ul style="list-style-type: none"> ▪ Radiate: Does pain or discomfort seem to travel or move?
S	<ul style="list-style-type: none"> ▪ Severity: Using a developmentally appropriate assessment tool, how does the student rate the severity of pain or discomfort? ▪ Signs: What clinical signs accompany the problem? ▪ Symptoms: What subjective problems does the student report?
T	<ul style="list-style-type: none"> ▪ Timing: When did the problem start? Was the onset sudden or gradual?

Pay particular attention to the following assessment points:

Problem

Ask the student to describe the chief complaint. Symptoms commonly reported with **tension headaches** include

- Difficulty falling asleep and staying asleep
- Chronic fatigue, irritability, disturbed concentration
- Mild sensitivity to light or noise
- Generalized muscle aches

Symptoms associated with **migraine headaches** may include

- Sensitivity to light, noise, or odors
- GI problems, such as nausea or vomiting, abdominal pain, loss of appetite
- Sensations of being very warm or cold
- Fatigue or dizziness
- Fever (rare)
- Visual disturbances, such as blurred vision, bright flashing dots or lights, blind spots, wavy or jagged lines

Provoke

Attempt to pinpoint the provoking incident by asking the student about specific potential triggers, such as a stressful situation (since anxiety, anger, and other strong emotions can provoke a headache) or exposure to noise or glare. Other factors that can trigger headaches include eating and sleeping patterns, diet, medications, environmental factors, hormones, and physical exertion.

Palliate

Factors that may provide symptomatic relief for headaches include medications, meditation, and lying down.

KEY POINT

A severe headache warrants a thorough assessment, with referral to a physician as necessary.

Severity

A severe headache (often described as “*the worst headache of my life*”) warrants a thorough assessment, with referral to the emergency department (if there’s no history of a headache-related disorder) or primary health care provider.

Interventions

The triage category varies from emergent to nonurgent, depending on findings. Activate EMS as indicated. For mild to moderate headaches, allow the student to rest in a darkened room. Consult the student’s individualized health care plan (IHP) or emergency care plan (ECP) and follow guidelines indicated. Administer medication as permitted by applicable protocols and individual physicians’ orders. Reassess.

The *Headache* protocol in *Appendix A* provides an overview of triage and interventions. For more information about headache associated with head injury, refer to Chapter 4.

Prevention

Injuries are the leading cause of death for adolescents and children older than 1 year. Those who survive neurologic trauma may suffer devastating and costly lifelong sequelae.

As a school nurse, you’re in an excellent position to educate students and staff about the benefits of developing safe habits that may prevent head and spinal trauma, such as proper use of bicycle helmets and other protective sports gear, personal flotation devices when boating or swimming, and seat belts with shoulder harnesses when riding in a motor vehicle.

You may wish to invite individuals who have suffered spinal cord injury to speak to students at your school. By recounting their postinjury experiences, they may convey a strong safety message to students.

Educate students with chronic conditions about appropriate self-care measures to help them avoid situations that increase the likelihood of an exacerbation.

Students With Special Needs

KEY POINT

Remember that you may encounter students who have neurologic deficits that have not been recognized or formally diagnosed.

Give special consideration to chronic and ongoing health problems when evaluating neurologic presentations. Keep in mind that some of the signs and symptoms you're seeing may indicate a neurologic deficit that has not yet been recognized or formally diagnosed. For example, students who experienced neurologic insults—such as anoxia or drug toxicity—during the neonatal period may exhibit no notable deficits until entering school, when learning disabilities become apparent.

Once a neurologic deficit has been identified, work with the student and parents/guardians to develop applicable care plans (IHPs/ECPs) and emergency information forms to keep with the student's school health records (see Chapter 14). Be sure to include information about baseline neurologic function. When assessing students with atypical baseline mental status and cognitive function, you must adjust your evaluation accordingly.

Some chronic health conditions carry a risk for specific neurologic complications during exacerbations of the underlying disorder, as shown in Table 7-10.

TABLE 7-10. CHRONIC CONDITIONS WITH POTENTIAL NEUROLOGIC COMPLICATIONS

Condition	Associated Complications
Hydrocephalus with CSF shunt	Increased intracranial pressure secondary to loss of shunt integrity, disconnection, infection, or obstruction
Congenital heart disease	Aortic stenosis, arterial occlusion, venous occlusion
Diabetes	Syncope, seizures; altered mental status due to hypoglycemia or DKA
Hemophilia	Intracranial hemorrhage from relatively minor trauma
Myasthenia gravis	Muscle weakness, ptosis, diplopia; ventilatory compromise due to myasthenic crisis
Seizure disorder	Seizures, status epilepticus; changes in consciousness associated with postictal state
Sickle cell disease	Cerebral infarction; hemorrhage

CSF indicates cerebrospinal fluid; DKA, diabetic ketoacidosis

Summary

Neurologic dysfunction may arise after a direct insult to the central nervous system or as a secondary effect of a systemic process. Your initial assessment of students with acute injury or illness should always include a brief baseline evaluation of **AVPU** status and pupillary response, followed by periodic reassessments to identify changes in neurologic status. Calculating a Pediatric Glasgow Coma Scale score can provide objective baseline data for evaluating neurologic status and tracking changes in level of consciousness.

If the student's condition permits, conduct a thorough neurologic examination during the focused physical evaluation. Evaluate the student's mentation and orientation, motor function, and cerebellar function to identify deficits and establish a baseline for identifying neurologic deterioration.

Except for mild headaches and minor, asymptomatic head injury, **any** illness or injury with neurologic manifestations should be triaged as **urgent** or **emergent**. Early intervention in neurologic emergencies can have a positive effect on outcome.

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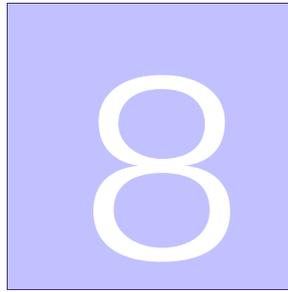
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Eye, Ear, Nose, Throat, and Dental Emergencies

On completing this chapter, you will be able to

- Identify common eye, ear, nose, throat, and dental emergencies.
- Describe interventions for specific emergencies involving the eyes, ears, nose, throat, and mouth.
- Identify specific dental, oral, and maxillofacial trauma and describe appropriate interventions.
- Identify school activities that place students at risk for facial and dental emergencies and encourage preventive practices.
- Identify the unique issues that may accompany eye, ear, nose, throat, or dental emergencies involving students with special needs.

EYE EMERGENCIES

Assessment

Eye injuries can cause students extreme anxiety—a reasonable reaction, given the potential for disabling morbidity. It's important to demonstrate a calm, reassuring manner as you proceed with your assessment. Explain your actions using simple, age-appropriate language. A young student may find it reassuring to sit on the lap of another adult during your examination. You may also be able to reduce anxiety and increase cooperation by giving the student a colorful toy, stuffed animal, or puppet to divert attention from the injury.

Equipment

To assess and treat eye injuries, the health room should be equipped with

- Age-appropriate visual acuity charts or cards
- A bright penlight
- Ocular irrigation fluid and equipment to apply it
- A magnifying lens
- Cotton-tipped applicators
- Sterile eye pads
- Paper tape
- Patches (gauze and metal shield)
- An eyecup
- Roller gauze

An ophthalmoscope is also helpful if you have been trained to use it.

External Examination

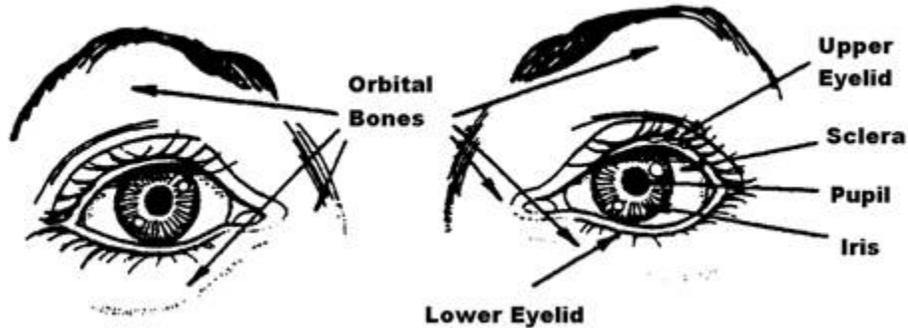
KEY POINT

Physical assessment of an eye injury should proceed systematically *except* in the case of a chemical splash, which should be flushed immediately.

Physical assessment of an eye injury should proceed systematically in the following order, **except** in the case of a chemical splash, which should be flushed **immediately** as described in the next section.

Examine the external structures of each eye without touching it. Figure 8-1 reviews the major anatomic features.

FIGURE 8-1. ANATOMY OF THE EYE



Note: Ethnic and genetic variations affect certain external structures of the eye. Individuals of Asian origin have epicanthic folds covering the inner canthus of the eye. These folds also occur in Down syndrome. In African American students, the cornea may have a gray-blue hue. Students with dark skin tones may have small dark spots on the sclera.

Inspect the lids, lashes, and symmetry of the eyes. Examine the conjunctiva and cornea. Note eye movements and test pupillary response. These procedures are detailed below:

Orbital bones

Gently palpate the orbital rim, noting tenderness and deformity.

Orbital nerve

Compare sensation in both cheeks and the upper lip. Decreased sensation may indicate a fracture of the orbital floor with nerve involvement.

Lids

Note integrity, appearance, and color; inspect for edema.

Position of the globe

Note whether it's displaced to one side, sunken, or protruding.

Conjunctiva or sclera

Separate the lids with your thumb and index finger. Ask the student to look up, down, left, and right. Look for engorged blood vessels and note the color of the sclera.

Cornea

Note appearance and clarity.

Anterior chamber

Note clarity and depth. Does the fluid appear clear, hazy, or bloody?

Pupils

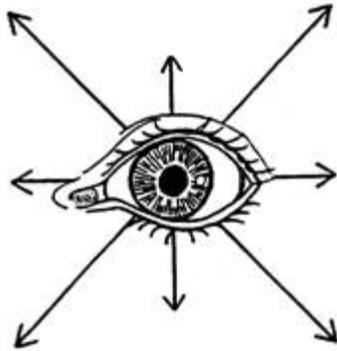
Note size, reactivity, symmetry, and accommodation. With the room semidarkened, ask the student to look at you and focus on your nose. Are the pupils of equal size? Are they round? Do they constrict symmetrically in response to light?

To check accommodation, hold your finger or an object about 10 inches from the student's nose, then move the object toward the student until it is within a few inches of the student's nose. Note whether the eyes converge and the pupils decrease in size as they track its movement. If all of your findings are normal, record as PERRLA (*pupils equal, round, and reactive to light and accommodation*).

Eye movement

To assess function of the extraocular muscles (Figure 8-2) and the cranial nerves responsible for their movements, sit in front of the student and hold a pencil directly in front of the student's nose. Ask the student to focus on the pencil. Move it about 18 inches away from the nose, then move it through all visual fields, returning the object to midpoint after each movement. When recording the results of this test, note any limitation of movement or asymmetric movement in either eye. Also note any reported pain or diplopia during the examination.

FIGURE 8-2. EXTRAOCULAR MUSCLES



<i>Muscle:</i>	<i>Rotates Globe:</i>
Inferior oblique	Upward and outward
Superior oblique	Downward and outward
Inferior rectus	Downward and somewhat medially
Lateral rectus	Laterally
Medial rectus	Medially
Superior rectus	Upward and somewhat medially

Fundoscopy examination

If an ophthalmoscope is available and you are trained in fundoscopic examination, evaluate the retinal structures.

NOTE | In African Americans, the optic disk and retina are normally darker than in fair-skinned individuals.

Visual Acuity

Evaluate visual acuity one eye at a time, being careful not to apply pressure when occluding the injured eye. Eyeglasses or contact lenses that the student normally wears should not be removed for the evaluation.

Be sure to use the appropriate screening tool. Vision screening equipment may be used in older children and adolescents. Use picture cards to assess vision in toddlers. Students with limited language skills (older preschoolers, students who

do not speak fluent English, or those with developmental disabilities or aphasia) can be assessed using the Snellen E-Chart. Note any change from previous screenings recorded on the student's health record.

If the student can't cooperate with assessment techniques that use available visual screening tools, perform a gross assessment of vision by checking light perception, asking the student to count the number of fingers you hold up, and determining whether the student can distinguish faces, objects, and movement.

History

Conduct a careful history. For young students, you may be able to obtain historical information from the student's health record or by contacting the parent/guardian. The following information is essential:

- Mechanism, nature, and time of injury
- Past history of eye problems, eye injuries, or eye surgery
- Use of corrective or contact lenses (note the type)
- Systemic health problems
- Oral or eye medication currently taken
- Drug allergies
- Loss of vision following the injury (have the student describe how vision was affected and whether the loss was immediate or delayed)

Ask the student how the injured eye feels. Make a note if the student complains of

- Pain or photophobia (may indicate involvement of the cornea or iris)
- Itching (potential allergic response)
- A gritty sensation (may indicate a foreign body or radiation burn)
- A burning sensation (potential reaction to irritants)
- Black cobweb shapes, floaters, or flashers (may accompany vitreous or retinal hemorrhage)
- Decrease or change in vision

Specific Eye Emergencies

Recognizing an Emergency

KEY POINT

Familiarize yourself with eye problems that require emergency referral to an ED or ophthalmologist for immediate evaluation.

Certain eye problems require **emergent** referral to an ED or ophthalmologist for **immediate** evaluation. The student should not wait for an ophthalmology appointment. These include

- Chemical/thermal burns
- Radiation burns
- Blunt impact injury
- Penetrating injury
- Foreign body embedded in the cornea, globe, or eye
- Haze or blood in the anterior chamber (hyphema)
- Evidence of perforation, laceration, or rupture of the globe
- Decreased visual acuity; constriction or loss of a portion of the visual field
- An irregular, asymmetric, or sluggishly reactive pupil

NOTE | Alert the emergency dispatcher or hospital staff if a student with an eye injury wears contact lenses.

Keep in mind that any significant blow to the eye may cause head injury as well. Bilateral periorbital ecchymosis (raccoon eyes), loss of vision, loss of eye movement, or unequal, fixed, or dilated pupils suggests brain injury requiring a rigorous neurologic evaluation.

Triage and intervention are summarized in the *Eye Emergencies* protocol (*Appendix A*). Interventions for specific emergencies are described in the following sections.

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

Suspected Perforation or Rupture of the Globe

Either blunt impact or a penetrating injury can rupture the globe. Signs and symptoms may include decreased vision, an irregularly shaped pupil, evidence of intraocular hemorrhage, or a shallow or flat appearance of the anterior chamber.

Interventions

Consider this an **emergent** injury. Activate EMS to provide transport to the ED. The student should be examined immediately by an ophthalmologist.

To decrease eye pressure while awaiting transport, have the student sit upright and restrict activity. Instruct the student to avoid any activity that could increase intraocular pressure, such as squeezing the eyelids shut, rubbing the eye, blowing the nose, or performing a Valsalva maneuver (forcibly exhaling while glottis, mouth, and nose are closed).

Blunt trauma

Patch the eye using double pads to fill the orbital recess, but do not apply pressure to the globe.

Penetrating trauma

KEY POINT

Never remove an object that is impaled in the eye. Stabilize it with gauze pads and secure a disposable cup over the dressing.

If an object is impaled in the eye, **do not remove it**. Stabilize it with gauze pads, then secure a disposable drinking cup over the dressing, positioning it carefully so that it doesn't press on the impaled object. Use a roller bandage or gauze wrap to anchor the dressing and cup in place. The uninjured eye should be loosely bandaged as well to minimize sympathetic eye movement.

NOTE | Patching both eyes can cause tremendous anxiety for the student, especially in the wake of a serious eye injury. Have someone stay by the student's side at all times to provide reassurance and to explain what is happening.

Blunt Impact Injury Without Rupture

Mechanisms of blunt injury to the eye include fist-fights, a misguided hockey puck or ball, a fall, elastic bands, and acts of maltreatment. The student may complain of pain, headache, or vomiting.

On inspection, you may note redness, hyphema (bleeding into the anterior chamber), or both. A small hyphema may be visible only under microscopic (slit lamp) examination. When the student is sitting, you may be able to see the level of the blood as a subtle or overt change of color in the iris, particularly if the injury is severe. Erythema and lacrimation may also be apparent.

Intraocular bleeding may impair visual acuity. Testing may reveal a decrease in visual acuity and field of vision, which may improve over time. Any limitation of movement or asymmetric movement in either eye after facial trauma could indicate entrapment of an extraorbital muscle, requiring a thorough evaluation by an ophthalmologist.

Interventions

Depending on severity, blunt impact injuries may be **either urgent or emergent**. If there is a potential threat to vision or an alteration in visual acuity, the injury is **emergent**. Activate EMS to provide transport to the ED or an ophthalmologist's office for **immediate** evaluation.

To decrease eye pressure while awaiting transport, have the student sit upright and restrict activity. Instruct the student to avoid any activity that could increase intraocular pressure, such as squeezing the eyelids shut, rubbing the eye, blowing the nose, or performing a Valsalva maneuver.

If possible, protect the eye with a metal eye shield. Tape it in place **without** an eye pad to avoid putting pressure on the globe. If an eye shield is not available, lightly cover the eye without applying pressure.

Chemical Burn

Caustic chemicals can severely damage the eyes:

- **Burns from alkalis** tend to be particularly severe because they continue to penetrate and destroy tissue after the initial exposure. Alkaline products that may be encountered at school include lye, ammonia, detergents, calcium oxide (lime), plaster of Paris, and cleaning solutions.
- **Tissue damage from acid** is generally more localized. Acidic products include battery acid, bleach, and certain hair care preparations.

Interventions

KEY POINT

A suspected chemical burn of the eye is an *emergent* injury. Activate EMS, assess scene safety, then begin irrigation of the eye immediately. Do not delay irrigation to identify the exact chemical involved.

Consider any chemical exposure an **emergent** injury.

- **Immediately** activate EMS to provide transport to the ED.
- Assess scene safety to ensure that there are no hazards to you, the student, or others on the scene.
- If it is safe to approach, **immediately** begin irrigation of the eye at the classroom sink or an eye fountain.

NOTE | If the student wears contact lenses **and** there is no obvious injury to the eye, ask the student to help you remove the lenses before beginning irrigation. Make sure the student's hands are clean and free from chemicals. Place the lenses in an appropriate container filled with sterile saline solution and label it with the student's name.

- Delegate someone to identify the chemical agent, call the Poison Control Center (800–222–1222), and obtain a material safety data sheet (MSDS). Do not delay or interrupt irrigation to perform these tasks. If the chemical can't be positively identified, send a copy of the MSDS for each suspected chemical to the hospital with the student. Keep another copy with the student's health record.
- Apply copious amounts of tap water, eyewash solution, or saline in a gentle, continuous stream until EMS arrives to transport the student. To avoid flushing contaminants into the unaffected eye, direct the stream from the inner corner of the eye toward the outer corner.
- Keep the eye open by applying gentle pressure to the bony orbit. **Do not press on the globe.** Have the student roll the eye in all directions to irrigate all areas.

Thermal Burn

Signs of a thermal burn include erythema or blisters of the eyelids or singed lashes.

Interventions

Do not try to inspect the eyes. Apply a loose, moist dressing and activate EMS for **emergent** transport to the ED.

Radiation Burn

Exposure to ultraviolet (UV) light can cause radiation burns. Sources of UV light in the school setting include arc welders, sun lamps, and bright sunlight reflecting off snow or water. Radiation burns usually cause pain, photophobia, and a gritty sensation in the eyes, with symptoms developing up to 12 hours after exposure.

Interventions

Consider this an **emergent** injury. Activate EMS to provide transport to the ED or an ophthalmologist's office for **emergency** evaluation. Close the student's eyes and cover them with eye patches while awaiting transport.

Suspected Corneal Abrasion

Scratches to the outermost layer of the cornea are a common cause of eye emergencies in students. Abrasions can be caused by a fingernail, a foreign body in the eye, or contact lenses. You'll note edema of the eyelid and erythema of the lower bulbar conjunctiva. The student may report irritation, pain, and photophobia. Delayed pupillary response may be present in the affected eye.

Interventions

Consider this an **urgent** injury. Patch the affected eye and have the student transported to the ED for evaluation.

Superficial Foreign Body

The findings associated with foreign bodies can be similar to those of corneal abrasion, including pain, erythema, and lacrimation. To inspect the eye for a superficial foreign body (one that is **not** embedded or on the cornea), carefully grasp the upper lashes between your thumb and forefinger, then fold the lashes over a cotton applicator swab as the student looks down, exposing the upper surface of the globe.

Interventions

A superficial foreign body can be flushed with sterile eyewash solution, then treated as a corneal abrasion. Once the foreign body is removed, observe the student. Evaluate pain and sensitivity. If the sensation of a foreign body persists, treat as a corneal abrasion.

The triage category is nonurgent. Patch the affected eye using 2 pads to fill the depth of the orbital space. Apply a single piece of paper tape from the hairline to the angle of the mandible to secure the patch. Refer the student to an ophthalmologist.

Documentation

In all cases of eye injury, carefully document the results of your evaluation and interventions. Include the student's subjective complaints, the history of the event, objective findings, and observations from your examination. Record your assessment of the injury, including nursing diagnoses, such as pain, sensory or perceptual deficit, and tissue integrity. Note the triage category, transport method, and referral (ophthalmologist, emergency department, or primary health care provider).

If an eye injury that occurred at the school requires medical assessment, write an incident report on the appropriate form. This information is valuable in assessing eye-safety risks in the school environment, with implications for supervision, education, and protective eyewear. Note the time and significant details of phone calls to the parent/guardian, the primary health care provider, and emergency personnel.

A vision report form and screening roster issued by the Illinois Department of Public Health appear in *Appendix B*.

Prevention

Children are more prone to eye injuries than adults. Most of these injuries occur during sports activities, especially those involving fast-moving objects or frequent body contact. Such sports include basketball, baseball (the foremost cause of sports-related eye injury), hockey, lacrosse, racquet sports, archery, and football. Boxing, wrestling, and martial arts also present a high risk of eye injury. Low-risk sports include swimming, track and field, and gymnastics.

Factors that affect the risk of sports injuries to the eye include the student's developmental level, any history of visual impairment, a preexisting eye condition (thin retinas, weak sclera, previous eye injury), and the general skill level of the participants.

The American Academy of Pediatrics recommends specific protective gear for certain sports, including

- Total protection for the head and neck in football, hockey, lacrosse, and baseball (catchers, batters)
- Full face protection in hockey (goalies) and fencing
- Eye protection for all racquet sports (strongly recommended for soccer, basketball, softball, and baseball as well)

High-risk Areas Within the School

Students who participate in vocational or technical classes, industrial arts classes, and chemistry or physics classes should wear industrial safety glasses or goggles during activities that involve

- Molten materials
- Milling, sawing, turning, shaping, cutting, grinding, or stamping any solid

material

- Heat treatment, tempering, or kiln-firing materials
- Any welding process
- Repairing or servicing any vehicle
- Chemicals, caustic materials, or potentially explosive materials

Make sure teachers instruct the students in the proper use of safety wear.

Protective eyewear used in a school must meet or exceed the requirements of the American National Standard Practice for Occupational and Educational Eye and Face Protection (ANSI Z87.1). This standard specifies the impact resistance and lens retention qualities of lenses and frames used in industrial settings. Eye protection should be matched to the potential risk; for example, chemical-resistant goggles should be used when there is a risk of liquid splashes or flying dust particles. Select eyewear with polycarbonate lenses whenever possible, as this material offers superior impact protection. Regular eyewear for the street is not an adequate substitute for safety glasses, even if it's labeled impact-resistant. Contact lens wearers should use the same safety eyewear others do.

Young students require adequate supervision when using sharp objects, such as scissors, pointers, or pencils. Toys should be suitable for the cognitive and motor skills of the students playing with them. They must be durably constructed and free of sharp edges. Toys with projectiles are not suitable for younger students.

Estimates from Prevent Blindness America (formerly the National Society to Prevent Blindness) suggest that 90% of all eye injuries can be prevented. As a school nurse, you have the ability and the opportunity to educate students, teachers, and staff about eye protection and injury prevention measures. Local affiliates of Prevent Blindness America can provide you with information about eye safety in the schools.

EAR, NOSE, AND THROAT EMERGENCIES

Assessment of the Ear, Nose, and Throat

Any emergency involving the ears, nose, or throat may cause students anxiety; severe problems can be life-threatening. It's important to recognize key findings that indicate an emergency so that you can act quickly. For example, drainage of blood or cerebrospinal fluid from the nose and ears is associated with blunt injury to the head. Battle sign (bruising behind the ears), hemotympanum (blood behind the tympanic membrane), and bilateral periorbital ecchymosis (raccoon eyes) may indicate a significant injury, such as a fracture of the temporal bone or basal skull fracture, requiring immediate hospital referral. Assess the facial bones, vision, and eye movement any time you observe or suspect facial trauma.

Always provide reassurance throughout your assessment and interventions. Younger students in particular should be addressed in a calm voice and age-appropriate manner.

Initial Assessment

Note the student's general appearance, level of consciousness, and obvious signs of illness or trauma. Focus initially on significant findings affecting the airway, breathing, or circulation; treat any problems you identify. After life-threatening injuries have been ruled out, obtain a complete history and perform a focused assessment of the ear, nose, and throat.

History

A careful history is of the utmost importance. Ask about

- When and how the injury occurred
- When symptoms first occurred
- Unilateral or bilateral hearing loss
- Foreign objects placed in the ear
- Pain
- Nasal congestion
- Tinnitus
- Dizziness or imbalance
- Associated injuries

Obtain a general health history covering medications and allergies. Check the student's health record to make sure tetanus immunization is up-to-date.

Examination of the External Ear

The external ear consists of the auricle—a cartilaginous structure covered by a thin layer of subcutaneous fat and skin—and the auditory canal.

Inspect for erythema, discoloration, or disfigurement of the ear and surrounding structures. Students who are nonverbal often pull at the affected ear.

Palpate the auricle and gently pull it to test for pain with movement.

Examine the external auditory canal and tympanic membrane with an otoscope, if available. Young students may need to be held firmly on an assistant's lap during this examination. Look for erythema, edema, debris, and drainage.

Inspect the tympanic membrane, which normally appears gray and flat. Note unusual color, perforations, or bulging. It is important to discern whether an injury or another abnormal finding involves deep tissue or only superficial tissue.

Triage and interventions are summarized in the *Ear Emergencies* protocol (*Appendix A*). Interventions for specific emergencies are described below.

Specific Ear Emergencies

Laceration of the External Ear

If the external ear is lacerated, assess the wound to see whether involvement extends to the cartilage.

Interventions

Control hemorrhage and wrap the ear in sterile gauze. Place padding between the external ear and the scalp. Refer the student to the ED or primary health care provider according to the severity of the injury. Note the date of the student's last tetanus vaccination on your documentation.

Laceration of the External Auditory Canal

This type of injury can be caused by inserting a cotton-tipped swab, hairpin, stick, or pencil into the ear. Small lacerations may produce significant bleeding, which usually stops spontaneously.

Interventions

Cover the laceration with a sterile dressing, check for tetanus prophylaxis, and refer the student to the primary health care provider for evaluation and treatment.

Hematoma

A hematoma may arise after blunt trauma to the ear. Findings include edema, discoloration, anterior displacement of the auricle, and pain. The external ear may have a doughy consistency.

Interventions

If you suspect a hematoma, refer the student to the primary health care provider or ED for evaluation and treatment.

Abrasions

Interventions

Clean the abrasion according to protocol or standing order and assess for embedded particles. Remove any particles that are not embedded. Cover the area with a sterile dressing. Check the student's health record for tetanus prophylaxis. Notify the parents/guardians to contact the primary health care provider. Instruct them to monitor the injury for signs of infection.

Foreign Body

Children younger than about 8 years often place inanimate objects, vegetable matter, or insects in the ear. Assess the ear with an otoscope if available; otherwise use direct inspection.

Interventions

If you find a live insect, instill 1 to 2 drops of mineral oil as specified in school protocols. Attempt to remove the object if it is close to the external acoustic meatus, avoiding excessive manipulation. If the attempt is unsuccessful, refer the student to the primary health care provider for evaluation and treatment.

Burns/Direct Thermal Injuries

Assess the burn to determine the depth (full thickness or partial thickness). More information about burn assessment appears in Chapter 9: *Environmental Emergencies*.

Interventions

Burns involving the ears or face should be evaluated and treated in the ED. Wrap the area lightly in sterile gauze, placing padding behind the rim of the auricle to separate it from the scalp. Check the health record for tetanus prophylaxis.

Frostbite

Signs of frostbite include local pallor, blisters, and bullae.

Interventions

Rewarm by applying warm compresses (100°F/37.8°C to 110°F/43.3°C). Avoid excessive heat. You may note erythema forming a line of demarcation as you rewarm the affected tissue. Keep the area as clean as possible. Refer the student to the ED or primary health care provider for immediate evaluation. Prevent reexposure to cold. More information about frostbite appears in Chapter 9.

Noise-induced Hearing Loss

Noise-induced hearing loss (NIHL) is irreversible, and its consequences are far-reaching: Impaired hearing can interfere with daily tasks, hinder communication, including speech and language proficiency, and increase levels of fatigue, irritability, anger, and frustration. These factors can have a devastating impact on educational and social development among students with hearing loss.

Causes

NIHL is a preventable hearing impairment that occurs with repeated or chronic exposure to noise levels of about 85 decibels (dB) or more. This type of exposure has become ubiquitous among students, with the widespread availability of portable media players (such as iPods and MP3 players), cell phones, and laptop computers. When headphones are used with these devices, audio output at the ear may greatly exceed the 85 dB threshold. Many electronic devices deliver 108 dB to 125 dB through headphones set at full volume, and 85 dB to 108 dB at half volume. Small-diameter headphones (“earbuds”) that are placed just distal to the external auditory canal can be particularly hazardous, as they generally do not

block ambient noise; listeners therefore increase the audio output to drown out unwanted sound.

Indicators

Although signs and symptoms vary, the following indicators may help you identify students who are at risk for NIHL:

- History of 3 or more ear infections
- Pulling or scratching at the ears
- Difficulty following conversations held in normal tones
- Difficulty identifying or localizing sounds
- Tendency to increase the volume of audio devices
- Frequent misinterpretation of, or inconsistent response to, oral instructions
- Short attention span; inattention during times of background noise
- Speech or language problems; poor memory for sounds or words
- Academic problems; poor reading or spelling
- Behavior problems
- Self-described feelings of isolation, exclusion, annoyance, embarrassment, confusion, or helplessness

Assess the student to rule out temporary causes of hearing loss, such as cerumen buildup, severe nasal congestion, or a foreign object in the ear. Confirm indicators of hearing loss by consulting with teachers and the parent/guardian. Screen students for suspected hearing loss at school if possible, and refer to an audiologist as indicated.

Specific Nose Emergencies

Triage and interventions are summarized in the *Nose Emergencies* protocol (*Appendix A*). Interventions for specific emergencies are described below.

Nasal Fracture

The nose is the most common site for facial fractures. Examine other facial structures for associated injury. Nasal fractures are often associated with more severe injuries that necessitate emergency care, such as closed head trauma or injury to the cervical spine.

Findings associated with an isolated nasal fracture include edema, external deformity, and epistaxis, which is rarely severe. The student may complain of pain and tenderness in the area. If nasal discharge of CSF is present, there may be an ethmoid fracture.

Interventions

Apply a cold pack and refer the student to the ED or primary health care provider for examination of the septum. If a septal hematoma is present, it must be drained immediately by an ENT specialist.

Epistaxis

Most nasal bleeding originates in the anterior portion of the nasal septum. Although epistaxis is usually self-limiting, severe hemorrhage may cause anemia or shock.

While blunt trauma is the most common cause of epistaxis, other potential causes include a foreign body, digitally precipitated trauma, a tumor, an upper respiratory infection, allergic rhinitis, dry environmental conditions, and hypertension. In young students, most epistaxis is caused either by digital manipulation or drying of the nasal mucosa.

Interventions

Use standard precautions and personal protective gear when treating epistaxis. Examine the anterior nostrils to locate the bleeding site. Firmly pinch the nose superior to the site. Have the student sit upright with the torso erect and the head and neck bent forward to prevent blood from draining into the airway or esophagus. Reassess after the student has maintained this posture for 10 minutes.

If bleeding continues, examine the nose again for an anterior bleeding site. Consider applying a cold pack to reduce edema and constrict the blood vessels.

At this point, pinch nostrils again and resume previous posture. Reassess after another 10 minutes. If bleeding still hasn't stopped, refer the student to the ED. If signs of shock develop, contact EMS (condition emergent). The triage category for prolonged epistaxis is **urgent**.

Foreign Body

Children younger than 3 years commonly place foreign bodies in the nose. Likely objects include toys, beads, vegetable matter, and insects. Findings include unilateral discharge that has continued for several days, purulent drainage, odor from the nostrils, and minor epistaxis.

Interventions

If possible, have the student blow the nose vigorously. Examine the nostrils with a bright light to see whether you can locate the object. Remove it only if it is easily retrievable. If you are unable to remove it, the triage category is **urgent**. Refer the student to the primary health care provider.

Acute Sinusitis

In acute sinusitis, the student may report pain over the cheeks, nose, teeth, and forehead. Throbbing pain may be exacerbated when the student leans forward. Headache and malaise are frequent complaints. Temperature measurement may

reveal fever. You may note edema in the periorbital area. Mucopurulent nasal secretions often accompany sinusitis.

Interventions

A student with acute sinusitis should be referred to the primary health care provider. The triage category is nonurgent.

Specific Throat Emergencies

Triage and interventions are summarized in the *Throat Emergencies* protocol (Appendix A). Interventions for specific emergencies are described below.

Tonsillitis

A student with a viral infection of the tonsils will generally report mild pharyngitis and dysphagia. Fever may be present. Inspection may reveal mild enlargement of the tonsils with no exudate.

Interventions

Interventions include fluids, acetaminophen for fever, and rest. The triage category is nonurgent. Refer the student to the primary health care provider for positive diagnosis and treatment.

Streptococcal Infection

Findings associated with a streptococcal throat infection include severe pharyngitis, dysphagia, and malaise. Fever is usually present. The student may exhibit signs of dehydration. The tonsils will appear enlarged with purulent exudate; the lymph nodes may be enlarged as well. You may note erythema of the pharyngeal mucosa. A coated tongue with enlarged, bright red papillae (strawberry tongue) may occur.

NOTE | A sandpaper rash of the skin may be a sign of scarlet fever, another streptococcal infection.

Interventions

Refer the student to the primary health care provider for diagnosis and treatment. The triage category is nonurgent.

Peritonsillar Abscess

Findings include severe pain and fever. Dysphagia and trismus (inability to fully open the mouth) may cause the voice to be muffled. Inspection may reveal erythema and medial deviation of the tonsil.

Interventions

This is an **urgent** condition. Refer the student to the ED for evaluation and treatment.

Epiglottitis

See Chapter 5: *Respiratory Emergencies*.

Retropharyngeal Abscess

This type of abscess is most likely to occur in younger students. A retropharyngeal abscess can lead to potentially life-threatening airway obstruction, indicated by stridor. Other signs and symptoms include pain and stiffness of the neck, fever, and dysphagia with drooling. You may see asymmetric edema of the posterior pharyngeal wall.

Interventions

This is an **emergent** condition, particularly if stridor or other signs of airway compromise are present. Activate EMS for **emergent** transfer to the ED. Monitor the student's ABCs continuously until ambulance personnel arrive.

Anaphylactic Reaction

See Chapter 13: *Medical Emergencies*.

Prevention of Ear, Nose, and Throat Emergencies

Injuries

KEY POINT

Students who participate in high-risk sports should wear well-fitting padding and helmets at all times.

In most cases, ear, nose, and throat injuries at school arise during sports or gym activities. Contact sports carry the highest risk. Students who participate in these sports should wear well-fitting padding and helmets at all times.

Make sure emergency protocols and individual emergency care plans are current. Review them regularly to ensure that they can be carried out properly.

Hearing Loss

Students should wear hearing protection during all school activities involving loud noises, such as industrial arts classes.

Conduct regular hearing tests, as well as screening tests to gauge language skills and speech development, especially in younger students. *Appendix B* includes a screening roster, audiogram form, and treating physician's report that are issued by the Illinois Department of Public Health.

To prevent NIHL associated with electronic devices, educate students and teachers about safe listening practices. Promote the use of noise-canceling

headphones when necessary, keeping the volume set to safe levels, and limiting overall exposure to noise.

DENTAL, ORAL, AND MAXILLOFACIAL EMERGENCIES

Assessment

Students may react very emotionally to injuries involving the dental, oral, and maxillofacial structures. These injuries carry a high potential for disabling morbidity as well. A prompt, accurate assessment and appropriate interventions will help to minimize morbidity and reassure an anxious student.

The Healthy Oral Cavity

Understanding normal findings in the oral cavity, including dentition, jaw movement, and soft tissue appearance, will help you recognize deviations.

Dentition

By the age of 3 years, most children will have a complete set of 20 primary teeth, which they begin to shed between ages 6 and 10. Adults usually have 32 permanent teeth (16 in each arch), although the number of third molars may vary. Table 8-1 shows normal dentition by age.

TABLE 8-1. TEETH IN EACH ARCH BY AGE

Teeth	3 ^a	7	10	14	21
Central incisors	2 ^b	2	2	2	2
Lateral incisors	2 ^b	2	2	2	2
Canines	2 ^b	2 ^b	2 ^b	2	2
First molars	2 ^b	2+2 ^b	2	2	2
Second molars	2 ^b	2 ^b		2	2
Premolars			4	4	4
Third molars (wisdom teeth)					2

^aAge indicated in years. ^bPrimary teeth.

Problems affecting dentition include *overjet*, *overbite*, *crossbite*, and *crowding*.

Overjet (horizontal overlap)

The degree to which the anterior maxillary teeth overlap the anterior mandibular teeth horizontally. It is usually expressed in millimeters. A student with an overjet exceeding 5 mm is prone to serious maxillary dental trauma during contact sports and may benefit from orthodontic correction of the malocclusion.

Overbite (vertical overlap)

The degree to which the anterior maxillary teeth overlap the anterior mandibular teeth vertically. The measurement is usually expressed in terms of the percentage of overlap; for example, if the maxillary teeth cover the upper half of the mandibular teeth when the mouth is closed, the overbite is 50%. A student with a deep overbite (approaching 100%) may complain of pain over the palate because the mandibular teeth strike the palate when the mouth is closed. The student should be referred to the dentist for evaluation and treatment.

Crossbite

An abnormal relationship between maxillary and mandibular teeth. In a normal bite, the maxillary teeth overlap the mandibular teeth. In a crossbite, however, 1 or more mandibular teeth overlap the maxillary teeth. This is usually not a painful problem, but could lead to a malocclusion as the permanent teeth erupt.

Crowding

An abnormal occlusion in which there is insufficient space between the teeth, resulting in bunching, overlapping, or displacement. Ideally, a young child should have space between the primary teeth to allow room for the larger permanent teeth. Severe crowding gives the teeth a jumbled, misaligned appearance. While not painful, the condition dictates meticulous oral hygiene to prevent caries and gum infections.

Jaw movement

Normal jaw movements are described below:

Range of motion

The mouth should open painlessly to 35 mm without deviation to the left or right.

Protrusion

The mandible should move anteriorly about 5 mm without pain or discomfort.

Retrusion

The mandible should retract up to 2 mm. (Even dentists find this difficult to assess, however.)

Lateral movement

The mandible should move laterally about 3 to 5 mm in either direction without pain or discomfort.

KEY POINT

Pain, discomfort, or deviation during mandibular movement is a potentially serious sign. It may indicate a fracture of the facial bones, an infection, or a tumor.

Pain, discomfort, or deviation during mandibular movement is a potentially serious sign that may indicate a fracture of the facial bones, an infection, or a tumor.

No sounds should be audible during jaw movement. If you hear occasional clicks or pops, report them to the primary health care provider or dentist. Crepitus is a more ominous sound, potentially indicating prior trauma or arthritis. This should be investigated within a week of onset.

Soft tissues

Table 8-2 summarizes normal and abnormal findings involving intraoral and facial soft tissue.

TABLE 8-2. ASSESSING INTRAORAL AND FACIAL SOFT TISSUE

Area	Normal Findings	Abnormal Findings
Facial skin	Soft and supple	Lacerations, abrasions, scars, ecchymosis, edema, tenderness, cellulitis
Parotid glands (anterior and inferior to each ear)	Soft	Tenderness or pain on palpation; erythema, edema
Lips (intraoral surfaces)	Moist or wet, pink	Cyanosis, dryness, distention, exudate
Lips and commissure (extraoral surfaces)	Continuous, even, and moist	Crusting, distention, lacerations, dryness, chapping
Vestibules and mucous membranes	Moist or wet, pink	Pallid or bright red color, dryness, ulcers
Floor of mouth	Moist or wet, pink	Erythema, edema, hemorrhage
Tongue	Mobile, pink; papilliferous dorsally, smooth ventrally	Deviation or limitation of function; atrophic glossitis; edema; growths; ankyloglossia
Gums	Pink (may or may not have black pigments); moist or wet	Dryness; pallid or red color; bleeding, edema, purulence, ulcers
Hard palate	Rugae present in anterior; pink, firm	Cleft, hemorrhage, erythema, tenderness, edema
Soft palate	Soft; mobile uvula	Edema, ulcers, deviation or limitation, cleft
Tonsils	Small, contained within fauces, pink	Red or white color, exudate, enlargement; strawberry appearance
Frenula	Mobile, pink, attached to bone and tissue	Immobility; ulcers; ankyloglossia
Masseter, buccinator, and temporalis muscles	Soft and mobile, without tension	Tenderness, edema; associated headaches
Submandibular and sublingual glands	Saliva is clear and flowing, ducts patent	Occlusion; tenderness; purulent saliva

Specific Dental, Oral, and Maxillofacial Injuries

KEY POINT

When treating a student for trauma to dental, oral, or maxillofacial structures, it is important to remain calm and attentive to airway status.

Trauma to the dental, oral, or maxillofacial structures requires quick and immediate attention because of the potential for airway compromise. Notify the parents/guardians whenever a student sustains a traumatic injury. It is important to remain calm. If you appear alarmed or anxious, the student will be frightened. A calm, soothing manner will relax most students and make treatment easier.

The following sections outline care for injuries to soft tissue, teeth, and bony structures. Information also appears in the *Dental, Oral, and Maxillofacial Emergencies* protocol in *Appendix A*.

Soft Tissue

Bleeding and lacerations

Locate the wound and evaluate the severity of the bleeding. Minor bleeding should stop within 5 to 6 minutes. Significant hemorrhage may not stop without intervention.

Interventions

Reassure the student as you provide intervention. Wearing protective gloves, apply direct pressure to the wound with gauze and cold compresses.

Major bleeds are **emergent**. Activate EMS. Be sure to copy pertinent information from the student's health record and send it with the student to the ED.

Minor bleeds should be considered **urgent**. Refer the student to a dentist for evaluation and sutures as needed. Check the student's health record for recent tetanus prophylaxis.

Documentation and follow-up

As you document the incident, clearly identify the origin of the bleeding and how long it persisted. When the student returns to school, find out whether any analgesic or antibiotic medication has been prescribed. Make sure the medication is properly administered in accordance with school protocols.

Edema

Determine whether edema could compromise the airway, cause dysphagia, or obscure the vision. Consider the possibility of anaphylaxis if oral edema is present.

Interventions

Reassure the student as you provide intervention. If the student has dysphagia, difficulty talking, or dyspnea, consider the triage category **emergent** and activate EMS. Send pertinent health records with the student to the ED. If these risks are not present, the triage category is **urgent**.

If there is edema related to trauma, apply cold compresses, 20 minutes on and 20 minutes off. If there is edema secondary to infection, do not apply cold compresses. Refer the student to the dentist.

Documentation and follow-up

Documentation should include the student's temperature, the location and size of the edematous area, and whether pain or erythema are present.

Follow up by calling the family or the primary health care provider to check on the student's status. Perform a reexamination when the student returns to school.

Impaled object

Reassure the student as you locate and identify the impaled object.

KEY POINT

Under no circumstances should an impaled object be removed. Stabilize it in place and activate EMS.

Interventions

Under no circumstances should the object be removed. If there is hemorrhage or edema, apply gauze and cold packs. Pack gauze sponges around the impaled object to stabilize it and prevent further injury. If the object is inside the student's mouth, tell the student not to move or bite the gauze.

The triage category for impaled objects is **emergent**. Activate EMS. Be sure to tell the dispatcher that there is an impaled object in the face. Send a copy of the student's health record with EMS personnel.

Documentation and follow-up

Document the details of the injury, including the type of object and its location. On returning to school, the student will probably require analgesics and antibiotics. Make arrangements to administer the medication at school in accordance with protocols.

Dental Injuries

Fractures of the tooth

Reassure the student as you don examination gloves to evaluate the injury. Carefully feel the tooth for rough edges. Try to discern whether fragments are missing.

Interventions

If the tooth has a small fracture and simply irritates the tongue, apply dental wax to cover the sharp edges. The triage category is nonurgent. Send a note to the dentist explaining what happened and what interventions were performed.

A larger fracture with visible red pulp is likely to be painful. The triage category is **urgent**. Immediately refer the student to the dentist. If you recover the tooth or tooth fragments, save them in whole milk or water, label the container, and send it to the dentist with the student.

Follow-up

The dentist usually performs the follow-up with the student. Check with both the parent/guardian and the student to make sure the dentist was seen for treatment.

Displacement of the teeth

Displacement may indicate fracture of the maxilla or mandible. Reassure the student as you determine how many teeth are out of alignment. Teeth are normally anchored in a symmetric pattern around the arch. Dislocations may be lingual, labial, lateral, inward, or extruded. Note the type of dislocation and the specific teeth affected. Check for soft tissue injury as well.

Interventions

If injury is present, have the student rinse the mouth with warm salt water. The triage category is **urgent**. Refer the student to a dentist with a copy of your documentation stating what happened and what interventions were undertaken.

Follow-up

Follow up to ensure that the student saw the dentist.

Avulsion of a tooth

Reassure the student as you examine the oral cavity. It is important to determine whether the avulsion involves a primary tooth or a permanent tooth.

Interventions

If a primary tooth is involved, have the student bite down on a gauze pad until bleeding subsides. No other immediate intervention is necessary, but the student should see a dentist for follow-up. Sometimes a prosthetic replacement is necessary.

An avulsed permanent tooth is a more serious matter, as it will need to be replanted as soon as possible. The shorter the interval between avulsion and replantation, the better the prognosis. For optimum results, the student must see the dentist within 1 hour of avulsion. Because of this time constraint, the triage category is **urgent**.

You will need the student's cooperation, so remain calm and reassuring.

- Locate the avulsed tooth and gently grasp it by the crown—**do not** handle the root. If the tooth is dirty, **gently** rinse it with milk or water.
- If only 1 tooth is avulsed and the student is alert and cooperative, gently replace the tooth in the socket (do not use force) and cover it with a gauze pad. Instruct the student to bite gently on the gauze. If replacement is not possible, place the tooth under the student's tongue and caution the student not to swallow it.

KEY POINT

If more than one tooth is avulsed, or if the student is not alert and reliable, do not place the tooth in the mouth for transport.

- **If more than one tooth is involved, or if the student is not alert and reliable, do not place the tooth in the mouth for transport.** Place it in a protective container and fill the container with a pH-balanced solution, if available. Alternatives, in order of preference, are **cold** whole milk or water.

Send a referral with the student describing your interventions. Note the time that the tooth was placed back in the socket or in the protective medium. Include a copy of the student's health record. Note the most recent tetanus prophylaxis.

Follow-up

Follow up by obtaining a copy of the dental form from the student to confirm that the appointment was kept. Determine the mechanism that led to the avulsion and look for ways to prevent this type of injury from recurring.

Bony Fractures

Alveolar fracture

Alveolar fractures may occur in either arch and most often involve the anterior teeth. Inspect the teeth in this area to see whether a segment appears uneven. With gloved hands, grasp the segment and manipulate it gently see if there is any movement. Even slight movement indicates an alveolar fracture.

Interventions

If your findings are positive, the triage category is **emergent**. Reassure the student and make sure the teeth are not loose enough to come out. If they are, have the student bite gently on a gauze pad until transport to the dentist's office can be arranged. Use direct pressure to control bleeding. A cold pack will reduce edema and provide analgesia. Send a referral with the student detailing the injury and your interventions.

Follow-up

Assist with administration of analgesic medications when the student returns to school. Determine the mechanism that led to the fracture and look for ways to prevent this type of injury from recurring.

Le Forte fracture

If the student sustained trauma to the midface, suspect a Le Forte fracture. Indicative signs include infraorbital edema, malocclusion, and bent nose.

Reassure the student as you proceed with your examination. With gloved hands, place your thumb on the maxilla and 2 fingers on the palate and check for mobility. If the segment moves, a Le Forte fracture is present.

Interventions

KEY POINT

A student with suspected Le Forte fracture requires immediate transport for emergency medical care.

This injury requires **immediate** medical attention. Activate EMS for **emergent** transport. Monitor the student closely for airway compromise. Treat bleeding with direct pressure. Cold packs will reduce edema and provide analgesia.

Documentation and follow-up

Record how the injury occurred and note your interventions. Send a copy of the documentation form and pertinent history from the student's health record with EMS personnel.

The student will be out of school for several days. Analgesics or antibiotics may be required when the student returns. Determine the mechanism that led to the fracture and look for ways to prevent this type of injury from recurring.

Mandible fracture

If the student sustains trauma to the lower face or chin, suspect a mandible fracture. Reassure the student as you examine the oral cavity with gloved hands. Signs that suggest a mandible fracture include irregular range of motion, *trismus* (inability to completely open or close the mouth), pain with jaw movement, edema or hemorrhage at the floor of the mouth, and malocclusion on closing the mouth.

Interventions

The triage category for a mandible fracture is **emergent**. Activate EMS. Monitor the student closely for airway compromise. Stabilize the jaw by wrapping a cravat around the protuberance of the chin and securing it on top of the head. (Avoid placing pressure on the neck.) This will also provide some relief from pain. Treat hemorrhage with direct pressure. Apply cold packs to reduce edema and pain. Monitor the student's level of consciousness and watch for vomiting. To prevent aspiration, remove cravat immediately if vomiting occurs.

Documentation and follow-up

Document as described under Le Forte fracture above.

Fracture of the zygomatic arch

Trauma to the midface in the vicinity of the cheekbone can fracture the zygomatic arch. Inspect for a sunken cheekbone. With gloved hands, palpate for tenderness and edema. Visual problems sometimes accompany this condition, so ask the student about changes in vision, then test vision as indicated.

Interventions

If a fracture is suspected, the triage category is **emergent**. Activate EMS. Place cold packs on the cheek to decrease edema and provide analgesia.

Documentation and follow-up

Documentation and follow-up are as previously described.

Dental, Oral, and Maxillofacial Pain

Dentition

Caries

The affected tooth is usually sensitive to sweets, cold, or heat. Pain is not spontaneous, and chewing generally does not provoke it. On inspecting the tooth, you may note discoloration or a crater, indicating decay.

Interventions

The triage category is nonurgent. Speak with the parents/guardians about taking the student to the dentist within the next week. Instruct the student to avoid eating sweets and to chew on the other side of the mouth.

Exfoliation

A primary tooth that's ready to shed will usually feel very mobile in the socket. On examination, you will see the permanent tooth erupting underneath the affected tooth.

Interventions

The triage category is nonurgent. Exfoliation is rarely painful, but can be irritating. If the student is particularly bothered by it, talk to the parent/guardian about taking the student to a dentist to have the tooth extracted. If the tooth is shed at school, have the student bite on a gauze pad until bleeding stops.

Eruption

A student may complain of pain when a new permanent tooth is erupting. On inspection, you will generally be able to see the new tooth coming through the gum. Pericoronitis (edema and infection) occasionally occurs in association with eruption, particularly when the third molars erupt in older adolescents.

Interventions

The triage category is nonurgent. Advise the student to drink cool or cold water, as this may bring some relief. Biting on a cold, wet washcloth may also help. Do not apply aspirin to the area, as this will burn the soft tissue.

Orthodontic appliances

Students with braces may complain of pain or pinching. On intraoral examination, you may find a break in the appliance or a wire that's out of place.

Interventions

If the appliance has come out of the mouth, do not replace it. Refer the student to the orthodontist. If the appliance is broken but remains in place, position gauze or dental wax over the irritating area to cushion it. If a wire has come out, you may be able to replace it with tweezers. If this is not possible, cover the wire with dental wax or have the student chew a stick of sugarless gum until it is malleable enough to cover the area.

If a wire is loose and threatens to abrade or lacerate the mouth, the triage category is **urgent**. The student should see the orthodontist within a day. If the problem is simply irritating, consider it nonurgent. The student should see the orthodontist within a week.

Soft Tissue

Bleeding gums

Bleeding gums usually signify poor oral hygiene. On inspection, you may find heavy plaque around the teeth and food particles on or between them. Less common causes of bleeding include gum disease, leukemia, or other systemic diseases and certain medications.

Interventions

If the problem appears to be hygienic, the triage category is nonurgent. Instruct the student about the importance of good oral care. Have the student return to your office daily for review. Try to present these visits in a positive light by appealing to the student's self-esteem and stressing the benefits of better hygiene. Inform the parents/guardians and encourage them to set up a dental appointment for the student within 2 weeks.

Dental abscess

The student generally reports to the health office complaining of intraoral swelling. On inspection, you'll notice a small area of localized edema on the anterior or lateral aspect of the gum with mild purulent drainage. The condition usually arises when a badly decayed tooth causes chronic inflammation and infection. An abscess may lead to facial cellulitis, which may spread throughout the facial planes, possibly causing airway compromise.

Interventions

The triage category is **urgent**. Have the student rinse the mouth with warm salt water. Speak with the parents/guardians about taking the student to a dentist for treatment.

Ulcers

The student will usually complain of nonspecific pain in the mouth, which may interfere with eating. Examination will reveal small pink or white lesions with red borders. Localized lesions suggest a reaction to trauma, while diffuse lesions suggest a viral infection, such as herpetic stomatitis. If fever and malaise are present, the cause is probably viral.

Interventions

The triage category is nonurgent. A problem involving 1 or 2 localized ulcers is usually self-limiting, resolving in 7 to 10 days. Caution the student to avoid foods that are very hot, spicy, acidic, or salty, as they will cause a painful reaction. The student can eat soft foods, but should rinse the mouth with warm water 3 to 4 times a day.

If the signs indicate a viral infection, notify the parent/guardian to take the student to see the primary health care provider or dentist, as diffuse lesions that interfere with eating and drinking can cause dehydration.

Psychosocial Issues

Dysmorphism

A student with facial disfigurement or craniofacial abnormalities may experience associated pain; if disfigurement is overt, the student may also be subjected to peer teasing or harassment.

If you suspect an undiagnosed abnormality, examine the structural anatomy of the head and neck for evidence of deviation. Inspect the eyes, ears, and nose, the occlusion of the teeth, the lips, soft and hard palates, tongue, chin, and mandible. Evaluate the student's speech as well.

Interventions

The triage category for this type of problem is **urgent**. Administer palliative care as needed. If the student appears to be having social difficulties, discuss the student's behavioral patterns and peer interaction with the school psychologist.

Students with disfigurement affecting the head or face have special needs that are best treated by a craniofacial team. Approach the issue sensitively when discussing it with the student and parents/guardians. If there is a craniofacial team overseeing the student's care, recommend that the student see the team dentist, and notify the team coordinator of your concerns and findings.

If the student is not receiving specialized care, strongly encourage the parents/guardians to investigate the possibility. Help them with referrals and resources if possible.

NOTE | A student with a disability is at greater risk for child maltreatment; be alert for injuries indicative of maltreatment.

Oral Habits

A student who habitually sucks a thumb or finger may require care because of teasing from classmates. These students are often unwilling to admit their problem, but may present to the health room complaining of pain in a finger or thumb, a tooth that is sensitive to pressure, or pain at the hard palate.

Examine the finger or thumb for erythema, a wrinkled appearance, scarring, or a callus. Inspect the student's anterior maxillary teeth for extrusion or intrusion. Tap the central incisors to see whether one of them is sensitive to percussion.

If you find any of these signs, question the student tactfully about sucking behavior. Be sensitive to the student's embarrassment; be careful not to sound demeaning.

Interventions

Finger-sucking or thumb-sucking can give rise to malocclusion as well as social ridicule. Encourage the student to overcome the habit before the permanent central incisors erupt. Refer the student to the primary health care provider or dentist, who may be able to help the student extinguish the behavior. The triage category is nonurgent.

Prevention

There are many ways you can promote dental health and prevent dental trauma through education. Encourage regular dental examinations to ensure preventive maintenance of teeth and gums. Ideally, all students should have access to a dentist. Investigate low-cost clinics or other options for students who lack dental insurance.

KEY POINT

Any student participating in contact sports should be fitted with an appropriate mouth guard.

School sports policies should address appropriate protective gear. Any student participating in contact sports should be fitted with an appropriate mouth guard. If your school doesn't have such a policy in place, spearhead an effort to initiate one.

Talk to students about other safety devices, such as seat belts and helmets, noting the protection they afford. Remind students that their teeth need to last a lifetime!

Students With Special Needs

As a population, students with special needs have a higher rate of injury than their peers and therefore may be at greater risk for the injury-related emergencies detailed in this chapter. Incorporating injury prevention strategies into their daily routine can help to alleviate this risk.

A complete neurologic assessment is always important when evaluating injuries to the head and face, as the force that causes obvious external injuries may damage the brain and other internal tissues. When assessing a student whose neurologic baseline is atypical, be sure to refer to the student's baseline status so that you can accurately interpret your findings and identify any deviation.

Some students with chronic conditions are at greater risk for ENT infections, such as tonsillitis or sinusitis, because of craniofacial abnormalities or medications (steroids, chemotherapeutic agents) that weaken the immune system. Limit such students' contact with classmates who show signs or symptoms of a communicable condition.

Students with chronic medical conditions have unique needs and health considerations. It takes a fine balance to allow them the opportunity for full

participation in school activities while limiting their exposure to situations that put them at risk.

Summary

Pain or injury involving the eyes, ears, nose, throat, or oral structures often evokes tremendous anxiety in students. Always maintain a reassuring demeanor as you perform your assessment. Once you have determined the cause, provide appropriate interventions to prevent further injury, reduce edema, and promote analgesia. Develop and conduct injury prevention programs and implement safety measures to prevent EENT emergencies. If an emergency does arise, be prepared to prioritize and triage appropriately.

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Click “A–Z Topics” at left, then scroll down and click “Hearing and Vision Reports and Forms.” The following forms can be downloaded: Audiogram Form, Hearing Screening Roster, Vision Screening Roster, Hearing Rescreening Roster, Vision Rescreening Roster.

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Environmental Emergencies

On completing this chapter, you will be able to

- List the critical components in assessing, treating, and documenting a bite or sting.
- Describe appropriate interventions for the 4 categories of burns.
- Describe primary interventions for the 3 types of heat-related illness.
- Identify early signs of hypothermia.
- State appropriate interventions and triage for a near-drowning submersion episode.
- Describe the role of the poison specialist in evaluating and treating student poisonings.
- List signs and symptoms associated with specific toxic syndromes.
- Identify ways in which students with special needs may have unique vulnerabilities and heightened risks for environmental emergencies.

BITES AND STINGS

Table 9-1 provides an overview of assessment findings, immediate interventions, and triage categories associated with bites and stings. Further discussion follows.

TABLE 9-1. BITES AND STINGS

Assessment Findings	Triage/Immediate Interventions
<p>Animal or human bites^a <i>Lacerations, bleeding (may be significant); look for bites on the extremities and face.</i></p>	<p>Urgent or emergent Control bleeding with direct pressure; apply dry, sterile dressings and elevate. Treat signs of shock. Monitor ABCDs, particularly airway if neck/face is involved. Document source of bite, date of last tetanus shot.</p>
<p>Poisonous snake bites</p> <p>Pit vipers <i>Hemotoxic venom. Small penetrating wounds from fangs; severe pain with edema and discoloration.</i></p>	<p>Emergent Calm student; agitation speeds transmission of toxins. Place supine. Clean wound per protocol. Do not scrub. Position extremity at heart level; immobilize. Document species if known. Monitor ABCDs.</p>
<p>Coral snake <i>Neurotoxic venom. Tiny scratches, numbness/little pain/edema initially; CNS symptoms in 1-8 hr.</i></p>	<p>Emergent Flush copiously with liters of cool, soapy water. Treat for shock. Apply cold packs (not ice). Monitor ABCDs.</p>
<p>Poisonous spider bites</p> <p>Black widow <i>Little initial sensation; dull ache, pain, spasms of large muscles within 30 min–3 hr, with abdominal rigidity, grimacing</i></p>	<p>Emergent Keep student calm, treat for shock, and apply cold compresses to site. Monitor ABCDs.</p>
<p>Brown recluse <i>Painless bite may ulcerate within hours, appearing bluish with red halo (bull's-eye); necrosis, fever, chills, nausea/vomiting ensue in 24 hours.</i></p>	<p>Urgent to emergent Severity of reaction depends on amount of venom injected. Triage according to symptoms. Treat for shock/monitor ABCDs as indicated.</p>
<p>Scorpion stings <i>Sharp pain, edema, discoloration at site; systemic reaction if caused by bark scorpion, including nausea, drooling, CNS symptoms, seizures.</i></p>	<p>Urgent to emergent Apply cold packs (not ice) to site. Document species if known. Activate EMS for bark scorpion sting/student with risk factors (age, chronic condition). Monitor ABCDs.</p>
<p>Tick bites <i>Local irritation, pruritus may occur at site after removal. Most reactions are delayed, including several diseases, potential systemic paralysis.</i></p>	<p>Nonurgent to emergent Use tweezers or gloved fingertips to grasp tick close to skin surface. Pull steadily. Preserve tick per protocol. Wash hands, site with soap and water; apply antiseptic. Important: document date/time of removal.</p>
<p>Flying insect stings <i>Localized pain, edema, erythema; allergic reaction possible.</i></p>	<p>Nonurgent to emergent Remove stinger as quickly as possible. Apply cold pack. Check history for allergic reaction, monitor for anaphylaxis.</p>
<p>Marine animal stings <i>Local pain, edema, necrosis; systemic muscle cramps, weakness, nausea/vomiting, dysrhythmias.</i></p>	<p>Emergent Immerse wound in hot water to reduce toxic effects. Elevate wounded area following intervention.</p>

^aDepending on state laws, you may have to report bites from dogs or wild animals to the appropriate agency. (In Illinois, report all bites to your local animal control office and health department.)

Bites and Stings in the School Setting

The immediate risks posed by bites and stings depend largely on the agent responsible for the incident, but most incidents fall into 1 of 4 categories: traumatic injury (human and animal bites); envenomation (reptiles, arachnids, marine and aquatic species, and other organisms); anaphylaxis (primarily flying insects, although this is a risk in envenomations as well); and disease transmission (blood-feeding arthropods, notably ticks and mosquitoes). Potential sequelae in many of these injuries include severe infection, tissue necrosis, organ damage, and other significant complications.

Traumatic Injury

Human and animal bites

The bites most commonly encountered in the school setting are animal bites (such as dog bites) and human bites. These bites cause soft tissue injuries with crushing and lacerations. Human bite wounds usually involve the ears, nose, fingers, or the back of the hand where a clenched fist would strike an opponent's mouth.

Infection is a primary concern; up to 5% of dog bites and 20% to 50% of cat bites become infected. Human bites pose an even greater risk; more than 40 potentially pathogenic organisms have been identified in human oral flora. The potential for functional or cosmetic damage is another important triage consideration.

Envenomation

Although rarely lethal, venomous bites and stings are common in many parts of the United States. Indigenous species, from jellyfish to Gila monsters, are capable of injecting toxins that can cause painful local reactions and, occasionally, major tissue destruction or severe systemic effects. Even mild venoms include complex chemical components, making the potential for anaphylaxis a concern in all exposures.

In most cases, venomous bites or stings

- Are more likely to occur on the distal extremities
- Are more dangerous if they occur closer to the heart (face, neck, torso)
- Are more lethal to younger students, those of smaller stature, and those who are in poor health or have chronic medical conditions

The fear often engendered by poisonous bites or stings should be treated as seriously as any other symptom. Fear can heighten pain perception and increase the heart rate, potentially accelerating the rate at which toxins are absorbed locally and systemically. A calm, reassuring demeanor is therefore one of your most important interventions.

A few types of envenomation are further discussed below.

Snakebites

About 20 species of poisonous snakes are found in the United States. In Illinois, there are 4 venomous snakes—the copperhead, the cottonmouth (also called water moccasin), the timber rattlesnake, and the Eastern massasauga rattlesnake. All belong to a group of snakes known as *pit vipers*. Except for the cottonmouth, these snakes are not aggressive and typically bite only when they are stepped on, picked up, or cornered. Recently killed snakes can deliver a venomous bite through a reflex reaction.

Lethal snakebites are rare, but their hemolytic venom can cause intense pain, edema, nausea, coagulopathy, and infection. More than half of all poisonous snakebites involve children; these injuries occur primarily during daylight hours from April to October.

Spiders

Although all spiders are venomous, most spiders are incapable of piercing human skin, and most of those that can deliver a bite lack sufficient toxicity to do much harm. Fatalities are extremely rare; in the United States, only brown recluse and black widow spiders have been implicated in any documented deaths. The venom these spiders deliver is significantly more potent than that of the snakes listed above, but they inject a much smaller amount. In some cases, a bite from one of these spiders is accompanied by slight pain, similar to that of a bee sting. Usually, however, there is little or no initial sensation, so that later efforts to positively identify the species are often unsuccessful.

Scorpions

The United States is home to 30 or more species of scorpions, including 1—the common striped scorpion—that may be encountered in Southwestern Illinois. As with spiders, all scorpions are venomous, and many of them can cause a painful local reaction, with occasional anaphylaxis in sensitive individuals. Only the bark scorpion, which is found primarily in Arizona, is capable of delivering a lethal sting to humans. Infants and toddlers are among the most vulnerable populations. Most documented deaths involve children aged 5 years or younger.

Anaphylaxis

Severe allergic reactions are associated with several stinging insects, notably bees, wasps, and hornets. Sensitive individuals may experience a life-threatening reaction to a single sting; most people, however, are unlikely to develop systemic symptoms unless numerous stings—usually 10 or more—are inflicted during a single incident. Anaphylaxis is discussed in Chapter 13: *Medical Emergencies*. The possibility of a delayed serum sickness reaction is an additional concern; this usually develops 10 to 14 days after the initial exposure.

Disease Transmission

Ticks

Ticks remain attached to the skin, often in warm areas of the body, until they finish feeding or are discovered and removed. Most tick bites are benign, requiring only thorough cleansing of the site after the tick has been carefully removed.

Some infected female ticks produce a toxin that can cause paralysis (*tick paralysis* or *tick-bite paralysis*) after prolonged attachment. Younger students are at higher risk for severe paralysis. Although symptoms usually resolve within 24 hours after simply removing the tick, paralysis of the respiratory muscles and death are possible if the cause is not discovered.

Because ticks are vectors for a number of diseases, it is important to monitor for sequelae after exposure. Tick-borne diseases include Rocky Mountain spotted fever, tularemia, Colorado fever, Lyme disease, and ehrlichiosis. Specific species serve as vectors for each disease.

Lyme disease, one of the most widely publicized tick-borne illnesses, is noted for its characteristic bull's-eye rash, a ring-like red rash with a clear center. What is less well-known is that the rash arises in fewer than 50% of those who develop the disease, and therefore should not be counted on for diagnosis. Other symptoms are nonspecific, and may include fatigue, chills, fever, headache, swollen lymph nodes, or joint and muscle pain. If you note a bull's-eye rash or any unexplained illness accompanied by fever in a student who has a known or suspected history of tick-bite exposure, contact the parent/guardian to follow up with the student's primary health care provider.

NOTE Inform teachers and the parents/guardians that students who contract Lyme disease may display transitory learning disabilities due to neurologic involvement.

Mosquitoes

Mosquitoes are a vector for West Nile virus (WNV), a potentially serious illness. Most infected individuals do not experience any symptoms; up to 20% exhibit nonspecific signs and symptoms, such as fever, headache, malaise, nausea, vomiting, swollen lymph nodes, or rash. Severe manifestations of WNV are rare; immunocompromised students are among the populations at risk for serious illness after exposure to WNV. Severe findings, including high fever and neurologic dysfunction (disorientation, tremors, muscle weakness, seizures), are cause to activate EMS for **emergent** transport.

Triage

Any student with severe bite wounds or a known envenomation should be referred for medical evaluation. Emergency staff will determine the potential for infection, toxicity, and other sequelae. Be prepared to monitor the student's airway and breathing, control hemorrhage, and assess for signs of shock as you await EMS transport. See the *Bites and Stings* protocol in *Appendix A* for additional information.

KEY POINT

Identifying the specific animal or insect that caused a bite or sting may be helpful in providing treatment and preventing complications.

Identifying the animal or insect involved may be helpful in treating the bite or sting and preventing complications. In many instances, however, wound

characteristics, other clinical findings, and a description of the circumstances leading up to the event will enable health care professionals to provide appropriate treatment.

Additional Considerations

Antibiotic-resistant *Staphylococcus aureus*

Documented reports have noted that skin lesions caused by community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) may be misdiagnosed as spider or insect bites, and a brief discussion of this emerging problem is worthwhile.

S aureus bacteria are common on the skin and in the nasal passages of healthy people. About 25% to 30% of the population carry *S aureus* without becoming ill.

Over the past several years, drug-resistant strains of many microorganisms, including *S aureus*, have become increasingly prevalent. Initially a cause of nosocomial infection, MRSA's encroachment on healthy adults and children who have not been exposed to the inpatient setting is the focus of considerable public health concern. Widespread transmission of CA-MRSA is possible in the school setting. It is important to initiate policies that allow

- Active surveillance of skin infections
- Expedited referral of suspect lesions for medical evaluation
- Resources for effective preventive measures, including education and stringent hygienic regimens

Transmission

CA-MRSA can be transmitted through direct skin contact with an infected person or contaminated articles and surfaces. Poor hygiene and crowded settings increase the risk of transmission.

Assessment

Since manifestations of CA-MRSA may have an unremarkable appearance, any unusual skin lesion or draining wound should be considered a potential source of infection.

Interventions

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

Cover all wounds and lesions—particularly those that are purulent—with clean, dry dressings to contain potentially infectious exudate. Properly dispose of contaminated materials in appropriate containers according to applicable protocols. Refer the student to have the wound cultured.

Two or more instances of MRSA is considered a cluster and must be reported to the local health department.

Prevention

If CA-MRSA is suspected in the school, initiate an immediate campaign to educate the academic community about the importance of containing the infection and preventing its spread. Better still, promote schoolwide adherence to the hygienic practices outlined below **before** a communicable disease enters the community.^a

Keep wounds covered

Highlight the importance of keeping wounds covered. Students with draining lesions must refrain from participating in sports activities, practices, or competitions.

Wash hands scrupulously

Proper hand-washing is one of the simplest **and** most effective methods of maintaining good health. Adequate liquid soap, warm water, and disposable towels must be available in all washrooms and sports facilities at all times. Bar soap and cloth towels should not be shared. Alcohol-based waterless hand sanitizers should be available in all areas where soap-and-water hygiene is not practical.

Advise students and staff to wash or sanitize their hands immediately after inadvertent contact with infected wounds or contaminated items.

Avoid sharing personal items

Personal items, such as uniforms, towels, skin balms or lubricants, razors, and certain sports equipment should not be shared, particularly if contact with an infected wound or bandage may have occurred.

Shower after sports activities

Work with coaches to instill hygienic practices in students who participate in sports activities, including showering and washing with soap after all practices and competitions.

NOTE | CA-MRSA outbreaks have been documented in settings where athletes did not have access to, or did not use, soap for hand-washing or showering.

Launder soiled clothing

Instruct students, parents/guardians, and coaches to promptly launder team uniforms and clothing worn during practices in hot water using laundry detergent; drying items in a hot dryer will help eliminate bacteria.

Disinfect contaminated items

Surfaces and equipment that have been in contact with potentially infectious wounds, other body fluids, or broken skin must be disinfected with an Environmental Protection Agency (EPA)-registered cleaner that meets the blood-borne pathogens standard of the Occupational Safety and Health Administration (OSHA). A dilute solution of household bleach (1 part bleach diluted in 9 parts water), prepared daily, can also be used.

Keep environmental surfaces clean

Work with school administrators to establish a written procedure and schedule for routine surface cleaning of shared athletic equipment, and ensure that cleaning products are used in accordance with the manufacturer's instructions. High-contact surfaces throughout the school, such as handrails, doors, and faucets, should be disinfected and sports equipment should be cleaned with an EPA-registered low-level disinfectant, such as quaternary ammonium solution, or a general purpose cleaner. Mats and other high-use equipment should be cleaned both before and after practice and several times a day during competitions or tournaments.

^aAdapted from "Guidance for schools and student athletes about community-associated *Staphylococcus aureus* (CA-MRSA) infections." www.idph.state.il.us/health/infect/MRSA_School_Recs.htm.

BURNS

Burn Risk Among Children

Thousands of children suffer burn-related injuries each year, with an estimated 75% of these injuries preventable. Burns rank high among the most painful and devastating injuries that can be survived. Scald burn injury (caused by hot liquids or steam) is the most common type of burn-related injury among young children, while flame burns (caused by direct contact with fire) are more prevalent among older children.

Most pediatric burns are caused by thermal exposure, rather than chemicals, electricity, or radiation. You will most often treat minor burns that respond well to basic wound care. Serious burns can be life-threatening, however, and survivors of these burns may suffer disfigurement and severe functional disability.

Children aged 4 years or younger suffer 4 times as many burn-related injuries as those aged 5 to 14 years. This is partly because they have thinner skin, so that a burn agent will penetrate more deeply and tissue damage can occur at lower temperatures. For example, tap water from a water heater set to 140°F/60°C will cause third-degree burns in younger children within 3 seconds. Water heaters should be set no higher than 120°F/48.9°C to prevent serious scald burns.

Assessment Parameters for Burns

The overall severity of a burn is determined by the following combination of factors:

- **Depth:** Superficial, superficial partial thickness, deep partial thickness, or full thickness
- **Extent:** The percentage of body surface area involved
- **Location:** Burns to the face, hands or feet, eyes or ears, or genitalia carry a greater risk of complications

- **Age and health of student:** Those with chronic or preexisting disease, such as diabetes, immunosuppression, asthma, or a seizure disorder, are at greater risk for disabling morbidity or mortality associated with burns
- **Associated injury:** For example, traumatic injury sustained in a structure fire

Accurate assessment of these factors is crucial in determining the triage category, transport decision, and intervention options.

Assessing Depth

KEY POINT

The depth of a thermal burn depends on the intensity of heat and the duration of contact with skin or tissue. It is difficult to determine the depth of a burn by inspecting the skin surface.

Thermal burns are broadly categorized according to their depth, which is dependent on the intensity of the heat source and the duration of contact with skin or tissue.

- A **superficial** (formerly first-degree) burn involves only the epidermis. It is characterized by erythema and local pain.
- A **superficial partial-thickness** (formerly second-degree) burn involves both the epidermis and the corium. This type of burn generally produces erythema and blisters.
- A **deep partial-thickness** (formerly second-degree) burn may appear white and dry, with locally reduced sensitivity to touch and pain.
- A **full-thickness** (formerly third-degree) burn has a tough, brownish surface and a hard eschar. The area will be locally insensitive to touch or pain. This type of burn will not heal without intervention.

It may not be possible to determine the depth of a burn injury from a simple inspection of the skin surface. A deep thermal burn does not cause uniform tissue damage throughout the affected dermal layers; therefore, the damage is described according to the dermal *zone* affected:

- **Surface zone:** Hyperemia (warm and red)
- **Zone of stasis:** Damaged capillaries, fluid leakage into interstitial space; local edema; shock is possible if a large area is affected
- **Zone of coagulation:** Damaged cells occlude blood vessels, causing loss of oxygen and nutrients to tissue

An additional consideration is that burns develop over time. A burn that initially appears superficial may prove to be a partial-thickness burn when reassessed several hours later.

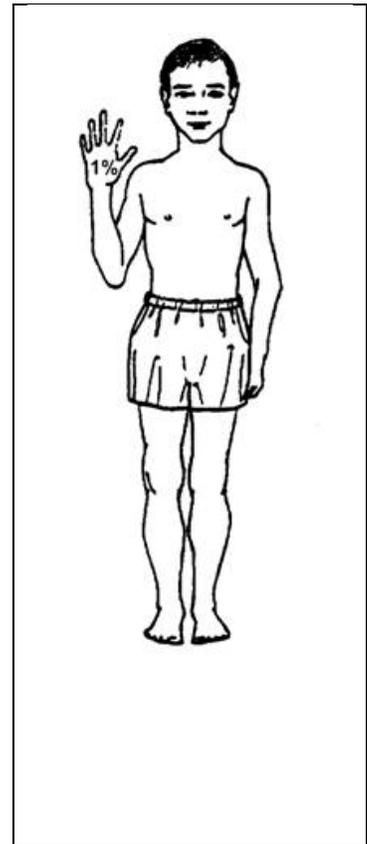
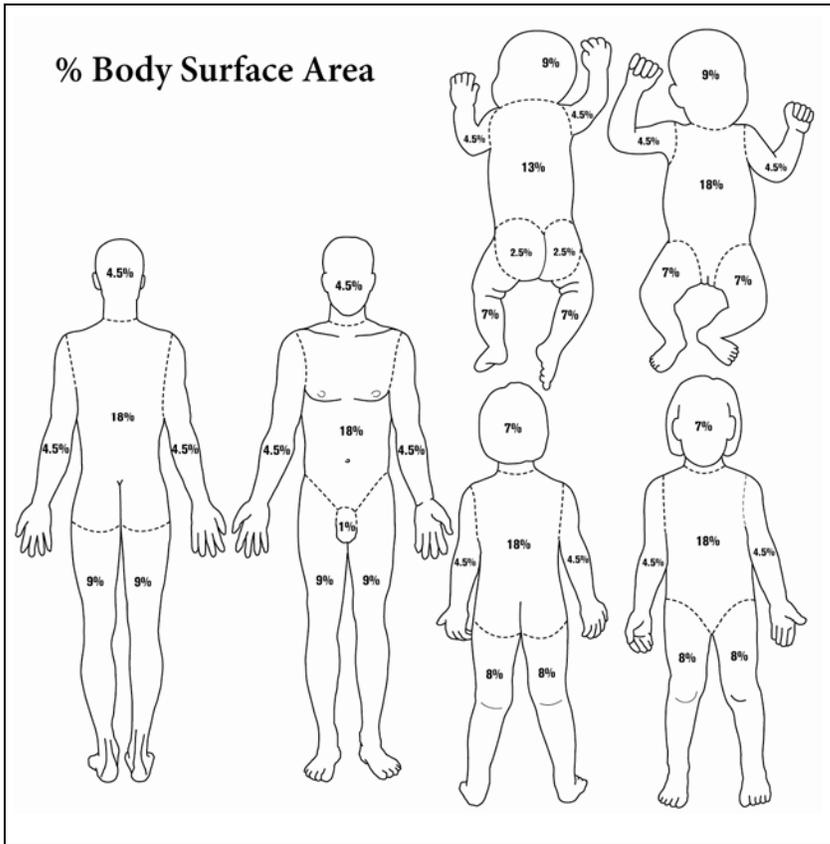
Assessing Extent

The extent of a burn is described as a percentage of the student's body surface area (%BSA). This calculation, combined with depth and a description of the burn location, provides a consistent basis for communicating information about a

burn injury between EMS and health care providers. There are several methods for performing this calculation, 3 of which are illustrated here. Figure 9-1 demonstrates calculation of %BSA based on an infant, child and adult body proportions. Table 9-2 on the following page shows a more detailed burn chart that uses the same mechanism, developed by the American Burn Association (ABA). Finally, Figure 9-2 (seen below) demonstrates the palm-and-hand method, a quick way to estimate %BSA for smaller burns. Here the child's hand (including the palm and fingers), which is roughly equal to 1% of the child's total body surface area, forms the basis for the estimate.

FIGURE 9-1. BODY SURFACE AREA OF CHILDREN

FIGURE 9-2. PALM-AND-HAND CALCULATION^a



^aInclude fingers.

TABLE 9-2. ABA BURN CHART

%BSA by Anatomic Area	Age in Years					
	<1	1	5	10	15	Adult
Head	19	17	13	11	9	7
Neck	2	2	2	2	2	2
Anterior Trunk	13	13	13	13	13	13
Posterior Trunk	13	13	13	13	13	13
Buttock	2½	2½	2½	2½	2½	2½
Genitalia	1	1	1	1	1	1
Upper arm	2½	2½	2½	2½	2½	2½
Lower arm	3	3	3	3	3	3
Hand	2½	2½	2½	2½	2½	2½
Thigh	5½	6½	8	8½	9	9½
Leg	5	5	5½	6	6½	7
Foot	3½	3½	3½	3½	3½	3½

Source: Deitch EA, Rutan RL. The challenges of children: the first 48 hours. *J Burn Care Rehabil.* 2000;21(5):423-431.

Burn Injuries

Scene safety and removal of the student from the heat source are your first priorities in thermal injury, followed by assessment and stabilization of the ABCDs. Do not focus on the burn injuries until you have completed these steps.

Scene Safety

Assess the scene to determine whether the source of the burn—such as a live electrical wire, uncontrolled fire, or chemical spill—presents a hazard that might endanger you, the student, or others present. Your first priority is to remove the student from the burn source to prevent further injury, but you cannot do this if conditions are unsafe. Call for additional help as needed. Do not approach until you have determined that is safe to do so.

Initial Assessment

Airway

Establish and maintain a patent airway, stabilizing the cervical spine if there is any potential for cervical spine injury. Facial or upper body burns and smoke inhalation increase the student's risk for edema and airway constriction.

Breathing

Assess respiratory rate, work of breathing, and breath sounds. A student with moderate to severe burns may have impaired ventilation.

Circulation

Check the heart rate and compare proximal and distal pulses. Assess perfusion by evaluating capillary refill time, followed by skin color, temperature, and moisture. Look for obvious bleeding as well. Burns can cause fluid loss, leading to shock.

Disability

Calculate the student's Pediatric Glasgow Coma Scale (PGCS) score as detailed in Chapter 7: *Neurologic Emergencies* and examine pupillary reaction to assess neurologic disability and level of consciousness.

Exposure

The brief exposure that usually completes the initial assessment in this case becomes exposure and assessment of the burn itself, as described below.

Exposure and Assessment of Burns

KEY POINT

If clothing adheres to burned skin, do not remove it!

Once you've provided immediate interventions to support the airway, breathing, and circulation, remove jewelry, rings, and constricting clothing as necessary to inspect the entire burn area so that you can determine the overall severity of the burn. **If clothing adheres to burned skin, do not remove it!**

Interventions

Your primary focus is to prevent further injury or deterioration. Interventions should include, as appropriate:

- Continuous monitoring of ABCDs, including PGCS score
- Irrigation of chemical burns for at least 20 minutes
- Cooling measures for thermal burns

Do not apply cold packs or ice to burns. Do not break blisters.

Cooling measures

Superficial burn

To provide cooling within 30 minutes of a superficial burn, immerse the area in cool water for 2 to 5 minutes. Apply tepid cloths to areas that cannot be easily immersed. Bandage loosely after cooling.

Superficial partial-thickness burn

To provide cooling within 30 minutes of a superficial partial-thickness burn covering less than 20% BSA, immerse the affected areas in cool water for 2 to 5 minutes. Apply tepid cloths or compresses to areas of the trunk and face that cannot easily be immersed. Do not leave a wet dressing on the burn for prolonged periods, as hypothermia can occur.

Deep partial-thickness burn

For deep partial-thickness burns involving small areas, provide cooling as above. If a large area is involved, cover loosely with a clean, **dry** dressing while awaiting EMS transport.

Full-thickness burn

Full-thickness burns should be covered with a **dry**, sterile dressing or clean sheet. If toes, fingers, or ears are involved, place gauze between adjacent skin areas before wrapping loosely.

In all cases, protect the student from hypothermia.

History and Pain Assessment

Collect history information from the student if possible; try to find out about the events that precipitated the injury and how long the student was in contact with the burn source. Check the student's health record as well, noting allergies, the date of the last tetanus shot, age, weight, and preexisting health conditions or baseline data.

Triage and Transport

KEY POINT

Any deep partial-thickness or full-thickness burn should be classified as an emergent injury. Initiate immediate EMS transport.

Emergent

For any burn that fits the criteria below, activate EMS immediately to provide emergency transport. Notify the parent/guardian as soon as you are able to do so. The following should be considered **emergent** injuries:

- Any deep partial-thickness burn or full-thickness burn
- Burns with associated inhalation injury or major trauma, such as a fracture
- Burns that are located in critical areas (face, eyes or ears, hands or feet, genitalia)
- Electrical burns
- Burns suggesting potential child maltreatment

Urgent

The triage category is **urgent** if the student has

- A superficial partial-thickness burn with no other complications
- Severe pain or emotional distress with superficial burns
- An existing burn that shows signs of infection or is not healing

Nonurgent

If the student has a minor superficial burn and is alert with little or no pain, the category is nonurgent.

See the *Burns* protocol in *Appendix A* for an overview of burn triage and intervention.

NOTE School policy may dictate that all burn injuries incurred at school be evaluated for insurance reasons. Protocols may require EMS transport to the ED, or they may allow the parent/guardian to take the student to a private clinic or primary health care provider.

Documentation

Be sure to document

- The source or agent that caused the burn
- The duration of contact with the burn source
- The time and place that the injury occurred
- Your assessment findings
- Related injuries or preexisting health conditions
- Your interventions and the student's response
- Disposition, including the mode of transportation

Evaluation and Follow-Up

Evaluate the incident, including the potential for recurrence, and note the effectiveness of interventions. Revise school policies if necessary.

Follow up with the student's parent/guardian or primary health care provider to find out the diagnosis, treatment rendered, medications the student may require on returning to school, and whether special monitoring or program modifications will be needed.

Prevention

All cases of injury at school should be investigated so that safety measures can be implemented to prevent the injury from recurring. Review school policies and safety education programs for students, revising them as necessary to improve their effectiveness. Alert students to the potential risk of injury from burns and the actions they should take to protect themselves from harm.

Specific Burn Injuries

Chemical Burns

Burns from alkalis tend to be particularly severe because they continue to penetrate and destroy tissue after the initial exposure. Alkaline products that may be encountered at school include lye, ammonia, detergents, calcium oxide (lime), plaster of Paris, and cleaning solutions.

Tissue damage from acid is generally more localized. Acidic products include battery acid, and certain hair care preparations.

Interventions

NOTE | Wear personal protective equipment to avoid self-contamination.

KEY POINT

Never apply additional chemicals to neutralize a caustic substance on the skin, as this can cause a thermal reaction that exacerbates the injury.

The standard regimen is to flush the exposed area with tepid water for 20 minutes, then wash with mild soap and water. If a powder or dust is involved, use a cloth to brush it from the skin before flushing. Never apply additional chemicals to neutralize the substance, as this can cause a thermal reaction that exacerbates the injury.

KEY POINT

A suspected chemical burn is an emergent injury. Activate EMS, assess scene safety, and begin irrigation. Do not delay irrigation to identify the exact chemical involved.

Consider any chemical exposure an **emergent** injury.

- **Immediately** activate EMS to provide transport to the ED. Inform rescuers if a potentially hazardous material is involved.
- Assess scene safety to ensure that there are no hazards to you, the student, or others on the scene.
- If it is safe to approach, **immediately** begin irrigation.
- Delegate someone to identify the chemical agent, call the Poison Control Center (800–222–1222), and obtain a material safety data sheet (MSDS). Do not delay or interrupt irrigation to perform these tasks.

If the chemical can't be positively identified, send a copy of the MSDS for each suspected chemical to the hospital with the student. Keep another copy with the student's health record.

Electrical Burns

Electrical burns may be caused by direct or indirect contact with household current, high-voltage wiring, or lightning strikes. Indirect contact may occur when an electrical charge arcs from one surface to another or travels through the ground. All electrical injuries should be considered **emergent**, requiring immediate EMS transport.

The appearance of an electrical burn does not necessarily reflect the actual extent of the burn or the severity of associated injuries caused by the flow of the current through tissue. The severity of an electrical burn depends on the path the current follows through the body, the type of current involved (alternating current is 3 times more dangerous than direct current), the voltage, and the duration of contact with the electrical source. Blood vessels and nerves offer the least

resistance to electricity, while moisture increases the flow of electricity through the skin; both of these factors contribute to the characteristics of the injury.

An electrical shock can cause cardiac dysrhythmias, impaired mental function (amnesia, sensory deficits), headache, and nonspecific abdominal pain. Outcome depends on quickly removing the student from the source of electric current so that you can stabilize the cervical spine, initiate appropriate resuscitation measures, and arrange for rapid transport to the ED.

KEY POINT

Do not touch a student who is in contact with a live wire or power source. Call for immediate assistance and keep bystanders at a safe distance.

It is essential to ensure scene safety before you approach. Although electricity **does not** leave a residual electrical charge in body tissues once the flow of current has stopped, **it is NOT safe to touch a student who is still in contact with a live wire** or power source. Call for immediate assistance and keep all bystanders at a safe distance.

You may safely touch a student who has been struck by lightning, but it is important to remove the student from any area in which there is danger of further lightning strikes. Assume that multiple injuries are present. Immediately assess for respiratory, cardiac, and CNS compromise. Spinal injuries, fractures, and dislocations commonly arise if the student is thrown or knocked down by the force of the current. **Early, aggressive resuscitation efforts may save a student who is in cardiopulmonary arrest; do not give up resuscitation efforts as you await EMS.**

Inhalation Injuries and Carbon Monoxide Poisoning

Inhalation injuries are caused by breathing heat, smoke, or toxic fumes. High temperatures cause edema of the upper airway structures, including the mouth, nasopharynx, oropharynx, and larynx. This constricts air passages and can quickly lead to total obstruction. Lower airway damage due to chemicals in the smoke may not become apparent during the first 24 hours after inhalation.

Carbon monoxide (CO), which is formed by incomplete combustion of organic materials, is often inhaled along with other toxic fumes, causing anoxia. CO molecules combine with hemoglobin in the blood, preventing adequate oxygen transport to tissues. Signs and symptoms of CO poisoning include headache, dizziness, nausea and vomiting, and reduced level of consciousness. Cherry-red mucous membranes are a late sign.

The triage category for a student with inhalation injuries or carbon monoxide poisoning is **emergent**. Call for immediate EMS transport to the nearest hospital. See Chapter 5: *Respiratory Emergencies* for more information on managing respiratory compromise.

HYPERTHERMIA

Pathophysiology of Hyperthermia

Hyperthermia involves an abnormally elevated body temperature, which may be caused by exposure to a hot environment, metabolic heat production during physical exertion, or a combination of these factors. Heat-related emergencies are most common when the air temperature exceeds 95°F, particularly when humidity is high and there is little or no breeze. As shown in Table 9-3, however, the combined effects of heat and humidity can create a dangerous risk for heat illness even when temperatures are cooler than 90°F/32.2°C.

TABLE 9-3. HEAT INDEX

RH (%)	Temperature (°F)															
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

LEGEND



RH indicates relative humidity. Shaded areas reflect progressive danger of developing a heat-related illness given either prolonged exposure or strenuous activity under the conditions shown. Source: National Oceanic and Atmospheric Association (www.weather.gov/om/heat/index.shtml).

When body temperature rises past comfortable levels, autonomic mechanisms—predominantly perspiration and vapor loss—work to dissipate heat. At the same time, peripheral vasodilation increases blood flow to the skin, where cooling can occur. The evaporative loss of water and salt through the skin and lungs, combined with increased peripheral blood flow, puts additional strain on the heart. Complicating these problems, the effectiveness of evaporation as a cooling

mechanism decreases as the relative humidity rises above 60%. All of these conditions increase the student's risk for heat illness.

KEY POINT

Individuals at particular risk for heat-related illness include the very young, the elderly, athletes, those who are medically fragile, those who take certain medications, and those who use alcohol or illicit drugs.

Individuals at particular risk for heat-related illness include the very young, the elderly, athletes, those who are medically fragile, those who take certain medications, and those who use alcohol or illicit drugs.

There are 3 types of heat illness: heat stroke, heat exhaustion, and heat cramps. Findings associated with each type are summarized in Table 9-4, followed by detailed descriptions. An overview of their triage and interventions appears in the *Heat-related Injuries* protocol in *Appendix A*.

TABLE 9-4. HEAT-RELATED ILLNESS

Type of Illness	Skin Findings	Other Findings/Comments
Heat stroke	Hot, dry, red	<ul style="list-style-type: none"> ▪ Tachycardia ▪ Weak peripheral pulses ▪ Headache ▪ Lethargy/listlessness ▪ Confusion ▪ Thirst
Heat exhaustion	Normal/cool; moist; pale	<ul style="list-style-type: none"> ▪ Fatigue ▪ Weakness
Heat cramps	Sweating	<ul style="list-style-type: none"> ▪ Muscle spasms ▪ Events leading up to incident usually include recent strenuous exercise with diaphoresis, copious intake of plain water

Heat Stroke

KEY POINT

Heat stroke is a potentially lethal condition requiring immediate interventions.

Heat stroke is an **emergent** condition that arises when the body's thermoregulatory mechanisms for dissipating heat have been overwhelmed. It may be caused or potentiated by exertion, a preexisting condition, intoxication, medications, or drugs.

Exertional heat stroke may have very rapid onset, particularly during warm weather. Chronic conditions, including cystic fibrosis and certain types of skin disease, can increase the risk of heat stroke. Very young children, as well as those recovering from recent illness, are at risk due to impaired thermoregulatory ability. Alcohol and some other drugs increase the risk for heat stroke because they boost production or absorption of heat, decrease the ability to sweat, or both.

Interventions

Rapid intervention is required in cases of heat stroke. Immediately remove the student from the source of heat. Activate EMS, assess and monitor the ABCDs and vital signs, and initiate cooling measures.

Heat stroke involves the entire body. Place cold packs or cool, wet towels at the head, axillae, and groin, positioning them where large blood vessels lie close to the skin surface. Wrap the student in a wet sheet and direct a fan toward the student. Slow these cooling measures if they induce shivering, as muscle contractions produce heat and increase oxygen demand.

During the cooling process, monitor the student for

- **Tremors or convulsions**, which produce body heat. They are most likely to occur when the body cools to 104°F/40°C.
- **Vomiting**, a common complication of heat stroke. Place the student in the left lateral recovery position to prevent aspiration of emesis.

When EMS personnel arrive, they will continue the cooling process during transport to the ED.

Heat Exhaustion

Heat exhaustion is usually caused by physical exertion in a hot or humid environment. Increased peripheral vasodilation directs blood to the skin for cooling, decreasing circulation to the brain, heart, and lungs. As shown in Table 9-4, you can distinguish heat exhaustion from heat stroke by skin findings: In heat **stroke**, the skin is typically hot, dry, and reddened; in heat **exhaustion**, the skin is wet, the temperature either normal or slightly cool.

Interventions

Have the student lie down in a cool place. Loosen the student's clothing and elevate the feet. Assess ABCDEs. If the student is conscious and able to swallow, give cool water at a rate of 1 or 2 glasses every 15 minutes for an hour. Withhold water if nausea or vomiting occurs. Apply cold, wet compresses.

The triage category for heat exhaustion varies according to the presentation:

- **Emergent** if skin findings indicate heat exhaustion **but** the student is unconscious and the temperature is rising above 101°F/38.3°C **or** if there is a history of injury or other health problems.
- **Urgent** if the student is vomiting or does not respond to initial interventions.
- **Nonurgent** if the student is fully conscious and responds to interventions.

Heat Cramps

KEY POINT

Heat cramps are muscle spasms that may arise when a combination of strenuous exercise, diaphoresis, and copious water intake creates a sodium imbalance. They can occur during relatively cool conditions.

Heat cramps can arise even during relatively cool conditions. These muscle spasms are caused by a combination of strenuous exercise, diaphoresis, and copious water intake, which creates a sodium imbalance. Conditions that contribute to heat cramps include

- Loss of salt through diaphoresis
- Inadequate salt intake to replace the loss
- Low calcium levels
- Excessive water intake
- Overexertion without prior conditioning

Interventions

If the environment is warm, move the student to a cooler area. Apply moist towels to the forehead and affected muscles. If protocols permit, gentle massage may help to relax and stretch the muscles. Allow the student to sip water or a diluted electrolyte-replacement drink as permitted by applicable protocols, taking up to a half glass every 15 minutes. To prevent recurrence, the student should refrain from exertion for 12 hours following the incident.

HYPOTHERMIA AND FROSTBITE

Hypothermia

Mechanisms of Hypothermia

Hypothermia, in which the body temperature falls below 95°F/35°C, is a life-threatening condition affecting the entire body. Heat loss may occur through several mechanisms:

- Respiration, in which air warmed by the lungs is exchanged for cold ambient air
- Radiation, in which body heat is lost into a colder environment
- Conduction of body heat through direct contact with cold objects
- Convection, in which air or water removes heat from exposed skin surfaces
- Evaporative cooling as perspiration vaporizes

Wind and water can significantly accelerate heat loss. Table 9-5 shows how cold temperatures coupled with wind speed increase the risk of freezing exposed skin.

TABLE 9-6. PROGRESSIVE HYPOTHERMIA

Core Temperature	Signs and Symptoms
95°F/35°C	<ul style="list-style-type: none"> ▪ Slurred speech ▪ Pronounced shivering ▪ Memory lapse
89°F/32°C	<ul style="list-style-type: none"> ▪ Altered level of consciousness ▪ Drowsiness ▪ Confusion, disorientation ▪ Ataxia
86°F/30°C	<ul style="list-style-type: none"> ▪ Cyanosis ▪ Edema ▪ Stupor, irritability ▪ Decreased cardiac output ▪ Hypotension ▪ Shallow respiration ▪ Cessation of shivering
82°F/28°C	<ul style="list-style-type: none"> ▪ Bradycardia, ventricular fibrillation, or asystole
Below 79°F/26°C	<ul style="list-style-type: none"> ▪ Loss of consciousness ▪ Absent reflexes ▪ Apnea ▪ Appearance of death

F indicates Fahrenheit; C, centigrade

Interventions

Hypothermia is always emergent! Immediately activate EMS while assessing and stabilizing ABCDEs. Particularly note neurologic status and level of consciousness.

Place the student supine and restrict movement. Move to a warm place. Cover student to prevent further heat loss, being careful to cover the head.

- **If the student is shivering**, monitor ABCDs, prevent heat loss, and await transport.
- **If shivering has stopped** and transport will not arrive for more than 30 minutes, **do not rewarm, as this may produce complications.**
- If the student is apneic on assessment of breathing, immediately begin **gentle** mouth-to-mask ventilation.
- If the student is pulseless for 45 seconds, begin chest compressions.

NOTE | **If the student is severely hypothermic, limit manipulation and movement** to keep from triggering ventricular fibrillation.

Frostbite

Frostbite, which often accompanies hypothermia, is a type of localized cold injury. It usually affects peripheral areas, such as the hands, feet, nose, ears, or face, causing permanent damage as ice crystals form in and between the cells of affected tissues, obstructing circulation.

Frostbite injuries are categorized as superficial or deep:

- **Superficial** frostbite may involve only the skin, or it may penetrate to subcutaneous tissues.
- **Deep** frostbite is a more serious injury involving not only the skin and subcutaneous tissue, but also deep tissue, bone, joints, and tendons.

Frostnip is sometimes recognized as a mild form of frostbite in which exposed skin is chilled, but not permanently damaged. The skin becomes blanched white and insensitive to pain, causing numbness and tingling.

Assessment

In superficial frostbite, the skin feels firm and waxy at the surface, with softer tissue underneath. In deep frostbite, affected areas are solid to touch and may appear mottled or blotchy-white to grayish blue. **Be sure to palpate gently when assessing frostbite, as frozen tissues are easily damaged.**

It is difficult to determine the full extent of tissue damage before thawing occurs. Assume that deep tissue damage is present if the length of exposure, temperature, and wind chill were sufficient to cause it.

Interventions

KEY POINT

Treatment of hypothermia always takes precedence over frostbite.

Always treat hypothermia before treating frostbite. Protect the affected areas from cold, but thaw frozen skin **only** if there is no danger of refreezing.

Frostnip

Attempt to rewarm the area quickly. Try skin-to-skin contact first, instructing the student to place the hands under the armpits. If this method is insufficient, use tepid water (100°F/37.8°C to 110°F/43.3°C) to rewarm. Hands and feet can be submerged; apply compresses to the face. Do not rub or massage, as this can exacerbate tissue damage.

Since it's difficult to differentiate frostnip from initial stages of frostbite, the triage category is **urgent**. Notify the parent/guardian. Refer the student for evaluation.

Superficial frostbite

The triage category is **urgent**. Activate EMS. While awaiting transport, attempt to warm the area quickly as described above. The student may experience sharp,

deep, aching pain or numbness. Skin will become mottled and edematous, with burning or tingling.

Deep frostbite

Immediately activate EMS for **emergent** transport. Do not delay to rewarm the area. Protect affected areas from pressure or friction, which can cause injury.

See the *Cold-related Injuries* protocol in *Appendix A* for additional triage and intervention information.

Follow-Up

A student who is recovering from frostbite may require medication and monitoring on returning to school. Provide health counseling and education to prevent recurrence, even if the injury was mild.

NEAR-DROWNING/SUBMERSION INJURIES

Epidemiology

In the United States, submersion is the second leading cause of injury-related death among children aged 1 to 14 years. Up to half of these deaths occur in children younger than 4 years. Boys are 3 times as likely to die from submersion injuries as girls. More than 90% of submersion-related deaths occur in fresh water, with half of these occurring in swimming pools. Alcohol contributes to 50% of lethal submersion injuries in adolescent boys—another reason to encourage students not to drink!

In the school setting, submersion injuries may occur during field trips or at the school swimming facility. Outcome often depends on the combined effects of preexisting health conditions, the duration of submersion, and water temperature.

Assessment

The findings associated with submersion injuries are caused by pulmonary injury and cerebral hypoxia and are not significantly affected by whether the incident involves fresh water or saltwater. Signs that may be present include

- Altered level of consciousness
- Cyanosis or pallor
- Cool skin and hypothermia
- Rales, rhonchi, and wheezing **or** apnea
- Bradycardia **or** asystole

- Fixed, dilated pupils

NOTE | Signs and symptoms of submersion injuries may have delayed onset. Do not rule out the possibility of significant injury based on initial assessment findings.

Interventions

KEY POINT

Near-drowning/submersion injuries are always emergent! Call EMS immediately for assistance and transport.

Near-drowning/submersion injuries are always emergent! Call EMS for assistance and transport. Notify the parent/guardian as soon as you are able to do so.

If the student is still in the water

Do not attempt removal without assistance. If you can safely do so

- Help the student remain afloat face-up, supporting the head and neck in alignment with the spine
- Use the jaw-thrust maneuver to open and maintain the airway
- Assist ventilation as indicated

When adequate assistance is available, place the student on a backboard or other rigid support before moving to land.

Once the student is out of the water

Continue to maintain the airway and spinal stabilization. If the student is unresponsive, begin CPR with 2 effective breaths, followed by chest compressions per applicable protocols and current American Heart Association guidelines.

Otherwise, complete your assessment of the ABCDs. Calculate the student's Pediatric Glasgow Coma Scale score as described in Chapter 7 and monitor vital signs. Cover the student to prevent hypothermia.

Even a student who is awake and breathing spontaneously or who exhibits only mild respiratory distress should be transported by EMS for hospital evaluation. More serious findings associated with submersion injuries may appear within 8 to 12 hours after a successful resuscitation. See the *Near-drowning/Submersion* protocol in *Appendix A* for an overview of triage and intervention.

TOXICOLOGIC EMERGENCIES

Toxic Exposures

Although we set high safety standards to protect our children, poisoning and drug overdose continue to be major health problems in the school environment. Poison control centers throughout the United States receive thousands of consultation requests from school nurses each year.

KEY POINT

Herbal preparations can be very toxic and potentially dangerous.

Our industrialized society puts us in daily contact with thousands of substances capable of causing reactions that range from benign to lethal. Potential sources of toxic exposure include herbal preparations used in alternative health care; intentional discharge of lacrimators, such as pepper spray; substance abuse; and drug overdose. Schools have their own range of environmental toxins—including cleaning products, craft materials, writing equipment, contaminated food, automotive and industrial chemicals, and poisonous plants.

The consequences of toxic exposure are as wide-ranging as the array of poisonous substances in our world. When a person inhales cyanide gas, it sets off a chain of complex mechanisms capable of producing lethal cellular hypoxia within minutes. If a child bites into a philodendron leaf, tiny, needle-shaped calcium oxalate crystals become embedded in the tongue and oral mucosa, producing severe pain and inflammation. When a student takes an overdose of a nonprescription stimulant to study all night for a test, significant toxic effects, such as hypertension and seizures, may ensue.

A basic understanding of the processes at work during toxicologic emergencies will help you develop a confident, skillful approach to poisonings. It is equally important, however, to avail yourself of the specialized assistance poison control centers provide.

Calling Poison Control

As toxicologic studies expand our scientific knowledge, poison control centers play an increasingly important role in managing toxic exposures. Advances in diagnosis and treatment of chemical and environmental toxins have made access to current treatment protocols absolutely essential to a successful outcome.

The poison information specialist recognizes that school nurses often function as primary health care providers and may work in isolated settings. These specialists can provide you with immediate answers about the vast spectrum of toxins and offer a course of action that is appropriate even for a questionable toxic exposure. They can also help you identify the substance involved, review interventions and treatment recommendations, and alert you to potential sequelae so that you will be prepared to manage them. Their advice will help you triage the student and determine appropriate disposition.

This makes the poison control center a crucial resource in your effort to achieve the best outcome after any toxic exposure. Always maintain ready access to the universal phone number for the Poison Control Center (800–222–1222).

It is also important, however, to enhance your understanding of toxicologic emergencies, as this will help you communicate effectively with information specialists at your local or regional poison control center.

Assessment

The first priority is to assess scene safety, then proceed with the ABCDEs and identify any life-threatening problems that require immediate intervention. After you have addressed emergent care, continue with a rapid but thorough physical examination. Try to gather essential information for the history as you go. Be sure to assess

- Current level of consciousness
- Vital signs (including temperature, if possible)
- Unusual odors
- Evidence or history of emesis

If you cannot identify the specific toxin by history, your clinical evaluation and vital signs may give poison specialists sufficient information to isolate a toxic syndrome, which will help guide intervention and improve outcome.

History

It is often impossible to get a reliable history following a toxic exposure, but rapid diagnosis and treatment must proceed despite this. It is estimated that the reported history is initially incorrect at least half of the time, particularly when the incident involves a drug overdose. Symptomatic care is therefore the mainstay of treatment. It is an adage in the field of toxicology to *treat the patient, not the poison*.

The history becomes paramount when you call the poison information specialist for advice. Poison control centers have well-developed procedures for responding to calls. When you make the call, immediately identify yourself as a school nurse and be prepared to give the following information:

- Your name, job title, and telephone number
- The student's name, age, and weight
- The specific substance, if known (have the container on hand, if possible)
- The route of exposure (ingestion, inhalation, topical), the amount involved, and the elapsed time since the event occurred
- Time that the student last ate or drank
- Physical findings and subjective complaints
- First aid you have rendered and the student's response

Report significant findings from the student's health history as well, such as chronic diseases (asthma, diabetes) and current medications.

In the case of an overdose, it is particularly important to ascertain the student's age and weight, as these factors help to predict the potential severity of sequelae. It is helpful if a friend or relative corroborates the history of an overdose; in many cases, however, treatment will proceed based on a worst-case scenario, as it is safer to overestimate rather than underestimate potential ill effects.

NOTE | Centers that belong to the American Association of Poison Control Centers are required to participate in a data collection program; their specialists will ask additional questions about the site where the exposure occurred, the reason it occurred, and your geographic location.

Once you have given this information, the poison information specialist will make recommendations for appropriate care, including measures you can initiate and those that may necessitate referral to a health care facility. The student's name is requested so that follow-up calls can be made to monitor sequelae and outcome. This information also makes it easier to retrieve the student's health record if the parents/guardians call the center later for clarification or to ask additional questions.

NOTE | All poison control centers adhere to the same strict standards of confidentiality as other health care facilities.

Interventions

Proceed with interventions as recommended by the poison information specialist, who will guide you in identifying the substance, assessing the student, and carrying out an appropriate treatment plan.

Specific Toxicologic Emergencies

The following sections summarize the assessment and treatment of toxicologic emergencies by category. Refer to material safety data sheets, as required by the OSHA, for further information. Always consult a poison control center for specific information.

Dermal Exposures

Topical exposures can damage the dermal layers and, in some cases, cause systemic reactions following skin absorption. The goal of decontamination is to minimize skin contact with the toxin; immediate action may prevent serious injury.

NOTE | Wear personal protective equipment to avoid self-contamination.

Interventions

KEY POINT

Never apply additional chemicals to neutralize a caustic substance on the skin, as this can cause a thermal reaction that exacerbates the injury.

The standard regimen is to flush the exposed area with tepid water for 20 minutes, then wash with mild soap and water. If a powder or dust is involved, use a cloth to brush it from the skin before flushing. Never apply additional chemicals to neutralize the substance, as this can cause a thermal reaction that exacerbates the injury.

Ocular Exposures

Interventions

KEY POINT

In ocular exposures, it is critical to act quickly. Immediately irrigate the eyes for 15 to 20 minutes with a gentle stream of tepid or room-temperature water.

In ocular exposures, it is critical to act quickly. If the student wears contact lenses, remove them as discussed in Chapter 8: *Eye, Ear, Nose, Throat, and Dental Emergencies*. **Immediately** irrigate the eyes with a gentle stream of tepid or room-temperature water. In the event of a massive exposure to the face, you may need to move the student to a shower to ensure continuous and copious flushing. Continue for 15 to 20 minutes. **Do not** instill a neutralizing solution.

NOTE | It is important to see that free-flowing drains are maintained in the showers to prevent the hazard of contaminated standing water.

Call the poison control center only after irrigation is underway. The poison specialist will direct follow-up evaluation and indications for medical referral based on the type of substance involved (such as an alkali or acid).

NOTE | Consider keeping litmus paper in the health office so that you can test the pH of the contaminant and assess the eye to gauge the effectiveness of irrigation. **Do not delay irrigation** to perform this test.

Inhalation Exposures

In most cases, inhalation exposures are treated by first removing the student from the source of toxic fumes or vapors, taking care not to expose yourself to irritants, then calling the poison control center for additional guidance. Hazmat resources may be required to help with ventilation if a toxic gas has been released into the environment. EMS dispatchers can usually determine the appropriate agency to mobilize.

Lacrimators

Poison control centers receive frequent calls for exposure to lacrimators, such as pepper spray, that have been released in school hallways or on buses. Common reactions to these substances include coughing and irritation to the eyes and throat, which usually resolves within 20 to 30 minutes on exposure to fresh air.

Interventions

Affected students should be encouraged to rest and drink fluids. Closely monitor students who have underlying respiratory problems, such as asthma. Refer the student for medical evaluation if symptoms worsen or fail to improve.

Inhalant abuse

An endless number of chemicals and other substances are the target of inhalant abuse. This problem arises in students of all ages – in elementary to high school.

Inhaling chemicals induces feelings of intoxication, including dizziness, light-headedness, and giddiness, which are perceived by the user as euphoria. Several methods are employed to concentrate the substance for inhalation, such as *huffing*, in which an aerosol chemical is sprayed into a plastic bag. Substances that are abused in this manner include asphyxiant gases, such as butane, which causes cerebral hypoxia. Other methods include inhaling fumes from rags saturated with paint thinner, gasoline, lighter fluid, or other hydrocarbon solvents. In the school setting, liquid correction fluids containing trichloroethane and glues containing toluene or other hydrocarbons are targets of abuse and should be carefully monitored.

Chronic abuse results in behavioral changes, recurrent headaches, memory loss, and emotional lability. Myocardial injury, serious ventricular dysrhythmias, and sudden death are possible. Cardiac sensitization and risk for dysrhythmias is a risk with acute exposure toxicity. It's important to keep exposed individuals calm to avoid a release of endogenous catecholamines that might increase this risk.

Interventions

Instances of inhalant abuse should always be regarded as life-threatening. Take immediate preventive action if this problem is suspected.

Toxic Ingestions

Assessment Considerations

Ingestions of potentially toxic substances require quick, appropriate interventions. Try to identify the substance thru history and assessment findings. Call the poison specialist with this information as soon as possible for advice.

Recognizing toxidromes

If assessment findings suggest a toxic ingestion and you do not know what substance is involved, it may be helpful to look for signs of identifiable toxic syndromes (*toxidromes*). Toxidromes involve a recognizable group of signs and symptoms that tend to occur consistently with particular toxins. Table 9-7

describes the 4 major toxidromes and provides mnemonics that can help you remember the associated findings. Examples of substances that can cause each toxidrome are also included.

TABLE 9-7. TOXIDROMES

Toxidrome	Clinical Findings	Causative Substances
Opioid	<ul style="list-style-type: none"> ▪ Constricted pupils ▪ CNS depression ▪ Respiratory depression 	<ul style="list-style-type: none"> ▪ Heroin ▪ Codeine ▪ Fentanyl ▪ Methadone
Sympathomimetic	<ul style="list-style-type: none"> ▪ Hypertension ▪ Tachycardia ▪ Hyperthermia ▪ Diaphoresis ▪ Dilated pupils 	<ul style="list-style-type: none"> ▪ Epinephrine ▪ OTC diet aids ▪ Amphetamines ▪ Oral decongestants (eg, pseudoephedrine) ▪ Bronchodilators
Anticholinergic <i>Listed phrases may help you recall clinical findings</i>	<ul style="list-style-type: none"> ▪ Hyperthermia (<i>Hot as a hare</i>) ▪ Flushed skin (<i>Red as a beet</i>) ▪ Hypertension, dry skin (<i>Dry as a bone</i>) ▪ Delirium (<i>Mad as a hatter</i>) ▪ Dilated pupils (<i>Blind as a bat</i>) ▪ Urinary retention (<i>Full as a flask</i>) ▪ Tachycardia ▪ Absent bowel sounds 	<ul style="list-style-type: none"> ▪ Antihistamines ▪ GI antispasmodics ▪ Certain toxic plants (eg, jimson weed, deadly nightshade, amanita muscaria) ▪ Certain toxic mushrooms ▪ Atropine ▪ Tricyclic antidepressants
Cholinergic	<ul style="list-style-type: none"> ▪ Diarrhea ▪ Urination ▪ Miosis, Muscle fasciculations ▪ Bradycardia, Bronchorrhea ▪ Emesis ▪ Lacrimation ▪ Salivation, Sweating ▪ Weakness 	<ul style="list-style-type: none"> ▪ Organophosphate and carbamate insecticides ▪ Mushrooms containing muscarine (imocybe species, amanita species, ibotenic muscimol) ▪ Physostigmine

CNS indicates central nervous system; OTC, over-the-counter; GI, gastrointestinal

Frequently abused substances

Poison centers receive numerous calls from school nurses regarding students who have deliberately ingested medications, including over-the-counter analgesics, cough and cold preparations, stimulants intended to boost wakefulness or weight reduction, and illicit drugs. These potentially life-threatening ingestions may require complex decontamination methods that are usually performed in the ED. The poison specialist will direct you regarding disposition as well as the drug's associated pharmacokinetics and information to help predict the onset and severity of sequelae.

Drug overdose most often involves common medications that are easy to obtain. Four such medications are discussed below.

Acetaminophen

More than 200 over-the-counter and prescription preparations for pain, coughs, and colds incorporate acetaminophen in varying strengths and formulations. Acetaminophen toxicity progresses in stages, with few specific signs until 16 to 24 hours after overdose. Because the drug is widely used, many students fail to recognize its potential for severe toxicity, which may lead to significant liver damage; and since the onset of symptoms is delayed, their cause may not be immediately obvious. Table 9-8 describes clinical findings associated with each stage of toxicity.

TABLE 9-8. ACETAMINOPHEN TOXICITY

Stage of Toxicity	Signs and Symptoms
Early stage (16–24 hours)	Mild anorexia, nausea, emesis, pallor, diaphoresis NOTE: Students may be symptom-free during this stage
Intermediate stage (1–3 days)	Early-stage symptoms continue in mild form, with RUQ pain and oliguria
Late stage (3–5 days)	Hepatic necrosis, renal failure, and cardiomyopathy

RUQ indicates right upper quadrant

Large doses of acetaminophen cause hepatotoxicity; an overdose involving more than 150 mg/kg can be lethal. Acetylcysteine, the antidote for acetaminophen toxicity, can effectively prevent hepatic injury **if** it is administered early enough in the course of intoxication. The Rumack-Matthew nomogram (see *Appendix B*) is generally used to determine whether acetylcysteine treatment is warranted based on the concentration levels of acetaminophen in the blood. The test is generally done 4 hours after the ingestion and may be repeated 4 to 6 hours later.

To ensure the accuracy of the test, it is critical to verify the time of the ingestion as nearly as possible. It is also important to find out whether an extended-release formula was involved, as this affects the timing of toxicity measurements. You can play an important role in obtaining this information for EMS and the ED.

Caffeine

Caffeine is a naturally occurring plant alkaloid chemically related to theophylline. It's found in many OTC medications, including cold and allergy preparations, analgesics, products for dysmenorrhea, appetite suppressants, and stimulants. This drug is often abused by students wanting to stay up all night to study or socialize.

Caffeine acts on the central nervous system, cardiovascular system, and kidneys. Initial manifestations of toxicity are usually gastrointestinal, including cramping and vomiting. CNS problems begin with irritability, restlessness, and agitation. Posturing, rigidity, and seizures are late signs. Tachycardia, hypertension, and dysrhythmias may be present. Significant diuresis leading to electrolyte imbalance is possible.

Severe caffeine toxicity may be life-threatening. Consult with a poison specialist to determine appropriate interventions and disposition.

Dextromethorphan

Dextromethorphan (DXM), a cough suppressant, is found in many nonprescription cold and cough medications. Its chemical structure is similar to morphine. High doses can induce feelings of euphoria, hallucinations, and profound alterations in consciousness.

Possible signs of DXM intoxication include hyperexcitability, lethargy, ataxia, slurred speech, diaphoresis, hypertension, and nystagmus; abdominal spasms, nausea, vomiting, and constipation; drowsiness, dizziness, hallucinations, muscle spasticity, and unresponsiveness; dyspnea, apnea, tachycardia, and alterations in blood pressure.

Consult with a poison specialist to determine the range of toxicity, appropriate interventions, and disposition. Contact EMS if the student has unstable vital signs, respiratory depression, or an altered level of consciousness.

Diphenhydramine

Diphenhydramine (DPH), the active ingredient in Benadryl, is an antihistamine with anticholinergic, antitussive, and antiemetic effects. It is widely used as a cold and allergy medicine, making it a standard drug in many homes. Familiarity with the drug and easy accessibility may contribute to overdose, particularly among adolescents and young adults.

Diphenhydramine is rapidly absorbed, reaching peak blood levels in 2 hours, although peak effects may be delayed in overdose. Findings are an anticholinergic toxidrome, including somnolence, pupillary dilation, flushed, dry skin, fever, and tachycardia. Hallucinations are not uncommon, particularly in children, and seizures may be seen in serious overdoses. Massive toxicity reportedly causes dysrhythmias similar to those seen in cyclic antidepressant overdose.

Call a poison specialist to determine the range of toxicity and appropriate disposition.

Appendix B includes several forms for nursing assessment of substance abuse. See the *Prevention* section later in this chapter for a table listing common substances that may cause serious toxicity in small amounts. An overview of interventions appears in the *Substance Abuse* and *Toxic Exposure* protocols in *Appendix A*.

Interventions

Dilution

Incidental ingestions involving small quantities of ballpoint ink, paints from art class, or pieces of crayons have no serious effects and require no more than simple dilution.

KEY POINT

Products that are potentially caustic or corrosive demand immediate consultation with a poison control center. Do not give fluids, as they increase the risk of emesis and aspiration.

Products that are potentially caustic or corrosive demand **immediate** consultation with a poison control center. **Do not** give fluids to dilute such substances, as the potential for emesis increases the danger of aspiration and esophageal damage.

Adsorptive agents

NOTE | Never administer emetic **or** adsorptive agents in the school practice setting.

Although emetic agents (such as syrup of ipecac) have been largely abandoned due to associated risks, activated charcoal is still considered an effective intervention for gastric decontamination in specific cases, as it binds with many toxins, preventing their absorption in the gastrointestinal tract. The remedy has several potential drawbacks, however:

- Some toxins, including iron, lithium, and alcohol, do not bind effectively with charcoal
- It should not be used in caustic ingestions, as it would obscure subsequent endoscopic examination
- It cannot be administered without risk, including the risk of aspiration

Because of these considerations, activated charcoal should be administered only by EMS or hospital personnel in consultation with a poison specialist.

Prevention

Familiarization, surveillance, and education can help school nurses fulfill their vital role in preventing poisonings in the school setting.

Familiarizing yourself with common toxic substances

Begin by increasing your own awareness of toxic substances that are likely to be encountered at your school and those that are most often subject to abuse. OSHA requires that an MSDS be available for every chemical on site. Obtain copies of these sheets and familiarize yourself with their contents.

NOTE | If a potentially toxic exposure occurs, do not rely on the material safety data sheet. Always call the poison control center to ensure that first aid interventions are accurate and current.

The following table lists common substances that can cause significant toxicity in children, even in small amounts.

TABLE 9–9. TOXICITY OF COMMON SUBSTANCES

Substance	Examples	Toxicity
Acetaminophen	Analgesic (Tylenol); included in many OTC and prescription analgesics as well as preparations for coughs and colds	Hepatotoxicity, hepatic necrosis, renal failure
Acetonitrile	Solvent used in removing cosmetic fingernails	Converted to cyanide in the body
Acids	Toilet bowl cleaner, industrial cleaners	Caustic, causing tissue necrosis
Aspirin	Contained in many analgesics	Acidosis, hyperthermia, cardiac collapse
Caffeine	Included in many OTC analgesic medications (Midol, Excedrin); preparations for allergy symptoms; appetite suppressants; energy drinks and other stimulants	Tachycardia, hypertension, seizures
Camphor	Liniments, muscle ointments	Seizures
Carbon monoxide	Contained in smoke; product of incomplete combustion	Seizures, coma
Cardiac drugs	Antiarrhythmic agents; beta blockers; calcium antagonists	Bradycardia, hypotension
Cardiac glycosides ^a	Contained in certain plants (lily of the valley, mistletoe)	Bradycardia, hypotension
Corrosives	Oven cleaners, industrial cleaners	Caustic, causing tissue necrosis; onset may be delayed
Cyanide	Industrial chemicals, products of combustion	Respiratory collapse, coma
Dextromethorphan (DXM)	OTC cough suppressants	Respiratory depression, altered level of consciousness
Diphenhydramine (DPH)	Antihistamine (Benadryl); included in many OTC preparations for colds and allergies	Seizures, tachydysrhythmias
Diphenoxylate hydrochloride ^a	Antidiarrhetic drugs (Lomotil)	Coma, respiratory depression
Ethylene glycol	Radiator antifreeze	Acidosis, renal failure
Hydrogen sulfide	Byproduct formed in decomposition of organic matter; may occur in sewers, on farms	Respiratory paralysis, coma
Imidazole ^a	Eye drops (eg, Visine); nose drops	Coma, respiratory depression, bradycardia
Isoniazid (INH)	Tuberculin medication	Seizures
Iron ^a	Prenatal vitamins, multivitamins	GI bleeding, shock, coma
Methanol	Gas line antifreeze, windshield washer antifreeze	Acidosis, blindness
Oral hypoglycemics ^a	Glyburide, tolbutamide	Severe hypoglycemia with delayed onset
Theophylline	Bronchodilators	Seizures, tachydysrhythmias
Tricyclic anti-depressants	Amitriptyline, desipramine hydrochloride (Norpramin)	Seizures, coma, dysrhythmias

^aSubstance is particularly toxic to children

Exposure to any of these products or medications necessitates an immediate call to a poison specialist.

Surveillance

In elementary schools with daycare centers, make regular outdoor inspections to identify accessible plants or shrubs with potentially toxic effects. Toxicity may be limited to specific plant parts, such as the berries, roots, or flowers; both indigenous flora and landscape plantings may have toxic elements. Your local agricultural department, a botanist, or a horticulturist from a plant nursery can help you identify dangerous plants.

Education

Many poison control centers provide public education programs consisting of slides, booklets, videos, and other materials that help bring the message of poison prevention to the public. Ask your local center about the availability of such materials. The center may also have speakers who will give presentations in the classroom.

Teach other adults within the school, as well as older students and parents/guardians, to call the poison control center immediately when a potentially toxic exposure occurs. Poison information specialists are trained to triage calls according to their severity. They can preclude unnecessary visits to the ED and—even more important—prevent delay in seeking emergency care for severe exposures.

OTHER EXTRINSIC HAZARDS

Body Piercing and Tattooing

In recent years, body piercing and tattooing have spread to every part of the body, and are seen in ever-younger populations, making it important to understand the attendant risks and recognize signs of complications among students at your school.

Body piercing

The skin is the body's first line of defense. Puncturing the skin increases the risk of local infection and systemic complications:

- Sensitivity to nickel or brass can cause allergic reactions
- Contaminated piercing supplies can expose the student to blood-borne diseases, such as hepatitis B, hepatitis C, tetanus, and HIV
- Local infections may cause erythema, edema, pain, purulent drainage, and abscesses

Additional complications are listed in Table 9-10.

TABLE 9-10. POTENTIAL COMPLICATIONS OF BODY PIERCINGS

Site	Complications
Ear	<ul style="list-style-type: none"> ▪ Allergic reaction and infection ▪ Auricular perichondritis ▪ Embedded earrings ▪ Keloid formation ▪ Perichondral abscess ▪ Traumatic tear
Genitals (women)	<ul style="list-style-type: none"> ▪ Allergic reaction and infection ▪ Compromise of barrier contraceptives ▪ Keloid formation
Genitals (men)	<ul style="list-style-type: none"> ▪ Frictional irritation and infection ▪ Paraphimosis ▪ Penile engorgement ▪ Priapism ▪ Recurrent condyloma ▪ Urethral rupture or stricture ▪ Urinary flow interruption
Mouth	<ul style="list-style-type: none"> ▪ Infection ▪ Edema ▪ Aspiration of jewelry parts ▪ Airway compromise ▪ Altered eating habits ▪ Gum trauma ▪ Hematoma formation ▪ Injury to salivary glands ▪ Interference with radiographs ▪ Loss of taste discrimination ▪ Ludwig angina ▪ Pain or permanent numbness ▪ Speech impediment ▪ Tooth fracture or chipping ▪ Uncontrolled drooling
Navel	<ul style="list-style-type: none"> ▪ Frictional irritation ▪ Infection (may take 9-12 months to heal) ▪ Bacterial endocarditis^a ▪ Jewelry migration and rejection
Nipples	<ul style="list-style-type: none"> ▪ Abscess formation and infection ▪ Bacterial endocarditis^a ▪ Breastfeeding impairment
Nose	<ul style="list-style-type: none"> ▪ Infection ▪ Jewelry ingestion or aspiration ▪ Perichondritis and necrosis of nasal wall ▪ Septal hematoma formation

^aIn patients with moderate- to high-risk cardiac conditions. Source: Metzger DI. Complications of body piercing. *Am Fam Physician*. 2005;2030.

Tattooing

Although piercings can be permitted to close, in many cases leaving little more than a scar, tattoos are more permanent. Removal procedures are painful, costly, and still imperfect. Many of the risks and complications associated with piercings apply to tattooing as well. In addition to those previously mentioned, granulomas or keloids may form around the tattoo site, and sensitivity to dyes can cause local allergic reactions, with pruritus, rash, edema, or hives. More rarely, systemic reactions may lead to dyspnea, wheezing, pharyngeal edema, and anaphylaxis.

Tattoo dyes are derived primarily from heavy metals, creating a long-term risk of poisoning as dyes slowly migrate into the surrounding tissues. Red tattoo dyes, which cause the most allergic reactions, are derived from mercury; green dyes are derived from chromium; yellow dyes from cadmium; and blue dyes from cobalt.

Assessment and Interventions

Students may report to the health office with local infections from new tattoos or piercings, lacerations from body jewelry that has ripped through the skin, or systemic complications arising from allergic reactions, exposure to contaminants, or blood-borne diseases.

Triage and treat according to the presenting complaint. In cases of local infection, do not remove jewelry, as wound closure could prevent drainage and lead to abscess formation. Clean infected wounds with mild soap and apply warm compresses. Refer the student for medical treatment as indicated. Topical ointments may be considered as permitted by individual physician's orders or applicable protocols.

Students With Special Needs

Collected data from educational personnel, injury prevention specialists, and the National Pediatric Trauma Registry indicate that children and adolescents with special needs, particularly those with preexisting *physical, cognitive, social, or emotional* limitations, are at greater risk for injury. Thus, the likelihood of environmental emergencies arising in this student population is heightened.

For example, students with paralysis or mobility problems will have difficulty fleeing a fire, potentially putting them at greater risk for significant burn injuries than their more mobile peers. Similarly, students with cognitive impairment may not perceive or react to a potentially dangerous situation. They may not take appropriate precautions while swimming, for example, increasing their risk of drowning or submersion injuries.

In addition, certain chronic conditions or medications can affect thermoregulation, potentiating heat-related illness—a significant environmental emergency.

These considerations pose unique challenges. The following measures are helpful in reducing or prevent environmental emergencies among students with special needs:

- Make sure you have appropriate individualized health care plans and emergency

care plans on file for these students

- Educate teachers, coaches, other school personnel, and parents/guardians about potential environmental risks associated with the student's condition
- Ensure that appropriate safeguards are in place

Summary

Students are subject to numerous environmental emergencies, from heat-related illness to frostbite. Insect stings, scald burns, and toxic ingestions are only a few of the hazards that can cause preventable illness, injury, or death. You must use your medical knowledge and clinical resources to provide appropriate interventions for the entire span of environmental presentations. Familiarizing yourself with focused assessment techniques can help you triage students accurately and initiate prompt interventions.

Prevention plays a major role in reducing the incidence and severity of environmental emergencies. Evaluate the school environment regularly to remedy problem areas. Avail yourself of opportunities to educate both students and staff regarding safety practices that can minimize environmental dangers.

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10

Abdominal and Genitourinary Emergencies

On completing this chapter, you will be able to

- Describe the steps in a systematic assessment of abdominal or genitourinary complaints.
- Discuss assignment of appropriate triage categories for abdominal or genitourinary complaints.
- Identify specific interventions for selected abdominal or genitourinary problems.
- Describe emergent complications that may arise in the pregnant student.
- Describe the procedure for emergency childbirth at school and interventions for potential complications affecting the mother and infant.
- Identify unique issues involving students with special needs.

Abdominal/Genitourinary Complaints in the School Setting

KEY POINT

All abdominal and genitourinary complaints should be taken seriously, regardless of presentation.

Abdominal and genitourinary (GU) complaints are common among school-aged children, and yet they are among the most difficult problems to diagnose. The clinical findings are frequently vague and nonspecific. Pain—often the chief presenting complaint—may be hard to localize, and the place where the student perceives the pain may not be the actual point of origin. Age, general health status, psychosocial issues, and other variables can all affect the presentation, so that 2 students with a common etiology may display a very different constellation of signs and symptoms.

In fact, in most cases involving abdominal or GU pain, a definitive cause is never found. That doesn't make the pain less real, however; and there's always a chance that it signifies an emergent underlying condition. Therefore, it's crucial to take all abdominal and GU complaints seriously, regardless of presentation. Remember that systematic assessment techniques and a skillful approach to student interactions will help you make appropriate triage and treatment decisions.

Types of Abdominal Pain

Pain characteristics play an important role in clinical decision-making. Understanding the unique qualities of abdominal pain can help you draw accurate conclusions from pain findings.

There are 3 distinguishing types of abdominal pain: *visceral*, *somatic*, and *referred*.

Visceral pain

Visceral pain is an intermittent, crampy pain caused by edema or obstruction of a hollow organ, such as the stomach, colon, small intestine, rectum, bladder, or kidneys. It can be particularly difficult to localize visceral pain, as nerve fibers in these organs perceive stretching. Students with visceral pain have difficulty finding a position that relieves discomfort. Diaphoresis, nausea, and vomiting are often present.

Potential causes of visceral pain include early-stage acute appendicitis, pancreatitis or cholecystitis, an intestinal obstruction, or a kidney stone.

Somatic pain

Somatic pain is severe, sharp, and constant. Once it starts, it does not go away. It arises when blood, bacteria, or chemicals leak into the abdominal cavity, causing peritonitis and irritating the nerve fibers. Students with somatic pain tend to lie very still, often keeping their legs flexed and knees close to the chest, because any

movement exacerbates the pain. The abdomen will be stiff and rigid (involuntary guarding). The student may complain of rebound tenderness on palpation.

Potential causes of somatic pain include late-stage acute appendicitis (after the onset of bacterial leakage, rupture of the appendix, or both); a ruptured spleen or other traumatic abdominal injury; or a perforated ulcer.

Referred pain

Referred pain originates in one area and manifests in another, away from the point of origin. It is discussed in more detail in the *History* section.

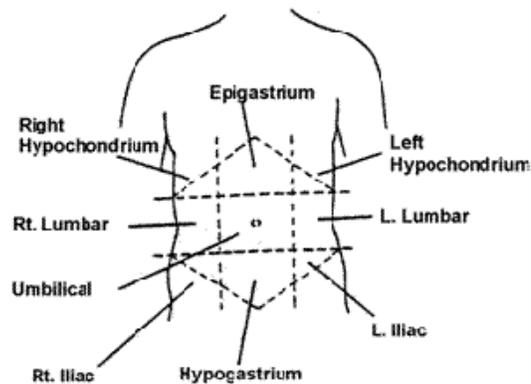
Anatomic Considerations

The anatomic divisions of the abdomen (Figure 10-1) provide useful referents for assessing abdominal pain.

The 4 clinical divisions (right lower quadrant, right upper quadrant, left upper quadrant, left lower quadrant) are generally used to describe its location.

Abdominal structures change markedly throughout the school years. As the student grows, the abdominal muscles develop significantly, becoming most prominent in the young adult.

FIGURE 10-1. ANATOMIC DIVISIONS OF THE ABDOMEN



Source: *School Nurse Emergency Medical Services for Children Course Manual*. University of Connecticut, Dept of Pediatrics; 1996.

Systematic Assessment of Abdominal/GU Problems

Assessment

It can be challenging to perform a physical assessment and obtain history information when a student is experiencing painful abdominal/GU symptoms; yet an accurate evaluation depends on a thorough assessment. Encouraging cooperation is therefore an important element in your approach. The following tips will be helpful:

- Provide privacy during the examination. School-aged children are preoccupied with modesty.
- Use language and techniques appropriate to the student's developmental level.
- Maintain a calm, reassuring demeanor.
- As your examination progresses, pay attention to the student's facial expressions, which provide important insight into the location and severity of the problem.

- Demonstrate a sensitive attitude toward the student's pain experience, especially during assessment procedures that exacerbate it.

Components of Assessment

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

Complete the first 3 elements of a systematic assessment—scene safety, across-the-room assessment, and the initial (**ABCDE**) assessment—providing appropriate interventions for abnormal findings as you go. (See Chapter 3: *Assessment and Triage*.) If possible, begin to elicit history information during this process. Activate EMS at the first indication of an emergent situation: Do not wait to complete the entire assessment.

History and Pain Assessment

The history is crucial to assessment of abdominal problems. It contributes to the triage determination and helps you decide on appropriate interventions. A **SAMPLE** history should always be performed (see Chapter 3), followed by a focused pain assessment.

SAMPLE history

During the **SAMPLE** history, be sure to note

- Allergies
- Medications currently taken
- Risk factors, such as chronic disorders
- Date of the last menstrual period, for girls who have passed menarche
- Changes in dietary habits
- Recent foreign travel

PQRST assessment

The **PQRST** mnemonic (Table 10-1) is a particularly useful tool for pain assessment. Specific assessment points are detailed below.

TABLE 10-1. PQRST HISTORY FOR ABDOMINAL PAIN

Assessment Points	
P	<ul style="list-style-type: none"> ▪ Problem: How does the student describe the chief complaint? ▪ Provoke: What makes the problem worse? ▪ Palliate: What makes the problem better?
Q	<ul style="list-style-type: none"> ▪ Quality: What is the quality or character of the problem?
R	<ul style="list-style-type: none"> ▪ Radiate: Is there pain or discomfort that seems to travel or move?
S	<ul style="list-style-type: none"> ▪ Severity: How does the student rate the severity of pain or discomfort on a scale of 1–10, with 10 being the most severe? ▪ Signs: What clinical signs accompany the problem? ▪ Symptoms: What subjective problems does the student report?
T	<ul style="list-style-type: none"> ▪ Timing: When did the problem start? Was the onset sudden or gradual?

Problem

Ask the student to describe the chief complaint. Pain, constipation, diarrhea, hemorrhoids, esophageal reflux, bleeding, change in appetite, weight gain or loss, and flatulence are common complaints associated with abdominal and genitourinary problems.

Provoke

To determine triggers that provoke the problem, ask the student about movement, position, and specific types of food that cause pain or other symptoms.

Palliate

Factors that may provide symptomatic relief for abdominal or genitourinary problems include medications, vomiting, and position.

Quality

Have the student characterize symptoms associated with the problem. If pain is a primary symptom, the following terms may help the student describe it: burning, crampy, sharp or stabbing, aching or dull, nagging, or a bloated feeling.

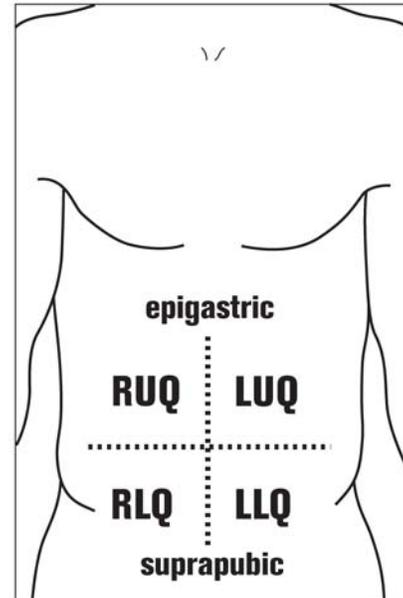
Radiate

Certain problems involve typical patterns of referred pain or discomfort as summarized in Table 10-2. The accompanying figure illustrates some of the common referral patterns.

TABLE 10-2. PATTERNS OF REFERRED PAIN

Source	Location of Pain
Aorta	Lower abdomen radiating to the back
Appendix	Umbilical migrating to McBurney point in RLQ
Colon	RLQ or LLQ; sigmoid pain may radiate to sacral area
Diaphragm	Posterior neck and shoulder
Duodenum	Midline abdominal wall just inferior to umbilicus, radiating to right subscapular area
Esophagus	Midline retrosternum radiating to the back at the level of the lesion
Gallbladder	RUQ radiating to right infrascapular area or middle of back
Kidney/ureter	Inguinal radiating to the back or flank
Liver	Radiates to right shoulder
Ovary	RLQ or LLQ radiating to the back
Pancreas	Epigastric area radiating to middle of the back or left lumbar region
Rectum	Deep pelvic region
Sm intestine	Periumbilical area
Spleen	Radiates to left shoulder

Sm indicates small; RLQ, right lower quadrant; RUQ, right upper quadrant; LLQ, left lower quadrant

FIGURE 10-2. RADIATION OF PAIN

Severity

KEY POINT

The student's self-assessment of pain can help you determine whether it is getting better or worse.

Use pain assessment tools, such as a numeric scale (for older students) or the Wong-Baker FACES scale (for younger students; see Chapter 3), to help the student quantify the subjective experience of pain or discomfort. Ask the student whether the pain seems to be getting better or worse.

Signs

Ask about any history of clinical problems, such as vomiting, diarrhea or constipation, flatulence or belching, fever, diaphoresis, rectal bleeding, frank blood or mucus in the stool, hematemesis, vaginal or penile discharge, polyuria, menstrual irregularities, weight gain or loss, or hiccups.

Note current signs as well, including facial grimace, grunting, evident apprehension, pallor, and clammy skin.

Symptoms

Prompt the student for subjective findings that were not mentioned as part of the chief complaint, such as nausea, dysphagia, burning or itching in the genital area, dysmenorrhea or *mittelschmerz*, and dizziness.

Timing

It is important to ask when the problem started, how long it persisted (if it has stopped), and whether onset was sudden or gradual. Find out what food the student has eaten during the last 24 hours and where meals were taken. To determine the possibility of contagion, ask whether the student was exposed to anyone who exhibited similar symptoms.

As a rule, if a student presents with abdominal/GU pain that has persisted for **less** than 24 hours, assume that there could be an emergent condition requiring surgical intervention, especially if the pain is accompanied by tenderness and guarding on palpation. Note, however, that a student with appendicitis can have a history of abdominal pain persisting for more than 24 hours. Duration does not necessarily rule out an urgent problem.

Focused Physical Examination

Perform a focused physical examination according to the dictates of applicable protocols. This section provides general guidelines and an overview of special techniques that are helpful in assessing abdominal and genitourinary complaints.

Obtain and record a complete set of vital signs (temperature, heart rate, respiratory rate, blood pressure).

Ask the student to empty the bladder before you assess the abdomen; reassure the student by explaining that this relaxes the abdomen to permit an accurate examination.

Remove the student's clothing as appropriate and apply a drape, keeping in mind that modesty is an issue with school-aged children. A sensitive approach minimizes associated embarrassment.

Position yourself at the student's right side and begin the physical assessment with inspection. As the examination progresses, pay attention to facial expressions indicating pain or discomfort, which provide insight into the presenting complaint.

Inspection

Color

Observe the color of the skin. Is it pallid, cyanotic, or jaundiced? Are there pigment changes? Inspect as well for rashes, scars, lesions, and petechiae. Maintain a high index of suspicion for possible blunt trauma to the abdomen if you observe ecchymoses; note the color and location in your documentation.

Interpreting your findings

A bluish discoloration in the flank (Grey Turner sign) is a late indication of retroperitoneal hemorrhage and may be associated with acute hemorrhagic pancreatitis. A bluish discoloration around the umbilicus indicates intraperitoneal hemorrhage, which may arise from a ruptured ectopic pregnancy.

Contour and symmetry

Next, inspect the contour and symmetry of the abdomen. In infants, toddlers, and young children, the abdomen is usually rounded. In older children, the abdomen

should appear moderately flat as appropriate for the student's weight and muscle tone. A bloated, protuberant, or sunken appearance denotes an underlying abnormality.

Inspect for bilateral symmetry while standing at the student's side; stand at the foot of the examining table to evaluate symmetry between the upper and lower abdomen.

Interpreting your findings

An asymmetric appearance may indicate a hernia, bowel obstruction, or abnormal spinal curvature. Table 10-3 lists additional problems associated with key findings.

TABLE 10-3. INTERPRETING ABNORMAL ABDOMINAL CONTOURS

Finding	Associated Problems
Protuberant	Obesity, ascites, tumor, pregnancy, gas, malnutrition
Sunken	Dehydration
Asymmetrical	
Upper abdomen	Problems affecting the liver, pancreas, spleen, stomach, or transverse colon
Lower abdomen	Bladder distention; pregnancy; ovarian, uterine, or colonic mass

Auscultation

Although it departs from the usual examination sequence, auscultating before performing percussion and palpation helps to ensure that bowel sounds are not inadvertently stimulated.

Auscultate systematically, using the diaphragm of the stethoscope rather than the bell. Most practitioners follow the path of the bowel: RLQ, RUQ, LUQ, LLQ. Normally, bowel sounds are audible as high-pitched clicks or gurgles occurring every 5 to 15 seconds; the intensity and frequency depend on the phase of digestion. Sounds are louder when the student is hungry.

NOTE | Bowel sounds are considered absent only if **no** sounds are auscultated for 1 full minute in each of the 4 quadrants. This indicates an **emergent** condition.

Interpreting your findings

The following abnormal sounds should be considered significant:

- Weak, infrequent, sluggish sounds (3 or fewer a minute) are associated with decreased motility.
- Loud, long, gurgling sounds that can be heard without a stethoscope indicate increased motility, which is associated with gastroenteritis, severe diarrhea, gas, cramping, or lactose intolerance.
- High-pitched tinkling sounds may indicate intestinal hemorrhage or bowel obstruction.

NOTE | When the bowel becomes obstructed, it fills with air. Peristalsis occurring in this tensely distended bowel first produces the high-pitched tinkling sounds. In a developing bowel obstruction, peristalsis increases superior to the point of pathology.

Percussion

Use percussion to identify organs that cannot be palpated. Determine whether abnormal fluid or gas is present in the abdominal cavity.

Palpation

KEY POINT

Begin palpation in the areas furthest from the pain and progress toward the areas where pain is present.

Palpation is one way to assess for the presence of pain. Begin palpation in the areas located furthest from the painful site and progress toward the areas where pain is present.

In a normal examination, the entire abdomen is soft on palpation, without pain, tenderness, or masses. If you note guarding, observe whether it is involuntary (continuous muscle contraction over an area of intense tenderness or pain) or voluntary (intermittent contraction in anticipation of palpation).

NOTE | If you question the validity of a pain response, return to the area later in the examination and apply pressure with the diaphragm of your stethoscope to see whether the same response is elicited.

There are 4 common methods to confirm peritoneal irritation:

Iliopsoas sign

Position the student supine, then have the student raise the right leg upward while you apply downward pressure with your hand. Repeat the test with the left leg.

Increased abdominal pain is a positive response indicating irritation of the psoas muscle.

Obturator sign

Position the student supine with the right leg flexed 90° at the hip and knee. Place one hand proximal to the knee and the other on the ankle. Rotate the leg laterally and medially.

Pain in the lower abdomen is a positive response indicating irritation of the obturator muscle.

Heel drop

This is a simple alternative for diagnosing peritoneal irritation. Have the student stand on tiptoes, then quickly drop the heels to the floor. Pain or increased discomfort in the abdominal cavity is a positive response. Alternatively, ask the student to hop.

A positive response is indicated if the student complains of pain or is unable to hop.

Rebound tenderness

Gently and slowly, press your hand deep into the abdomen, then release quickly. A cry of pain is a positive response.

This sign is commonly associated with appendicitis. In young students, however, rebound tenderness has limited diagnostic value.

Document your findings accurately, as this information will help health care providers determine appropriate actions if further medical attention is necessary.

Triage and Transport

Perform triage to determine disposition.

NOTE | Since findings are often nonspecific, it can be difficult to determine the urgency of abdominal/GU problems. When in doubt, **always** place the student in the higher triage category.

Emergent

Findings suggest a life-threatening problem requiring immediate medical attention. Ominous findings include

- Onset of pain within the past 24 hours
- Any sign of intra-abdominal hemorrhage
- Precipitating event involved abdominal or genitourinary trauma, followed by rapid and progressive abdominal distention

Activate EMS for **immediate** transport. Notify parents/guardians so that they can meet the student in the ED.

Urgent

The student has a significant problem requiring treatment within the next 2 hours. Most students with moderate to severe abdominal pain would be in this category.

Notify the parent/guardian. Activate EMS if appropriate; otherwise, have the parent/guardian transport the student to the primary health care provider.

Nonurgent

The student has a minor illness or injury that does not require immediate medical intervention.

A student in this classification may be observed in your office, returned to class, or taken home. You may wish to consult with the primary health care provider before you contact the parents/guardians. Advise them of your findings and recommendations, and encourage them to take the student for further medical evaluation if they feel a high degree of concern.

Documentation and Follow-Up

Document the incident and make a copy of the history available to the student's parent/guardian, the primary health care provider, and EMS personnel as appropriate, since it provides a baseline for further assessments and subsequent care. In nonurgent cases, you may find it helpful to talk to the parent/guardian to clarify or supplement the information and to determine follow-up. Record this information in your documentation.

Selected Abdominal and Genitourinary Emergencies

Appendicitis

As children reach school age, the incidence of appendicitis increases, becoming one of the leading causes of acute abdominal pain. In the early stages, pain is visceral, poorly localized, and crampy. Somatic pain develops over time, becoming constant and localized in the right lower quadrant (McBurney point). The student will complain of anorexia or nausea; there may be a history of vomiting. Assessment usually reveals pallor, irritability, tachycardia, and low-grade fever. (Be aware, however, that in some cases a student with appendicitis may not have an ill appearance.) Bowel sounds are hypoactive or absent. Once pain has localized, tests for peritoneal irritation will be positive.

Interventions

The triage category is **emergent**. Immediate intervention is necessary to prevent rupture. Activate EMS to provide emergency transport to the ED.

Ectopic Pregnancy

Signs of ectopic pregnancy include abdominal pain and abnormal vaginal bleeding. If rupture occurs, pain may be intermittent, indicative of intraperitoneal bleeding. Suspect peritonitis if pain is located in the shoulder and back.

Interventions

This is an **emergent** condition. Activate EMS for **immediate** transport.

Ovarian Cyst

Ovarian cysts—sacs filled with fluid or semisolid material—are a potential cause of abdominal pain in postpubertal girls. Cysts can develop at any age after ovulation begins. Types of cysts include

- Follicular and corpora lutea cysts, which form during the normal hormonal cycle
- Endometriomas, formed from endometrial tissue
- Neoplasms

The student with an acute rupture of an ovarian cyst will have well-defined, unilateral pelvic pain with abrupt onset. A graafian follicle may rupture at midcycle when ovulation occurs, releasing follicular fluid into the peritoneal cavity and producing a dull, aching, unilateral pain (*mittelschmerz*) that lasts from several minutes to a few hours.

Hemorrhagic ovarian cysts are more serious. They generally cause sudden, sharp abdominal pain accompanied by significant local tenderness, guarding, and evidence of peritoneal irritation. The student may become hemodynamically unstable, depending on the amount of blood loss. Definitive diagnosis of a hemorrhagic ovarian cyst is difficult in the school setting, since similar signs and symptoms are seen with ectopic pregnancy and appendicitis.

Interventions

If abdominal pain is accompanied by unstable vital signs or signs of shock, categorize the condition as **emergent**. Activate EMS for **immediate** transport.

If the student has significant abdominal pain and stable vital signs, the triage category is **urgent**, requiring activation of EMS.

Pelvic Inflammatory Disease

KEY POINT

Signs of acute pelvic inflammatory disease with peritonitis include rebound tenderness, guarding, and decreased bowel sounds. This is an emergent condition.

Pelvic inflammatory disease (PID) may develop as a complication of a sexually transmitted disease, although other causes are possible. PID is classed as acute, subacute, or chronic, depending on associated signs and symptoms, severity, and previous episodes:

- **Acute PID** involves high fever, continuous bilateral pain, and sometimes vaginal bleeding or discharge. Assessment findings include rebound tenderness, guarding, and decreased bowel sounds.
- **Subacute PID** presents with low-grade fever and moderate abdominal tenderness.
- **Chronic PID** is characterized by recurrent abdominal pain, backaches, and vaginal discharge.

Interventions

Acute PID with peritonitis is an **emergent** condition. Activate EMS for **immediate** transport.

Testicular Pain

Testicular pain may be caused by *torsion*—a twist in the spermatic cord—which occludes blood flow to the testis. Pain may be intermittent or constant and is usually intense; you may note edema on inspection.

Interventions

This is an **emergent** condition. If ischemia persists, testicular necrosis may occur. Activate EMS for **immediate** transport.

Trauma

Abdominal injuries are usually caused by blunt-force impact, such as a student might incur after a fall on the playground. Maintain a high index of suspicion for child maltreatment when abdominal trauma cannot be adequately explained.

The findings that accompany significant abdominal trauma may be subtle at first; therefore, any complaint of tenderness or pain must be taken seriously. An accurate account of the mechanism of injury may help you determine the potential severity of the injury.

See Chapter 4: *Trauma* for more information.

Selected Abdominal and Genitourinary Conditions

Acute Gastroenteritis

KEY POINT

In acute gastroenteritis, diarrhea can cause significant fluid loss with the potential for electrolyte imbalance.

Acute gastroenteritis is a frequent cause of abdominal pain in school-aged children. The origin of the inflammation may be bacterial, viral, or protozoan. The student will present with crampy, colicky abdominal pain of sudden onset, nausea, vomiting, diarrhea (usually explosive and foul-smelling), and fever. Diarrhea can cause significant fluid loss, with the potential for electrolyte imbalance. Most cases are self-limiting, with recovery in approximately 3 to 5 days.

Interventions

The triage category is **urgent**. Contact the parent/guardian or EMS to transport the student for further medical care or home.

Recurrent Abdominal Pain

Recurrent abdominal pain (RAP) is defined as abdominal pain that

- Occurs at least 3 times a month over a 3-month period **and**
- Is severe enough to interfere with normal activity

The disorder is typically associated with stress. Students with RAP often prove to be overachievers, despite school absences caused by abdominal problems.

The quality of the pain is often crampy. While the pattern may be inconsistent, pain is frequently located in the umbilical region. During an episode, the student

will usually appear pallid with diaphoresis and may cry from the pain. Fear and anxiety may exacerbate the pain.

Interventions

Once you are aware that RAP has been diagnosed, document the condition in the student's health record. During an episode, let the student take a short rest break in the health office before returning to class. The triage category is nonurgent.

Constipation

Constipation is a common cause of abdominal pain across the pediatric age span. Frequently, the student will complain of colicky pain in the right lower quadrant where the cecum is located, as this is the most common place for gas to collect.

Interventions

If pain is mild or intermittent, the triage category is nonurgent. The **urgent** triage category applies if pain is moderate to severe, or if pain is accompanied by nausea and vomiting.

Urinary Tract Infection

Among pediatric bacterial infections, the rate of incidence for urinary tract infection is second only to upper respiratory tract infection. Signs and symptoms include abdominal pain, vomiting, dysuria, frequent urination, and fever.

Interventions

If the student has moderate to severe dysuria, particularly if vomiting or fever are present, the triage category is **urgent**. Contact the parent/guardian to transport the student for further medical care.

Sexually Transmitted Diseases

Sexual activity among youth in the United States has been increasing since the 1970s. Concomitantly, infection rates for sexually transmitted diseases (including the human immunodeficiency virus, beginning in the 1980s) as well as unintended pregnancies have also increased among adolescents, according to the Centers for Disease Control and Prevention (CDC).

Many sexually active young people engage in behavior that puts them at high risk for sexually transmitted diseases (STDs), such as having sex with multiple partners and without using condoms. More recent findings seem to indicate that teens may be turning to unprotected oral sex on the assumption that it is safer, not realizing that HIV and other STDs can be transmitted this way as well, according to the CDC. Anal sex, which is used as a method of pregnancy avoidance among youth, also carries high risks.

STDs for which children and adolescents are at risk include

- Syphilis
- Gonorrhea

- Chlamydial infections
- Genital herpes
- Genital warts (*condyloma acuminatum*, caused by a human Papillomavirus)
- Human immunodeficiency virus
- Viral hepatitis type B
- Bacterial vaginosis
- Pediculosis pubis

Obtaining a sexual history can be an important step in promoting health and preventing sexually transmitted infections. Because this is a sensitive subject, preface your questions with an explanation of their purpose and explain that you will keep the answers confidential.

Interventions

Clinical findings associated with STDs can vary widely, depending on the specific etiology and the severity of the infection. A student with moderate to severe pain, vomiting, or fever should be placed in the **urgent** triage category.

Prevention

Offer guidance to all adolescents regarding responsible options for sexual activity, including abstinence. Make sure they have easy access to information on how STDs (including HIV) are transmitted and the possible consequences of infection.

Vaginal Bleeding

Vaginal bleeding can be caused by many different mechanisms, from menarche to sexual maltreatment. An accurate history is essential in determining appropriate interventions. Be sure to ask about the date of the last menstrual period, whether the student is sexually active, and whether trauma has occurred.

Interventions

Abnormal vaginal bleeding must be considered in the context of all accompanying clinical findings before determining the triage category, which may range from nonurgent to emergent. Consider the triage category **emergent** if the student

- Is pregnant (see next section)
- Exhibits signs of shock
- Has a history of trauma as the precipitating event
- Reports sexual or physical maltreatment **or** has additional findings suggestive of maltreatment

Obstetric Emergencies

It's not uncommon for pregnant adolescents to attend regular school classes, often continuing right up until delivery. Teen pregnancies carry a higher risk of

attendant complications for numerous reasons, from physiologic immaturity to emotional unpreparedness to lack of adequate prenatal care. Some of the more serious complications you may see in the health office are listed below. An overview of triage and interventions appears in the *Obstetric Emergencies* protocol in *Appendix A*.

Pregnancy-induced Hypertension

This condition is the second leading cause of maternal death in the United States. It is associated with morbidity involving the brain, kidneys, and liver, the result of elevated peripheral vascular resistance. *Preeclampsia*, the earlier stage of the condition, involves hypertension with marked edema. It usually develops sometime after the twentieth week of gestation. Complete bed rest may be prescribed to prevent progression to *eclampsia*, the later stage, in which seizures arise.

Interventions

Any of the following findings should be considered **emergent**:

- Seizures
- Blood pressure equal to or higher than 140/90 mm Hg
- Blood pressure elevated by 30 mm Hg (systolic) **or** 15 mm Hg (diastolic) above a known baseline

Activate EMS to provide **immediate** transport to the ED. In the event of a seizure, place the student on her left side as soon as it is feasible to do so. Remove any nearby objects that could cause harm, but do not restrain the student or attempt to force anything into her mouth. See Chapter 7: *Neurologic Emergencies* for more information about seizures.

Hemorrhage

Vaginal hemorrhage can cause life-threatening shock. There are 3 types of hemorrhage specific to the intrapartum period:

Abruptio placentae

Abruptio placentae is when the placenta separates prematurely from the uterus. The resultant hemorrhage may be apparent or occult, depending on where the separation occurs. The seriousness of the problem correlates with the degree of placental separation. In all cases, however, this is considered an **emergent** situation.

Factors that increase the risk of abruptio placentae include crack cocaine use, injury (especially from a fall or motor vehicle crash), hypertensive disease, advanced maternal age, sudden uterine decompression, lack of prenatal care, cigarette smoking, and excessive alcohol consumption.

Signs and symptoms include sudden, severe abdominal pain, abdominal rigidity on palpation, and signs of shock; hemorrhage need not be evident. Fetal distress is possible. A cesarean section may be necessary to guard against fetal death.

Interventions

The triage category is **emergent**. Activate EMS to provide **immediate** transport to the ED. Place the mother on her left side with legs elevated. Administer oxygen if available.

Placenta previa

Placenta previa is the most common cause of painless bleeding during the third trimester of pregnancy. In this condition, the placenta is abnormally placed in the lower uterine segment, where it may partially or completely obstruct the internal cervical os. Hemorrhage may occur if any part of the placenta separates from the uterus.

Factors that increase the risk of placenta previa include advanced maternal age, multiparity, and previous uterine surgery.

Women with this condition present with sudden, bright red, painless bleeding. Depending on the amount of hemorrhage, signs of shock and fetal distress may be present.

Interventions

Life-threatening hemorrhage is possible, making this an **emergent** situation. Activate EMS to provide **immediate** transport. Place the student on her left side with her legs elevated. Administer oxygen if available.

Spontaneous abortion

Cramping and vaginal bleeding during the first 12 weeks of pregnancy may indicate spontaneous abortion of the fetus or embryo, terminating the pregnancy. Dilation and curettage may be necessary to ensure that no products of conception remain within the uterus, as they could cause further hemorrhage or infection.

Interventions

This is an **urgent** or **emergent** condition that requires transport by EMS. Provide emotional support and monitor the mother for signs of shock.

Trauma in Pregnancy

During late pregnancy, gait and balance are affected by the protruding abdomen and relaxation of pelvic girdle ligaments, which causes the pelvis to tilt. These factors increase the risk of falling, with attendant trauma. Eighty percent of maternal falls occur after the thirty-second week of pregnancy, with the potential for pelvic fracture and abruptio placentae. Even minor trauma can cause the inelastic placenta to tear from the uterus.

Interventions

After any fall, the student should be monitored closely for any signs of contractions or decreased fetal activity. The triage category ranges from nonurgent to emergent, depending on associated findings. See Chapter 4 for information about specific traumatic injuries.

Epistaxis

Nosebleeds are common during pregnancy, as capillaries in the upper respiratory passages become engorged.

Interventions

Epistaxis that continues after 10 minutes of direct pressure is considered **urgent**. Milder episodes are nonurgent. Interventions are described in Chapter 8: *Eye, Ear, Nose, Throat, and Dental Emergencies*.

Drug Use During Pregnancy

Use of illicit drugs, particularly cocaine, can cause serious complications for both the student and her baby. Cocaine's stimulant effects cause vasoconstriction, tachycardia, and hypertension, increasing the student's risk for spontaneous abortion, premature labor, hemorrhage, seizures, myocardial infarction, and abruptio placentae. The newly born infant may suffer from withdrawal symptoms and increased risk of sudden infant death syndrome (SIDS). Alcohol use increases the risk of spontaneous abortion and stillbirth and may result in birth defects and mental retardation associated with fetal alcohol syndrome.

Interventions

If you suspect that the student is using harmful or illicit substances, make a referral to the Department of Children and Family Services per school protocol.

Treat a suspected drug overdose as described in Chapter 9: *Environmental Emergencies*. Try to determine the agents involved so that you can identify potential effects and complications. The triage category is **urgent** or **emergent**, depending on specific findings.

Out-of-hospital Delivery

Determining Whether to Stay or Go

Although there is little risk that you will be confronted with an emergency delivery, you should be prepared to manage the situation if it arises.

When a pregnant student experiences uterine contractions, the first step is to determine whether delivery is imminent. In some cases, a brief focused history may provide enough information to make this determination, as well as alerting you to potential complications. Begin with the following information:

- The student's age
- Whether she has had a previous pregnancy (*multigravida*)
- Whether she has had a previous delivery (the duration of labor is likely to be shorter after the first birth)
- The calculated due date (to determine whether delivery may be premature)
- Whether the student received prenatal care, and if so, where (ask for the name)

and phone number of her doctor)

- Whether there is a chance of multiple births, which would require extra assistance and supplies

These questions represent the minimum information you should obtain; a complete history is recommended if time allows.

NOTE | If a pregnant student is attending your school, it is a good idea to gather this information and prepare an individualized health care plan for the student as soon as you are aware of the situation.

Four additional points can help you determine how far labor has progressed:

Expulsion of mucous plug

During gestation, a collection of thick mucus occludes the cervical os, protecting the fetus from bacteria. During early labor, this plug separates from the cervix and is expelled. Blood from severed capillaries may be expelled at the same time (this vaginal bleeding is also referred to as *bloody show*).

Rupture of the amniotic sac

During pregnancy, the developing fetus floats in a membrane sac containing amniotic fluid. As labor progresses, the amniotic sac usually ruptures, releasing approximately 1 pint to 1 quart of fluid.

NOTE | If rupture of the amniotic sac has already occurred, it is important to determine whether the fluid was clear and odorless. Green-tinged or yellow-tinged amniotic fluid indicates the presence of *meconium*—fecal material that may be released by the fetus in utero in response to physiologic stress. An unpleasant odor may indicate infection. Either of these findings indicates a complication that must be communicated to EMS personnel. The presence of meconium represents an **emergent** situation. Request a paramedic response team, as intubation and tracheal suctioning will be required.

Timing of contractions

The muscles of the uterine wall contract with increasing strength and frequency as they push the fetus downward through the cervix. Note the time from the beginning of one contraction to the beginning of the next. Birth is imminent when contractions lasting close to a minute occur at 1- to 2-minute intervals.

Pressure on the rectum

As delivery progresses, the head of the fetus presses against the mother's rectum, causing a sensation like the urge for a bowel movement. If the mother reports this feeling, birth is imminent.

Given this information, you should be able to decide whether true labor has begun and make an initial triage determination. Generally speaking, the triage category is

- Nonurgent if the amniotic sac is intact and contractions are variable. Observe the student in the health office and contact the parent/guardian to provide transport for medical care.

- **Urgent** if the amniotic sac is intact and regular contractions (signaling the onset of active labor) are occurring more than 10 minutes apart. Findings from the physical examination will help you determine whether EMS is needed; otherwise, contact the parent/guardian to transport the student for medical care within 2 hours.
- **Emergent** if regular contractions are less than 10 minutes apart **or** if labor is premature **or** if this is not the student's first pregnancy. **Immediately** activate EMS and proceed with delivery preparations.

Preparation for Delivery

KEY POINT

If an out-of-hospital delivery appears imminent, activate EMS immediately and proceed according to applicable protocols.

If delivery is imminent, movement to the hospital must be put on hold. Activate EMS if you have not already done so and proceed according to applicable protocols. From this point on, do not leave the student alone at any time.

Prepare the area

Establish as much privacy as possible at the scene, removing anyone who is not essential to the student's care or comfort. If the student indicates that there is someone (such as a friend, teacher, or partner) whose presence is important to her, permit this person to stay.

Place the student on a firm surface that she will not sink into. (Do not place her on a mattress, cushion, or pillow.)

Remove as much of the student's clothing as necessary so that she can move her legs freely. You will need clear access to the birth canal.

Provide support

Enlist an assistant to stand at the mother's head and provide emotional support. Be alert for emesis.

KEY POINT

Explain what you are doing as the delivery progresses, communicating at all times in a calm, reassuring, and encouraging tone. Gentle repetition of instructions is the most crucial component in facilitating a controlled birth.

Explain what you are doing as the delivery progresses, communicating at all times in a calm, reassuring, and encouraging tone. Gentle repetition of instructions is a crucial component in facilitating a controlled birth.

Determine the current stage of labor

There are 3 stages of labor:

- The first stage begins when contractions become regular and ends when the cervix is fully dilated.
- The second stage begins when the cervix is fully dilated and ends when the infant

is fully delivered.

- The third stage begins when the infant is fully delivered and ends with delivery of the placenta.

Inspect for crowning

Inspect for crowning **without** touching the vaginal area. Touching this area increases the risk of infection. In a normal birth, you will see the top of the baby's head during crowning (cephalic presentation); however, other presentations are possible. Generally, if you observe any part other than the baby's head, the risk of complications increases. Communicate this information to EMS if rescue personnel aren't already on the scene.

Once crowning occurs, birth is imminent. If the student is multiparous, delivery may proceed rapidly without crowning. If EMS personnel haven't yet arrived, you must take charge of the delivery.

Lay out the equipment

Ready an obstetric kit. You will need to prepare extra kits if there is a potential for multiple births.

NOTE | Prepackaged obstetric kits should be available at any school in which there are pregnant students, teachers, or staff.

If you do not have an obstetric kit, gather the following equipment:

Essential equipment

- A bulb syringe (such as an ear syringe) to suction the baby's nose and mouth
- Towels or blankets to wipe and warm the baby
- Disposable gloves (sterile if possible)

Desirable equipment

- Hemostats, cord clamps, or sterile string to tie or clamp the cord
- Scalpel or scissors to cut the cord

NOTE | Always observe standard precautions!

You will also need dry, clean towels or blankets. Warm them if you have the means to do so.

Delivery of the Baby

Deliver the head

Place your gloved hands (and a 4" × 4" gauze) at the vaginal opening, being careful not to touch the mother's skin. As the infant's head emerges, place one hand below it with your fingers spread wide. Support the perineum to prevent lacerations and to help control the baby's head. Instruct the mother in simple, direct language to open her mouth and pant-blow. These measures help to

prevent an explosive delivery, which can cause trauma to both mother and baby. Continue to support the baby's head gently as delivery progresses, but do not put excessive pressure on the baby's fontanelles.

If the amniotic sac is intact, puncture it so that the fluid can drain. Note any sign of meconium staining. Clear the membrane from the baby's mouth and nose.

Check the umbilical cord

Once the head is delivered, check for the umbilical cord. If it is wrapped around the baby's neck, instruct the mother to pant during the next contraction while you gently remove the cord. In rare instances, the cord may be too tight for easy removal. In this case, clamp the cord in 2 places, cut the cord between the clamps, and gently unwrap the ends of the cord to free the baby's neck. Throughout this process, continually coach the mother to pant during contractions.

Suction the mouth and nose

Next, suction the baby's mouth and nose. Do this between contractions if possible. It's important to suction the mouth first, then the nose. Suctioning the nose tends to trigger the infant's first breath; the mouth must be free of fluid before this happens. This step is particularly important if meconium is present.

Deliver the shoulders

The shoulders will deliver next. Gently support the baby during this process. If the upper shoulder becomes wedged, gently guide the baby's head downward; this will usually free the shoulder. Once the shoulders have delivered, the rest of the baby will deliver immediately. Be prepared for this, as the baby will be very slippery.

Dry and warm the infant

KEY POINT

To prevent neonatal cold stress, quickly dry the infant with a towel, then wrap the infant in a second, dry towel.

Place the baby on a towel or blanket with the head slightly lower than the rest of the body and note the time in your documentation.

NOTE | Until the umbilical cord is cut, it is important not to place the infant at a level higher than the placenta.

To prevent neonatal cold stress, quickly dry the infant with a towel, then wrap the infant in clean, dry (preferably warm) towel. Be careful to cover the head while leaving the face unimpeded.

Check for breathing

Assess the baby to make sure the airway is clear. Repeat suctioning as necessary, being careful not to suction for more than 5 seconds at a time. Avoid deep suctioning, as this will cause vagal stimulation and subsequent bradycardia.

If the baby does not cry, try rubbing the baby’s back with a blanket or towel or snapping the baby’s heel with your finger. These methods produce effective respiration in most infants. **If they do not, proceed immediately with resuscitation.**

Assess the initial Apgar score

KEY POINT
Do not delay necessary resuscitation measures to check the Apgar score.

Unless resuscitation measures are needed, assess the baby’s Apgar score 1 minute after birth and again 5 minutes after birth. **If resuscitation measures are necessary, do not delay them to obtain an Apgar score.** Table 10-4 summarizes categories and scoring.

TABLE 10-4. APGAR EVALUATION OF THE NEONATE

	Sign	0	1	2
A	Appearance (color)	Cyanotic or pallid	Centrally pink, extremities cyanotic	Completely pink
P	Pulse rate	Absent	slower than 100 bpm	faster than 100 bpm
G	Grimace (reflex irritability) ^a	No response	Grimace	Cough/cry/sneeze
A	Activity (muscle tone)	Limp	Some flexion (extremities)	Active movement
R	Respiratory effort	Absent	Slow/irregular	Good; cries

^aIn response to nasal or oral stimulation. bpm indicates beats per minute

Cut the umbilical cord

Once the baby is delivered, you may cut the umbilical cord. Ideally, only sterile equipment should be used when clamping or cutting the cord. Apply the first clamp approximately 10" from the baby’s abdomen, then apply a second clamp about 7" from the baby’s abdomen. Cut the cord between the clamps. Once the cord has been cut, facilitate mother-infant bonding by encouraging the mother to hold and nurse the infant.

If cord clamps are not available, substitute string, rubber bands, or lanyards until EMS arrives.

Deliver the placenta

The mother will experience additional contractions to expel the placenta shortly after the baby is fully delivered. Once the placenta delivers, place it intact in a plastic bag or similar container and send it to the hospital with the mother and baby for examination.

Resuscitation Measures

Most of the time, the baby will need no other care beyond maintenance of warmth, airway suctioning, and mild stimulation. If the baby’s respiration is

inadequate despite gentle stimulation, however, resuscitation measures may be needed. A brief overview of neonatal resuscitation appears below.

NOTE | Maintain current neonatal resuscitation skills through courses provided by the American Red Cross, the American Heart Association, and local hospitals.

Indications for assisted ventilation

According to American Heart Association guidelines, positive-pressure ventilation is indicated if any of the following conditions is present:

- Apnea or gasping respiration
- Heart rate slower than 100 beats per minute
- Persistent central cyanosis despite 100% oxygen

Provide assisted ventilation at 40 to 60 breaths per minute.

Reassessment

After 30 seconds of assisted ventilation, check for spontaneous breathing and evaluate the baby's heart rate, either by auscultating with a stethoscope or by palpating the pulse at the base of the umbilical cord.

- If respiration is inadequate **or** if the heart rate is slower than 100 bpm, continue assisted ventilation.
- If the heart rate is slower than 60 bpm, begin chest compressions in addition to assisted ventilation.

NOTE | Hypoxia is the main cause of bradycardia. With adequate oxygenation, the heart rate usually increases.

Care of the Mother

After delivery, place the mother in a comfortable position and cover her with a blanket to keep her warm. Assess for vaginal hemorrhage or signs of shock.

Interventions for vaginal hemorrhage

Uncontrolled vaginal hemorrhage is an **emergent** situation. Reassure the mother and place her in the Trendelenburg position with her hips elevated. Apply a sanitary napkin if available and change it as necessary. Keep an accurate count of the number of sanitary napkins used. Provide emergency transport to the hospital.

Uterine massage can be performed to increase uterine tone and slow vaginal hemorrhage.

Special Situations

Premature birth

A baby is considered premature if delivery occurs before 30 weeks' gestation or if the infant weighs less than 5.5 pounds. Premature infants are thinner and smaller than term babies and have a redder appearance. These infants have marginal fat stores and lose heat very quickly; therefore, it is critical to warm the baby as rapidly and efficiently as possible.

Interventions

Wrap the baby in a clean towel or blanket after drying, then wrap the towel in aluminum foil if possible. Be sure to cover the baby's head, as this is a primary source of heat loss.

Multiple births

The babies are likely to be smaller than usual and may be delivered prematurely. After the first baby is delivered, contractions for the second will begin. Optimally, the second birth should occur between 3 and 15 minutes after the first.

Interventions

If you have determined that the mother is expecting more than one infant, gather extra supplies and make every attempt to enlist additional personnel to assist you.

Stillbirth

If the fetus dies in utero, labor will proceed as previously described, but the mother will feel no fetal movement. There may be a foul smell when the fetus delivers.

Interventions

This is an emotionally traumatic experience. It is important to provide comfort and reassurance. Allow the mother to hold the fetus if she requests this. Help her with referrals to appropriate social services where she can receive assistance with grief, coping skills, and any necessary actions she must take.

Breech birth

KEY POINT

Consider any breech presentation a serious complication that necessitates emergency transport.

In a breech presentation, the baby's feet, knees, or buttocks emerge from the birth canal first rather than the head. This is more likely to occur with premature infants.

Interventions

This is an emergent situation! Consider any breech presentation a serious complication. Delivery should take place in a hospital if at all possible, as the baby's head may become wedged in the bony pelvis after the body has delivered,

slowing or halting delivery. This may give rise to hyperextension of the infant's neck as well as anoxia.

If a breech birth is not progressing, **do not pull the baby forcibly from the birth canal**. Don a pair of protective gloves, preferably sterile. Slide your hand into the mother's vagina alongside the baby and locate the infant's mouth. Open the mouth slightly. Place a finger along either side of the baby's nose, forming a V, and push slightly against the vaginal wall with the back of your hand. This creates a passageway that allows the baby to breathe.

Once you have achieved this position, you must maintain it, leaving your gloved hand in place until the baby delivers or you arrive with the mother at the hospital and the attending physician instructs you to remove your hand.

Prolapsed umbilical cord

At times, the umbilical cord will emerge before the infant.

Interventions

This is an **emergent** situation, as compression of the cord during delivery occludes the oxygen supply from the placenta to the fetus.

Do not attempt to push the cord back into the vagina! Instead, place the mother in the Trendelenburg position with her hips elevated **or** in the knee-chest position. Don a pair of sterile protective gloves, if available, and gently push the baby's head or other presenting part back into the vagina until pulsation returns to the umbilical cord. Maintain this position to ensure that the head or presenting part does not compress the cord. Provide rapid transport to the hospital.

Prevention

Abdominal and genitourinary emergencies encompass a vast array of disorders. Early recognition of emergent and urgent conditions is fundamental to ensuring appropriate intervention.

Educate students about the physical changes of puberty and encourage them to develop good hygiene and nutritional habits. This can reduce the incidence or morbidity associated with some of the abdominal and genitourinary problems discussed in this chapter.

It is also important to encourage safe-sex strategies to reduce the risk of pregnancy and sexually transmitted disease. When pregnancy does occur, students must understand the importance of prenatal care. They may benefit as well from guidance in determining their postpartum needs and plans.

Students With Special Needs

Since teen pregnancy is not uncommon, school nurses who work with adolescent populations may be called on to manage pregnant students' medical needs. Pregnancy in adolescents is associated with marked health risks, including higher maternal-infant mortality rates, lower birth weights, anemia, and preeclampsia,

as well as numerous socioeconomic challenges. These factors are compounded if the pregnant student has special needs, increasing your concerns on many fronts.

Pregnant students may not be receiving routine or consistent prenatal care. It is important to work with them to secure their enrollment in appropriate prenatal programs—particularly if the student already has special health needs—as these programs can offer obstetric and gynecologic care, psychosocial support, nutritional assessment and support, and case management to ensure that the medical needs of both mother and baby are met.

Summary

Abdominal pain may be visceral, somatic, or referred. Identifying the location, intensity, and quality of abdominal pain can help you determine the most likely underlying condition, which will facilitate accurate triage and appropriate interventions. The history is a crucial part of your assessment. Use the **PQRST** mnemonic to gather relevant information.

Be prepared to manage complications of pregnancy and out-of-hospital deliveries if there are pregnant students, teachers, or staff members at your school. Make sure the school health room is stocked with sterile, prepackaged obstetric kits and additional supplies as appropriate. Review delivery procedures so that you will know how to assist the mother if the need should arise.

References and Information Sources

American Heart Association. *2005 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care*. Dallas, TX: American Heart Association; 2005.

Hockenberry MJ, Wilson D. *Wong's Nursing Care of Infants and Children*. 8th ed. St Louis, MO: Mosby; 2006.

School Nurse Emergency Medical Services for Children Course Manual. Farmington, CT: University of Connecticut Health Center, Department of Pediatrics; 1996.

11

Musculoskeletal Emergencies

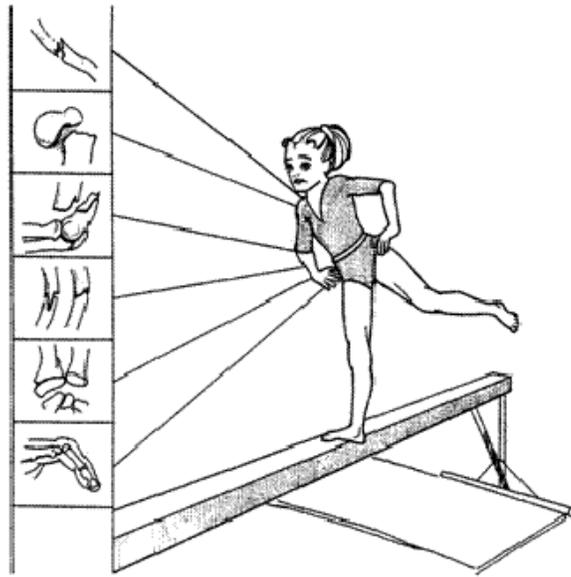
On completing this chapter, you will be able to

- Identify important focused history points and physical assessment techniques for evaluating musculoskeletal injuries.
- Differentiate soft tissue injuries from skeletal injuries.
- Demonstrate appropriate nursing interventions for various types of musculoskeletal trauma.
- Identify unique issues that may arise when students with special needs incur musculoskeletal injuries.

Introduction

The musculoskeletal system is subject to a wide spectrum of injuries, from microscopic tearing of soft tissues to complex fractures that require surgical intervention. A single high-risk activity may cause musculoskeletal injuries across this entire spectrum, as shown in Figure 11-1: Young gymnasts are subject to any combination of strains, sprains, dislocations, or fractures in the course of their training. Such injuries may result in chronic pain, permanent disability, or even death.

FIGURE 11-1. RISK OF INJURY



There are many situations in the school setting that carry this type of risk; and when these injuries occur, you're likely to be the first health care provider on the scene. Therefore, it's essential to familiarize yourself with special assessment techniques, associated findings, and appropriate treatment modalities that allow you to render expeditious care. By combining this knowledge with your own experience and intuition, you can improve the student's outcome and reduce morbidity.

Your role during a musculoskeletal emergency includes

- Assessing for potential strains and sprains or dislocations and fractures
- Providing immediate interventions as indicated
- Determining the appropriate triage category and disposition
- Documenting relevant information to ensure a smooth transition of care

After the student has been transferred from your care, hospital personnel or primary health care providers will alleviate the student's discomfort and provide

safe interventions, with the ultimate goal of preserving function in the injured area and restoring optimal abilities for daily living.

Anatomic and Physiologic Considerations

Several unique anatomic considerations affect the mechanisms and resultant injuries children incur after a musculoskeletal insult.

- A child's bones are more porous and flexible than an adult's, while the periosteum is stronger and thicker. This means that the bone may bend before breaking, resulting in an incomplete (*greenstick*) fracture that affects only 1 side of the periosteum.
- The periosteum can produce new bone (*callus*) in a very short time, making prompt reduction of a fracture essential to ensure normal growth.
- In growing children, elongation of the long bones takes place at the epiphyseal plate (*growth plate*). Injury to this area may disrupt growth, resulting in uneven limbs. Any suspected epiphyseal injury requires prompt attention.

Types of Musculoskeletal Injuries

Soft tissue injuries include contusions, strains, and sprains; **skeletal** injuries include dislocations and fractures.

Contusions

Contusions occur when an external force (pressure or impact) damages subcutaneous blood vessels without breaking the skin, causing extravasation of blood into adjacent tissues. Initially, contusions appear as areas of bluish discoloration, sometimes accompanied by edema. The area is tender to the touch. Depending on the severity of the injury, discoloration will begin to dissipate within 48 to 96 hours.

Strains

Strains occur when a tendon, ligament, or muscle is overstretched, often due to excessive force or overuse. The injury causes immediate pain in the affected area that persists during active movement and may radiate to other areas. Possible signs and symptoms include muscle spasms, muscle weakness, loss of function, and local edema. The lumbar spinal area is a common site for strain injuries caused by poor biomechanics when moving or lifting an object.

Sprains

Sprains are specific to ligaments, the bands of fibrous tissue that connect bone to bone. These injuries involve partial or complete separation of the ligament in or around a joint. Ligaments in the ankle and knee are commonly affected, particularly the anterior talofibular ligament. Sprains are caused by excessive force during such movements as twisting or pulling. They frequently arise during heavy work and sports activities.

Sprains are classified according to the degree of damage:

First-degree

A *first-degree* sprain involves mild trauma to the ligament, with little or no edema and minimal pain or point tenderness. The student can bear weight and tolerate normal motion. There is no visible deformity. The mechanism of injury often involves excessive inversion of a flexible area, such as the ankle.

Second-degree

In a *second-degree* sprain, the force of injury causes partial separation of the ligament. The student will report moderate to severe pain; bearing weight is painful. On examination, you'll note visible deformity with local edema and point tenderness. Abnormal findings may be apparent during both active and passive movement.

Third-degree

A *third-degree* sprain involves disruption, separation, or avulsion of the entire ligament from its bony attachment. The student may report hearing a loud snap or pop just before the onset of severe pain, followed by loss of function and marked local hemorrhage. The student will be unable to bear weight on the affected limb. You'll note abnormal motion and instability at the joint with visible deformity, point tenderness, and edema.

Dislocations

Dislocations involve the displacement of a bone from a joint with which it articulates. For example, displacement of the humerus from the glenoid cavity of the scapula results in a shoulder dislocation. Ball-and-socket joints, such as the hip and shoulder joints, are at higher risk for dislocation due to their wide range of motion, which includes extension/flexion, adduction/abduction, and rotation.

Dislocations may arise secondary to acute or chronic damage to the ligaments that hold the bones in proper alignment; for example, a third-degree sprain (as described above) allows the joint to move beyond its normal range of motion, increasing the risk for dislocation of the bone. This makes it important to ask about previous injuries during the focused history.

NOTE In young children, ligaments and capsular structures at the joints are stronger than epiphyseal plates. Trauma that might cause a dislocation in an adult will instead produce a fracture at the epiphyseal plate in a young child.

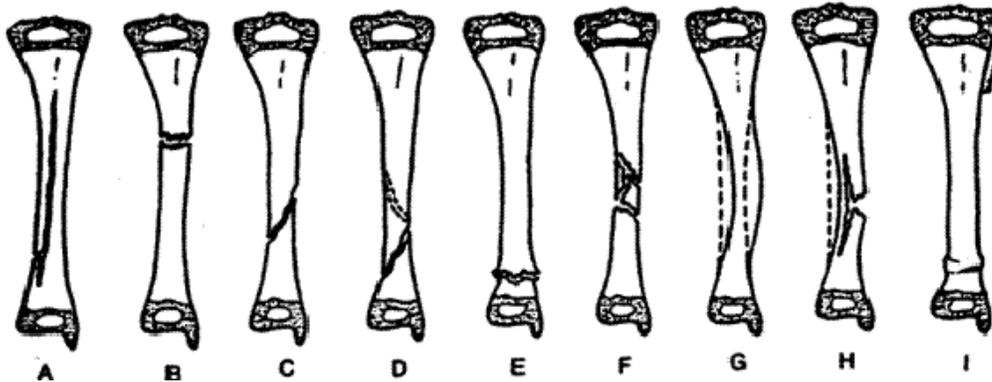
Dislocations may be partial (*subluxation*) or complete. Subluxation can occur secondary to arthritic deterioration of the joints.

Signs and symptoms that may accompany dislocations include local deformity, severe pain, rigidity and edema, and decreased movement. The dislocated bone may compromise blood flow through the area. Disruption of neurovascular integrity may alter sensation and circulation distal to the injury.

Fractures

Fractures range from simple avulsions, in which a bony fragment remains attached to a muscle or ligament that has torn from its insertion point, to open fractures, which involve bone displacement through the skin with a high risk of infection. Several types of long-bone fracture are illustrated in Figure 11-2.

FIGURE 11-2. PEDIATRIC FRACTURE PATTERNS OF THE TIBIA



- A** Longitudinal: fracture running lengthwise.
B Transverse: horizontal fracture.
C Oblique: fracture transects the long bone at an angle.
D Spiral: helical fracture curving around the bone, usually due to twisting injury.
E Affected: compression fracture due to crush injury.
F Comminuted: fracture involving more than 2 fragments.
G Bowing: deformity without fracture.^a
H Greenstick: incomplete fracture secondary to bowing.^a
I Torus: bending or buckling of bone without fracture.^a

^aGenerally arises only in young children due to soft, pliable bone structure. Source: Kelly SJ. *Pediatric Emergency Nursing*. 2nd ed. East Norwalk CT: Appleton & Lange; 1994.

Open fractures

KEY POINT

Assume that any open fracture is contaminated, making wound care an emergent priority.

In an open fracture, the broken bones are displaced through the skin, causing an open wound. The bones may recede after the initial trauma, carrying debris and bacteria into the wound with them. Assume that any open fracture is contaminated, making wound care an **emergent** priority.

Epiphyseal fractures

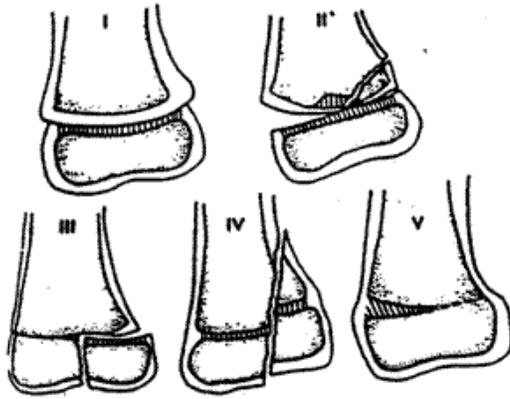
KEY POINT

Always suspect epiphyseal damage when a long bone is injured.

The epiphyseal plate, located at either end of a long bone, is where elongation occurs as a child grows. Injury to this area may disrupt normal growth, potentially deforming the limb. Always suspect epiphyseal damage when a long bone is injured.

The Salter-Harris classification system (Figure 11-3) provides a way to categorize epiphyseal fractures by severity; a type V fracture has the highest potential for alteration in growth patterns.

FIGURE 11-3. SALTER-HARRIS CLASSIFICATION



Salter-Harris I. Mild avulsion injury or shearing force separates epiphyseal plate ▪ Most often seen in distal fibula ▪ Usually heals in about 7 days

Salter-Harris II. Fracture extending through metaphysis displaces epiphyseal plate ▪ Most common type of epiphyseal fracture ▪ Usually affects distal radius or proximal humerus

Salter-Harris III. Moderately severe intra-articular fracture of epiphysis and joint, with displacement of epiphysis ▪ Most often seen in distal tibia

Salter-Harris IV. Intra-articular fracture through epiphyseal plate, epiphysis, and metaphysis ▪ Often arises in humerus after a fall or bicycle crash

Salter-Harris V. Compression fracture caused by crush injury to epiphyseal plate ▪ Rare; may arise secondary to a fall or projectile impact ▪ Growth is usually affected

Source: Barkin RM, Rosen P. *Emergency Pediatrics*. 4th ed. St Louis, MO: Mosby; 1994.

Systematic Assessment of Musculoskeletal Injuries

Assessment

Refer to Chapter 3: *Assessment and Triage* for a detailed discussion of the 5 components of a systematic assessment. The information in the following sections outlines assessment, triage, and follow-up activities as they apply to musculoskeletal injuries. Detailed information about physical examination techniques and specific injuries of the upper and lower extremities follows in a separate section.

Throughout the assessment process, remember that it is essential to perform interventions for significant problems **before** moving on to the next step. **Be prepared to activate EMS at the earliest sign of any injury that is potentially life- or limb-threatening.**

Scene Safety

When responding to the scene of an injury, check for potential hazards that might endanger you, the student, or others present. Call for additional help if indicated. Do not approach until you have determined that is safe to do so.

Across-the-room Assessment

The across-the-room assessment is a quick overall appraisal of the student's condition based on appearance, breathing, and circulation allowing you to form an initial impression of vital functions and overt injuries.

Initial Assessment

The goal of the initial (**ABCDE**) assessment is to identify and treat life- and limb-threatening emergencies. Do not pursue a more detailed investigation of injuries until this assessment is complete.

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

KEY POINT

Assume that any injury above the clavicle involves a concurrent c-spine injury!

If head or spinal cord injury is suspected, stabilize the cervical spine as described in Chapter 4: *Trauma* before beginning the initial assessment. **Always assume that any injury above the clavicle involves a concurrent cervical spine injury!**

Proceed with a rapid evaluation of the airway, breathing, circulation, and disability (neurologic status), followed by a brief exposure as described in Chapter 3. If possible, gather history information as you go.

Throughout the initial assessment, watch for signs that could signify an autonomic response to pain, such as an elevated respiratory rate or tachycardia.

If the injury involves an extremity, briefly check capillary refill time, skin color, and skin temperature distal to the injury as you perform the circulatory assessment, then compare with the uninjured limb. This can help you determine whether the limb is at risk. Signs of neurovascular compromise (distal pulselessness, delayed capillary refill, abnormal skin color, cool skin temperature, numbness or loss of sensation in the affected extremity) indicate an **emergent** condition.

History and Pain Assessment

SAMPLE history

The history can help you determine the seriousness of the injury so that you can plan an appropriate response. Use the **SAMPLE** mnemonic to guide your history questions. Table 11-1 highlights elements of the **SAMPLE** history that are particularly important in assessing musculoskeletal injuries.

TABLE 11-1. SAMPLE HISTORY FOR MUSCULOSKELETAL INJURY

Mnemonic	History Points
S ymptoms	<ul style="list-style-type: none"> Current and recent symptoms, including pain, paresthesia, function, movement, and sensation Loss of consciousness, nausea/vomiting, impaired mobility (particularly important in head or neck injury)
A llergies	<ul style="list-style-type: none"> Sensitivity to medications, food, materials, such as latex, or environmental exposures, such as bee stings
M edications	<ul style="list-style-type: none"> Prescribed and OTC medications the student takes regularly, including dosage regimen and time of the last dose
P ast health history	<ul style="list-style-type: none"> Chronic or recurring medical conditions Psychosocial issues Physical impairments, particularly orthopedic problems Chronic or recurring pain, previous injury affecting the same area Any musculoskeletal injury requiring surgical intervention Immunization status, including tetanus prophylaxis
L ast meal	<ul style="list-style-type: none"> When and what the student last ate or drank
E vents	<ul style="list-style-type: none"> Events that led up to the injury Mechanism that caused the injury Anything the student can recall regarding position, movement, and activity at the moment that the injury occurred

OTC indicates over-the-counter

KEY POINT

It is essential to investigate the mechanism that caused an injury.

Document the time and the student's location when the injury occurred. Try to get as complete a picture as possible of the events leading up to the injury and the exact mechanism that caused it:

- Ask the student to describe what was going on just before the incident; for example, was the student participating in a game or athletic practice?
- Try to get a precise idea of the type of movement that preceded the onset of pain: Did the student fall, twist the affected area, or move with unusual force? Was the student grabbed or pushed?
- Have the student describe how the affected area was positioned when the injury occurred. For example, if the injury involved the upper extremity, ask about the angle of the arm, shoulder, or hand when impact occurred. Was the arm or hand outstretched? Did hyperflexion or hyperextension occur? Did the student hear a snap or popping sound as the injury occurred?
- Ask whether the student has previously fractured, strained, or dislocated the injured area, which would suggest the possibility that residual instability at the joint contributed to the current incident.
- Find out whether the student has been training strenuously for a competitive sport, which might suggest an overuse injury associated with the student's position on the team (such as quarterback or pitcher).
- Inquire about any other related injuries.

Pain assessment

Pain may be the deciding factor in determining whether a potentially serious injury should be considered urgent or emergent. Try to get an accurate assessment of the student's pain experience. The **PQRST** mnemonic described in Chapter 3 is useful for this purpose. Ask the student to point to the affected area and describe pain or discomfort, including the **Quality**, such as dull or sharp, aching or throbbing, and the **Severity**, using a developmentally appropriate pain scale (Chapter 3).

Also find out

- Whether the onset of pain was immediate or gradual
- Whether discomfort has improved or worsened since the incident
- Which activities exacerbate or alleviate discomfort

Note any history of chronic or recurring pain in the affected area.

Focused Physical Examination

The focused physical examination may be limited or complete (head-to-toe), depending on the circumstances, the student's health status, and applicable protocols.

At minimum, measure and document baseline vital signs, including heart rate, respiratory rate, and blood pressure. If possible, measure the student's temperature, weight, and blood glucose levels as well. Reassess vascular status of any injured extremity and compare the result with your findings from the initial assessment.

After completing these essential tasks, use observation, inspection, and palpation to investigate the injury that is the student's principal concern and to assess for additional injuries that may be less obvious. Your goal is to reduce pain and anxiety while improving outcome. The information will also help you determine a triage category.

The 5 Ps

The **5 Ps** mnemonic is useful during all components of the focused physical examination. As you observe, inspect, and palpate, think about these key issues:

- **Pain**—location and possible causes
- **Pulse**—neurologic and circulatory function (reassess every 10 to 15 minutes)
- **Pallor**—skin color and temperature distal to the injury
- **Paresthesia**—tingling or prickling sensations
- **Paralysis**—inability to move the extremity or the area distal to the injury

NOTE | If at **any** point during your physical assessment you note positive signs suggesting fracture, dislocation, or severe pain, avoid further manipulation of the affected area and instruct the student to restrict movement.

Observation

Your observations should include

- Whether the student is ambulatory or immobilized by the injury
- The student's general affect (quiet or talkative, crying, anxious)
- Physical signs, as when one shoulder appears lower than the other and the student holds the arm across the chest

Also, observe the student's facial expressions for important clues about pain and discomfort as you progress through the physical examination.

Inspection

Inspect for edema, discoloration, and deformity at the site of the injury. Compare the injured limb with the uninjured one and note any differences in size, symmetry, and circumference.

During this comparison, assess for any change or deviation in the joints, both distal and proximal to the affected area. Watch to see whether the student appears to guard the injury.

Use range of motion (ROM) exercises to check stability and disability of the injured area. Ask the student to move the limb and compare ROM in the affected and unaffected limbs. To determine the degree of mobility, apply passive ROM to the extent that the student tolerates it. Compare strength in the injured and uninjured limbs.

Palpation

Palpation should progress logically through the affected area. For example, in an injury to the lower extremity, you would palpate the entire surface of the thigh for hematomas, tenderness, edema, external rotation, or deformity, then continue to the knee by inspecting the patellar borders and palpating the collateral ligaments for tenderness. Compare the circumference of both legs. Check for point tenderness. Check the foot for sensation, movement, and strength of pulse.

Putting it all together

Your investigation of neurovascular compromise, mechanism of injury, and severity of pain, which you began during the initial assessment and focused history, continues with a visual inspection for deformity as you prepare to begin palpation. The following example describes the progression of assessment techniques as they would be applied to the lower extremity. A similar approach can be applied to other body areas.

NOTE Explain your actions to the student as you go. To reassure the student, perform each maneuver on the uninjured limb first, then on the injured one. Compare your findings.

- Palpate the entire surface of the thigh for hematomas, tenderness, edema, rotation, or deformity. Compare the circumference of the injured thigh with the uninjured one.
- Continue to the knee, watching the student's face while palpating for tenderness.

Assess the patellar borders for signs of subluxation.

- Check neurologic integrity and adequacy of pulses in the foot.

If there are any abnormal findings, refer the student for evaluation. If the examination is negative for visible injury, deformity, pain, and neurovascular compromise, continue with your assessment.

Return to the knee and assess for stability in the medial, lateral, anterior, and posterior quadrants using the maneuvers described below.

- To test the **quadriceps-patellar mechanism**, position the student supine with the legs extended. Have the student raise one leg, then the other, while maintaining extension.
- To determine **collateral ligament integrity**, face the student and support the extended leg with the foot tucked under your arm.
 - To test **medial integrity**, place your hand on the inner aspect of the knee, then exert pressure by abduction of the lower leg (away from midline).
 - To test **lateral integrity**, place your hand on the outer aspect of the knee and exert pressure by adduction of the lower leg (toward midline). If there is disruption, you will feel that the ligament is more open on the injured side.
 - Repeat these maneuvers with the knee flexed 15% to 20%. Remember to examine the uninjured leg first. Halt the test if the student complains of pain or tenderness.
- To assess **anterior cruciate ligament integrity**, have the student flex the knee to 90°. (If pain prohibits 90° flexion, discontinue testing and refer the student for evaluation.)
 - Brace the foot to keep it from moving forward. Place your hands around the knee so that your fingers meet posteriorly, thumbs anteriorly. Slide the lower leg forward. The knee should not move appreciably; consider movement of 10 mm or more abnormal.
- To assess **posterior cruciate ligament integrity**, slide the lower portion of the leg posteriorly. Again, the knee should be firm, not mobile.

KEY POINT

Any deformity or evidence of restricted mobility noted during your focused physical examination may indicate an urgent condition.

When you have completed your physical examination **or** discovered a significant abnormality, immobilize and support the area distal and proximal to the injury as described below. Triage the injury as **urgent** if

- You note deformity, edema, or pain
- The student is unable to move the injured area or bear weight on it
- You simply have a sixth sense that the injury is urgent

Plan and Interventions

Overview of Interventions

Your goals in managing musculoskeletal injuries are to maintain neurovascular integrity while controlling hemorrhage, reducing morbidity, and alleviating pain.

RICES mnemonic

The mnemonic **RICES** can help you recall the typical steps for injury intervention.

Rest

Advise the student to rest and remain still; moving the affected area or putting weight on it may exacerbate the injury. Be sure to provide **R**eassurance as well.

Ice

Apply a cold pack (**not** ice) to the affected site for 15 to 30 minutes. This will alleviate edema and reduce pain. To prevent cold injury, wrap the cold pack in a towel before applying.

Compress

Observing standard precautions, apply a compress to reduce bleeding and edema. Cover all open wounds using sterile dressings.

Elevate

Raise the affected area above the level of the heart to decrease edema and control bleeding. To prevent additional injury, immobilize the area as described below **before** moving it.

Support

Apply a splint, sling, or another appropriate means of immobilization to support the area as described below.

Immobilization techniques

KEY POINT

It is critical to immobilize musculoskeletal injuries. This will increase comfort and reduce morbidity.

Immobilization is critical! It increases the student's comfort and reduces potential morbidity. Stabilizing the wounded area minimizes movement, reducing the likelihood of further injury. It can prevent a closed fracture from becoming an open one while minimizing damage to bone ends and adjacent muscles, nerves, and blood vessels. This step can also reduce edema associated with extravasation of blood and fluid into adjacent soft tissues.

- The sling-and-swathe technique is useful for immobilizing injuries of the upper extremities.
- Injuries involving the lower extremities are often splinted using either soft or hard splints. Splint devices secured by elastic bandages provide useful support and compression as well.

More information appears later in the chapter.

Triage and Transport

Triage categories for musculoskeletal injuries are detailed below. (Also see the *Musculoskeletal Injury* protocol in *Appendix A*.)

Emergent

Student requires immediate medical attention. Condition is acute and has the potential to threaten life, limb, or vision. Activate EMS for emergency transport.

Consider the student's condition **emergent** if your assessment findings include

- Compromised airway, breathing, or circulation
- Altered level of consciousness
- Severe trauma

Emergent injuries require immediate EMS transport. Examples include

- Any open fracture
- Any suspected femoral fracture (monitor for shock)
- Degloving injury
- Evidence of neurovascular compromise
- Third-degree sprains with severe pain, edema, and point tenderness

Urgent

Acute condition that is not severe or life-threatening, but requires additional medical intervention within 2 hours.

If there are signs indicating a closed fracture, dislocation, or severe sprain **without** compromise to vital functions or loss of neurovascular integrity, consider the student's condition urgent. Signs to look for include restricted movement in the affected limb, pain or inability to bear weight, edema, and deformity. If you have an intuitive sense that the student's condition is urgent, trust your instincts.

It may be appropriate for the parent/guardian to provide transport if the student's vital signs are stable and the injured area has been adequately immobilized. Call for EMS transport if you have any doubts about the stability of the student's condition or the injury.

Nonurgent

Condition is nonacute or not severe. May require referral for routine medical care.

Consider the student's condition nonurgent if vital functions are normal, neurovascular integrity is intact, **and** there is

- No obvious deformity
- Only minor edema
- At least partial ability to bear weight or use the extremity

In nonurgent cases, ensure student safety and notify the parent/guardian. The student may be returned to class or sent home as indicated.

Documentation and Data Collection

If you refer the student to a hospital or primary health care provider, be sure to send along a written summary of your nursing assessment and interventions. Include

- Subjective and objective findings from the history
- Tetanus immunization status
- Pertinent information regarding chronic health issues or special needs

Update the student's health record; add information regarding the date of the student's return to school and the outcome (such as modifications in activities) as soon as they are known.

After the student returns to school, levels of care and interventions needed during the school day should be recorded periodically until the incident is closed.

Prepare an incident report documenting nursing care, referral, and outcome as required by school policy.

Evaluation and Follow-Up

Evaluation

If EMS was activated, evaluate the effectiveness of the emergency plan, including the following elements:

- School staff response
- Elapsed time before EMS providers arrived on the scene
- The service that responded to the 911 call
- Oral report to EMS responders
- Communication with the emergency physician

Follow-Up

Make sure you receive a completed form signed by the primary health care provider so that you can develop a plan of intervention for the student's return to school. This information will also help you complete the incident report.

Your plan of care depends on sequelae and outcome stemming from the injury, including

- Whether surgical intervention was required
- The anticipated duration of the recovery period
- The need for homebound instruction during recovery

- Anticipated requirements for special transportation, classroom modification, or restricted activities at school

Use this information to create a plan of care that will accommodate the student's needs at school. Facilitate arrangements for special transportation, mobility problems, transfer activities, and assistive devices, such as a wheelchair, crutches, or a walker. (See *Assessing Fit and Use of Crutches* in *Appendix B*.) Be prepared to help the student deal with emotional issues, such as frustration or reduced self-esteem caused by physical limitations and loss of mobility. Consider whether the student will need help performing activities of daily living and create an individualized health care plan (IHP) that reflects the student's tolerance levels. Modify the care plan as wellness improves.

Prevention

Make yourself aware of every feature of the school's physical plant, grounds, and boundaries with an eye toward injury potential. Use data collection to determine where and when students are injured, then try to address the cause. Are safety procedures emphasized during all school activities? Is the playground equipment safe, structurally sound, and appropriate to the developmental level of students who attend the school?

Many state laws require school and coaching staff to maintain current first aid certification. Some school boards also retain an athletic trainer who provides in-service education for coaches and staff, works closely with health care staff to evaluate injury prevention practices and rehabilitation measures, and maintains the safety of sport and athletic equipment. If you have no athletic trainer at your school, you must take responsibility for working cooperatively with physical education teachers and coaches to promote prevention, immediate care for injuries, and subsequent rehabilitation.

Injuries of the Upper Extremity

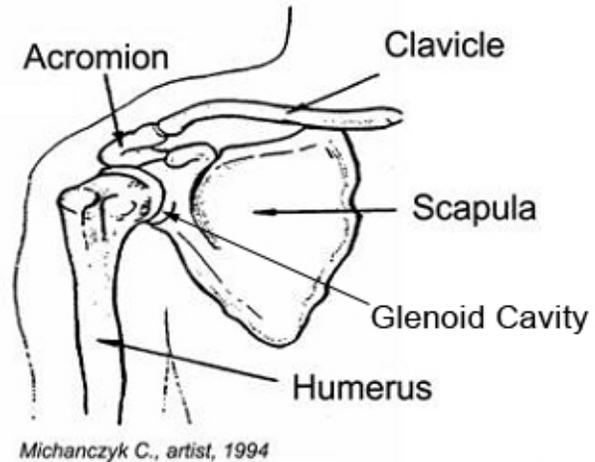
Shoulder and Arm

Anatomy

The proximal head of the humerus rests in the glenoid cavity of the scapula below the acromial process, forming a ball-and-socket joint (Figure 11-4). The wide range of motion afforded by this type of joint increases the risk of dislocation.

The distal humerus articulates with the proximal ulna at the elbow, forming a hinge joint. The ulna is stationary, while the radius, attached with numerous ligaments, moves around it, allowing pronation and supination of the hand. The brachial artery and vein bifurcate at the proximal head of the radius.

FIGURE 11-4. RIGHT SHOULDER



Common injuries

Clavicular fracture

Clavicular fractures are usually caused by a fall or a blow to the shoulder or extended arm. In preschoolers, a greenstick fracture is the most common result. The student will report pain on movement of the affected arm or shoulder. Your examination will reveal point tenderness and sometimes visible deformity.

Interventions

Immobilize the injury with a sling and swathe as described at the end of this section. Refer the student for evaluation. Triage category may be **urgent** or nonurgent, depending on pain, additional injuries, and associated findings.

Acromioclavicular separation

Separation of the acromion from the clavicle may involve partial or complete disruption of the acromioclavicular (AC) ligaments. The injury is commonly caused by a fall or a blow to the acromion. The student will have tenderness at the AC joint; abduction of the arm will be limited. In severe presentations, there will be a step-off defect (a change in the bony contour of the shoulder) with upward displacement of the clavicle.

Interventions

Immobilize the injury with a sling and swathe. Refer the student for evaluation and treatment. Triage category may be **urgent** or nonurgent.

Shoulder dislocation

Ninety-five percent of shoulder dislocations are anterior dislocations: The proximal head of the humerus is displaced anteriorly from the glenoid cavity,

resulting in a deformity. The usual mechanism is a blow or a fall in which the arm is abducted and externally rotated. You will note edema, tenderness, and deformity of the shoulder's normally rounded contour.

Interventions

Consider the student's condition **urgent**. Apply a sling and swathe to take the weight off the shoulder joint and decrease movement. Refer the student for evaluation and reduction.

Humeral fracture

Fractures of the humeral shaft are uncommon compared with proximal or distal fractures of the epiphyseal plate. The usual mechanism of injury is direct blunt trauma. Findings may range from mild edema to obvious deformity and shortening of the arm.

Interventions

Immobilize the injury with a sling and swathe. Refer the student for evaluation and treatment. Triage category may be **urgent** or nonurgent.

Radial head dislocation

Also known as *nursemaid's elbow*, this injury generally occurs in children younger than 3 years. It is caused by axial traction to the extended and pronated arm, as when an adult grabs the arm and pulls or lifts the child off the ground. The student will report pain and, in most cases, will not use the arm.

Interventions

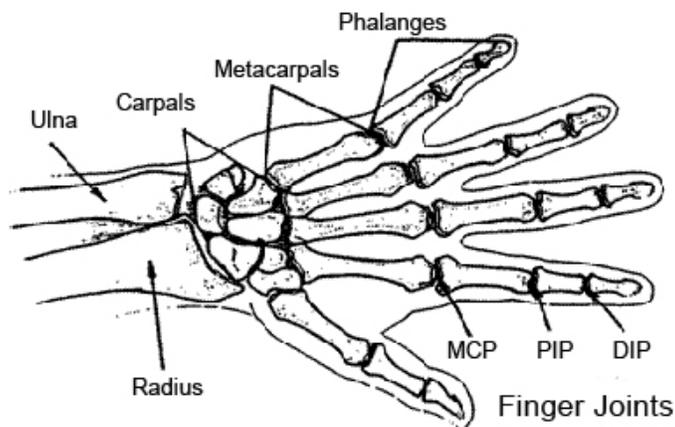
Immobilize the arm in a position of comfort. Refer the child for evaluation and treatment. Triage category may be **urgent** or nonurgent.

Hand and Wrist

Anatomy

At the wrist, the distal radius articulates with the 8 carpal bones at the radiocarpal joint. The carpal bones articulate with the metacarpal bones that

FIGURE 11-5. LEFT HAND



form the main structure of the hand.

Hinge joints between the metacarpals and phalanges allow flexion and extension of the fingers.

Figure 11-5 shows the metacarpophalangeal (MCP) joints and the proximal and distal interphalangeal (PIP, DIP) joints. Numerous tendons, ligaments, blood vessels, and nerves are found in the hand and wrist.

Common injuries

Scaphoid (navicular) fracture

In children, this is the most common fracture of the hand, usually occurring during a fall in which the hand is outstretched. The student will have tenderness at the anatomic snuffbox (the depression that forms at the wrist when the thumb is extended and abducted) as well as pain in the wrist. Grip strength may be reduced.

Interventions

Apply a splint and refer the student for evaluation and treatment. Triage category may be **urgent** or nonurgent.

Phalangeal fracture

The phalanges of the hand are a common site for pediatric fractures. Injury generally arises due to a direct blow, as when the finger is caught in a car door. Findings include edema, deformity, and point tenderness.

NOTE | In children, traumatic injury to the fingers is more likely to produce a fracture than a dislocation, due to the strength of ligaments and capsular structures as compared to the epiphyseal plates.

Interventions

Buddy-tape the injured finger to the adjacent finger and refer the student for evaluation and treatment. Triage category may be **urgent** or nonurgent.

Mallet finger

Mallet finger denotes a fracture that disrupts the extensor tendon at the DIP joint. This is typically a Salter-type fracture caused by a blow to the fingertip. It often arises during softball or football games.

Interventions

Apply a rigid, padded finger splint and refer the student for evaluation and treatment. Triage category may be **urgent** or nonurgent.

Degloving injury

The injury arises when the hand is caught in a moving device, such as a roller, causing a crushing friction burn; a shearing force is added if the student attempts to pull away. As a result, the skin, subcutaneous tissue, or deeper tissues are pulled away from the bone. Degloving injuries may be incurred through use of machinery found in shop, agricultural, or other technical classes.

Interventions

This is an **emergent** injury. Immediately activate EMS. Attempt to keep the student calm. Apply a sterile, nonadhesive dressing, followed by cold packs. Elevate the injured limb. Monitor the ABCDs while awaiting EMS.

Sling-and-swathe Immobilization

The sling-and-swathe technique (Figure 11-6) provides soft splinting using 2 large, triangular bandages to stabilize a dislocation or fracture of an upper

extremity. Properly applied, sling and swathe is safe and useful for many types of injuries. Keep in mind that you must use careful application techniques and reassess frequently to ensure continuing circulation to the affected area.

Begin by explaining the need for immobilization. If the student is wearing any jewelry on the arm or hand, remove it and give it to the student for safekeeping.

Check the pulse, capillary refill time, skin color, and sensation distal to the injury. If neurovascular integrity is compromised, **do not attempt to reduce the injury or reposition the arm!** Apply a splint or other support device to immobilize it in the presenting position, taking care to immobilize the joints both proximally and distally. If angulation at the injury impairs distal circulation, move the extremity toward its normal physiologic position using **gentle** traction, **just** until a palpable pulse returns, before immobilizing.

FIGURE 11-6. SLING-AND-SWATHE IMMOBILIZATION



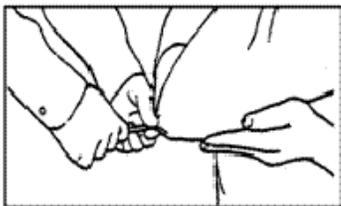
If you can do so without exacerbating the injury, gently position the student's arm so that the hand is at least 4" above the level of the elbow. Unfold the first bandage and place it so that its widest angle is behind the elbow of the injured arm. Bring the bandage point that's nearest the chest up and over the opposite shoulder.



Next, bring the other point of the bandage up and over the injured arm and shoulder.



Adjust the length as necessary and tie the ends. The arm should be well supported, relieving pressure on the shoulder. Place the knot so that it lies over the shoulder rather than against the cervical spine. Placing a pad under the knot will enhance comfort.



Secure the sling at the elbow with a safety pin, tape, or knot, creating a pocket in which the elbow rests securely. Reassess neurovascular integrity. Adjust the sling if necessary to maintain circulation. **This step completes application of the sling.**



If further immobilization is needed to secure the extremity and a second bandage is available, swathe the arm as permitted by applicable protocols. Lay the second bandage flat, then fold it several times lengthwise. Use the folded bandage to swathe the injured arm against the chest wall, immobilizing it.

KEY POINT

Any immobilized area should be closely monitored for continuing neurovascular integrity. Use the 5 Ps mnemonic to guide frequent reassessments.

Any immobilized area should be closely monitored. **Reassess neurovascular integrity every 5 to 10 minutes.** Use the **5 Ps** mnemonic to guide additional assessment points.

Injuries of the Lower Extremity

Leg and Knee

Anatomy

The femur—the body's longest and strongest bone—is well-protected by a mass of strong muscles. The distal femur articulates with the tibia at the knee joint (Figure 11-7). Several muscles, tendons, and ligaments help to stabilize the joint, while the patella, which floats over the femur, reduces friction between the bones and joints during movement. Motion of this hinge joint is limited to flexion and extension. The quadriceps femoris muscle tendon and the patellar ligament hold the patella in place. Where the femur and tibia come together there is a large articular cavity. The medial and lateral menisci, attached to the tibia, help to cushion this area.

FIGURE 11-7. RIGHT KNEE

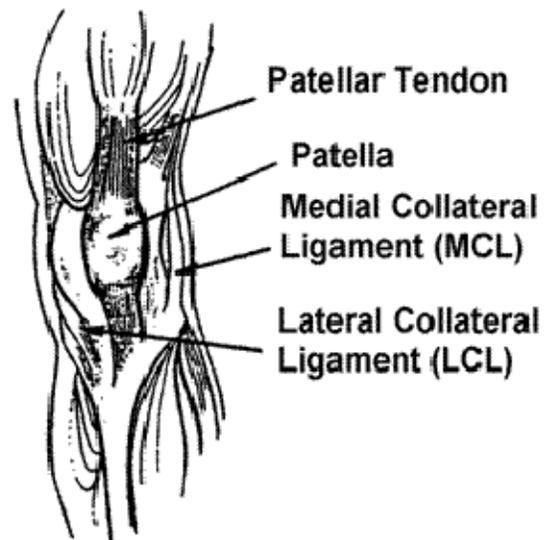
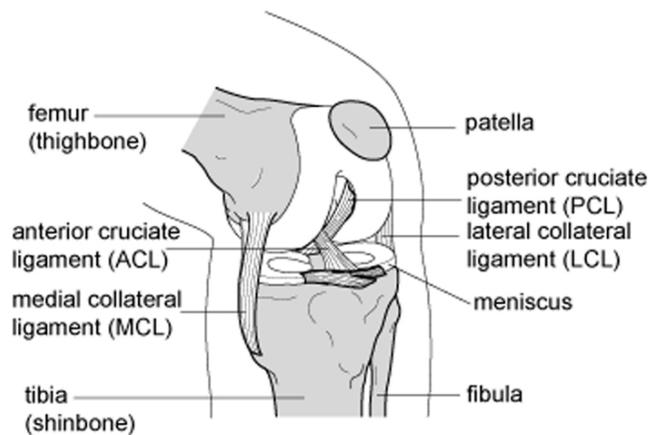


FIGURE 11-8. STRUCTURE OF THE KNEE



Major stabilizing ligaments of the knee include the anterior and posterior cruciate ligaments (Figure 11-8); side-to-side stability is maintained by the medial and lateral collateral ligaments (MCL, LCL).

Common injuries

Collateral ligament injury

Injuries to the collateral ligaments of the knee may result when the leg is rotated while the foot is firmly planted.

Impact to the side of the knee can also cause injury. The medial collateral ligament is most often affected, due to a blow to the lateral aspect of the knee. The student will report pain on flexion and palpation, and you will note significant edema at the knee joint.

Interventions

Position the student to eliminate weight-bearing. Apply cold packs and refer the student for evaluation and treatment. The triage category may be **urgent** or nonurgent, depending on pain, additional injuries, and associated findings.

Cruciate ligament injury

The anterior cruciate ligament (ACL) is one of the 2 main stabilizing ligaments of the knee joint that connects the tibia to the femur at the center of the knee. The ligament limits rotation and forward motion of the lower leg. It can tear when excessive rotational force is placed on the knee, which generally occurs on landing after a jump, stopping suddenly, or pivoting. For unknown reasons, ACL injuries are more common among female athletes.

With either an anterior or posterior cruciate ligament injury, you will note edema, impaired range of motion, pain or tenderness along the joint line, and discomfort while walking. A typical recovery from this type of injury usually restores the ability to walk and run, but sports that involve jumping or pivoting may be difficult.

Interventions

Immobilize the knee, elevate the extremity, and apply cold packs. Refer the student for evaluation and treatment. The triage category is usually **urgent**.

Meniscus injury

This injury is uncommon in children, but does occur in adolescents. The medial meniscus is most often affected, usually due to a twisting or squatting injury. There will be pain on flexion; the knee may lock, preventing full extension. You will note edema and point tenderness over the involved meniscus.

Interventions

Position the student to eliminate weight-bearing. Apply cold packs and refer the student for evaluation and treatment. The triage category may be **urgent** or nonurgent.

Dislocation

Dislocation of the patella is rare in children and is usually associated with a fracture.

Interventions

Immobilize the knee and refer the student for evaluation and treatment. The triage category may be **urgent** or **emergent**.

Osgood-Schlatter disease

This condition involves inflammation or partial separation of the tibial tubercle due to chronic traction of the patellar tendon at its insertion point. It is often an overuse injury and is seen primarily in active boys aged 11 to 15 years. The student will report pain and tenderness over the tibial tuberosity. You will note local edema.

Interventions

Apply cold packs and refer the student for evaluation and treatment. The triage category may be **urgent** or nonurgent.

Chondromalacia patellae

Softening of the patella may be caused by a fall on a flexed knee or by chronic strenuous exercise, such as jogging. The student will report pain after exercise and a sensation that the knee gives out or grates after extended periods of flexion or when walking up or down stairs. On palpation, you'll note crepitus as the patella moves over the articulating surface.

Interventions

Restrict strenuous activity and refer the student for evaluation and treatment.

Slipped Capitofemoral Epiphysis

KEY POINT

Separation of the epiphysis from the head of the femur should be considered urgent or emergent, with immediate activation of EMS.

This injury involves separation of the epiphysis from the head of the femur. It may be unilateral or bilateral, and usually occurs in obese or rapidly growing adolescent males aged 12 to 15 years. This can be a slowly progressive disorder. The student will report pain on movement or weight-bearing. The pain may be referred to the knee, groin, or hip. The affected leg will appear shortened, externally rotated, and abducted. There may be no history of trauma. Range of motion assessment will reveal limited internal rotation.

Interventions

Consider the student's condition **urgent** or **emergent**, depending on the severity of accompanying pain. Activate EMS and position the student to

eliminate weight-bearing. Transport the student for **emergency** evaluation and treatment.

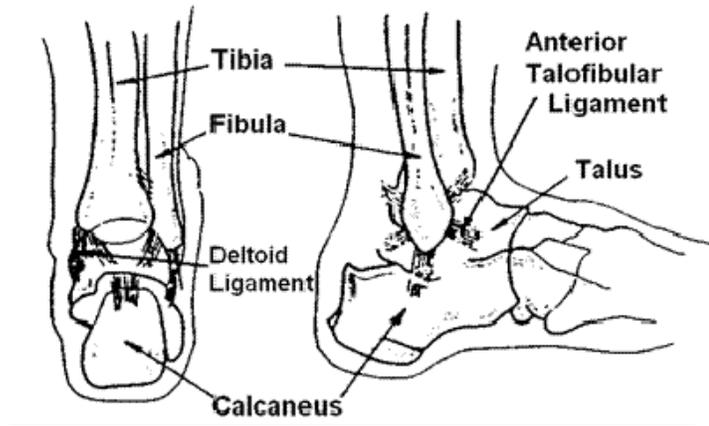
Ankle and Foot

Anatomy

The medial malleolus of the tibia and the lateral malleolus of the fibula articulate with the talus at the ankle joint, a hinge joint (Figure 11-9). The joint is supported by numerous ligaments, including

- The anterior and posterior talofibular ligaments, which attach the fibula to the talus
- The calcaneofibular ligament, which connects the fibula to the calcaneus
- The medial (deltoid) ligament of the ankle, which consists of 4 component ligaments (tibionavicular, tibiocalcaneal, anterior tibiotalar, and posterior tibiotalar) that connect the medial malleolus to the 7 tarsal bones that form the instep.

FIGURE 11-9. RIGHT ANKLE



The anterior talofibular ligament is the most common site of soft tissue injuries to the ankle.

Common injuries

Ankle sprain

Injury to ankle ligaments may arise when the foot twists forcefully. Inversion injury predominates; plantar and dorsiflexion injuries are infrequent. Findings usually include local edema, discoloration, and tenderness. Weight-bearing ability is impaired.

Interventions

Position the student to eliminate weight-bearing. Apply cold packs and elevate the ankle. Refer the student for evaluation and treatment. The triage category may be **urgent** or nonurgent.

Ankle fracture

The lateral malleolus is the most common site for ankle fractures. The mechanism usually involves inversion. You'll note edema, ecchymosis, and tenderness over the malleolus. The student will have difficulty bearing weight.

Interventions

Position the student to eliminate weight-bearing. Splint the area, elevate, and apply cold packs. Refer the student for evaluation and treatment. The triage category is usually **urgent**.

Phalangeal fracture

Phalanges of the feet may be fractured when the toe is stubbed on a hard object. Local pain and edema will be noted.

Interventions

Buddy-tape the injured toe to the adjacent one and refer the student for evaluation and treatment. The triage category is usually nonurgent.

Open Fractures of the Lower Extremity

Open fractures are generally associated with the long bones (femur, tibia, and fibula).

In an open femur fracture, the thigh muscles contract, forcing the irregular bone ends and fragments together. Lacerated blood vessels can cause moderate to severe hemorrhage into the tissue, which may not be evident. (In an adult, the thigh can accommodate up to 2 pints of blood.)

Interventions

KEY POINT

Consider any open fracture emergent due to the likelihood of bacterial infection or other contamination of the wound.

It is generally agreed that traction splints should be applied in cases of femoral fractures in which bone ends are likely to recede from view. Any open fracture is considered **emergent** due to the likelihood of bacterial infection or other contamination of the wound.

Students With Special Needs

You may need to adjust your approach when a student with special needs incurs a musculoskeletal injury. Proceed based on your knowledge of the student's developmental level, cognitive abilities, and ability to communicate and cooperate. Explain your actions in a manner the student can understand.

Some students with special needs depend on medical assistive devices or support equipment (oxygen, wheelchair, walker); others require chemotherapy, special feedings, or intermittent catheterization. These factors can affect your evaluation and triage decision as well as follow-up care. Arrangements may be needed for students who require special transportation to and from school.

Remember that EMS responders, hospital personnel, and other health care providers will need information about the student's condition as well as the data in the IHP/ECP.

Summary

Musculoskeletal injuries range from simple strains and sprains to joint dislocations and bony fractures. During your assessment, it's essential to

determine the mechanism that caused the injury, as this may affect your evaluation of its severity. Use observation, inspection, and palpation techniques, including range of motion evaluation, to guide your nursing diagnosis and determination of triage category.

Your primary goals in treating these injuries are to prevent morbidity and alleviate pain. For many soft tissue injuries, the mnemonic **RICES** points the way to appropriate treatment steps. For injuries that require immobilization and further intervention, such as suspected fractures and dislocations, use the sling-and-swathe technique or appropriate splinting strategies to stabilize the area until transport arrives.

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12

Emergencies Involving Mental or Behavioral Health

On completing this chapter, you will be able to

- Identify common pediatric mental and behavioral health emergencies.
- Identify characteristics predictive of mental health disorders, violent behavior, or suicide risk in students.
- Conduct a brief screening examination to assess a behavioral health emergency.
- Describe appropriate steps to take during a behavioral health emergency.
- Demonstrate techniques for communicating effectively with a violent or suicidal student.
- Identify the need for community resources and referral planning for the student.
- Identify unique issues that may arise during mental or behavioral health emergencies involving students with special needs.

Introduction

Psychopathology is an evolving scientific discipline. Its predominant focus is to integrate biologic/genetic, psychological, environmental, and social concepts of normal and abnormal development across the life span.

It is important to understand basic cognitive and emotional growth and development in students of all ages in order to determine the needs of the student in the area of mental health and behavioral emergencies.

Mental health is a significant issue in today's schools; and yet, pediatric mental illness often goes unrecognized and untreated. Misconceptions about mental illness in children, or reluctance to accept its realities, may delay diagnosis and hinder interventions. Even without these barriers, precursors to mental illness may be difficult to distinguish from the spectrum of normal childhood and adolescent behaviors.

An important first step is simply to recognize that children **are** subject to such serious mental health problems as major depression, bipolar disorder, and anxiety disorders. Psychiatric illness may lead to emotional disturbances, aggressive behaviors, self-injury, or substance abuse. These problems can affect students of all ages, from preschoolers to young adults.

Mental illness imposes a heavy burden on affected individuals, no matter what their age. They must cope not only with the illness itself, but also with associated social stigmas, which persist despite solid evidence that biologic components, not character flaws, are the basis for many of these disorders.

The outlook for those with mental illness is continually improving, however, as our deepening grasp of the mind's workings leads to new therapeutic pathways. This chapter will help you identify, respond to, and—ideally—prevent acute exacerbations of mental health problems in the school setting. By enhancing your own awareness of these disorders and the resources that are available to treat them, you can help affected students attain optimum wellness.

Selected Mental and Behavioral Health Disorders

Several of the psychiatric disorders most likely to affect school students are briefly described below.

Depression

Depression may be situational, maturational, or clinical. Symptoms vary depending on the student's growth and development. Sadness, joylessness, a lack of spontaneity, or a flat affect (lack of emotion) are common. In adolescents, these symptoms may be accompanied by sullenness, anger, violent outbursts, disturbances in sleep patterns or appetite, or rebellious acts, such as running away from home, truancy, or vandalism. Younger students with depression may worry excessively, clinging to the parent/guardian, pretending to be sick, or simply refusing to go to school.

Bipolar Disorder

Bipolar disorder is a mood spectrum disorder, characterized by mood swings that may range from depression to mania. *Rapid cycling*, with mood shifts as frequent as hourly, or *mixed cycling*, in which manic and depressive symptoms arise simultaneously, may occur.

Bipolar disorder has a high attendant risk of suicide. This risk may be particularly significant in younger students (even those younger than 8 years), whose high energy levels, poor impulse control, and lack of overall maturity may increase the likelihood that suicidal ideation will lead to action.

Anxiety Disorders

Occasional anxiety—a subjective sense of worry, apprehension, fear, or distress—is a universal experience. Anxiety *disorders* are characterized by excessive or unrealistic worry that is persistent enough to affect quality of life. In students, the focus of anxiety may range from peer rejection to catastrophic loss. Somatic complaints, including dyspnea, nausea, stomachache, or headache, often accompany anxiety disorders. Symptoms may be mild or incapacitating. Specific anxiety disorders include

Phobias

Characterized by overwhelming, irrational fear and compulsive avoidance of something (an object, person, or situation) that poses little actual danger.

Panic disorder

Involves brief, usually inexplicable periods of intense apprehension or terror. Symptoms during a panic attack may include trembling, tachycardia, diaphoresis, dizziness, nausea, dyspnea, or feelings of impending doom

Posttraumatic stress disorder

Severe, ongoing emotional sequelae following a terrifying event in which perceived harm was inflicted or threatened.

Obsessive-compulsive disorder

Repeated intrusion of unwanted, distressing thoughts (obsessions) that can be dispelled only by engaging in associated behaviors or rituals (compulsions).

Disruptive Behavior Disorders

Disruptive behavior disorders include oppositional defiant disorder (ODD) and conduct disorder (CD). These disorders involve patterns of negative behavior and consistent rule-breaking.

Oppositional defiant disorder

An ongoing pattern of purposeful disobedience, hostility, and defiant behavior toward authority figures is the hallmark of ODD. To meet diagnostic criteria, other potential causes, such as depression or anxiety, must be ruled out, **and** oppositional traits must clearly exceed the levels seen in normal childhood behavior, interfering with the student's ability to function in school, at home, or in the community.

Students with ODD often engage in temper tantrums. They may be argumentative, resentful, and vengeful, refusing to obey rules or take responsibility for the consequences of their acts. There is a strong association between early diagnoses of ODD and later development of conduct disorder.

Conduct disorder

CD involves a pattern of repetitive behavior in which social norms or the rights of others are violated. It is more common among older children and adolescents. Behaviors associated with CD include deceitfulness, aggression toward people and animals, theft or vandalism, and serious violation of rules.

Eating Disorders

Eating disorders include anorexia nervosa, bulimia nervosa, and binge eating disorder. All are characterized by a severely disturbed relationship with food; eating patterns may involve abnormal aversion or overconsumption. Onset is most prevalent during late adolescence, but eating disorders are on the rise among younger age groups.

Anorexia

Anorexia is a potentially lethal disease characterized by self-starvation to the point of emaciation, resulting in a body weight that is at least 15% below the normal range for age, height, and build. Physical repercussions may include electrolyte imbalance and damage to the heart muscle.

Bulimia

In bulimia, episodes of binge eating are followed by measures to prevent weight gain, which may include purging, fasting, or prolonged, rigorous exercise. Students with bulimia often have a pervasive sense that their eating behavior is out of control.

Binge eating disorder

Binge eaters rapidly consume large amounts of food, often eating beyond the point of discomfort with a sense of guilt and disgust. No measures are taken to control weight, which may lead to morbid obesity.

You may suspect an eating disorder in a student with signs of poor nutrition, pallor, brittle hair and nails, dizziness or fatigue, knuckle abrasions incurred when vomiting is induced, and dental erosion or discoloration from frequent regurgitation of stomach acids.

Students with eating disorders may wear loose, bulky, or heavy clothing, even during warm weather, due to body dysmorphia, chronic hypothermia, or both. The *Eating Disorders* protocol in *Appendix A* provides an overview of triage and interventions for these conditions.

Substance Abuse

Substance abuse describes a pattern in which drugs (including alcohol) or other substances are used in a way that impinges significantly on the student's ability to function and maintain relationships at home or at school. Continued reliance on the substance after it has caused significant problems is considered *dependence*.

- **Physical dependence** is associated with increasing tolerance for the substance and development of withdrawal symptoms when the substance is withheld.
- **Emotional or psychological dependence** involves increasing obsession with the substance and its effects, so that previously important relationships and activities are neglected.

Many nonprescription drugs are targets of abuse, posing as great a danger as prescription drugs when taken in excessive amounts.

It can be difficult to detect signs of substance abuse or dependence among students, which increases the risk of such sequelae as a toxic overdose.

Interventions

Contact EMS and your poison control center in the event of any suspected overdose. More information appears under *Toxic Syndromes* in Chapter 9: *Environmental Emergencies*. The *Substance Abuse* protocol in *Appendix A* provides an overview of triage and interventions.

Self-Injury

Deliberate

Deliberate self-injury is associated with a number of psychiatric disorders, including depression, eating disorders, phobias, and conduct disorder. Those who resort to self-injury generally use it to relieve emotional pain or discomfort; it is not necessarily indicative of suicidal intent. Injuries may involve areas of the body normally concealed by clothing. Common types of self-injury may include

- Hair-pulling (*trichotillomania*)
- Cutting, scratching, biting, burning, or picking at the skin
- Self-inflicted tattooing and body piercing

Unintentional

Adolescents tend to be risk-takers, and may engage in an array of reckless activities, many of which have the potential to cause life-threatening harm. Students who have emotional difficulties or existing mental health problems may be particularly vulnerable to participating in risky acts, particularly under pressure from their peers. During your mental health assessment, openly discuss thrill-seeking activities that can result in unintentional self-harm.

Attention-deficit/Hyperactivity Disorder

ADHD is characterized by chronic problems with inattention, impulsive hyperactivity, or both. To fulfill diagnostic criteria, these traits must clearly exceed levels seen in normal childhood behavior, to the extent that they interfere with the student's ability to function in different settings (for example, both in school and at home). A student with ADHD may struggle in important areas of life, such as relationships with family or peers and academic or work performance. There are 3 types of ADHD:

Predominantly inattentive type

The student is easily distracted and may forget details of daily routines. Areas of difficulty include organizing tasks or finishing them; paying attention to details; following instructions or conversations.

Predominantly hyperactive-impulsive type

The student is talkative, restless, and fidgety, finding it difficult to sit still through a meal or homework assignment. Younger students will be in constant motion—running, jumping, or climbing. Impulsivity causes the student to interrupt conversations or speak at inappropriate times, blurt out thoughtless comments, or grab items from others. It is hard for these students to wait their turn or listen to directions. There is evidence that students with this disorder may be more prone to injury.

Combined type

The student displays characteristics of both types of ADHD, with neither type clearly predominant.

As many as half of those with ADHD have other mental disorders as well. This can hinder diagnosis while adding to the challenges these individuals must face.

Systematic Assessment of Behavioral Problems

Planning and collaboration are key in managing mental and behavioral health problems and preventing emergencies. Practical intervention guidelines and standards of care are available online from national mental health organizations (see the *References and Information Sources* section at the end of this chapter). The current edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* can be a valuable resource for differentiating and describing behavior.

Assessment

Recognizing behavioral changes requires a thorough understanding of normal growth and development among children and adolescents, as well as an appreciation for the individuality of each student you see. Always keep in mind that behavior varies not only from person to person, but also from day to day.

When a student is referred to your office for a pattern of uncharacteristic or disruptive behavior, it is important to consider **all** of the possible causes. Factors that may contribute to sudden behavioral changes range from a stressful situation at home to a new medication regimen for an ongoing health problem. Even an established diagnosis of a mental or behavioral disorder does not automatically rule out the possibility that a new, unrelated condition has arisen.

A thorough investigation is warranted, using the standard assessment components described in Chapter 3: *Assessment and Triage*, supplemented with specialized assessment tools for the psychobehavioral interview.

Scene Safety and Across-the-room Assessments

Behavioral and mental health emergencies may range from an episode of panic or deep psychic pain involving a single student to an incident in which a hostile or suicidal student threatens an entire classroom.

Just as you would with any other emergency, begin by assessing scene safety. If you are called to an emergent situation involving a student who is armed and threatening harm, **immediately** call for assistance. Do **not** approach the student unless it is safe to do so. (More information appears in the section on *Selected Behavioral Emergencies*.)

Even in the health office, it's important to be alert to subtle signs that indicate mood and attitude. You can do this simply by paying attention to the student's facial expression and posture during your across-the-room assessment.

Initial Assessment and Focused Physical Examination

Quickly perform an initial (**ABCDE**) assessment, performing necessary interventions as you go. See *Appendix A* for protocols that summarize assessment and triage in emergency situations associated with eating disorders, sexual assault or dating violence, substance abuse (drug overdose), suicide attempts, or violent behavior.

If there are no emergent initial findings, measuring and documenting vital signs and performing a brief focused physical examination may help the student recover a sense of normalcy while ensuring that you do not overlook signs of an incipient physical health problem.

In most cases, however, the most essential component of your assessment will be the history.

History and Psychosocial Assessment

SAMPLE history

Use the **SAMPLE** history mnemonic (Chapter 3) as a starting point for your interview, with a special emphasis on mental health factors. Selected points are noted below.

Medications

Pharmacologic management is often part of the overall care plan for students with mental or behavioral health problems. It's important to be aware of any medications the student is taking so that you can help to monitor the efficacy of the drug regimen at school. Be vigilant about documenting the reason the medication was prescribed and the intended outcome of pharmacologic management. Familiarize yourself with potential side effects and adverse effects associated with drug therapy so that you can monitor for these problems and report them if they arise. It may be necessary to educate teachers and other school staff about drug-related effects that can influence behavior, academic performance, and other aspects of the student's school experience. Table 12-1 lists a number of psychotropic agents that are used to treat children and adolescents,

as well as antiepileptic medications that are sometimes prescribed as mood stabilizers.

TABLE 12-1. PEDIATRIC PSYCHOTROPIC MEDICATIONS

Category/Examples	Adverse Effects
<p>Antipsychotics Risperidone HCL (Risperdal) ▪ quetiapine (Seroquel) ▪ aripiprazole (Abilify) ▪ olanzapine (Zyprexa)</p>	<p>Suicidal ideation; sedation, dystonia, dizziness, fatigue; weight gain, nausea, amenorrhea; neuroleptic malignant syndrome: muscle rigidity, fever, and delirium.</p>
<p>Antidepressants <i>Selective serotonin reuptake inhibitors (SSRIs)</i> Fluoxetine (Prozac) ▪ sertraline (Zoloft) ▪ escitalopram (Lexapro) <i>Atypical antidepressants</i> Mirtazapine (Remeron)—tetracyclic ▪ venlafaxine (Effexor)—selective norepinephrine reuptake inhibitor (SNRI) ▪ bupropion HCl (Wellbutrin) <i>Tricyclic antidepressants (TCAs)</i> Amitriptyline (Elavil) ▪ clomipramine (Anafranil) ▪ imipramine (Tofranil) <i>Monoamine oxidase inhibitors (MAOIs)</i> Phenelzine (Nardil) ▪ isocarboxazid (Marplan)</p>	<p>SSRIs, SNRIs, NDRIs Suicidal ideation; headache, insomnia. Effects may be amplified by regimens that combine drugs affecting similar neurotransmitters. Rare, severe: Serotonin syndrome: fever, confusion, hypertension, muscle rigidity, seizures, renal failure. TCAs Dry mouth, constipation, urinary retention, orthostatic hypotension, blurred vision, sedation, tachycardia. MAOIs Severe: May interact with tyramine in certain fermented foods (cheese, wine, pickles) to cause sudden, acute hypertension and stroke.</p>
<p>Mood stabilizers Lithium carbonate (Carbolith) <i>Antiepileptics (off-label use)</i> Lamotrigine (Lamictal) ▪ carbamazepine (Tegretol) ▪ valproic acid (Depakote)</p>	<p>Lithium Common, Drowsiness, weakness, nausea, fatigue, weight gain, polydipsia, polyuria, tremors. Indicators of lithium toxicity: Nausea, vomiting, blurred vision, confusion, seizures, cardiac dysrhythmias. Lamotrigine Rare, but potentially lethal: Stevens-Johnson syndrome, toxic epidermal necrolysis. Any instance of rash should be reported to a physician. Valproic acid Gastrointestinal effects, weight gain, somnolence, tremor, headache, diplopia, dizziness, anxiety, confusion, liver dysfunction.</p>
<p>Stimulants Methylphenidate (Ritalin, Concerta, Daytrana) ▪ dexamethylphenidate (Focalin) ▪ dextroamphetamine (Dexedrine, Dextrostat, Vyvanse) ▪ dextroamphetamine and levoamphetamine (Adderall) ▪ methamphetamine (Desoxyn)</p>	<p>Anorexia, nausea, vomiting, headache, insomnia, tremors hypertension, restlessness, serious psychosis or paranoia, seizures.</p>

Past health history

Ask about psychiatric hospitalizations and any family history of mental illness. If the student is under treatment, note the name of the mental health practitioner. This professional will be a valuable resource during emergencies.

Psychological screening tools

A screening interview performed during a psychological crisis is not an attempt to diagnose a psychiatric disorder (which is better reserved for a time when the student is calm) so much as a means of assessing the severity of the immediate situation and beginning a conversation about mental health issues. Use both subjective and objective assessment skills to determine the student's need for referral and intervention, keeping in mind that it is always better to err on the side of caution in making this decision. Two useful screening tools—the mental status examination and the **HEADSS** risk assessment survey—are described on the following pages.

Mental status examination

A mental status examination (MSE) is a valuable tool when psychobehavioral problems arise. The elements, outlined in Table 12-2, allow you to assess and document baseline data when behavioral or mental health problems are first identified, then monitor for changes over time.

NOTE | If the student is intoxicated or is taking certain medications at the time of the MSE interview, the results may be skewed.

TABLE 12-2. MENTAL STATUS EXAMINATION^a

Component	Includes:	What to Look For
Appearance	General appearance, grooming, posture	Neat or unkempt; cleanliness, including hair, fingernails; appropriate clothing for weather
Mood	Prevailing emotion displayed	Cooperative, frightened, irritable, relaxed; how does student describe current mood?
Speech	Tone of voice, flow of words, use of slang	Soft or loud, fast or slow, slurred
Behavior	Eye contact, body language, gait	Fidgeting, pacing, foot tapping, slouching
Memory	Recent memories, immediate recall	Ability to remember clearly
Orientation	Place, time, situation	Ability to respond correctly to orientation questions
Thought process	Mental activity as demonstrated by speech: how student thinks	Evidence of delusions, hallucinations
Thought content	Themes of conversation: what student says	Hopelessness, suicidal ideation; note spontaneous statements
Insight	Awareness of responsibilities, analytical ability	Tendency to blame others
Judgment	Decision-making abilities	Superficial, impulsive
Perception	Sensory processing; self-awareness	Guilt, indecisiveness

^aIf the student is too young to respond to your questions, note the student's manner of relating to you, capacity for play and fantasy, sensorimotor development, and intellectual development.

The **HEADSS** risk assessment instrument

The **HEADSS** survey instrument is widely used as a model for assessing psychosocial risk in adolescents. The mnemonic provides a way to organize your approach to important topics.

H

Home environment

- Who lives at home with you? Where do you live?
- What are relationships like at home?
- Who can you talk to at home if you have a problem?
- Is there anyone new in the household, or has someone left recently?

Additional questions include ▪ whether the parents/guardians work ▪ whether the family has moved recently ▪ whether the student has ever run away from home.

E

Education/~~E~~mployment

- What do you like or dislike about school? What subjects are you best at? Which give you the most difficulty?
- How do you get along with your teachers/other students?
- How are your grades? Have they changed much?
- Have you changed schools in the past few years?

If the student has a job, ask where and how many hours are worked each week. If not, ask about future plans further education or goals for a career.

Eating/~~E~~xercise

- When you're feeling sad or stressed, do you lose your appetite and find it hard to eat? Do you want to eat more at those times?
- Has your weight changed recently? Have you dieted during the past year? How? What other ways have you tried to manage your weight?
- How much exercise do you get in an average day or week?

If you suspect an eating disorder, include additional questions about body image as well as attitudes toward food and eating. Find out whether the student has used laxatives, diuretics, vomiting, or excessive exercise to lose weight.

A

Activities and peer relationships

- What do you and your friends do for fun? Where? When?
- What do you and your family do for fun? Where? When?
- Are you involved in any sports or other activities?
- Do you regularly attend a church or other organized group activity?

Other possible topics could might include ▪ average “screen time” (time spent watching television, surfing the Internet, or playing video games) ▪ Hobbies ▪ Favorite music ▪ Reading or other solo pursuits.

D

Drugs (including nicotine, alcohol)

It may be helpful to ease into this topic by first asking about the habits of others in the student's life—family or friends—who might smoke, drink, or use drugs.

- Is there any history of alcohol or drug problems in your family? Does anyone at home smoke?
- Do any of your friends use tobacco? Alcohol? Other drugs?
- What about you, have you tried any?

A student who answers either of these questions affirmatively is probably seeking help and may be willing to continue the discussion as long as you remain nonjudgmental in your approach. Invite the student to describe feelings about drug use and its impact on quality of life, as well as specific information about

what substances are being used, how much, and how often. Try to find out whether drug use has been increasing.

S

Sexuality

Set the tone by normalizing the subject of sexuality as you approach this sensitive topic.

- Have you ever been in a romantic relationship? Tell me about the people you've dated.
- Some of your friends may be experimenting with sex by now. Have any of your relationships been sexual relationships?
- Are your sexual activities enjoyable?
- What does the term *safer sex* mean to you?

Suicide/Depression/Mood Screen

- Have you been feeling sad or down more than usual lately? Do you find yourself crying more than usual?
- Are you having trouble getting to sleep?
- Have you thought a lot about hurting yourself, or hurting someone else? Have you ever felt like you had to hurt yourself—for example, cutting yourself—to calm down? Do you feel this way often?
- Have you ever tried to kill yourself? What prevented you from doing so? Do you feel the same way now?

If the student admits to feeling suicidal, ask whether the student has a plan, a method, and the means to carry it out.

Safety

- Have you ever been seriously injured? How? What about other people who are close to you?
- Have you ever ridden in a car with a driver who was drunk or high? How often has that happened?
- Does school feel like a safe place for you to be?
- Does home feel like a safe place? Is there any violence in your home or neighborhood?
- Have you ever been physically or sexually abused? Have you ever been raped, on a date or at any other time?

Plan and Intervention

Helping students who have behavioral health issues requires a team approach. Work with teachers and other school personnel, the parents/guardians, the primary health care provider, and the student's psychiatrist or other mental health practitioner to develop appropriate health care plans, goals, and interventions. Special education services and a 504 plan may be incorporated as appropriate (see Chapter 14: *Planning for Students With Special Needs*).

In many cases, the parents/guardians of students who have emotional or behavioral issues do not know where to seek help. Develop a network of mental health professionals and facilities you can call on for immediate consultation when necessary as well as routine referrals. Providing this first step may be all that's needed to ensure that the student gets appropriate care.

Psychiatric nurse practitioners, psychiatrists and psychologists who specialize in child and adolescent mental health, psychiatric hospitals, behavioral health centers, local health departments, and substance abuse facilities should be included among your resources. Make sure their telephone numbers are readily accessible in case of an emergency.

Documentation

Document specific observations about what the student did and said during the incident, as well as significant physical findings. Include your findings from the mental status examination and **HEADSS** interview as applicable. If the student receives psychotropic medication at school, note the date, time, and amount of the last dose given. Document adverse effects so that they can be accounted for when pharmacologic regimens are adjusted.

Evaluation and Follow-Up

If emergency transport is initiated, be sure to evaluate your procedures and identify strengths and weaknesses.

Students may feel embarrassed or uncomfortable when they return to school after a disruptive or emotional incident. It's essential to continue (or if necessary, reestablish) your therapeutic relationship with the student.

Selected Behavioral Emergencies

Suicide

Occurrences of completed suicide are increasing among school-aged children and adolescents. Guns, drugs, and other means of self-annihilation are only too easy to acquire; today's computer-savvy students can simply search the Internet to learn new ways to die by suicide. According to the National Foundation for Health Statistics (2006), suicide is the fifth leading cause of death among those 5 to 14 years old and the third leading cause of death in those 15 to 24 years old. Among younger students aged 10 to 14 years, the rate has doubled in the last 2 decades.

Assessment

Follow the assessment process outlined in the *Systematic Assessment* section. If a suicide attempt has resulted in injury, provide interventions and activate EMS **immediately**.

For students whose condition is not immediately emergent, use the psychosocial assessment tools described earlier to identify indicators of heightened suicide

risk. There is no universal profile for the student who completes, attempts, or considers suicide.

SAMPLE history for a suicidal student

Selected points are noted below.

Symptoms

- Hopelessness, helplessness, powerlessness; a sense that emotional resources are exhausted
- Feelings of isolation; lack of desired attachments and intimacy

Past health history

- Previous suicide attempt
- A concomitant mental disorder, such as depression or an anxiety disorder
- Chronic illness/disability
- Abuse of alcohol or other drugs, particularly to numb emotional pain
- Family history of mental illness or suicide
- Unplanned pregnancy

Events leading up to crisis

- Significant loss/death of an important person or thing in the student's life; recent divorce in the family; breakup with girlfriend or boyfriend
- Target of bullying
- Multiple life stressors (family recently relocated; transfer to a new school; academic difficulties; setback in a goal or ambition)
- Inability to seek assistance
- Making preparations: suicide talk/Internet discussions; creating a suicide plan, acquiring the means, putting affairs in order, giving away prized possessions; suicide note

Psychosocial history

Personality factors

- Negative self-perception or distorted interpretation of events
- Inadequate social skills to develop or sustain healthy relationships
- Aggressive, hostile behavior or self-directed anger
- Passive or impulsive behavior
- Impulsivity, hostility
- Separation anxiety

Chronic/recurring issues

- Sudden mood swings
- Obsession with death; recurrent death themes in drawings or poetry
- Loss or lack of friends

- Truancy from school or classes
- Self-injury or other self-destructive acts
- Inability to communicate with parents/guardians or others of significance

Recent issues

- Suicidal ideation
- Abrupt change in personality
- Change in eating or sleeping habits
- Inability to concentrate; inattention to schoolwork; declining grades
- Increased incidence of injury

Be concerned if a student who has experienced a period of marked depression seems suddenly to recover with no apparent cause, as this may indicate that the student has come to a decision regarding suicide. Similarly, a student who is under medical treatment for depression deserves close observation. The early stages of treatment can be a high-risk period, as some people will regain the energy to carry out a suicide plan before they have sufficiently recovered from suicidal despair.

Interventions

KEY POINT

If the likelihood of suicide is high, the parent/guardian *must* be called. The student is *never* to be left alone. Collect the student's book bag and other personal effects, and check the student's pockets carefully.

If the likelihood of suicide is high, EMS **must** be activated and parent/guardian **must** be notified. The student is **never** to be left alone.

Remove all of the student's personal effects, including book bag or purse. Check the student's pockets for pills, weapons, string, matches, or anything that could be used as an instrument of self-harm.

How to talk to the student

Acknowledge the student's feelings of helplessness and discuss alternatives to suicide. The following are examples of therapeutic communication.

- State that you are concerned about the student's welfare.
- Express your observations using nonjudgmental phrasing: "It looks like you haven't been sleeping well"; "I've noticed that you seem depressed and sad"; "I understand that you've been skipping school."
- Normalize thoughts of suicide; for example: "It's common for people to feel so helpless and hopeless sometimes that they think about ending their lives. That doesn't mean you have to act on it."
- Ask what event precipitated the immediate crisis; for example, "What happened that was just the last straw for you?"
- Reflect back to the student the feelings you hear behind a response; for example, "It sounds like you're feeling rejected, sad, and alone right now. You feel as if no

one really cares for you.”

- Assess the student’s emotional pain by asking, “On a scale of 0 to 10, if 0 is the worst you’ve ever felt and 10 is the best, where are you right now?”
- If the student has felt this way before, find out what personal resources and strengths helped on that occasion: “What did you do to feel better and get yourself through that time?”
- Find out about the student’s support system; state, “It’s important that I call someone in to be with you. Who would you like to have with you now?” or “You need to connect with the people who care about you and who can help you deal with this.” Offer to call a parent/guardian, other relative, friend, or minister.

Triage and transport

The acutely suicidal student must be transported **immediately** to a facility where physical safety can be maintained. Make sure a responsible adult is present constantly until transport arrives.

If a suicide attempt has been made, resulting in significant wounds, partial asphyxiation, or a toxic exposure, support the ABCDs and activate EMS for **emergency** transport to a hospital.

A student with nonurgent suicidal ideation should be monitored in a safe place with adult supervision, as this is a vulnerable time. Notify the parents/guardians immediately.

KEY POINT

Many parents/guardians do not recognize the significance of suicidal ideation. Help them understand the seriousness of the situation.

Many parents/guardians do not recognize the significance of suicidal ideation. You must help them understand the seriousness of the situation and assist them in finding referral sources.

The *Suicide Prevention* protocol in *Appendix A* provides an overview of assessment and triage.

Documentation

Document any attempt at self-injury or expression of suicidal ideation, with or without a plan, in the student’s health record. Note the nature of any injuries and interventions rendered. The student’s responses to your history interview and findings from any psychological assessments should be recorded. Document the name of the family member you contacted and the plan for future care (psychiatric appointment, mental health clinic, or other resource).

Evaluation and follow-up

Evaluate the efficiency and timeliness of emergency procedures and policies. If necessary, note how deficiencies will be corrected. Arrange for a debriefing session for all school personnel who were involved in the emergency so that they can process their feelings.

Completed suicide

KEY POINT

In the case of a completed suicide, open communication is essential. *Do not* act as though nothing has happened.

In the case of a completed suicide, it is important to communicate frankly with students and faculty. **Do not** attempt to downplay or suppress the incident. Death by suicide creates complex feelings in those left behind to grieve, profoundly affecting family members, friends, and the entire community. The grieving process will include feelings of anger, guilt, anxiety, and depression. Small-group interventions should be available for students.

Prevention

Your school should have a crisis plan with written policies and procedures for dealing with behavioral health emergencies. If no policy is in place, you are in an ideal situation to facilitate the process with evidence-based materials.

A universal prevention program encompassing not only students, but also their families and the community, can teach and strengthen skills in problem-solving, coping, communication, conflict resolution, and social relationships. Ideally, students should identify support systems comprising health professionals (counselors, social workers, the school psychologist, or you) and other people they can turn to for help before a crisis erupts.

Bullying and Violence

Bullying is antisocial behavior: It should never be dismissed as normal, unavoidable, or benign. Zero tolerance for bullying should be the policy throughout the school system.

What Constitutes Bullying?

Bullying has been defined as deliberate, hostile aggression toward another with an outcome that is always painful and emotionally distressing for the target. It can take the form of physical harm, verbal taunts, or *relational* aggression—a form of social aggression that seeks to damage an individual's reputation or relationships with others. *Cyberbullying*, a relatively recent phenomenon, uses a proliferating array of digital technologies as a platform for social aggression. Harmful information—rumors, threats, hate messages, embarrassing images—can be disseminated rapidly through e-mail and instant messages, cell phones, personal blogs or Web sites, and online message boards or chat rooms.

Reasons and Repercussions

KEY POINT

Bullying is *never* benign. It is *always* damaging to the bully, the bullied, and the bystander.

Students who are targeted by aggressors frequently experience long-term psychological harm, including self-esteem issues, anger, and depression. Repercussions may include impaired academic performance, social avoidance, violent retaliation, or suicide.

The motivation for bullying behavior can be complex. Students may turn to bullying as a means of coping with or covering up deep hurt or feelings of inadequacy caused by a difficult situation: a divorce, the death of a significant family member, maltreatment or witnessing domestic abuse of others. No matter what the reason, however, all students must understand that bullying is unacceptable, and that there are consequences for their behavior.

Bullying is never benign. It is always damaging to the bully, the bullied, and the bystander.

Prevention

Every school must establish a clear, consistent policy against bullying that is strictly enforced.

NOTE | Illinois Public Act 92-060, HB 646 (2001) requires school boards, in consultation with parent-teacher advisory committees and other community-based organizations, to establish disciplinary policies for students who demonstrate specific behaviors associated with bullying and other forms of aggression.

All school personnel must be familiar with the policy and formally review its tenets with students, so that they will understand the types of behavior that constitute bullying and the consequences for engaging in these acts.

Addressing this problem requires a team effort. Good documentation, as well as ongoing communication with all school personnel, students, and parents/guardians, are essential to ensure a consistent and coordinated approach to bullying prevention.

Violent Incidents

Students' lives are touched by violence in many arenas, from domestic violence in the home, to street violence in the neighborhood, to national and global acts of violence in the news. A high level of exposure affects our perception of aggression and our own capacity for violent acts. Even fantasy violence depicted in movies and video games has been linked with aggressive behavior in children.

This constant exposure has been associated with increasing levels of violence within the school environment. Violence that occurs on a personal level—such as domestic violence or violence in the neighborhood—is likely to spark serious behavioral problems. Children and adolescents who are the targets of maltreatment are at greater risk for delinquency, drug abuse, and illegal conduct.

Schools are still considered a safe environment, and they must continue to be a place of protection for students progressing through the educational system. Violence prevention must therefore be an integral part of every school health

program, from preschool on. Involving school leaders, community agencies, and families will help to vitalize and sustain these programs.

Identifying the capacity for violence

Maintaining awareness of the potential for violent behavior can help you intervene early enough to circumvent a violent act. Individuals who are on the verge of violence often display characteristic warning signs (Table 12-3).

TABLE 12-3. CHARACTERISTICS PREDICTIVE OF VIOLENT BEHAVIOR

Area	Characteristics
Social relations	<ul style="list-style-type: none"> ▪ Few friends, no steady relationships ▪ Considered a loner, not accepted by peers ▪ Involved with a gang or an antisocial group
Behavior/ coping skills	<ul style="list-style-type: none"> ▪ History of acting out, tantrums, angry outbursts ▪ Very withdrawn ▪ Drastic changes in behavior; significant mood swings ▪ Easily frustrated or angered ▪ Resorts to name-calling, cursing, abusive language, violent threats when angry ▪ Blames others for problems ▪ Displays cruelty to animals ▪ Brags of intention to commit violent acts
Family	<ul style="list-style-type: none"> ▪ Little or no supervision or support from parents/guardians or a caring adult ▪ Dysfunctional family ▪ Witness to or target of maltreatment in the home
School	<ul style="list-style-type: none"> ▪ Chronic underachiever ▪ Recent decline in grades ▪ Serious disciplinary problems at school and in the community ▪ Writing assignments reflect morbid themes, anger, frustration ▪ Repeated referrals to school counselor for tardiness or disciplinary problems
History	<ul style="list-style-type: none"> ▪ Recent trigger has increased emotional stress ▪ Has threatened or attempted suicide ▪ Has brought a weapon to school ▪ History of drug, alcohol, or other substance abuse ▪ Target of bullying
Interests	<ul style="list-style-type: none"> ▪ Interested in and has access to guns or other weapons ▪ Preoccupied with weapons, explosives, incendiary devices ▪ Prefers movies, music, and reading materials expressing violent themes and abusive acts ▪ Dabbles in Satanism or occult practices

Managing a violent incident

Your school must have a carefully considered de-escalation plan for managing aggressive or violent incidents involving students. The following guidelines may be used in developing your own plan, if you don't already have one in place. You may also wish to review the *Violent Behavior* protocol in *Appendix A*.

Scene safety assessment

KEY POINT

During any violent incident, safety is your first priority. Ensure your own safety as well as the safety of the student involved, other students in the school, and school personnel.

In all cases, remember that safety—both your own and that of others present—is your first priority. **Do not approach** the student unless it's safe to do so. **Ensure the safety of the student involved, other students in the school, and school personnel.**

Student appears highly dangerous, violent, and unpredictable

Do not approach if the student

- Is brandishing a weapon
- May be under the influence of drugs
- Exhibits violent or unpredictable behavior

Intervention

This is an **emergent** situation. **Do not attempt to intervene alone.** Call immediately for assistance from other staff, security personnel, or law enforcement officials who can transport the student out of the school.

NOTE | Physical restraint, if mandated, requires at least 6 people with special training in restraint techniques. Follow applicable protocols if physical restraint is necessary.

To keep the incident from escalating, you must not appear threatening.

- Remain at least 5 feet away from the student to avoid invading personal space.
- Do not position yourself directly in front of the student—stand at a 45° angle.
- Do not block the exit door.
- Keep an open posture. Do not adopt an aggressive stance.
- Maintain eye contact.
- Be prepared to move quickly, but avoid sudden moves if possible.
- Make sure you have your own exit route planned.

As you speak with the student, demonstrate that you are a concerned professional. Explain the steps you're taking in brief sentences. Make your expectations clear. Give explicit, authoritative instructions so that the student will know what actions you require to resolve the situation.

Student is not actively violent, but displays aggressive or agitated behavior

Address the student in low, measured tones. State that you know that something extremely troublesome has happened to provoke these feelings and behavior, and that you will help the student regain control. Ask, "What do you feel that you need to do?" or "When you felt like this before, what helped you?"

It's often difficult for an agitated student to sit and talk, so you may choose to walk with the student as you discuss the problem; moderate agitation can often be diffused by this means. Consider your safety, however, and remain in common areas.

Repeat the student's statements, rephrasing them to show that you're listening and you understand: "You're feeling angry about what happened." As the student regains composure, you can work together to identify ways to deal with such feelings. Discuss the possibility of a referral for additional help, either to the school social worker or psychologist, or to an outside agency. Explain that you will need to notify the parent/guardian about the situation.

Triage and transport

A student who exhibits dangerous behavior and requires transport should be observed in a quiet environment with an adult present at all times.

- If transport is provided by the parents/guardians, offer them support and put them in touch with resources that can help them.
- For EMS transport, provide a written report for the receiving facility or mental health professional, including findings from any psychological assessments performed.

Documentation

Carefully document the situation, noting what happened, who was called, and disposition. This information becomes part of the student's health record.

Evaluation and follow-up

Any violent or threatening encounter should be followed by a confidential debriefing session for all school personnel involved. This provides validation and defuses emotions. At the same time, personnel can review the crisis for procedural integrity, discuss whether school policy is working, and share ideas for improving policy or training if necessary.

Prevention

Violence prevention is a complex issue that requires a multifaceted approach. It begins with awareness among school administration and faculty that violence is a reality for many students. A written policy for violence prevention must be developed if one is not already in place, together with procedures for de-escalation of violent situations. All staff members should

- Know that this policy exists
- Clearly understand its provisions
- Rehearse the procedures it describes

All school personnel should learn about risk factors predictive of violent behavior. Teachers, in particular, need to know the specific behavioral cues that may signal an impending incident so that they can implement appropriate strategies to prevent its escalation—which may be as simple as calling for lowered voices or a time-out session, or as forceful as mobilizing emergency assistance. Faculty in-service sessions provide an appropriate forum for this. You may wish

to distribute an assessment instrument, such as the one summarized in Table 12-3.

KEY POINT

Publicize the school’s zero-tolerance policy toward violence and ensure that every student understands its stipulations. This alone can decrease violent incidents.

Publicize the school’s zero-tolerance policy regarding weapons and violent behavior. Every student must be aware of its stipulations. Simply making these expectations clear can help to decrease violent behavior.

Legal Aspects

Many states have enacted special policies and programs to respond to the social and emotional needs of students. For example, the Illinois Children’s Mental Health Act of 2003 requires that school districts have

- A policy for incorporating social, emotional, and mental health development into the school district’s educational program
- Protocols for responding to students with social, emotional, or mental health problems that affect learning

Familiarize yourself with the provisions and mandates in the following legislation as they apply to students with mental or behavioral health issues:

- Section 504 of the Rehabilitation Act of 1973
- Individuals With Disabilities Education Act of 2004
- Family Educational Rights and Privacy Act (FERPA)
- Health Insurance Portability and Accountability Act (HIPAA)
- State Mental Health Acts (Illinois’s Mental Health Act is accessible at www.isbe.net/spec-ed/pdfs//cmh_act.pdf)

These laws discuss students’ rights in school, plans and programs to ensure equal access to educational opportunities, and confidentiality matters affecting disclosure of treatment or referral for mental health issues. Additional information on discipline and conduct issues appears in the Illinois School Code. See Chapter 2: *Legal Issues in Nursing* as well as Chapter 14 for more information.

Prevention

Prevention of mental and behavioral health emergencies should follow a health promotion approach. Prevention measures take place at primary, secondary, and tertiary levels.

Primary prevention

Primary prevention seeks to prevent or minimize exacerbations of the disorder. Guiding students and parents into early intervention programs can be helpful.

These programs may teach skills in health promotion, parenting, assertiveness, stress management, and relaxation techniques.

To spark broader knowledge and discussion of mental and behavioral health disorders, keep relevant literature on display in the school health office and in the administrative office.

Secondary prevention

Secondary prevention activities are aimed at early detection of a disorder so that strategies can be initiated to prevent emergence and progression of symptoms. Here your role includes screening students, identifying health needs, and providing emergency interventions. Be available to teachers and staff for referral when concerns arise about a student.

Tertiary prevention

Tertiary prevention focuses on reducing the severity of an established mental disorder and its associated disabilities, permitting the student to achieve the highest level of function. Despite our best efforts at prevention, there will always be students with mental and behavioral health issues. You must provide individualized health care plans for these students; they may need to be evaluated for individual education programs or 504 plans as well (see Chapter 14).

In some cases, the school social worker or psychologist may provide services directly to the student.

Education

As a respected health care professional, you're in an excellent position to educate the public about mental illness. Discuss behavioral and mental health disorders with students, their families, faculty, and administrative personnel. To address social stigmas, it may be helpful to compare mental illness with more widely acknowledged organic diseases, such as diabetes. Using this model, discuss medication, acute onset of problems, and chronicity. Encourage discussion of how individuals throughout the school can help each other with issues involving mental illness.

Students With Special Needs

Comorbid mental illness may accompany a variety of neurologic, genetic, or developmental disorders or disabilities. Students with special needs often engage in challenging behaviors, such as aggression, self-injury, inappropriate social interactions, stereotypes, and destructive acts. These problems can be triggered by the underlying medical condition, a change in the student's environment, or a diagnosable psychiatric disorder.

Students with cognitive impairments may have atypical symptoms when psychiatric disorders are present.

When a student with special needs presents behavioral challenges, your responsibilities include collaborating and communicating with school personnel, the parents/guardians, and the student's primary health care provider to identify

the underlying causes and determine appropriate interventions. The student may benefit from a behavioral modification plan or pharmacologic treatment.

Summary

Pediatric mental illness is a fact of life, and often has its roots in organic causes. Mental health problems go unrecognized all too often, making it paramount for school systems to implement mechanisms for routine screening and evaluation.

Mental and behavioral health emergencies are inevitable, but with planning and preventive measures, you may be able to avert tragic consequences. Emergencies of this type demand specialized knowledge and skills, including excellent therapeutic communication techniques, an understanding of normal growth and development in children and adolescents, and a comprehensive network of mental health professionals and resources in the community.

School nurses must be adept at identifying indicators of mental health problems and discerning whether these problems are impairing the student's ability to function optimally at home, at school, with peers, or in the community. You should consider yourself a key player in directing and implementing strategies for development of crisis response teams, procedures for suicide intervention, and student assistance programs.

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13

Medical Emergencies

On completing this chapter, you will be able to

- Assess changes in the health status of students who have chronic conditions.
- Provide appropriate emergency intervention during exacerbations of these conditions.
- Follow up with these students to prevent recurrences of medical emergencies.
- Identify strategies to help these students cope with their conditions and maintain optimum wellness.
- Describe the unique challenges that may arise during medical emergencies involving students with special needs.

Introduction

Children with significant health problems are not only living longer, they are also spending less time under hospital care and more time at home, attending school, and participating in community life in ways that would not have been possible only a short time ago. This has greatly affected your role, as you collaborate with nurse colleagues and other health care professionals in hospitals, clinics, and community agencies to develop comprehensive health care plans for these students. Close partnerships with the students, their parents/guardians, and their primary health care providers are essential to this process.

As you work with these students, keep in mind that developmental, psychosocial, and emotional factors affect both their physical and psychological well-being. For example, apparent behavioral problems may be symptomatic of an underlying physical problem, and psychological issues may exacerbate physical illness. Simply coping with their health conditions may cause these students to experience emotional problems that require intervention. Their acceptance within the school community represents an additional consideration.

It's essential to assess each of these students and develop an appropriate individualized health care plan (IHP), an emergency care plan (ECP), or both, delineating specific interventions. See Chapter 14: *Planning for Students With Special Needs* for a detailed discussion of the types of plans students may require and how to develop and maintain them.

This chapter reviews assessment and interventions for 5 pediatric conditions you're likely to encounter in the school setting: anaphylaxis, diabetes, hemophilia, immunosuppression, and sickle cell anemia.

Anaphylaxis

Anaphylaxis—a severe, systemic allergic reaction—may involve any of the following body systems: skin, respiratory tract, gastrointestinal tract, and (occasionally) cardiovascular system. While most allergic reactions are self-limiting or respond readily to prompt intervention, anaphylaxis can be fatal.

In students, anaphylaxis is generally associated with allergies to foods, insect stings, or (rarely) medications. Common food allergens include peanuts, tree nuts, dairy products, eggs, shellfish, and fish. Anaphylaxis due to insect stings is generally associated with hornets, wasps, bees, and fire ants.

NOTE | A student who has experienced a systemic allergic reaction to an insect sting has a 60% chance of developing a similar or worse reaction if stung again.

Signs and symptoms associated with anaphylaxis, as well as the onset and duration of the response to the allergen, can vary widely.

- The most common pattern of response is *monophasic*, with signs and symptoms usually developing within 5 to 30 minutes of exposure.
- In a *biphasic* response, this initial reaction is followed by a second reaction,

which may be more severe, approximately 1 to 8 hours later.

- *Protracted* anaphylaxis persists episodically for periods lasting up to 24 hours or more, with asymptomatic intervals possible.

Anaphylaxis is unpredictable. It is essential to treat all students promptly and transport them to the nearest emergency department, where they can be monitored for biphasic or protracted symptoms. Make sure students or parents/guardians inform you of any anaphylactic reaction occurring at home, as they should be monitored for late-phase symptoms for up to 24 hours.

Assessment

A student experiencing an anaphylactic reaction may exhibit variable signs and symptoms in the following areas:

Skin

- Generalized or localized pruritus
- Warmth, erythema, and rash or hives
- Generalized edema of the oral mucosa, face, and extremities

Respiratory tract

- Wheezing or stridor
- Dyspnea, air hunger
- Dysphagia, tracheal constriction
- Nasal congestion, persistent cough or sneeze

Gastrointestinal tract

- Nausea, vomiting, diarrhea
- Abdominal pain or cramping
- Perioral or pharyngeal pruritus
- Perioral paresthesia
- Metallic taste

Circulatory

Signs and symptoms of shock, including

- Tachycardia
- Pallor or cyanosis
- Dizziness or lightheadedness
- Hypotension (late sign)

Neurologic/psychological

- Altered level of consciousness
- Anxiety, apprehension
- Headache

KEY POINT

Anaphylaxis can occur within minutes or be delayed for several hours.

Remember that the onset of anaphylaxis can occur within minutes **or** be delayed for several hours. A student with a history of anaphylaxis should report to the health office for observation if exposure to an allergen occurs.

Interventions

Because a life-threatening reaction may develop rapidly in a susceptible student, it is essential to begin interventions at the earliest sign of **any** reaction and monitor the student closely. If the reaction progresses, or if there is **any** sign of airway involvement, activate EMS for **immediate** transport to an ED.

NOTE | Because anaphylactic reactions to peanuts and tree nuts are rapid and severe, the physician may file a standing order to initiate interventions and transport even before symptoms arise, so that the student is at the ED if a reaction should occur.

Epinephrine is the most effective drug for treating anaphylaxis; ideally, it should be readily available in the health office. It helps to counteract the histamine cascade, alleviating tracheal and bronchial constriction; at the same time, it causes peripheral vasoconstriction that helps to stabilize blood pressure.

The easiest way to administer epinephrine is with an automatic injection device, such as the preloaded EpiPen Auto-Injector. Give the dose in the lateral thigh muscle, using the EpiPen Jr for students weighing less than 45 pounds and the standard EpiPen for those weighing 45 pounds or more. A second injection may be given 10 minutes later if EMS personnel have not yet arrived and the student continues to exhibit severe distress.

The student's IHP and ECP may recommend following epinephrine with an oral antihistamine—typically liquid diphenhydramine (Benadryl)—to further relieve pruritus and other symptoms.

For students with asthma, the ECP may also provide for administration of a pulmonary bronchodilator, such as albuterol, in cases of wheezing and severe dyspnea. The medication usually comes in a metered-dose inhaler.

NOTE | When administering medications, follow physician orders as outlined in the IHP and ECP in conjunction with applicable protocols.

Latex Allergies

Latex allergies are becoming increasingly prevalent. Students who have spina bifida or a history of multiple surgical interventions are at highest risk, as repeated exposure to latex antigen increases sensitization over time.

Reactions to latex can include hives, mucosal edema, dyspnea, pruritus, nausea and vomiting or other gastrointestinal disturbances, and anaphylaxis.

There are many potential sources of latex in the school setting, including examination gloves, balloons, balls, condoms, rubber bands and other elastic products, adhesive bandages, and carpet backing. Fumes from latex paint may also be hazardous to sensitive students. Note that individuals with latex allergies are often sensitive to certain fruits as well, including bananas, kiwi fruit, pears, pineapples, grapes, and papayas.

NOTE | A chapter dedicated to latex allergies is included in Silkworth et al, *Individualized Healthcare Plans for the School Nurse*. The book also provides a list of products containing latex. (See *References and Information Sources* at the end of this chapter.)

When a student with latex allergies is attending your school, remove sources of latex from the environment, replacing them with latex-free products whenever possible. When no such product is available (for example, when using a blood pressure cuff), use a barrier to prevent skin contact.

Triage and Transport

KEY POINT

Be sure to inform EMS personnel if a student is sensitive to latex.

Any student who shows signs of an allergic reaction after contact with a latex product should receive prompt emergency care. Although treatment and triage are the same as in any other allergic reaction, **it is essential to inform EMS personnel of the student's sensitivity to latex.**

Triage decisions for anaphylaxis are based on a combination of clinical findings, the student's health history, and an allergy action plan developed by the student's physician, which should be kept on file with the student's other health records.

Emergent

KEY POINT

Always activate EMS for a student who has received epinephrine.

Activate EMS following suspected allergen exposure if the student

- Develops signs of respiratory distress, such as wheezing or stridor
- Develops hypotension or other signs of shock
- Exhibits edema of the lips, tongue, or eyes
- Has received epinephrine

Even if the student displays no signs or symptoms of a reaction, **always** activate EMS if the student has been exposed to an allergen **and** the history includes

- A previous severe anaphylactic reaction
- A documented severe reaction together with allergy to peanuts or tree nuts

KEY POINT

In students with emergent anaphylaxis, never delay intervention or transport to contact the parent/guardian or primary health care provider!

Notify the parent/guardian and primary health care provider as soon as you are able to do so, but **never** delay intervention or transport to reach them!

Urgent

If findings indicate a mild to moderate systemic reaction (hives, cramps, nausea) **without** cardiopulmonary compromise, contact the parent/guardian to take the student for medical evaluation.

Nonurgent

A localized reaction that responds to oral medication can be monitored at school or at home, based on the specific situation and the preferences of the parent/guardian.

See the *Anaphylaxis* protocol (*Appendix A*) for summary information.

Planning and Prevention

Identify any student who is at risk for an anaphylactic reaction and have the parent/guardian complete an allergy assessment form (see *Appendix B* for an example). Make sure you have appropriate plans (IHP, ECP, allergy action plan) on file for the student. Refer to these plans regarding medication administration: They should list the dosage for epinephrine, antihistamines, and bronchodilators, as well as the phone number of the preferred ambulance service (if other than 911) and phone numbers for the primary or specialist health care provider, the parents/guardians, and a secondary contact person.

NOTE | Not all EMS personnel have protocols for administration of medications. The student's ECP should address this possibility in case you need to readminister medications before transport and provide care to the student during transport.

Teachers and other school personnel must be notified about students at risk for anaphylaxis. Train them to recognize the signs of impending anaphylaxis, administer appropriate medications as permitted, and follow applicable protocols regarding EMS contact.

NOTE | Follow state law and applicable protocols regarding administration of medications by nonnursing staff. Keep abreast of current state laws.

Students who have food allergies should be taught to check labels for hidden allergens and to be vigilant when eating in public places or away from home. Modifications may need to be made in the lunchroom, such as designation of a peanut-free table and cleaning procedures to prevent cross-contamination of eating surfaces. A letter may be sent home to parents/guardians, encouraging them to provide peanut-free foods that the student can bring for snack time,

lunchtime, or special celebrations. Educate classmates about the seriousness of this condition.

Encourage students who have severe allergies to wear an identifying device, such as a medical bracelet. The student may also need to carry an EpiPen as permitted by state law. Ensure that information about the allergy is included in the student's ECP and that those who come in contact with the student are informed.

Diabetes

Types of Diabetes

Diabetes mellitus is a chronic illness that is characterized by a high level of blood glucose. In diabetes, the body does not produce or properly use insulin, a result of impaired pancreatic function, insulin resistance, or both.

Diabetes is subdivided into 2 categories—type 1 and type 2. Individuals with type 1 diabetes require regular insulin administration to maintain proper blood glucose levels. Those with type 2 diabetes may be able to control the disease by following a prescribed regimen of diet and exercise. Increasingly, however, oral antidiabetic medications and insulin have been necessary for management of type 2 diabetes.

Type 1 diabetes

Type 1 diabetes results from destruction of pancreatic beta cells, which usually leads to absolute insulin deficiency. It is most common among children and young adults, with onset generally following an infection or growth spurt. Signs and symptoms that may indicate type 1 diabetes include fatigue, increased fluid and food intake, weight loss, and bedwetting.

Although warning signs and symptoms, methods of treatment, and anticipated complications are similar in children and adults, the developmental, emotional, and psychosocial factors in children necessitate a different type of care plan that accounts for such considerations as

- The length of the disease process in children, which may lead to additional complications over time
- The prospect of lifelong dependence on insulin (barring successful islet cell or pancreas transplantation)
- The frequency of hypoglycemic and hyperglycemic episodes

It can be challenging to help these students maintain near-normal blood glucose levels. Current modalities place many of these students on aggressive insulin regimens to reduce hyperglycemic episodes, but this may increase the incidence of hypoglycemic episodes at school.

Types of insulin

A combination of insulin types, which may include rapid-acting, short-acting, and intermediate-acting insulin, may be needed for optimal control (Table 13-1). Premixed insulin that combines these different types in prescribed ratios is also available.

TABLE 13-1. TYPES AND ACTION OF INSULIN

Type	Onset	Peak	Duration
Rapid-acting <i>Aspart (NovoLog), lispro (Humalog)</i>	10 min	90 min	3–5 hr
Short-acting <i>Regular (Humulin R, Novolin R)</i>	20–40 min	3–4 hr	6–8 hr
Intermediate-acting <i>NPH human (Humulin N, Novolin N)</i>	2–4 hr	6–10 hr	16–22 hr
Long-acting (basal) <i>Glargine (Lantus), detemir (Levemir)</i>	2 hr	peakless	22–26 hr
Combined 70%N 30%R <i>Novolin/Humulin 70/30</i>	20–60 min	3–10 hr	12–20 hr
Combined 75%N 25%H <i>Humalog Mix 75/25</i>	10 min	1–6 hr	12–20 hr
Combined 70%N 30%No <i>Novolog Mix 70/30</i>	10 min	1–6 hr	12–20 hr

NPH indicates Neutral Protamine Hagedorn; min, minutes; hr, hours. **SOURCE:** Adapted from “Types of insulin” [patient handout]. Chicago, IL: Children’s Memorial Hospital; 2006.

Insulin delivery

Traditionally, insulin has been delivered using an insulin pen or syringe; increasingly, however, the preferred method is *continuous subcutaneous insulin infusion* (CSII) delivered through a device about the size and weight of a pager, is worn outside the body. Often referred to as an insulin *pump*, the unit holds a 3-day supply of rapid-acting insulin that is delivered subcutaneously through a plastic infusion set. It is programmed to provide insulin at a continuous basal rate that meets general requirements throughout a 24-hour period. This basal flow can be supplemented with insulin boluses to manage the carbohydrates consumed during meals and snacks. It also has correction-dose capabilities that provide a specified dose of insulin when blood glucose levels exceed a predetermined limit.

This method can maintain near-normal blood glucose levels, which improves growth, decreases hypoglycemic and hyperglycemic episodes, and helps to prevent long-term complications of diabetes. Students who have an insulin pump can pursue a more flexible lifestyle, as the device matches insulin delivery to carbohydrate intake and activity levels. A quick-release mechanism allows students to disconnect the pump while participating in water activities or contact sports. The infusion site remains intact.

CSII can fail if the cannula or tubing becomes damaged, clogged, or kinked. Hyperglycemia and ketoacidosis can develop in as little as 3 hours without insulin, so the student should always have necessary supplies at school to manage an occlusion, including a replacement infusion set.

If you have a student at your school who uses an insulin pump, familiarize yourself with its specific features. Manuals are often available online, while videos and other materials on operation and maintenance are usually available at

no charge from the manufacturer. Check the back of the pump for a phone number and Web site listing.

Note the make and model of the pump in the student’s health record. Add the manufacturer’s helpline number to listings of readily accessible phone numbers in the health office, so that you can easily locate it in the event of a problem.

Type 2 diabetes

Although less common among children, type 2 diabetes is on the rise in the United States with the increasing incidence of pediatric obesity. This has created a major public health issue. Children who have the disease but show no symptoms are at high risk for heart disease, kidney failure, and loss of vision. In Illinois, diabetes screening is a required element in all students’ physical examinations.

Managing type 2 diabetes requires healthy lifestyle changes involving diet, exercise, and weight control. Pharmacologic therapy based on single or combined medication regimens may be needed as well. Table 13-2 lists the 5 types of oral antidiabetic agents currently available in the United States.

TABLE 13-2. PHARMACEUTICAL THERAPY FOR TYPE 2 DIABETES

Class/Drug	Primary Action	Adverse Effects	BG Affected
Sulfonylurea (<i>glipizide, glyburide, glimepiride</i>)	Increases insulin production in the pancreas	<ul style="list-style-type: none"> ▪ Hypoglycemia ▪ Weight gain 	Fasting and postprandial
Meglitinide (<i>Repaglinide, Nateglinide</i>)	Increases insulin release from the pancreas	<ul style="list-style-type: none"> ▪ Hypoglycemia ▪ Weight gain 	Postprandial
Biguanide (<i>Metformin</i>)	Increases insulin sensitivity	<ul style="list-style-type: none"> ▪ Nausea ▪ Lactic acidosis (rare) 	Fasting
Thiazolidinedione (<i>Rosiglitazone, Pioglitazone</i>)	Increases insulin sensitivity	<ul style="list-style-type: none"> ▪ Weight gain ▪ Edema 	Fasting and postprandial
Glucosidase inhibitors (<i>Acarbose, Miglitol</i>)	Slows hydrolysis of complex carbohydrates; slows carbohydrate absorption	<ul style="list-style-type: none"> ▪ Diarrhea 	Postprandial

BG indicates blood glucose

Monitoring Type 1 and Type 2 Diabetes

Periodic monitoring of glucose levels throughout the day, both at home and at school, is important in diabetes management. Preprandial blood glucose levels should be maintained near the normal range of 80 to 120 mg/dL; the 2-hour postprandial level should be less than 140 mg/dL. Blood glucose levels can fluctuate significantly, so results from frequent home tests may not be a reliable indicator of a student's overall success in controlling blood glucose.

Hemoglobin A_{1c} test

One way to monitor the long-term efficacy of diabetes management is to measure the level of glycated hemoglobin in the blood. The diagnostic test is referred to as the hemoglobin A_{1c} test, often abbreviated as HbA_{1c}.

The HbA_{1c} test determines the average plasma glucose concentration over the previous 2- to 3-month period. The American Diabetes Association (ADA) recommends maintaining an HbA_{1c} level of less than 7% or “as close to normal (less than 6%) as possible without significant hypoglycemic episodes.” The value of this regimen was demonstrated in the 10-year Diabetes Control and Complications Trial, which showed a greatly reduced incidence of retinopathy (76%), neuropathy (60%), and nephropathy (50%) among those who maintained intensive control of blood glucose levels.

Students with diabetes should have their HbA_{1c} levels checked twice a year to determine how closely they are able to meet the ADA's recommended goal under their current diabetes regimen.

Maintaining awareness of the student's current management status and working with the student as necessary to modify exercise and nutritional regimens may help these students meet their goals.

Diabetes Care in the School

Students have specific rights regarding diabetes management at school. Three federal laws support requests for a medically safe and educationally appropriate academic environment: Section 504 of the Rehabilitation Act of 1973; the Individuals With Disabilities Education Act of 2004; and the Americans With Disabilities Act of 1990. Procedures for identifying students with disabilities, requirements for developing educational plans, parent/guardian involvement in the plan, and procedural safeguards vary under each of these laws. (More information appears in Chapter 14.)

The American Diabetes Association (ADA) publishes a pamphlet titled “Your School and Your Rights” that provides a succinct guide to these laws. Specific recommendations from the ADA’s *Standards of Medical Care in Diabetes* appear below.

ADA STANDARDS OF MEDICAL CARE IN DIABETES

- An individualized diabetes medical management plan (IHP/ECP) should be developed by the parent/guardian and the student’s diabetes health care team.
- An adequate number of school personnel should be trained in the necessary diabetes procedures (including monitoring of blood glucose levels and administration of insulin and glucagon) and in the appropriate response to high and low blood glucose levels. These school personnel need not be health care professionals.^a
- The student with diabetes should have immediate access to necessary supplies at all times, with supervision as needed.
- Depending on age and level of independence, the student may be permitted to monitor blood glucose levels and take appropriate action to treat hypoglycemia in the classroom or anywhere the student is in conjunction with a school activity as indicated in the student’s IHP/ECP.

^aRefer to your state Nurse Practice Act.

Assessment

Differentiating hypoglycemia, hyperglycemia, and diabetic ketoacidosis

In students with diabetes, a glucose imbalance involving hypoglycemia, hyperglycemia, or diabetic ketoacidosis (DKA) can cause a medical emergency. Table 13-3 lists findings that can help you differentiate these states.

TABLE 13-3. SIGNS OF HYPOGLYCEMIA, HYPERGLYCEMIA, AND DKA

Finding	Hypoglycemia	Hyperglycemia	DKA
Blood glucose level <i>Normal range 80–120 mg/dL</i>	60–80 mg/dL (mild); less than 60 mg/dL (moderate)	120–250 mg/dL (mild to moderate)	Exceeds 250 mg/dL (severe)
Vision	Dilated pupils	Blurred	Blurred
GI	Hunger; numbness of mouth and tongue	Polyphagia, polydipsia, nausea	Polydipsia, vomiting and abdominal pain
Musculoskeletal	Normal	History of weight loss; fatigue	Muscle weakness
Neurologic	Tremors, headache, delirium, seizures	Headache, difficulty concentrating	Confusion, headache, irritability
LOC	Anxiety, decreasing responsiveness	Confusion	Lethargic to comatose
Respiration	Normal or rapid; shallow in coma	Dyspnea	Deep, rapid (Kussmaul respiration); fruity breath odor
Skin	Pale, diaphoretic; cold, clammy	History of vaginal or skin infections; wounds slow to heal	Flushed, dry, warm overall; cool extremities with onset of dehydration/shock
Urinary	Negative for glucose	Polyuria	Polyuria; glucosuria; ketonuria

DKA indicates diabetic ketoacidosis; GI, gastrointestinal; LOC, level of consciousness; mg/dL, milligrams per deciliter

Factors that can precipitate an acute episode of glucose imbalance include infection, strenuous exercise, failure to eat, and changes in insulin dosage. Hypoglycemic reactions are the most common diabetic emergency seen in the school setting.

As you proceed with your assessment, it is important to remember that the findings typically associated with a diabetic crisis may have another potentially serious etiology, such as a toxic ingestion. This necessitates careful evaluation to prevent misdiagnosis.

Initial (ABCDE) assessment

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

A rapid initial assessment of the airway, breathing, circulation, disability (neurologic status), and exposure is a critical first step in any diabetic emergency.

Follow the procedure described in Chapter 3: *Assessment and Triage*. If the student's condition permits it, gather history information as you go.

During your **C**irculation assessment, check for dehydration by gently pinching a fold of skin. Skin that is inelastic and prone to tenting usually signifies dehydration, which is associated with DKA.

Remember that it is essential to perform interventions for significant problems **before** moving on to the next step of the assessment. Be prepared to activate EMS at the earliest sign of an emergent situation.

History and pain assessment

SAMPLE history

Use the **SAMPLE** mnemonic to guide the focused history. The following points are critical:

Symptoms

Ask the student to describe the problem, including how long ago it began. Note whether the student has experienced dyspnea, agitation, diaphoresis, nausea, or abdominal pain. Get the student's own impression of symptoms: Are they typical or unusual? Record any steps the student has already taken to alleviate the problem.

Allergies

Determine whether the student has any known allergies. If so, try to rule out exposure to an allergen as a cause of illness.

Medications

Ask when the student last took insulin and note the dose. Know what type of insulin the student uses and when peak action occurs. Note any over-the-counter or prescribed medications (such as antibiotics, oral contraceptives, or steroids) the student is taking.

Past health history

Ask about the standard insulin regimen and how effectively the condition has been managed. Find out whether the student has been losing weight. Ask about problems the student typically experiences when blood glucose levels go outside normal limits. Also find out whether the student has a viral or bacterial infection.

Last food or drink

Document what the student ate that day and when. Have there been any or recent changes in eating habits? Are bowel and bladder function normal?

Events leading up to the incident

Ask about factors that precipitated the incident, such as unusual exercise, sudden illness, a change in dietary intake, or increased emotional stress at home or at school. Note whether the student forgot to take a dose of insulin or decreased the amount taken.

Pain assessment

Follow the history with a pain assessment, using a developmentally appropriate numeric or visual pain scale (Chapter 3).

Focused physical examination

Record a complete set of vital signs. If possible, include temperature, weight, and blood glucose level. Assess for the physical signs previously listed in Table 13-3.

Interventions

Check the student's ECP and medication orders for specific instructions regarding appropriate interventions.

Hypoglycemia

Immediate intervention is necessary for early warning signs of hypoglycemia. If the student is awake and alert and the blood glucose level indicates mild (60 to 80 mg/dL) to moderate (less than 60 **but** student retains normal LOC) hypoglycemia, the usual regimen is a carbohydrate snack or juice.

KEY POINT

Generally, 15 grams of carbohydrates will raise the blood glucose level 50 points in 15 minutes.

Follow the 15:15 rule: Give 15 grams of carbohydrates (which is equivalent to 3 or 4 glucose tablets, 4 ounces of regular soda or juice, or 5 hard candies, such as Life Savers) and retest in 15 minutes. Generally, 15 grams of carbohydrates will raise the blood glucose level 50 points in 15 minutes.

Give an extra snack as indicated (2 peanut butter crackers or a half sandwich and 8 ounces of milk).

Although the blood glucose level may be in the optimum range following treatment, the CNS effects of hypoglycemia may persist for up to an hour following intervention, so the student should not perform tasks requiring intense concentration or physical exercise during this time. Notify appropriate school personnel about hypoglycemic reactions.

Severe hypoglycemia

KEY POINT

If a student with severe hypoglycemia loses consciousness or has a seizure, emergent action is required to prevent permanent cognitive impairment.

If the blood glucose level is less than 60 mg/dL and the student loses consciousness or experiences a seizure, **emergent** action is required. Failure to treat severe hypoglycemia may lead to permanent cognitive impairment.

- Activate EMS.
- Administer intramuscular or subcutaneous glucagon according to applicable protocols as permitted in the student's ECP. This will mobilize stored glycogen and raise blood glucose levels.
- In the absence of glucagon, instant glucose gel can be administered: Squeeze the gel between the student's cheek and gum and massage the area to hasten absorption.

- Place the student in the left lateral recovery position in case of vomiting.

Hyperglycemia

If findings suggest mild to moderate hyperglycemia (blood glucose levels between 120 and 250 mg/dL with mildly abnormal physical findings), treat with insulin therapy as directed in the student's ECP. Encourage the student to increase water intake. Test for ketonuria.

Diabetic ketoacidosis

A change in the student's mental status together with significantly abnormal physical findings indicates severe hyperglycemia (glucose levels exceeding 250 mg/dL) that is progressing to DKA. DKA is a serious medical condition requiring **immediate** EMS transport to the emergency department for intravenous rehydration, electrolyte therapy, and cardiac monitoring.

- Activate EMS immediately
- Consult the student's ECP
- Give nothing by mouth
- Monitor for additional complications while awaiting EMS

Triage and Transport

Most health office visits involve students with type 1 diabetes and are not emergent. Since the potential for serious sequelae is always present, however, every episode should be evaluated carefully and treated as indicated.

Emergent

A student with diabetes who exhibits moderate to severe dehydration, Kussmaul respiration, tachycardia, cool extremities, an altered level of consciousness (lethargic to comatose), or seizures.

Urgent

A student with diabetes who has mild abdominal pain or tenderness, nausea and vomiting, mild dehydration, fruity breath odor, or tachycardia.

Nonurgent

A student with diabetes who reports minor distress (diaphoresis, hunger, tremulousness, irritability) with a history of polyuria, polydipsia, polyphagia, or recent weight loss, but with no signs of dehydration.

See the *Diabetic Emergencies* protocol in *Appendix A* for an overview of triage and intervention.

Documentation

Record in the student's health record the details of any incident involving glucose imbalance. Include specific assessment data, such as the blood glucose level, as well as your interventions (administration of oral glucose or insulin), the student's response, and disposition.

Follow-Up

The primary health care provider should evaluate repeated incidences of acute blood glucose imbalance, as this reflects inadequate control of diabetes. If there is a trend in the contributing factors (often indicating that the student is not adhering to the preventive regimen), this should be noted. Health counseling, education, or referral may be indicated.

Planning

Any student with type 1 diabetes should have an IHP and an ECP on file. The plan should allow for monitoring the student's blood glucose levels using a glucose meter. Make sure the student's primary health care provider gives you written directives to follow when blood glucose levels fall outside the normal range. These should include specific dosage for glucose, insulin, or glucagon. In students who present repeatedly with any blood glucose imbalance, the long-term plan should address adherence issues.

Prevention

Obesity has become increasingly prevalent in younger age groups, putting students at risk for type 2 diabetes. Be aware that this disease can arise in obese students who are younger than 12 years. Educating students and their families about proper nutritional habits and physical activity is an essential step in promoting good health and decreasing the incidence of diabetes.

Through education and planning, you can play an important role in helping students with known diabetes maintain near-normal blood glucose levels, thereby preventing critical episodes and such serious sequelae as kidney failure, loss of vision, and heart disease.

Hemophilia

Hemophilia is a rare congenital blood disorder that causes a deficiency in a specific clotting factor, usually either factor VIII (hemophilia A) or factor IX (hemophilia B, or Christmas disease). The disease may be mild, moderate, or severe, depending on the level of deficiency.

The disorder is inherited through an X-linked recessive gene on the maternal side. Although there are very rare exceptions, the disorder is limited almost exclusively to males.

Hemophilia is usually detected during infancy. Prolonged bleeding after circumcision may elicit the diagnosis, or there may be subcutaneous ecchymoses over bony prominences, bleeding from the oral mucosa, or a persistent pattern of ecchymosis and bleeding.

In students with hemophilia, even minor lacerations, abrasions, or hematomas may cause excessive bleeding, depending on the severity of clotting factor deficiency and the location of the injury. Internal bleeding can occur as well, especially into muscles and joints. Students with hemophilia can often sense this,

and may describe the feeling as a tingly sensation in a joint. Large intramuscular hematomas may be indicated by increased warmth or tenderness and limited range of motion in the affected area (most commonly the knees, ankles, or elbows). Additional signs and symptoms of internal bleeding may include abdominal pain, nausea, headache, dizziness, or a change in level of consciousness.

Interventions

If there is external bleeding, try to control it by applying firm pressure for 10 minutes.

Apply a cold pack to painful or swollen areas. Consult the student's ECP for other specific measures.

Triage and Transport

Emergent

Consider the student's condition **emergent** and activate EMS immediately if you note

- A change in level of consciousness
- Headache with neurologic deficit
- Signs of shock
- Uncontrollable hemorrhage
- Severe abdominal pain

Support the airway, breathing, and circulation as necessary. Place the student in the Trendelenburg position if signs of shock are present. Notify the parent/guardian.

Urgent

The following findings should be considered **urgent**:

- Acute joint swelling/pain
- Abdominal discomfort
- Moderate external bleeding that does not respond to prolonged pressure

Activate EMS as indicated; transport may be provided by the parent/guardian if appropriate.

Nonurgent

If the student has minor lacerations, ecchymoses, or abrasions that respond to direct pressure, return the student to class after bleeding stops or send home as indicated. Notify the parent/guardian.

See the *Hemophilia* protocol in *Appendix A* for an overview of triage and treatment.

Prevention

Students with hemophilia can participate in sports; in fact, exercise can help prevent bleeding, as the muscles protect the joints. Some sports are riskier than others, however. The severity of the disease should be taken into consideration when choosing a sport. Make sure the student and the parents/guardians discuss sports activities with the student's primary health care provider.

The Immunocompromised Student

A number of problems can compromise the immune system, including cancer treatment, the human immunodeficiency virus (HIV), sickle cell anemia, and immunosuppressive drugs taken by students who have undergone organ transplantation.

Whatever the etiology of immunosuppression, however, many treatment considerations are the same. Environmental modifications and precautions to minimize exposure to infection are essential to these students' long-term care plans.

Immunosuppression Associated With Cancer

Although children are subject to several forms of leukemia as well as solid malignancies, improved treatment regimens are increasing their rate of remission and cure.

Interventions may involve surgery, radiotherapy, chemotherapy, or a combination of these modalities. Parents/guardians of students with cancer are intimately involved in the child's care. They know about the anticipated adverse effects of treatment and how they will affect the child's life.

Most students with cancer are on chemotherapeutic regimens involving a combination of agents. Since these highly toxic drugs target cells that are dividing rapidly, they destroy many other cells besides those associated with the tumor, including myelogenic cells—thereby suppressing production of bone marrow.

Myelosuppression causes blood cell counts to fall after a course of chemotherapy, typically continuing for 10 to 14 days before recovery begins. Recently, medications that stimulate myelogenesis have been added to treatment regimens, promising to significantly shorten the period of myelosuppression and reduce certain side effects.

You can usually assume that a student who is in school is well enough to be there, as the pediatric oncology service keeps the family apprised of the child's blood counts: Children are permitted to attend school only when these counts reach acceptable levels.

Special considerations associated with cancer treatment

Many of the adverse effects associated with chemotherapy (and often radiotherapy) are caused by suppression of blood cell formation. Lack of erythrocytes leads to anemia; a low level of leukocytes causes

immunosuppression; and lack of platelets causes coagulopathy. Specific treatment and triage considerations (below) are associated with each condition.

Anemia

Signs of anemia include pallor at the conjunctiva, headache, fatigue, and dyspnea on exertion. Anemia is nonurgent, as the body can compensate when the hematocrit is dropping slowly, but the parent/guardian should be notified if symptoms are present. Note that hypovolemia due to blood loss is **emergent** in these students.

Immunosuppression

Fever, often accompanied by lethargy, fatigue, and irritability, is a sign of immunosuppression due to neutropenia. While this is considered an emergency in a student who is undergoing cancer treatment, it is rarely encountered in the school setting, as these children usually do not return to school until the absolute neutrophil count exceeds 1000. (The absolute neutrophil count is derived from the percentage of neutrophils in the total WBC count; for example, if the WBC count is 2000 with 50% neutrophils and polymorphonuclear cells, the absolute neutrophil count is 1000.)

Coagulopathy

Thrombocytopenia can cause coagulopathy and bleeding, which may manifest in ecchymoses, petechiae, epistaxis, or more serious bleeding. It is important to control any type of external bleeding and notify the parent/guardian to take the student for medical evaluation. Occult bleeding may also occur and may persist for some time before it is discovered. Suspect GI bleeding if a student reports abdominal pain or a history of tarry stools. A sudden change in level of consciousness, or any other neurologic change, such as gait abnormalities or severe headache, should be considered an **emergent** sign requiring immediate medical evaluation.

Special considerations associated with venous access devices

Many students who are undergoing cancer treatment have some type of indwelling venous access device, which reduces both emotional and physical trauma associated with chemotherapy and blood transfusions. The most commonly used access devices are

- Central catheters (Hickman, Broviac)
- Implanted devices (Port-a-Cath, Infuse-a-Port)
- Peripheral indwelling central catheters (PICCs)

NOTE | **Observe standard precautions before inspecting or handling any venous access device.**

Central catheters

Central catheters can have multiple lumens. They are surgically inserted through the chest and into a large vein, most often the subclavian vein. The procedure is usually performed while the student receives general anesthesia. The accessible end of the catheter protrudes from the chest and may be sutured in place. It is covered with a dressing and often appears as no more than a bump under the

shirt. The catheter is accessed through a capped pinch-clamp on the proximal end of the lumen. This should remain clamped and capped when not in use.

Implanted catheters

An implanted catheter, which is inserted in a similar manner, involves a disc-shaped device connected to a single-lumen or double-lumen catheter that's sutured under the skin of the chest. The catheter doesn't show and cannot be dislodged; however, it requires needle access, which can be painful. Older students are more likely to opt for this device, as they're able to understand that it provides reliable access and will not make them look different from their friends. There are virtually no concerns associated with this type of device unless the student is forcefully struck or jarred directly at the site. This would be cause for evaluation by the oncology team.

Peripheral indwelling central catheters

A PICC is inserted in a vein in the upper arm using radiologic imaging, then threaded deep into the vascular system. Like the Hickman central catheter, it is covered with a dressing and accessed through an external protrusion. It can have more than 1 lumen and is generally of a smaller gauge than a Hickman.

School nurses must have PICC certification to access a central catheter. The *References and Information Sources* section of this chapter points to Web sites and other sources of information on PICC certification training.

Interventions

If a student has a dislodged central catheter or PICC, save the catheter, apply pressure to the insertion site using gloves and a clean (preferably sterile) dressing, and notify the parent/guardian. Bleeding is usually slight and quickly controlled; if the site continues to bleed, however, it may require examination by the oncologist. This situation is generally nonurgent, with transport provided by the parent/guardian.

If a central venous catheter of any type is severed, clamp it with the pinch clamp or a Kelly clamp to prevent bleeding through the line. The student should be transported to a hospital, preferably the one where the student's oncology team is located. The line is usually replaced, although occasionally it can be repaired. See *Appendix B* for more information about managing catheter complications.

Additional considerations

Increased intracranial pressure

Intracranial pressure (ICP) can increase suddenly in a student who has cancer with CNS involvement. Symptoms associated with rising ICP include headache and nausea or vomiting. This condition can lead to dangerous sequelae. Notify the parent/guardian **immediately** so that the student can be evaluated by the physician.

Varicella

Varicella can have devastating effects on an immunocompromised student. Since varicella is contagious for 48 hours before any rash appears, exposure—generally defined as an hour or more spent in a room with a student who has the disease—may occur before the illness has been diagnosed. Notify the student's parent/guardian in such a case. To help prevent this situation from arising, send

a note home with the student's classmates explaining the importance of notifying you or the teacher at the first sign of varicella in the household. This holds true for any student with a compromised immune system.

Planning and education

NOTE | Intrathecal chemotherapy may change a student's cognitive abilities. An evaluation for special education services may be necessary.

Students with cancer are often more mature than their peers, simply because they have been through so much; yet they desperately want to be seen and accepted as no different from other students. Although your instinct may be to protect these students, try not to single them out for special treatment any more than the illness dictates.

On the whole, these students are subject to few medical emergencies. Work with the oncology team and the parents/guardians to alleviate any concerns you may have and provide the best possible care.

To aid the student's social acceptance, consider inviting a social worker or oncology nurse from the student's health care team to visit the school and talk to faculty, staff, and classmates, as they can allay fears and dispel misconceptions about cancer patients. Experienced professionals will know how to make the presentations age-appropriate.

Immunosuppression Associated With HIV and AIDS

The human immunodeficiency virus, a type of retrovirus, depletes T lymphocytes in the body, increasing susceptibility to communicable agents. Students with HIV are subject to heightened recurrence of childhood infections, such as otitis media, sinusitis, and infections of the integument and mucosa, which are often recalcitrant to treatment. More serious manifestations include *Candida* esophagitis, cytomegalovirus infection, *Mycobacterium avium* infection, *Cryptosporidium* enteritis, and *Cryptococcus* or *Toxoplasma* infections of the CNS. A regimen of prophylactic medication may increase the student's resistance to many of these diseases, as well as varicella and measles.

The progression from HIV to acquired immune deficiency syndrome (AIDS) can be monitored through T cell levels. Typically, diagnosis is made after the student experiences an opportunistic infection—commonly *Pneumocystis jirovecii* (formerly *carinii*) pneumonia, certain lymphomas, Kaposi sarcoma, lymphoid interstitial pneumonitis, or multiple or recurrent bacterial infections.

Additional problems that may affect the HIV-infected student or the student with AIDS include lymphadenopathy, hepatosplenomegaly, hepatitis, cardiomyopathy, nephropathy, failure to thrive, developmental delay, recurrent fever, diarrhea, parotiditis, and hematologic abnormalities, such as anemia, neutropenia, and thrombocytopenia.

Assessment

NOTE | It is particularly important to observe standard precautions during assessment and interventions.

Obtain a comprehensive and accurate health history that includes past illnesses, current medications, and immunizations. Assess the student for respiratory difficulty, fever, vomiting, diarrhea, petechiae, bleeding, and seizures or other neurologic changes.

Interventions

Notify the parent/guardian if you find any of these signs so that the student can be evaluated by the primary health care provider.

Prevention

KEY POINT

Before you develop an IHP for a student who has HIV or AIDS, be sure to find out whether the student is aware of the diagnosis.

Make sure you have a comprehensive IHP for the student. Work with the parent/guardian and primary health care provider to develop this plan. Be sure to find out whether the student is aware of the diagnosis.

Additional considerations

- Misperceptions regarding HIV and AIDS can lead to social isolation for these students. It is an essential part of your care to educate students and school personnel about how HIV is transmitted as well as the differences between HIV and AIDS.
- In sensitive illnesses of this nature, confidentiality is particularly important. Failure to maintain confidentiality can lead to serious legal repercussions.
- Be sure to notify the parent/guardian if the student is exposed to varicella or other communicable diseases.

Immunosuppression Associated With Organ Transplantation

Transplantation is now an accepted treatment modality for children with end-stage organ disease. Improved surgical techniques and immunosuppressive agents have facilitated the transition to community life following transplantation surgery, so you are likely to see younger organ recipients who are able to return to school.

The most common pediatric transplantations involve the heart, liver, and kidney. With candidates for transplantation far exceeding organ availability, however, children are 55% more likely to die awaiting a donor organ than their adult counterparts. In infants aged 1 year or younger, mortality rates are even higher.

Indications for transplantation

Liver

Two common indications for pediatric liver transplantation are biliary atresia and alpha₁-antitrypsin deficiency, a metabolic liver disease.

Kidney

Kidney transplantation is indicated in young children with end-stage renal disease secondary to congenital conditions, such as renal hypoplasia, renal dysplasia, and obstructive uropathy; among older children, genetic, metabolic, or acquired renal diseases are more frequently the cause.

Heart

Heart transplantation is indicated in children with dilated cardiomyopathy and congenital heart disease not amenable to conventional treatment.

Other

Less commonly, heart-lung and double lung transplantation may be attempted in children with pulmonary hypertension (usually associated with cystic fibrosis) or congenital heart disease.

Intestinal transplantation may be indicated in young children with short-bowel syndrome arising from such problems as volvulus, gastroschisis, and necrotizing enterocolitis.

Liver, heart, and lung transplantations are usually orthotopic: The native organ is removed and the donor organ is placed in its normal anatomic position.

In kidney transplantations, the native kidneys are usually left in place, as they may continue to produce urine and the anemia associated with chronic renal failure is more severe after a bilateral nephrectomy.

Table 13-4 summarizes additional comments.

TABLE 13-4. PEDIATRIC ORGAN TRANSPLANTATION

Organ	Incision Site	Comments
Liver	Bilateral subcostal	Cholecystectomy is performed on donor liver.
Heart	Sternal	Native right atrium remains, so two P waves are seen on ECG. Since donor heart is denervated, angina pectoris is rarely experienced, even with severe occlusive coronary artery disease.
Kidney	Flank-abdominal (long incision)	Donor kidney may be connected to iliac vessels or grafted to aorta and vena cava. It may be palpated laterally in the upper abdominal quadrants. May involve living donor.
Lung	Clamshell at 4th or 5th intercostal space	May be unilateral or bilateral.

ECG indicates electrocardiogram

Consequences of immunosuppression

Following transplantation, the student will undergo long-term immunosuppressive therapy to prevent T cells from rejecting the donor organ.

Common immunosuppressive agents include cyclosporine, prednisone, and tacrolimus (FK506). Immunosuppression increases the incidence of hypertension and opportunistic bacterial, viral, and fungal infections. Exposure to such common illnesses as varicella and influenza can compromise the student's health.

These students are susceptible to lymphoproliferative disorder (LPD), a type of lymphocytic proliferation caused by the Epstein-Barr virus. LPD can lead to lymphomas, which may resolve or regress if immunosuppressive therapy is decreased. Hypertension is associated with cyclosporine, which affects renal vasoconstriction. The student may receive captopril or nifedipine to prevent hypertension; however, the parents/guardians are cautioned to monitor blood pressure closely, measuring and recording it at least twice a day.

Assessment

Rejection and infection are the most common health problems seen in organ recipients. Both present similar nonspecific symptoms, including fever, malaise, and anorexia; positive diagnosis is based on physical examination, laboratory tests, and sometimes tissue biopsy, in the case of rejection.

Initial (ABCDE) assessment

NOTE | When performing a physical assessment, always observe standard precautions to prevent exposure to body fluids.

After you have completed the scene safety and across-the-room assessments described in Chapter 3, perform a rapid initial assessment of the airway, breathing, circulation, disability (neurologic status), followed by a brief exposure. If possible, gather history information as you go.

Remember that it is essential to perform interventions for significant problems **before** moving on to the next step of the assessment. Be prepared to activate EMS at the earliest sign of an emergent situation.

History and pain assessment

SAMPLE history

Use the **SAMPLE** mnemonic to guide the focused history. The following points are critical:

Symptoms

Ask the student to describe the problem, including how long ago it began. Get the student's impression of whether the problem is typical of past illnesses associated with the primary disorder or its complications. Note whether the student has recently experienced dyspnea, pain, fever, vomiting, or diarrhea.

Allergies

If the student has a history of allergies, determine whether the student may have been exposed to a known allergen.

Medications

Ask what immunosuppressive agents the student takes, when the last dose was given, and whether the student has missed any doses because of vomiting. Note any additional prescribed or over-the-counter medication taken.

Past health history

Make sure the student's health record accurately reflects the date and location of the transplantation and the organ transplanted. Update the student's health history with any recent changes involving the primary illness or complications associated with immune problems.

Find out whether the student has been exposed to a viral or bacterial infection and whether immunizations are up-to-date. Organ recipients may fall behind in their immunization schedule. In general, these students cannot receive any live-virus vaccine, such as the measles-mumps-rubella vaccine, due to their heightened susceptibility to vaccine-related infection.

Last food or drink

Document what the student ate that day and when. Note any dietary restrictions. Also ask whether bowel and bladder function are normal.

Events leading up to the incident

Ask about events leading up to the health office visit and any factors that could have precipitated the current problem.

Pain assessment

Follow the history with a pain assessment, using a developmentally appropriate numeric or visual pain scale (Chapter 3).

Focused physical examination

The physical examination can be limited or complete (head-to-toe) as dictated by the student's condition and applicable protocols. At minimum, record a complete set of vital signs. If possible, include temperature, weight, and blood glucose level.

Inspect the mouth for bleeding, gum hyperplasia, and ulcerations. Palpate the neck for enlarged lymph nodes. Check for abdominal distention and palpate for areas of pain or discomfort. Assess for muscle weakness and inspect the skin for rashes, lacerations, or hirsutism. Measure the student's temperature.

Interventions

In most cases, your interventions will be limited to making the student comfortable and notifying EMS or the parent/guardian, as appropriate, to provide transport. Consult the student's health record and ECP for medication orders and specific instructions regarding appropriate interventions.

NOTE Every immunocompromised student should have an IHP, ECP, or both (see Chapter 14). Names and contact information for the student's primary health care provider and specialty care team should be listed, together with a summary of the current immunosuppressive regimen.

Triage and transport

Most health office visits by immunocompromised students do not involve emergent complaints; however, any significant complaint should be triaged, at minimum, as **urgent**. These students are followed closely by their primary health care providers or specialist teams; changes in their health status should be evaluated promptly in case additional measures are indicated.

Emergent

The triage category is **emergent** if the student has

- Compromised airway, breathing, or circulation
- Seizure activity or neurologic abnormalities
- Significant pain

Urgent

Consider the student's condition urgent if you note fever, malaise, vomiting, or diarrhea.

Nonurgent

As a rule, immunocompromised students with substantial complaints should not be triaged as nonurgent.

Documentation and data collection

All assessment and history findings should be documented in the student's health record together with a summary of the student's perception of the problem. Follow-up with the primary health care provider or specialist should be documented as well.

Prevention

Preventing infection is a key component in keeping immunocompromised students well. They should be isolated from other students or school personnel who have communicable diseases. Notify the student's parent/guardian in the event of a varicella outbreak.

Promote good hand-washing techniques among all those in contact with the student to prevent the transmission of disease.

A student with a donated organ experiences anxiety on 2 fronts: organ rejection and peer rejection. Lack of adherence to the immunosuppressive regimen may become an issue among older students as they become increasingly sensitive about following a special routine that sets them apart from their peers. It is essential to help these students reconcile themselves to their regimens. Among sexually active adolescents, it is important to provide education about contraceptive choices, which are limited by their medication regimen and their increased infection risk.

Sickle Cell Anemia

Sickle cell anemia is a genetic disorder. The trait is recessive, so a child must inherit the sickle cell trait from both parents to develop the disease. Sickle cell

disease occurs primarily in people of African descent; 1 in about 12 African Americans carries the sickle cell trait, and 1 in 400 is affected by the disease.

Pathophysiology

The manifestations of sickle cell disease are caused by defective hemoglobin known as *Hb S*. Although the disease is present at birth, during the first 4 to 6 months of life, Hb S is blocked by fetal hemoglobin. After that, fetal hemoglobin production generally ceases and symptoms may begin to arise.

When Hb S is deoxygenated, the normally biconcave erythrocyte converts to a sickle shape, resuming its former shape on reoxygenation. Repeated cycles of deoxygenation and reoxygenation irreversibly damage the cell membrane so that the erythrocyte remains sickled and the surface grows rigid. Sickled erythrocytes cause pain and ischemic damage when they occlude small blood vessels. They are fragile, living an average of only 10 to 20 days (compared with about 120 days for a normal erythrocyte), and many of them are destroyed in the spleen. A chronic shortage of erythrocytes leads to anemia.

Sickle cell crisis

The most common findings in sickle cell disease are related to vaso-occlusive crises, involving pain in the extremities, back, chest, or abdomen. These episodes typically begin around the age of 4 or 5 years; frequency and severity varies widely. A crisis can be triggered by

- Fever
- Infections, including the common cold
- Environmental temperature extremes
- Increased physical activity
- Dehydration
- Malnutrition
- Menses
- Pregnancy and childbirth
- Emotional stress

Pain is usually severe and continuous during a crisis, persisting for 2 to 6 days. Tenderness and edema can be elicited over the joint, indicating a bone infarct that is the source of the pain. Moderate to severe abdominal pain may be present, and must be differentiated from other emergent causes of abdominal pain.

There are 2 major syndromes in which anemia reaches critical levels:

Splenic sequestration syndrome

Usually occurring in children younger than 5 years, *splenic sequestration syndrome* is associated with acute splenomegaly following a bout of communicable illness. Blood pools in the enlarged spleen, hemoglobin levels fall, and shock sets in. This is the primary cause of death in young children with sickle cell anemia.

Aplastic crisis

KEY POINT

Parvovirus B 19 (fifth disease) causes aplastic anemia in students who have sickle cell disease. Notify parents/guardians when there is a case of fifth disease at school.

An *aplastic crisis*, which can occur at any age, is associated with the abrupt cessation of bone marrow production for 5 to 10 days, again following an infection. In the absence of hemopoiesis to replace the short-lived sickled erythrocytes, anemia is likely to reach life-threatening levels. Parvovirus B 19 (fifth disease) can lead to aplastic crisis. Notify parents when there is a case of fifth disease in the school.

Morbidity and mortality

Most of the complications associated with sickle cell disease are caused by chronic anemia and the ischemic damage that results when sickled erythrocytes occlude local circulation to tissues, notably in the liver and spleen. Some degree of liver dysfunction arises in nearly all cases, causing jaundice and hepatomegaly. The liver becomes palpable and tender.

Damage to the spleen, which filters bacteria from the blood, leaves these children highly susceptible to infection; this contributes to episodes of sickle cell crisis. Other problems that can trigger a sickle cell crisis include physiologic stress due to dehydration or exposure to environmental extremes.

Neurologic sequelae of sickle cell crises may include seizures, meningitis, subarachnoid hemorrhage, or cerebrovascular accidents (CVAs). CVAs commonly affect children aged 6 to 7 years, with a 50% recurrence rate.

Acute chest syndrome is a life-threatening condition characterized by chest pain, dyspnea, fever, cough, and hypoxemia. It can be triggered by a pain crisis, respiratory tract infection, or occlusion of pulmonary blood vessels by thrombi, sickled erythrocytes, or bits of bone marrow.

Sickle cell anemia also increases the likelihood of

- Gallstone formation during childhood and adolescence
- Orthopedic abnormalities (osteoporosis, bony necrosis, osteomyelitis)
- Delays in growth and sexual maturation
- Visual impairment or blindness
- Ulcerations of the lower extremities
- Frequent pulmonary infections and infarctions
- Pain and edema in any joint or organ
- Priapism
- Septicemia

Although improved treatment regimens have extended the potential lifespan for those with sickle cell anemia, it is still a fatal disease. Mortality correlates with the severity of the disease: An individual who experiences frequent crises each

year is likely to die sooner than one who experiences few crises. About half of those with sickle cell anemia survive into their 40s.

Long-term Management

The following regimens may be used to treat or prevent complications of sickle cell anemia:

Blood transfusions

A student who experiences a CVA will receive monthly blood transfusions for at least 5 years. Those at particularly high risk may continue the regimen indefinitely.

Prophylactic antibiotics

To minimize infections, infants are given penicillin daily from the time of diagnosis until the age of 5 years. Those who undergo splenectomy require lifelong antibiotic prophylaxis.

Folic acid

Part of the B-vitamin complex, folic acid has hemopoietic effects and is particularly important for those with dietary deficiencies.

Immunizations

In addition to the regular schedule of pediatric vaccinations, children with sickle cell disease receive polyvalent pneumococcal vaccine.

Assessment

When a student with sickle cell anemia reports to the health office, always complete an initial (**ABCDE**) assessment, with particular attention to breathing. Respiratory distress may indicate acute chest syndrome or a respiratory infection.

The student's chief complaint is usually pain. Joint and bone pain results from bone infarcts. Moderate to severe abdominal pain may also be present; when evaluating this factor, however, remember to consider other possible causes besides sickle cell crisis.

During the focused physical examination, be sure to check for

- Fever
- Painful edema of the hands or feet
- Pain and tenderness in the abdomen
- Pallor and lethargy with signs of internal hemorrhage
- Limping, paresis, or other findings compatible with stroke or neurologic deficit

Interventions

If the student is alert and able to drink, provide oral hydration at the rate of 4 to 8 ounces of fluid per hour. Allow the student to rest with the affected extremity elevated. Consult the student's IHP or ECP for additional information.

NOTE | Do not apply cold packs to painful joints, as this will increase sickling!

Triage

KEY POINT

Prompt analgesia is crucial for a student experiencing extreme pain during a sickle cell crisis.

Early intervention is crucial for students with symptoms of sickle cell crisis. Pain related to vascular occlusion is extremely severe. A student experiencing a crisis needs prompt analgesia, often in the form of intravenous narcotics, and may require IV fluids as well. The student may be admitted to the hospital until the crisis has passed.

Emergent

The condition is **emergent** if the student exhibits fever exceeding 100°F/37.8°C, severe pain, seizures or neurologic deficits, signs of shock or dehydration, dyspnea or signs and symptoms of impending respiratory collapse. Activate EMS and await emergency transport. Notify the parent/guardian as soon as you are able to do so.

Urgent

In most cases, other presentations (low-grade fever, mild to moderate pain) will be considered **urgent**. Notify EMS or the parent/guardian to take the student for prompt evaluation.

See the *Sickle Cell Anemia* protocol in *Appendix A* for additional information.

Prevention

Because the spleen is impaired in sickle cell anemia, classmates and teachers should be aware that the student must avoid activities that could lead to abdominal injury, such as football or other contact sports. The student is also at increased risk for infection, which can trigger sickle cell crisis. Protect the student from individuals with contagious illness.

A well-balanced diet and adequate hydration are crucial factors in maintaining optimum health. Encourage students with sickle cell disease to consider good eating habits part of their therapeutic regimen.

Students who experience frequent crises may come to be viewed as drug seekers because of their recurring need for narcotic analgesia. As a health educator, you need to help school personnel understand the disease process and its ramifications. It is extremely important for faculty and staff to regard the acute pain associated with sickle cell crisis as grounds for immediate medical referral.

Students with sickle cell anemia may be absent from school more than well students, so they often require extra support and guidance.

Students With Special Needs

Students with special needs comprise a diverse group, encompassing those with physical disabilities, mental disabilities, and chronic illnesses. These students may require the support of technologic devices; they are likely to need emergency care more often than their peers, and may have atypical baseline assessment findings. In sum, these students present unique assessment and treatment challenges. Yet providing support for their medical needs can be extremely rewarding.

The educational system is fraught with complexities for these students and their families. How successfully they deal with the system and how well it meets their needs can influence their academic success and their future success in society.

The following tips are helpful when students with special needs attend your school:

- Use age-appropriate guidelines for assessment and intervention.
- Focus on the student's abilities rather than disabilities. This emphasis promotes self-esteem and a positive self-image.
- Communicate in a manner appropriate to the student's abilities. A physical disability does not necessarily mean that the student is cognitively impaired.
- Meet with the parents/guardians and obtain a careful, detailed history. Their assistance in interpreting behaviors and responses can give you a better understanding of the student's needs.
- Develop an individualized health care plan, emergency care plan, or both for each student.
- Become familiar with respiratory emergency adjuncts and interventions. Respiratory problems are the most prevalent emergencies these students experience.
- Obtain a release of information to maintain contact with the student's primary health care provider.

Review your school's readiness to manage the emergency care of these students. Ensure that there are always others on site who have current certification in first aid and CPR, especially during times when you are not available. Be sure to meet with your local EMS agency to review unique student health care needs within your school population and discuss potential emergency care issues requiring EMS response. With consent from the parents/guardians, give EMS agencies copies of student ECPs to keep on file.

Summary

Thanks largely to improved treatment modalities, more children with significant health problems are living in the community and attending school. Through your understanding of their unique health conditions, you can help these students accept and adapt to health challenges they may face at school. It's important to develop individualized health care plans and emergency care plans for each of these students and communicate fully with their parents/guardians and health

care providers. You may also need to educate teachers, classmates, and school staff to allay misconceptions and enhance awareness of medical complications that may arise at school as well as precautions and therapeutic regimens the student must follow.

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14

Planning for Students With Special Needs

On completing this chapter, you will be able to

- Understand the federal laws that affect students with chronic health conditions or physical impairments.
- Develop an individualized health care plan, an emergency care plan, or both for students who have special needs.
- Understand how the Individuals With Disabilities Education Act, the Americans With Disabilities Act, and Section 504 of the Rehabilitation Act relate to the various care plans.
- Understand the implications and special challenges posed by pediatric do not resuscitate orders.

Your Role in Planning for Special Care

Advances in medical technology, health care, and pharmaceutical agents have made it possible for increasing numbers of students with special needs to attend school. School nurses must be ready to provide care for students with such medical conditions as asthma, cancer, diabetes, genetic disorders, immunologic disorders, life-threatening allergies, neurologic disorders, mental health disorders, and orthopedic disorders. Some students with disabilities require complex medical interventions; they may rely on medical devices or specialized equipment to function within the school setting.

Federal Legislation Affecting Student Care in School

Appropriate school staff must be available to provide safe and effective medical management for students who have chronic physical, developmental, behavioral, or emotional conditions. This may require special accommodations, medical interventions, specific precautions, or emergency treatment. Schools are mandated to provide these accommodations through 3 key federal laws:

The Individuals With Disabilities Education Act of 2004

The Individuals With Disabilities Education Act of 2004 (IDEA) governs special education services. The Act provides federal funding to ensure free and appropriate public education in a safe, inclusive environment for students with specific disabilities that adversely affect educational performance. Currently, there are 13 specific categories under which a student may be eligible for these services. Individualized education programs (IEPs) must be developed for students who qualify.

Your role within this framework is to make sure that students who are covered by the Act are receiving the health services they need.

NOTE | In Illinois, a properly credentialed nurse with Illinois Type 73 certification as a related service provider must be available to review the student's health history and develop any necessary health care plans and goals for the IEP.

The Americans With Disabilities Act of 1990

The primary function of the Americans With Disabilities Act (ADA), a civil rights law, is to ensure that the physical structure of the school is accessible to students with disabilities. The Act provides for specific adaptations in such areas as classrooms, washrooms, playgrounds, and buses. ADA laws are not supported by federal funding.

The Rehabilitation Act of 1973, Section 504

The Rehabilitation Act of 1973, another civil rights law, prohibits discrimination against individuals who have disabilities. Section 504 of the Rehabilitation Act addresses the many disabilities not covered under IDEA, guaranteeing accommodations for students whose physical or mental impairments substantially limit one or more significant activities of daily living. These include such functions as self-care, walking, seeing, speaking, learning, working, hearing,

and breathing. Although Section 504 applies to all schools that receive federal funding, the schools must bear the cost of making the necessary accommodations.

Plans That Address These Mandates

You have an important role in developing care plans that meet federal or local mandates and provide for each student's individual needs. This chapter describes 3 important types of care plans:

Individualized health care plans

An individualized health care plan (IHP) is a variation of a nursing care plan. It outlines specific health care services to be provided in the school setting for students with chronic health conditions. The plan is written with the intent that the student will achieve specific outcomes.

Emergency care plans

The emergency care plan (ECP) is an adjunct to the IHP. It provides a plan of action for specific medical emergencies the student may experience.

504 accommodation plans

A 504 plan is written for qualified students who have health-related disabilities that require special accommodations but are not covered under IDEA. These accommodations may apply to the environment or instruction in the regular classroom.

Individualized Health Care Plans

An individualized health care plan should be developed for any student who

- Has a complex health condition
- Takes medication at school
- Requires environmental modifications in order to attend school

Environmental modifications include those necessary for the student to participate in field trips and school-sponsored activities as well as safe, swift evacuation during an emergency.

Developing the Plan

KEY POINT

Developing an individualized health care plan is a nursing function that cannot be delegated.

Developing an IHP is a nursing function that cannot be delegated. It involves working collaboratively with teachers, the parents/guardians, the student, and the student's health care providers. The plan should specify any nursing care that is necessary to manage the student's health conditions at school and support academic success. The IHP reflects the nursing process and includes the elements described below.

Assessment/history

Assessment data should encompass both subjective and objective information specific to the student's medical diagnosis. For example, a student with diabetes requires different assessment data from a student with scoliosis.

An essential part of the assessment is a comprehensive health history that covers pertinent family history and lifestyle factors. Since the parents/guardians know their child best, be sure to involve them in this process. Ask them for appropriate releases so that you can obtain relevant information from the student's primary care provider and any specialists involved in the student's care as well.

KEY POINT

A comprehensive health history is essential in developing an IHP. Remember that a good history starts with good questions.

Remember that a good history starts with good questions. Inquire about

- Syndromes and diseases
- Baseline abilities
- Actual and potential health concerns
- Specific medical orders to be implemented during school hours
- Medical devices and medications
- Baseline vital signs, particularly if they are unusual
- Allergies

A standardized form may make it easier to gather complete, consistent information.

Nursing diagnosis

Use the assessment data to formulate and apply a nursing diagnosis that correlates with the student's needs. This will help you organize the plan, focus on important aspects of the student's condition, and create goals.

Outcome identification

Written outcomes (goals) provide benchmarks for evaluating the student's progress. Outcomes should be specific, measurable, and **achievable**, reflecting the most desirable state the student may realistically attain. Outcomes are written as statements; for example,

Juan will recognize and respond appropriately to the signs and symptoms of hypoglycemia 2 out of 3 times.

Both short-term and long-term outcomes may be developed. If applicable, they may be used as goals in the student's IEP as well.

Planning

Using information from the assessment and nursing diagnosis, develop specific, goal-oriented nursing interventions that will achieve the desired outcomes.

Clearly define how nursing actions will be implemented and how data will be collected and used.

Implementation

Using lay terms, create a version of the IHP to give to the teachers and other school personnel who may have a role in implementing the plan. Permission from the parent/guardian is necessary before sharing this information with others. Provide for documentation of care delivered outside the health office.

Evaluation

Evaluate the effectiveness of the plan at regular intervals, making changes as necessary and noting progress toward the identified outcomes. Update the information if there is a change in the student's health care needs as well. This is an ongoing process.

Using and Maintaining the Plan

If the student qualifies for special education and related services, a copy of the IHP can be attached to the IEP as an addendum. Certain IHP goals and outcomes may be written into the IEP by a properly credentialed nurse. (In Illinois, this requires Type 73 certification as a related service provider.)

KEY POINT

IHPs are only as useful as the information they contain. Create a detailed plan and update it regularly.

Remember that IHPs are only as useful as the information they contain. Take the time to create an accurate, detailed IHP. Review it regularly to ensure that the information is always current and relevant. Update the IHP any time the student's condition changes. The information in the IHP will be especially valuable

- When another nurse substitutes for you
- If you move to another position
- If the student moves to another school

Emergency Care Plans

Where the IHP is a comprehensive plan that focuses on the student's daily needs, the emergency care plan provides specific directions for handling life-threatening incidents. The ECP may be included in the IHP. You should have an ECP on file for any student who has a health condition that could require emergency intervention.

Write the plan in clear language that is free from technical terms so that it will be understood by anyone who may need to follow its instructions. Refer to these plans when you train staff members to take appropriate action in the event of an emergency.

KEY POINT

In schools that do not have a full-time nurse, the emergency care plan becomes a document for delegation of care.

Like all sensitive health documents, ECPs should be kept secure; however, they must also be readily accessible to authorized staff members when you are not immediately available: In schools that do not have a full-time nurse, the ECP becomes a document for delegation of care. As such, it must conform to state and local laws and policies. See Chapter 2: *Legal Issues in Nursing* for more information about delegation of duties.

What to Include in the ECP

In general, an ECP should include

- Relevant information about the student’s medical condition, medications, allergies, and necessary equipment and supplies
- Identification of initial and progressive signs and symptoms that signify an exacerbation of the student’s condition
- Step-by-step action for each presenting problem
- The appropriate response for escalating situations
- A chain of command for managing the emergency at school
- Information about contacting the parent/guardian as well as a secondary contact person
- Information about contacting primary care physicians and specialists for consultation
- A request for transport to a specific ED for specialized care

Developing and Using the ECP

Like the IHP, developing an ECP is a collaborative effort involving parents/guardians, teachers, care providers, and local EMS providers. The specific steps are described below.

Collect information

Discuss the student’s current health status with the parent/guardian, noting health problems that may require emergency interventions at school. Obtain a release of information so that you can discuss the student’s health and developmental status with primary and specialty care providers, school staff, social agencies, and the student as appropriate. It is essential to include the hospital ED staff and community first responders in the process as well.

Confirm the information

Clarify and resolve any problems with the proposed interventions. Ensure that it is within the school’s capabilities to carry out the plan, including allowances for transportation and off-campus activities.

Prepare the ECP

Write the plan in action terms using the following format:

If (*specific contingency*) is noted, then do

(*step 1*)

(*step 2*)

(*step 3*)

Identify specific individuals on staff who are expected to carry out these steps.

NOTE You may also wish to complete a standardized emergency information form (EIF), such as the *Emergency Information Form for Children With Special Needs* included in *Appendix B*, to organize and distribute key baseline medical data and instructions for caregivers.

Instruct the staff

Provide in-service education as needed on the nature of the student's health problem, specific signs and symptoms of an impending emergency, specific actions to take or interventions to provide, and appropriate follow-up procedures. Staff competency performance and documentation. Make sure potential responders know where to find the ECP and any special equipment they will need.

Provide for access to the ECP

Personnel designated to implement any ECP plan must be able to find a specific plan quickly. It is usually efficient to file ECPs alphabetically in a special binder. Securely store copies of the binder in the health room, the central office, and the student's classrooms.

If the risk of a life-threatening emergency is high and the necessary interventions are complex, the student should carry a copy of the ECP as well. Permission from the parent/guardian is necessary before sharing this information with others, including the student.

Monitor the student's progress

Review and update the ECP

- At regularly scheduled intervals
- Any time there is a significant change in the student's condition
- Any time the student changes care providers
- Any time the plan is implemented

Evaluate the plan's effectiveness with the parent/guardian and determine whether modifications are needed.

NOTE | Some school districts require administrative review of all special care plans before they can be shared with the student's parent/guardian. Familiarize yourself with the policy in your district.

Communicate with the parents/guardians

Make sure the parent/guardian understands the importance of telling you about changes in the student's condition or care. Establish a specific method of communication between school and home. *Appendix B* includes a sample letter for communicating with the parent/guardian, forms for recording the student's current health status, and an example of a completed ECP.

Coordinating With EMS

KEY POINT

Meet with your local EMS coordinator to discuss special considerations for dispatch, equipment, and evacuation of students with special needs.

Developing an ECP provides an opportunity for preplanning with your local EMS coordinator. You may want to discuss special dispatch considerations, equipment needs, and evacuation of the student based on the medical condition involved and potential emergency situations. (See Chapter 1: *Your Role in Emergency Care* for additional information on working with EMS; Chapter 15: *School Emergency Response and Crisis Management* includes information on evacuation planning and procedures.)

Do not resuscitate orders

If the student carries a *do not resuscitate* (DNR) order, it is particularly important to discuss it with EMS responders. The ECP should give specific directions regarding

- Permitted response to cardiac arrest or respiratory distress
- Transport destination (hospital or home)
- Who will pronounce death

The DNR form can be kept with the ECP. More information appears later in the *Do Not Resuscitate* section.

504 Plans

Identifying Students Who Qualify for a 504 Plan

Schools have a legal duty to identify students with disabilities. This can be relatively simple in the case of prominent physical disabilities, but not all disabilities are obvious. To identify the potential for less obvious disabilities, each student's performance in both academic and nonacademic school activities must be monitored.

Section 504 of the Rehabilitation Act of 1973 defines an individual with a disability as anyone who

- Has a physical or mental impairment that substantially impedes at least one major activity of daily living
- Has a record of this impairment
- Is regarded as having an impairment as defined in Section 504

Your role in this process is essential, as your assessment of the student is key in determining whether Section 504 applies. Schools must make reasonable accommodations—defined as those that are not unduly expensive and do not interfere with the learning of others—for those students who are covered under this Act. The local school district must bear all costs incurred in implementing necessary care. Your school district must designate an employee who will be responsible for ensuring that the district complies with this Act.

Developing and Using the 504 Plan

The following steps are typical in developing a 504 plan:

1. A request for Section 504 consideration comes to the appropriate school administrator from the student's parent/guardian, the school nurse, a teacher, or a community agency.
2. A team is convened, composed of the student's parents/guardians and teachers, the school nurse, other appropriate school personnel and administrators, and the student (if appropriate), to discuss the presenting problem and previous interventions.
3. Accommodations to the regular education program are developed and documented in the 504 plan.

What to include in a 504 plan

The following information should be included in any 504 plan:

- The reason for concern
- The basis for determining disability
- How the disability affects ADLs
- Services, assistive devices, and accommodations the student will require
- A date for review and reassessment of the plan's provisions
- A list of all individuals involved in planning, including their names and titles
- The name of the student's case manager, together with contact information

KEY POINT

For students with 504 plans, make it a priority to implement the care plan within the regular classroom environment.

As school nurse, you will work with the team to plan all necessary health care services. Keep a written record of the plan and review the information annually or

when the student's needs change. Make it a priority to implement the student's care plan within the regular classroom environment as appropriate.

Special Situations

Do Not Resuscitate Orders

Do not resuscitate orders are written medical directives that limit or prohibit emergency treatment for an individual who is experiencing respiratory or cardiac arrest. They are usually associated with adults suffering from terminal illness, but a parent/guardian may request a DNR order for a terminally ill child. A student who has DNR orders may wear an identifying accessory, such as a bracelet, or carry a special form or identification card.

The rising incidence of DNR orders for children has brought this issue to the forefront in schools. It's important to familiarize yourself with state laws regarding DNR orders and how these laws affect you. If your school has no policy of its own regarding DNR orders and you have a student in school who carries one, you must determine how the student's rights will be preserved if clinical death occurs in the school setting.

What must be included

To be valid, a DNR order **must** be issued in writing by the student's primary care provider. It must include, at minimum, the following information:

- Name of the student
- Name and signature of the physician
- Effective date
- The words *do not resuscitate*
- Signature documenting consent by one of the following:
 - The student, if legally empowered to consent
 - The parents/guardians
 - An individual holding a durable power of attorney for health care
 - A surrogate decision-maker

The document must contain no abbreviations and must be currently valid. In Illinois, the form is considered valid **unless** the order is physically destroyed or verbally rescinded, either

- By the physician who signed it, **or**
- By the person who gave written consent

Illinois employs a universal DNR form for prehospital use, which is reproduced in *Appendix B*. This form must accompany the student to the hospital.

Understanding the provisions

KEY POINT

A DNR order does not prohibit all care, but rather provides for comfort measures while limiting resuscitative interventions.

A DNR order does not prohibit all care, but rather provides for comfort measures while limiting resuscitative interventions. This may conflict, however, with the school's written protocols regarding cardiopulmonary arrest. A student who is subject to a valid DNR order cannot be excluded from public school; therefore, you must collaborate with the school medical adviser and nursing staff to establish a protocol for managing these students in compliance with applicable laws.

The student's ECP should list specific action steps permitted in such situations as respiratory distress or cardiac arrest. The plan should specify the student's transport destination and the individual who will pronounce death. The parents/guardians are responsible for working with EMS to develop a transport plan in keeping with local and state protocols. Convene a team meeting to explain the ECP to school staff members.

Pediatric DNR orders have created evolving legal situations in many school districts, and many states have sought legal guidance about handling these orders. Be sure to incorporate state statutes or guidelines into your emergency protocols for students with DNR orders.

Summary

When students with special needs attend school, it is important to have appropriate records, forms, and care plans on hand that address their specific needs. Familiarize yourself with school policies regarding the development, approval, review, and maintenance of all special care plans.

Individualized health care plans act as a framework to help you maintain personalized care instructions for students who have special medical needs or disabilities. The IHP helps to encourage goal-setting with measurable outcome criteria.

An emergency care plan is a valuable adjunct to the IHP, setting forth specific, step-by-step instructions for student care during an emergency.

Section 504 regulations ensure the availability of appropriate accommodations for students who have disabilities that do not qualify for special education services, allowing these students access to the same educational opportunities as their peers.

Once the plans have been created, they must be filed with the student's health records, reviewed regularly, and accurately maintained to ensure optimum care.

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15

School Emergency Response and Crisis Management

On completing this chapter, you will be able to

- Describe situations that constitute a disaster at school.
- Describe the 4 phases of emergency planning.
- Understand the general concepts of the Incident Command System.
- Describe key differences between routine triage and mass-casualty triage.
- Discuss your role and nursing responsibilities during and after a school disaster.
- Discuss the composition and activation of the crisis response team.
- Understand the ways in which students are more vulnerable to terrorist weapons than adults.
- Identify specific issues that must be addressed in the emergency response and crisis management plan to accommodate students with special needs.

Introduction

School nurses today must be prepared to deal with situations in which many people—students, staff, and members of the community at large—are simultaneously afflicted with illness, injury, or emotional trauma.

Disasters and other emergencies—from floods to epidemics, from chemical warfare to technology failure—are a reality in the modern world.

School communities may be affected not only by critical incidents within their own facilities, but also by regional disasters in which the school is a designated response site. School facilities may serve as a temporary shelter for those who have been displaced, a reunification point for families that have been separated, a staging area for mass prophylaxis—even as a temporary morgue.

The emotional impact from loss of life, livelihood, or property that disasters leave in their wake affects everyone who works in or attends the school, as well as immediate and extended families and friends.

As school nurse, you have vital responsibilities throughout the continuum of an unfolding disaster. Your role begins with involvement in planning efforts and preparedness activities, such as school drills; continues through delivery of immediate care during the actual emergency; and extends into recovery efforts, as normalcy is restored and the business of daily living resumes.

Chapter 1: *Your Role in Emergency Care* examined issues involved in providing immediate care to students during individual health emergencies. This chapter examines your role when a larger incident affects the school or the community at large.

Defining Disaster

Many terms—essential commonalities

Many terms are used to define and describe a catastrophic event; for example, emergency planners and EMS agencies may use such terms as *disaster*, *crisis*, *multiple-casualty incident*, or *mass-casualty incident*. But all of these terms refer to an emergency situation that overwhelms readily available resources and disrupts the local community.

It's best if all of the entities that must coordinate their efforts during a critical event use a common vocabulary for essential communications, and many government organizations have made this a priority. This effort is still evolving, however. For now, this chapter uses the following terms, which have been designated for school emergency planners in Illinois:

- *Emergency response* refers to the group of measures that are deployed when internal or external disasters threaten to overwhelm school resources.
- *Crisis management* refers specifically to emotional and psychological support that is provided to students, staff, and families during and after a disaster.
- The overall plan that schools develop to prepare for disasters is referred to as the *emergency response and crisis management plan*.

This plan should outline a structured approach for managing disasters of any scope at school and provide guidance for the recovery process while seeking to minimize morbidity and mortality.

NOTE | The *emergency response and crisis management plan* is separate from a school's *general safety plan*. It's important to familiarize yourself with both plans.

Categorizing disaster

Schools are vulnerable to both internal and external disasters. The types of incidents that can result in a disaster will differ from one school or district to the next, depending on local geography, climate, emergency resources, socioeconomic issues, and numerous other factors.

Disasters are often categorized according to their origin, for example:

Natural disasters

Natural disasters involve destructive physical forces that are largely beyond our control, including tornadoes, hurricanes, ice and snow storms, severe thunderstorms, wildfires, floods, and earthquakes.

Disasters of human origin

Unintentional disasters of human origin may arise out of significant industrial or engineering failures, structural collapse, or human error. Examples include explosions, chemical spills and other release of hazardous materials, and transportation crashes.

Deliberately engineered disasters of human origin range from arson, acts of sabotage, hostage-taking incidents, and riots, to bombings and deployment of chemical, biologic, radiologic, or nuclear weapons.

Technology-related disasters may be of intentional or unintentional origin, and often arise as the secondary result of damage caused by an evolving disaster. These are situations in which the technology that supports business, commerce, government, or critical services is disrupted, threatening essential infrastructure. The repercussions of a failure in a major power grid, communications network, municipal water system, or waste disposal plant may include destruction of property or vital records and loss of life.

Pandemics

The likelihood that a global outbreak involving a new disease against which we have no natural resistance is a matter of increasing concern. Many scientists and research organizations believe that it is only a matter of time before such a situation arises, with potentially catastrophic consequences.

Planning for Emergencies

KEY POINT

Preparing for disasters requires a comprehensive schoolwide emergency response and crisis management plan.

Disasters can occur with little or no warning; when they strike, the outcome will depend on local preparedness. Your health care background and professional standing make you a key contributor in the development of an emergency response and crisis management plan.

Tailored to the unique needs of schools within your district, the plan should strive for flexibility to

- Accommodate all hazards, from fires to natural disasters; from terrorist activities to youth violence
- Accommodate emergencies of any scope
- Incorporate contingency plans in case the primary plan should fail

Preparing to meet the challenges of a wide variety of situations is essential in realizing the best possible outcome when an emergency arises.

Building Coalitions for Integrated Response

KEY POINT

Developing a comprehensive emergency response plan is a team effort. As a health professional, you are a valuable resource in this process.

Developing a comprehensive plan requires collaborative work with school administrators and staff, the local medical community, law enforcement officials, the EMS coordinator for your area, and regional EMS providers.

Collaborate within the school

Your input is extremely valuable throughout the process, and you should seek out opportunities for involvement in planning meetings. Work with school and district administrators, teachers and support staff, and the school medical adviser (as applicable) to develop a comprehensive plan. Consider including parents/guardians in the planning process as well.

Collaborate with law enforcement and EMS agencies

Your work with local law enforcement officials and EMS agencies can provide a lifesaving link with community resources. It is particularly important to

- Find out about the capabilities, limitations, and functions of responding agencies, including projected response times, intervention capabilities, and transport protocols.
- Encourage the school planning committee to share copies of site plans for school buildings with first responders. Designate the access points responders should use to enter the buildings and collect casualties. Alternative entrances should be specified in case the primary entrance is compromised.

NOTE | Make sure that exterior doors are sequentially numbered.

- Keep agencies up-to-date about students with special needs who are attending the school. As appropriate, ask parents/guardians for consent to share necessary information from the student's individualized health care plan (IHP) and emergency care plan (ECP).

- Conduct drills with law enforcement and EMS agencies to test traffic patterns and identify potential trouble spots involving ingress and egress during a large and complex disaster.

Collaborate with your local health department

Your local health department can serve as a valuable planning partner. Ask representatives to review and evaluate your school's emergency response and crisis management plan. Discuss your response to various natural disasters, communicable disease outbreaks, and acts of terrorism. Make sure you have ready access to contact information for your liaison at the local health department.

NOTE | A comprehensive plan will include processes for collaborating with media partners and the community. Know the name of the media liaison who has been designated to communicate school needs and updates during an emergency.

Understanding the National Incident Management System

After the September 11, 2001 terrorist attacks, the first Homeland Security Presidential Directives were issued to address the need for a unified national approach to domestic incidents. The National Incident Management System (NIMS), which operates through the Federal Emergency Management Agency (FEMA), is one outgrowth of these directives.

NIMS provides a consistent framework for emergency response that is based in part on an *Incident Command System* (ICS). ICS is an *all-hazard* incident management concept, meaning that it is

- Flexible enough to accommodate a variety of emergency situations
- Modular in structure to permit expansion and reduction of the response force as the situation evolves

During an emergency incident, ICS establishes consistent, clearly defined roles and responsibilities that apply across all responding agencies, allowing efficient coordination of efforts. The system is intended to permit seamless integration of newly deployed response teams arriving at the scene of a developing emergency.

All local and regional government and nongovernment agencies, private sector organizations, and owners of critical infrastructure must have disaster plans in place that align with NIMS and ICS. Since your regional office of emergency management will be using this system, it's important to ensure that your school emergency response and crisis management plan conforms with its standards.

NOTE | FEMA has developed industry-specific online training courses to introduce ICS concepts to the private sector. Completing these educational modules will help you understand and adapt to the all-hazards approach. Visit www.training.fema.gov for information.

ICS in practice

KEY POINT

All members of the school community must be familiar with their roles within the organizational structure of the Incident Command System **before** an emergency arises.

It is impossible to overstate the importance of ensuring widespread familiarity with the incident command system **before** the school's emergency response and crisis management plan must be deployed. The organizational structure of ICS is very different from the school's normal administrative structure. All school staff members must know their ICS roles so that they can support changes in authority and continue to perform efficiently throughout the emergency event.

When an incident arises within the school's facilities, staff members will respond independently until first responders arrive on site. At that point, however, EMS typically assumes control of the incident. Some school staff members fulfilling ICS management roles under the school's emergency response plan may need to relinquish those roles under an incoming incident commander and help emergency responders coordinate school resources. This should be clearly understood to ensure a smooth transition.

Management structure of ICS

There are 5 major management functions under ICS, as outlined in Table 15-1. School nurses usually fill a role within the operations section; depending on the nature of the event, however, you may be assigned to incident command or planning.

TABLE 15-1. INCIDENT COMMAND STRUCTURE

Section (Title)	Responsibilities
<i>Incident Command</i> (Incident Commander)	Sets incident management objectives, strategies, and priorities. Has overall responsibility for incident management and determines how many people to deploy.
Operations (Operations Section Chief)	Conducts the tasks needed to reach the incident objectives. Establishes tactics and directs all operational resources.
Planning (Planning Section Chief)	Supports the incident action planning process by tracking resources and gathering information. Maintains documentation pertinent to the incident.
Logistics (Logistics Section Chief)	Provides resources and services needed to achieve the incident objectives. Usually activated at the district level or higher during large-scale incidents.
Finance and Administration (Finance/Administration Section Chief)	Monitors all costs associated with the incident. Provides accounting, procurement, timekeeping, and cost-analysis. Usually activated at the district level or higher during large-scale incidents.

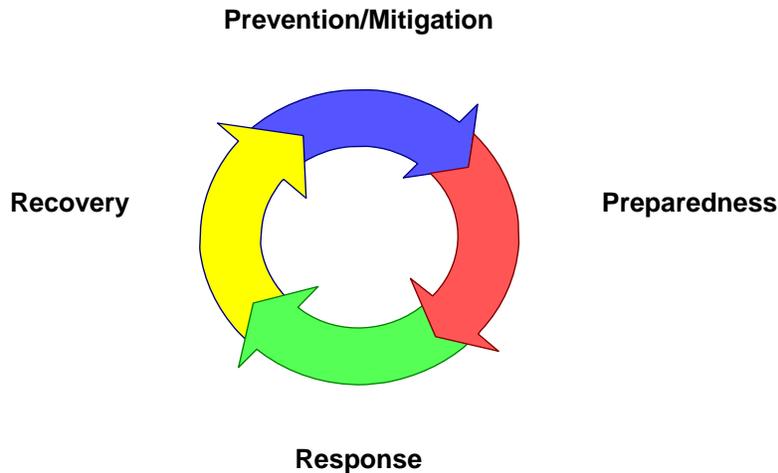
The section chiefs listed above form the leadership of the general staff. They direct all responses and tactical actions to achieve the incident objectives. In a more complex incident, these section chiefs may be joined by a command staff

comprising a public information officer, liaison officer, and safety officer. All report directly to the incident commander.

Components of the Emergency Response and Crisis Management Plan

The emergency response and crisis management plan is divided into 4 major phases, as shown in Figure 15-1.

FIGURE 15-1. FOUR PHASES OF EMERGENCY RESPONSE



Prevention/mitigation

Measures that reduce the likelihood or potential consequences of an emergency incident. Examples include education and awareness efforts and implementation of programs to minimize the impact of potential hazards.

Preparedness

Planning, establishing roles and responsibilities for emergency actions, and gathering necessary resources. Training programs, drills, and exercises fall within this phase, as well as maintenance of equipment and emergency supplies. Conducting a hazard vulnerability assessment (HVA) is an important preparedness activity that will be discussed in more detail.

Response

Actions taken during an emergency event to save lives, property, and the environment while stabilizing the situation. Your role during this phase includes mass-casualty triage and nursing interventions.

Recovery

Efforts taken to restore school operations and return to normalcy. Depending on the magnitude of the incident, immediate goals may include securing temporary classroom space and providing crisis counseling until some stability is achieved.

Each of these 4 components is described more fully below.

Prevention/Mitigation

Mitigation plans identify a broad range of preventive actions to reduce the impact of a disaster or other emergency. Mitigation is an ongoing effort that addresses implementation, management, and maintenance of identified prevention/mitigation strategies. The process involves

- Identifying necessary preventive actions
- Developing strategies to address them
- Implementing corrective programs
- Reassessing the target problem and evaluating the effectiveness of correctional measures
- Making necessary adjustments in goals and initiatives

Your Role in Prevention and Mitigation

Because you are familiar with health-related needs of the student population, you can make valuable contributions throughout this phase by identifying specific issues that should be addressed and illuminating statistical health trends among students. This information lends support for implementation of needed programs and acquisition of resources.

Your involvement may extend to the following prevention/mitigation tasks:

- Develop written protocols for emergency procedures
- Place information binders and portable emergency kits in all classrooms
- Distribute wallet cards to members of your emergency response team, summarizing their responsibilities during an emergency event and providing contact information they may require at the onset of an incident
- Review student health records to ensure that a secondary contact person is listed in all cases
- Implement a mechanism to regularly update contact information
- See that site plans for each school building are centrally located
- Inspect and test equipment (such as AEDs) at set intervals
- Maintain and restock emergency supplies and medications

See *Appendix B* for additional information on mitigation and response strategies, including *Be Proactive: The Awareness/Prevention Checklist* and emergency equipment and supply lists for schools, teachers, and administrators.

Surveillance

School nurses have a key role in syndromic surveillance and have been the first to identify and report new disease outbreaks. Suspicious patterns or clusters of illness, high absenteeism, or isolated cases in which you see highly uncharacteristic signs and symptoms in a specific student may be the earliest indicators of a new strain of virus, an undetected biohazard, or a deliberate release of chemical or biologic weapons. Immediately reporting suspicious

findings to your local public health department in all cases, and local law enforcement agency as appropriate, is the first step toward containing and addressing the problem.

Many biologic and chemical agents initially cause respiratory symptoms characteristic of a common cold or flu virus. In such cases, vigilance is required to distinguish a suspicious pattern. For more information about the signs and symptoms associated with terrorist agents, see *Characteristics of Biologic, Nuclear, Incendiary, and Chemical Agents* in Appendix B.

Hazard Vulnerability Assessment

A comprehensive analysis of potential hazards, referred to as a *hazard vulnerability assessment* (HVA), provides a basis for mitigation and prevention tasks, allowing the school emergency response and crisis management plan to be tailored for the school's unique risks.

School personnel should conduct an initial HVA and then review the document annually. Your skills as a health professional can be essential to this process.

During the HVA, inspect the school grounds and immediate vicinity to locate and catalog hazards associated with

- Overhead power lines
- Underground gas lines
- Storage facilities for pressurized gases, chemicals, or other hazardous materials
- Intake ducts for school ventilation systems
- Traffic patterns
- School water supply and sewage disposal system

Branching out into the community and environs, investigate

- Rail carriers and interstate commerce transporting hazardous materials
- Local industries that produce toxic materials
- Major transportation corridors
- Flood plains, rivers, tributaries

Wherever possible, develop a plan for reducing or eliminating each environmental hazard and security risk you identify. Work with local businesses and industrial centers that may be contributors to identified hazards. Enlist other community partners, such as fire, EMS, and law enforcement officials and community representatives, to participate in reviewing the assessment results and discussing your findings. This will help to promote cooperative engagement in exploring beneficial solutions, rather than allowing adversarial relationships to develop.

Preparedness

Preparedness tasks include educating staff and students about disaster procedures, ensuring that designated support personnel maintain appropriate certifications to provide assistance during the event, developing a comprehensive communications plan, and ensuring that all facets of the program are reassessed at regular intervals.

Education and Training

Initiate regular training sessions, skills practice, and drills to ensure that students and staff, including substitute personnel, are familiar with emergency procedures for evacuation, lockdown, and shelter-in-place.

Provide for an evaluation session after each exercise to identify areas for improvement. Create an action plan to ensure that modifications are carried out.

Drills and exercises

In Illinois, schools are required to conduct the following drills during the school year:

- Three evacuation drills in participation with the local fire department or fire district
- One bus evacuation drill
- One severe weather and shelter-in-place drill

Additional participation in law enforcement drills can prepare students and school staff for incidents involving reverse evacuation, lockdowns, shootings, bomb threats, or hazardous materials.

Your role includes

- Participating in school drills
- Contributing to the development of the emergency response plan
- Providing key content for training exercises
- Recommending corrective action
- Conducting or making arrangements for training that will enable school staff members to provide first aid during emergencies involving a large number of casualties

You'll find that taking an active role in drills and exercises not only provides you with valuable experience in rendering or directing first aid under disaster conditions, but also allows you to anticipate medications and supplies you'll need that might not have occurred to you otherwise.

Recruiting student volunteers

During mass episodes of illness or injury, you will need additional assistance from personnel who are trained and certified in delivering first aid and CPR. Make sure your emergency plan provides for this.

A large-scale incident can overwhelm your staff and volunteer resources. Consider encouraging older students to complete basic lifesaving and safety courses in such areas as CPR, fire safety, first aid, and search and rescue. Investigate whether programs such as community emergency response teams (CERTs) are offered in your area. These programs train laypeople to respond to local emergencies.

Program review

An essential, but often neglected, aspect of preparedness is to schedule mandatory periodic reviews that encompass all aspects of the emergency response plan. Review tasks should include

- Reassessment of hazards
- Confirmation that regular, realistic drills and training exercises have been performed at adequate intervals
- An action plan to implement necessary amendments that have been identified

NOTE In Illinois, Public Act 094-0600 (105 ILCS 128) School Safety Drill Act (August 2005) and Title 29 Part 1500 Joint Rules of the Office of the State Fire Marshal and the Illinois State Board of Education: School Emergency and Crisis Response Plans (August 2006) mandate an annual review of the ▪ school emergency response and crisis management plan ▪ protocols and procedures programs ▪ school safety drill programs.

The Communications Plan

When an emergency occurs, communication is the first step in implementing the school response plan. Determine how you will communicate with staff members, families, community members, and the media.

The school should have a designated public information officer who will brief the media and the community during a disaster and maintain relationships with media liaisons.

Establish processes for communicating both within the facility and with the community at large. Provide for alternative ways to communicate if primary systems fail or are unavailable. These may include cell phones (preferably with texting capabilities), portable 2-way radios, stationary radio equipment, and other available options. Any staff members who have a leadership role in disaster management should be trained to use all communication devices that may be employed.

Include procedures and protocols for conveying information to parents/guardians and for addressing rumors. It is particularly important to have a mechanism in place for notification of parents/guardians when an emergency arises. This mechanism must be tailored to address cultural differences and language barriers within the community. Make sure families understand the school's emergency communication protocols, including when and how they may initiate contact so that they do not disrupt or endanger students during a developing emergency; and when and how they will be notified regarding the safe

release of students, so that they do not endanger themselves and others by attempting to take their children out of school prematurely.

NOTE | It may be helpful to remind parents/guardians that in many instances, students will be safer if they remain in the school building when danger threatens.

Elements of a comprehensive communications plan

The communications plan should establish a chain of authority under the school's designated public information officer, and include specific instructions or guidelines in the following areas:

Outside communications

Spell out the **circumstances** that dictate communication with

- Families
- First responders (fire, law enforcement, EMS)
- Community liaisons
- Media liaisons
- Other external outlets

Designate **specific individuals** who will be in charge of

- Notification of family members
- Other external communications
- Broadcast monitoring

It is crucial to develop specific, detailed instructions for calling EMS and posting the appropriate contact number (particularly if it is not 911) on all telephones at school.

Internal communications

- Designate specific individuals who will be in charge of intrafacility communications with students, staff, and administrators.
- Identify any dead zones (areas that are inaccessible using wireless devices) within the school buildings and develop a plan for managing communications in these areas.
- Develop procedures for communicating during an evacuation (cell phones, bullhorns, megaphones, portable 2-way radios, intercoms, runners).

Communication contingency plans

Develop an alternative communication strategy to be used

- When the primary communications system is out of service
- During a bomb threat (wireless communication devices should not be used, as they may trigger the bomb)

Safeguards

Address such issues as

- How to ensure that information has been verified before it is released to family members and the public
- Who will authorize the release of information as well as the content (typically the school principal, or in some cases law enforcement liaisons)

Intrafacility warning system

Determine how you will alert the school community, as well as staff members who have a role in providing immediate care, that an emergent situation exists. NIMS recommends using plain language (terms such as *lockdown* or *evacuation*) that will be immediately meaningful to visitors and substitute staff members, rather than instituting a system of codes.

Anniversaries of Critical Incidents

The approaching anniversary of a significant disaster or other tragedy can provide impetus for plan review. Those who were originally affected by the event may experience a renewal of fears and concerns about safety. The potential for false alarms, copycat acts, or threats may increase during this period. Watch for such trends in your school and anticipate the need for heightened security or crisis management. Significant anniversaries in the United States include

- **February 14** (shootings at Northern Illinois University: DeKalb, Illinois, 2008)
- **April 16** (shootings at Virginia Tech: Blacksburg, Virginia, 2007)
- **April 19** (bombing of the Alfred P. Murrah Federal Building: Oklahoma City, Oklahoma, 1995)
- **April 20** (shootings at Columbine High School: Littleton, Colorado, 1999)
- **September 11** (terrorist attacks targeting New York City and Washington DC, 2001)

Response

Appropriation of School Facilities

Communities may designate school facilities to fulfill disaster-related needs associated with widespread or prolonged incidents; such uses may include

- Family reunification
- Shelter for those who have been displaced from their homes
- Overflow medical care
- Medication distribution
- Temporary morgue

Special Procedures as Incidents Develop

Evacuation

Designate primary and secondary evacuation sites within the school grounds as well as remote evacuation sites located off campus. Potential sites include community centers, businesses, and religious institutions.

- Define circumstances that trigger evacuation (bomb threats, fires, flooding)
- Develop plans for transportation to designated remote sites
- Maintain written agreements with designated remote sites
- Create contingency plans that provide for alternate routes and rallying points in case of need
- Develop protocols or plans for communicating with family members

Reverse evacuation

Procedure for returning students to the school building

- If they were outside when the emergency arose
- If, after evacuation occurs, changing conditions make it unsafe to remain outside

Lockdown

Designate circumstances in which lockdown procedures are initiated.

Hard lockdown

This procedure is typically activated when a hostile intruder is in the school building. Exterior doors and classroom doors are locked. Students and staff remain in the classroom until the situation resolves.

Soft lockdown

When there is an external threat, such as an armed robbery in the vicinity, external doors are locked and no one is permitted to enter or leave the building, but limited movement may be permitted within the school building.

Shelter in place

When a threat creates a hazardous condition outside the school and timing or proximity makes evacuation dangerous, occupants of a school building may be forced to shelter in place. Such a situation might arise due to a tornado or a hazardous material spill. For airborne contaminants, such as a plume of hazardous gas, school administrators should shut off the air handling system. If the external hazard involves severe weather, students should move to interior rooms or hallways away from glass and assume the duck, cover, and hold position.

A shelter-in-place situation usually precludes retrieval of students by parents/guardians until the hazard has resolved.

Nursing Responsibilities

School nurses become first responders in any situation involving multiple casualties. Your specific responsibilities and actions will be event-driven. As the primary health care provider on site, you will take a leadership role in assessing the incident, activating EMS, and mobilizing intrafacility resources as specified in the school's emergency response and crisis management plan.

A communitywide mass casualty incident is likely to delay response from outside agencies. As the sole health care professional on site, you will continue to direct emergency interventions. Take any available steps to deescalate the emergency while providing immediate nursing interventions until additional resources arrive.

NOTE | Even after arrival of EMS or other emergency responders, you must remain with the ill or injured until the transfer of care is complete. See Chapter 2: *Legal Issues in Nursing* for more information.

Examples of nursing responsibilities during an evolving emergency include

- Appropriate delegation of duties to teachers, staff, or students who have been assigned to assist you until EMS providers arrive
- Deployment of resources
- Documentation, recordkeeping, incident reports (remember: If it isn't documented, it didn't happen)
- Maintenance of student health records, including a record of care provided during or after the incident

Incident assessment and resource mobilization

KEY POINT

Remember that scene safety is always the first consideration in any emergency situation.

Assess the severity and magnitude of the incident as soon as you are made aware of it. Remember, scene safety is always the first consideration in any emergency situation.

Activate EMS and provide initial information about the location of the incident, the approximate number of casualties, and the potential for escalation.

Mobilize immediate resources to help you manage the incident until emergency responders arrive. Consult your roster to locate staff members and volunteers who can provide basic or advanced interventions and other types of assistance. A mechanism should be in place for alerting these individuals if it is safe to do so.

Dispatch a student or volunteer to meet emergency responders and direct them to the scene where the incident is taking place.

While awaiting EMS, determine whether to set up a triage team comprising trained staff or students. This team can begin

- Providing first aid to the injured

- Establishing treatment areas
- Documenting care

If there is a need and you have sufficient resources to do so, you may help to establish a temporary morgue within the school building.

Special triage techniques

Mass-casualty triage is a method of quickly identifying those who have life-threatening injuries and determining which have the best chance of survival, so that rescuers and health care professionals will be directed to these casualties first when they arrive on the scene. A standardized triage system provides objective criteria for those in charge of prioritizing care—decision-making that otherwise may be influenced by emotional issues, particularly when the wounded include children.

It is essential to understand that mass-casualty triage is fundamentally different from the type of routine triage you perform each day. When you triage students who are experiencing individual health emergencies, your goal is to determine the severity of the condition as quickly as possible, designate an appropriate triage category (emergent, urgent, or nonurgent), and either activate EMS or proceed with a more thorough assessment as circumstances dictate. Your goal under these circumstances is to provide the best possible care for the individual student.

In mass-casualty triage, however, the goal is to do the greatest good for the most people in the least time. When the requirement for immediate care exceeds readily available resources, you must think differently about how to sort a group of casualties. It is critical to go into the situation understanding that some students and staff may have a low chance of survival, and under mass-casualty conditions, it is essential to allocate resources to those who have the greatest chance of survival.

Using START and JumpSTART

In Illinois, START (*simple triage and rapid treatment*) and JumpSTART (a pediatric version of START) are used for mass-casualty triage. One of the most widely recognized triage systems for mass-casualty incidents, START permits rescuers to make a primary triage decision in less than 30 seconds based on assessment of respiration, perfusion, and mental status. JumpSTART modifies the START parameters to account for developmental and physiological factors unique to infants and young children, making breathing the cornerstone for triage decisions.

START and JumpSTART use 4 color-coded acuity categories:

Red: Potential threat to life or function requiring immediate intervention

Shock, respiratory distress/failure, or major burns would typically place a student in the red category.

Yellow: Acute condition that does NOT threaten life or limb, but requires care within 1 to 2 hours

Examples: Fracture of a long bone without circulatory compromise, lacerations without significant blood loss.

Green: Nonacute or minor condition

Examples: Major abrasions/ecchymoses, muscle sprains/strains, emotional distress.

Black: Catastrophic injury or condition such that survival is unlikely

A student with a massive open head injury or cardiopulmonary arrest would probably be placed in the black category. In a disaster situation, limited resources do not permit resuscitation of those who are unlikely to survive.

Casualties are tagged to denote their assigned triage category, so that triage team members can proceed to the next casualty. Additional personnel move the tagged casualties to a separate treatment area, where red-tagged casualties are placed in a designated **Immediate Care** area, while those whose condition is less severe may await further attention in the **Delayed Care** area.

The algorithms for START and JumpSTART triage appear on the back of the *Disaster/Emergency Response* protocol in *Appendix A* and in *Appendix B*.

Immediate interventions

Provide interventions according to the nature of the emergency. As much as possible, try to stabilize each casualty quickly, working in order of acuity and moving to the next. Do not attempt to do everything yourself: Direct the efforts of any trained personnel who are available to assist you and delegate duties as permitted until additional resources arrive.

Assisting EMS

Once response teams begin to arrive, you may be able to transfer care to other providers of equal or higher certification (see Chapter 2). Be prepared to continue critical interventions until incoming teams have been briefed and appropriately deployed.

Monitoring your own response

Throughout the emergency or disaster, it is important to monitor your own emotional and physical response to the situation that is unfolding.

- Exhaustion, exposure, and injury can not only endanger your health, but also affect your judgment and ability to deliver appropriate care
- Ensure adequate rest breaks, food, water, and other basic necessities for you and those working under your supervision

NOTE It is important to have a personal preparedness plan in place to lessen your own concerns about home and family during a widespread disaster, so that you can focus on following through where your expertise is needed. For more information on creating a family plan, visit www.ready.gov/america/makeaplan/index.html.

Recovery and Crisis Management

Crisis management refers to the actions taken in the aftermath of a disaster or other emergency to

- Protect and sustain life
- Relieve emotional trauma
- Assist in recovery from physical trauma

The school emergency response and crisis management plan should provide for a crisis response team, usually comprising the principal, assistant principal, any school counselors, psychologists, and social workers, and selected teachers. You are a key member of this team as well.

The crisis management plan should address

- Response procedures specific to the precipitating incident (severe weather, a shooting, a suicide)
- Criteria for closing and reopening the school after a traumatic event
- Contact information and procedures for mobilizing members of the crisis response team, as well as a professional crisis consultant
- Instructions regarding the chain of command if a key administrator is not available
- A designated spokesperson
- A communication plan encompassing both internal and external communications, whether written or spoken
- Arrangements for external support services
- Procedures for achieving closure and initiating the healing process
- Use of school mental health resources through your employee assistance program

Your Role During Recovery

The recovery phase involves the ongoing mental, emotional, and physical healing of students, their families, and staff members. During the immediate aftermath of an incident and throughout long-term recovery efforts, you play an essential role in the process of healing, rebuilding, and returning the school community to a state of health and resilience. Essential tasks include

- Mobilizing the crisis response team
- Facilitating an evaluation of the school's response to the incident
- Implementing revisions to plans and protocols
- Monitoring students and staff for early indications of posttraumatic stress

It is important to reestablish normal routines as soon as possible. Reassure the community that the school is a safe place to return to. Launch a clearly defined action plan to help students with psychological issues during the recovery process. Actively promote this action plan to families so that they will know what you are doing to help their children in the aftermath of a disaster.

If school buildings were destroyed or rendered unusable, be sensitive to signs of difficulty adapting, particularly in younger students. Address these fears and help students and staff members adjust to temporary facilities.

Students' reactions after a catastrophe tend to vary according to age. Some possible reactions are listed in Table 15-2.

TABLE 15-2. AGE-RELATED REACTIONS TO CATASTROPHIC EVENTS

Age	Common Reactions
All ages	<ul style="list-style-type: none"> ▪ Anxiety about own safety or that of others ▪ Worries about recurrence or repercussions ▪ Behavioral changes ▪ Absenteeism ▪ Sensitivity to loud noises (sirens, thunder, engines backfiring)
Elementary school	<ul style="list-style-type: none"> ▪ Clingy with teacher or parent/guardian ▪ Increased levels of distress (whininess, irritability, moodiness) ▪ Recreating the event (talking repeatedly about it, reenacting it) ▪ Statements about death and dying
Elementary and middle school	<ul style="list-style-type: none"> ▪ Decreased concentration or attention ▪ Increased activity levels/hyperactivity ▪ Changes in school performance ▪ Withdrawal ▪ Angry outbursts; aggression ▪ Somatic complaints (headaches, stomachaches)
Middle school	<ul style="list-style-type: none"> ▪ Changes in academic performance ▪ Irritability with friends/teachers ▪ Repeated discussion of event, dwelling on gruesome details
Middle and high school	<ul style="list-style-type: none"> ▪ Feelings that cause discomfort, such as thoughts of revenge ▪ Feelings of distrust, particularly of those who are different ▪ Repetitive thoughts/comments about death or dying
High school	<ul style="list-style-type: none"> ▪ Increased risk of alcohol/substance abuse ▪ Suicidal thoughts

All individuals, regardless of age, recover from traumatic events at their own pace. The process can take weeks, months or even years. Be sensitive to reactions among staff and students of different age groups, and facilitate age-appropriate emotional intervention services.

Mobilizing the Crisis Response Team

To address the emotional and psychological consequences of an incident or disaster, it is essential to ensure that appropriate grief counseling or stress management intervention is available to students, staff, and families.

This may involve mobilization of

- A crisis response team
- A critical incident stress management team
- A professional crisis consultant to assess individual members of the school community or provide group interventions

As a health professional, you are a natural liaison with credentialed mental health workers who can best provide these services.

Credentialed mental health team

A comprehensive clinical interview is a primary assessment tool in the evaluation of posttraumatic stress. Identify and approve a team of credentialed mental health workers to provide emotional and psychological support services. Recovery takes place over time, so these services may be needed for an extended period.

Critical incident stress management team

A critical incident is any event or perceived threat that overwhelms an individual's coping ability. Critical incident stress is a normal response to an abnormal event. In the wake of a critical incident, crisis intervention may be needed to provide stabilization and symptom reduction, help affected individuals return to adaptive functioning, or simply facilitate access to continued care. Interventions should be matched to the situation and the needs of the recipient population.

NOTE | Students may manifest stress reactions after drills and exercises, necessitating appropriate interventions.

Identify procedures for making critical incident stress management resources available to students, parents/guardians, and school staff immediately after an emergency incident. A referral tree listing contacts and phone numbers should be readily available.

Being on the frontline of any major emergency leaves you vulnerable to critical incident stress as well. Be sure to take advantage of crisis intervention sessions.

Professional crisis consultant

Identify a professional *crisis consultant* outside of the school community who may be called on to assist with postincident trauma or grief. Help school administrators and emergency planners develop a process for tapping into additional resources on an as-needed basis.

Assess local counseling and mental health resources and consider obtaining interagency agreements with selected community mental health and counseling services to ensure availability in the aftermath of a traumatic event.

Incident Evaluation and Quality Improvement

Mechanisms for postincident follow-up

Any time the school's emergency response and crisis management plan is invoked, it is critical to evaluate the incident and its outcome as soon as possible, while recollections are fresh. During this debriefing session, staff members with firsthand experience of the incident should be encouraged to share their impressions freely, critiquing strengths and weaknesses both the overall response to the emergency and those facets they were directly involved in. The goal is to identify opportunities for continuous improvement to the plan. Mechanisms for initiating these review sessions should be part of the overall crisis plan.

Continuing improvement of the plan

The culmination of the postincident evaluation should be a task-oriented after-action report that provides an overview of the event and translates participants' impressions and recommendations into a logical sequence of prioritized steps. Having a written action plan helps to ensure that modifications to the plan are realized.

Special Considerations in Emergency Planning

Pediatric Vulnerability to Terrorist Weapons

Since children are physiologically and developmentally different from adults, their response to illness and injury differs as well. This makes them more vulnerable to biologic, chemical, and radiologic agents than adults. Your emergency response and crisis management plan must take issues of heightened vulnerability into account. Some examples of these differences are noted below.

Physiologic and developmental considerations

Aerosolized biologic/chemical agents; radioactive fallout

Because of their shorter stature and faster respiratory rates, young children absorb larger doses of contaminants and biologic agents that settle close to the ground.

Blistering agents

Children have thinner skin and a greater surface-to-mass ratio. Agents that are absorbed through the skin (such as blistering agents) pose a greater threat.

Radiation

Developing organs have increased susceptibility to cancerous growth after radiation exposure.

GI agents

Agents that produce vomiting and diarrhea can lead to more rapid dehydration in younger children.

Traumatic injury

A smaller circulating blood volume increases a child's vulnerability to shock due to bleeding or extravasation of fluids. Profound shock can develop quickly.

Cognition/mobility

Younger children may not immediately recognize danger or their reaction may put them at greater danger. They also may lack the strength, stamina, and coordination to escape a hazardous incident.

Practical considerations

Decontamination

Children are more vulnerable to hypothermia during decontamination procedures. Younger children who are fearful may need to be assisted through decontamination showers.

Medical accommodation

Children require specialized treatment modalities, appropriately sized equipment, and attention to their psychological needs. Advance preparations must take these factors into account.

Extracted from: American Academy of Pediatrics. *Pediatric Terrorism and Disaster Preparedness: A Resource for Pediatricians*. Foltin GL, Schonfeld DJ, Shannon MW, eds. AHRQ Publication No. 06(07)-0056. Rockville, MD: Agency for Healthcare Research and Quality; October 2006.

Response to Chemical Spills Within the School

Most schools have limited personal protection equipment appropriate for incidents involving chemical or hazardous materials. Without specialized equipment **and** training, you cannot safely respond to this type of emergency or attempt decontamination of students who have been exposed. Be sure to maintain ready access to appropriate phone numbers for assistance with field decontamination.

The following procedures are suggested for chemical spills inside the building:

- Evacuate the area immediately
- Check the material safety data sheet to determine the level of risk presented and the urgency of decontamination
- Notify school administration as soon as possible
- Contact the appropriate emergency services and inform the dispatcher of a hazmat event
- Refer to the school's safety plan for standard operating procedures

Pandemic Illness and Biologic Agents

A pandemic is a widespread outbreak of illness; an influenza pandemic, for example, could arise with the emergence and rapid transmission of a new influenza virus against which we have no natural resistance. Many experts believe that this is a likely contingency. The best defense against such an occurrence is advance preparation.

As with other types of emergencies, mitigation activities in anticipation of a flu pandemic are collaborative. Your involvement should include sharing information and coordinating plans and preparations with local and state public health departments, boards of education, and other key agencies. Your most valuable contribution, however, may be the energetic promotion of measures to reduce exposure to pathogens and minimize the transmission of communicable diseases at school.

Simple preventive measures

Simple preventive measures can have tremendous impact on disease containment. Educate students, their families, and school staff about the importance of basic hand-washing, respiratory etiquette (such as the public health campaign to *Cover Your Cough*), and staying at home when ill. Encourage students and staff to be vaccinated annually against influenza.

Surveillance measures

Look for early signs or precursors of communicable illness, such as absenteeism trends. Develop mechanisms that will ease the exchange of tracking data and other information with public health departments and the Centers for Disease Control and Prevention.

KEY POINT

When you identify a suspicious pattern of illness, report it promptly to public health authorities.

Data collection, discussed in Chapter 1, is essential to *syndromic surveillance*, which can aid early detection of epidemics, pandemics, and the release of biologic agents. Your ongoing awareness of school health trends puts you in a unique position to identify suspicious patterns of illness, allowing you to report them promptly to public health authorities.

NOTE | Many biologic and chemical agents cause initial respiratory symptoms that resemble a common cold or flu; vigilance is required to identify suspicious patterns.

Students With Special Needs

The school's emergency response and crisis management plan must accommodate students who have special physical, cognitive or emotional requirements. To address this facet of the plan, you will need to assemble the following information:

- The number of students with special needs who regularly attend the school
- The nature of their disabilities
- Their class schedules or anticipated location throughout the day

Evacuation

- Create one-on-one assignments to ensure that assistance is provided to those who require it
- Review the accessibility of entrances and exits designated as evacuation routes and create alternative routes if needed

Shelter-in-place

- During a widespread disaster, regular services and access to normal care may be disrupted for an extended time. Ensure that the school's inventory of necessary medications and special supplies will last at least 72 hours.
- If some students depend on electrical or electronic assistive devices, you will need to ensure that fully charged batteries and auxiliary power mechanisms are in place and are routinely tested.

Summary

As a school nurse, you have a critical role in the safety of students during any emergency situation, regardless of its size and complexity. To that end, it is crucial to actively participate in the development, review, and maintenance of your school's emergency response and crisis management plan.

A comprehensive plan includes 4 phases of emergency management:

- Prevention/mitigation
- Preparedness
- Response
- Recovery

Your immediate actions at the outset of a developing emergency at school can do much to minimize mortality and morbidity. Regular participation in training activities and drills will prepare you to respond decisively and to work collaboratively with EMS responders when such an event arises.

The intensity of a critical situation can lead to debilitating physical and emotional stress, both during and after a disaster. You can provide leadership in ensuring the designation and activation of a crisis response team to curtail emotional and psychological trauma in students, their families, and school staff members.

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APPENDIX

A

Protocols

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Systematic Assessment/Immediate Care

Every nursing encounter begins with a systematic assessment. The 5 components of a comprehensive assessment are listed below. Suggested actions should be performed if indicated and in accordance with applicable protocols and available resources. **Take any necessary actions before progressing to the next step of the assessment.** See Chapter 3: *Assessment and Triage* for a detailed review of the assessment process.

NOTE

Triage determination and EMS activation should occur as soon as the need becomes apparent.

SCENE SAFETY ASSESSMENT

Call for assistance as indicated before proceeding.

ACROSS-THE-ROOM ASSESSMENT

Use Pediatric Assessment Triangle (PAT)

- **Appearance** (mental status ▪ muscle tone/body position ▪ interaction)
- **Breathing** (work of breathing, including nasal flaring, retractions; abnormal airway sounds)
- **Circulation** (visible skin color)

INITIAL (ABCDE) ASSESSMENT/IMMEDIATE INTERVENTIONS

- Standard precautions
- C-spine stabilization
- **Airway** (positioning)
- **Breathing** (O₂, mouth-to-mask)
- **Circulation** (control bleeding ▪ CPR/AED)
- **Disability** (**AVPU**, pupil check)
- **Exposure** (brief inspection)

HISTORY/PAIN ASSESSMENT

- **SAMPLE** (**S**ymptoms ▪ **A**llergies ▪ **M**edications ▪ **P**ast health history ▪ **L**ast food/drink ▪ **E**vents)
- Pain—**PQRST**, numeric or **FACES** scale (comfort measures)

FOCUSED PHYSICAL EXAMINATION

- Full vital signs, temperature, weight, blood glucose
- Limited or complete examination (inspect ▪ auscultate ▪ palpate)

TRIAGE (E–U–N)

- **E**mergent (activate EMS)
- **U**rgent (determine need for EMS)
- **N**onurgent (return to class or send home)

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score		
Eye opening	Spontaneous		Spontaneous		4		
	To verbal command		To shout		3		
	To pain		To pain		2		
	No response		No response		1		
Best motor response	Obeys commands		Spontaneous		6		
	Localizes pain		Localizes pain		5		
	Flexion-withdrawal		Flexion-withdrawal		4		
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3		
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2		
	No response		No response		1		
	Older Than 5 Yr		2-5 Yr		Younger than 2 Yr		
Best verbal response	Oriented		Appropriate words/phrases		Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words		Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams		Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts		Grunts, agitated, restless		2
	No response		No response		No response		1
Total Score							

Triage

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions **AS YOU GO**.

DETERMINE TRIAGE CATEGORY

The assessment *findings* allow you to determine a triage category, which dictates subsequent actions. Key findings associated with each triage category are listed below, together with general interventions. Specific actions will vary according to the situation.

EMERGENT

Findings that suggest a potential threat to life or function requiring immediate medical attention include

- Cardiopulmonary arrest
- Altered LOC
- Burns, severe/major
- Caustic chemical exposure
- Childbirth, imminent
- Head injury with any history of loss of consciousness
- Pain, severe, **or** significant location (eg, chest)
- Poisoning/drug overdose
- Respiratory distress, severe, **or** respiratory failure
- Shock (hypovolemic, anaphylactic, cardiogenic)
- Spinal cord injury, suspected
- Status epilepticus **or** first-time seizure
- Suicidal behavior
- Trauma, severe, **or** trauma to limb, distal pulse absent
- Violent/homicidal behavior

INTERVENTIONS

- Support ABCs
- Activate EMS
- Initiate appropriate interventions as per specific protocol or IHP/ECP
- Directly/continuously observe student
- Contact parent/guardian
- Notify school administrator
- Follow up

URGENT

*Findings that suggest an acute, severe, but **non-life-threatening** condition requiring additional medical intervention within 2 hours include*

- Burns, minor
- Deformity/suspected closed fracture **without** circulatory compromise
- Fever exceeding 100°F/37.8°C
- GI symptoms, persistent (nausea, vomiting, diarrhea)
- Lacerations requiring sutures **without** excessive blood loss
- Pain, moderate, following abdominal trauma
- Seizure, atypical, in a student with a history of seizures
- Wheezing

INTERVENTIONS

- Support ABCs as indicated
- Determine need for EMS
- Observe student closely
- Initiate appropriate interventions as per specific protocol or IHP/ECP
- Contact parent/guardian to transport student to medical care or home
- Follow up

NONURGENT

Findings that suggest a nonacute condition that is not severe (but may require referral for routine medical care) include

- Essentially well with S/S of mild noncommunicable illness or URI
- Headache **without** fever or other abnormal findings
- Injury, minor (abrasions, ecchymoses, sprains/strains)
- Pain, mild (eg, abdominal or menstrual pain, headache or toothache), **without** fever or other abnormal findings

INTERVENTIONS

- Initiate appropriate interventions or administer medications as per specific protocol or IHP/ECP
- Observe student
- Contact parent/guardian
- Return student to class or send home as indicated
- Follow up

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	Inappropriate words	Persistent cries/screams	Persistent inappropriate cries/screams	3	
	Incomprehensible sounds	Grunts	Grunts, agitated, restless	2	
	No response	No response	No response	1	
					Total Score

Abdominal Pain

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR ABDOMINAL PAIN

- Focused abdominal assessment
- Time of last bowel movement
- Urinary symptoms
- Events preceding episode, including trauma
- Menstrual history and possibility of pregnancy
- History/pattern of previous occurrences

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Capillary refill time exceeds 2 sec ▪ Orthostatic vital signs^a ▪ Change in mental status, LOC ▪ Decreased or absent bowel sounds ▪ Abdominal/GU trauma (see <i>Trauma</i> protocol) ▪ Abdominal distention, rigidity, or guarding ▪ Bluish discoloration of flank or periumbilical area (Grey Turner sign) ▪ Severe abdominal pain ▪ Imminent childbirth (see <i>Obstetric Emergencies</i> protocol) ▪ Pregnant with vaginal bleeding <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Place student supine ▪ Give nothing by mouth ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;"><i>Stable vital signs with</i></p> <ul style="list-style-type: none"> ▪ Moderate abdominal pain or dysuria ▪ Nausea/vomiting or significant diarrhea ▪ Significant pain with fever ▪ Mucus or frank blood in stool; tarry stools ▪ Abnormal vaginal bleeding or discharge without pregnancy <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Observe student closely ▪ Give nothing by mouth ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<p style="text-align: center;"><i>Stable vital signs with</i></p> <ul style="list-style-type: none"> ▪ Mild or intermittent abdominal pain/cramps ▪ Onset related to menses <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ If recurrent abdominal pain (RAP) has been diagnosed, allow student to rest in health office ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Refer to medical care or school support services as indicated for frequent complaints ▪ Follow up

^aOrthostatic vital signs

Assess BP and HR while student is supine. Have student sit up or stand and reassess 1 min later. If BP decreases by more than 20 mm Hg or HR increases by 20 bpm, orthostasis is present.

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score	
Eye opening	Spontaneous		Spontaneous		4	
	To verbal command		To shout		3	
	To pain		To pain		2	
	No response		No response		1	
Best motor response	Obeys commands		Spontaneous		6	
	Localizes pain		Localizes pain		5	
	Flexion-withdrawal		Flexion-withdrawal		4	
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3	
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2	
	No response		No response		1	
	Older Than 5 Yr		2-5 Yr	Younger than 2 Yr		
Best verbal response	Oriented		Appropriate words/phrases	Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words	Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless		2
	No response		No response	No response		1
Total Score						

Anaphylaxis/Allergic Reaction

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR ANAPHYLAXIS

- **Respiratory assessment**
- Focused assessment of skin findings
- History of systemic allergic reaction
- History of food allergy
- Events preceding reaction, such as a bite/sting

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ S/S of cardiopulmonary compromise (see reverse) ▪ Airway compromise ▪ Change in mental status, LOC ▪ Cyanosis at mouth and lips ▪ S/S of severe respiratory distress (wheezing, dyspnea) ▪ Signs of shock/hypotension ▪ History of anaphylaxis ▪ Edema of face, lips, eyes, tongue ▪ Generalized hives involving large area ▪ Diaphoresis ▪ C/o tightness in throat or chest ▪ C/o apprehension, weakness <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Administer prescribed Epi-Pen/Epi-Pen Jr if available ▪ Repeat Epi-Pen/Epi-Pen Jr in 10 min if no response ▪ Initiate CPR if necessary ▪ For severe respiratory distress, administer prescribed bronchodilator ▪ Consult IHP/ECP ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ S/S of mild systemic reaction; eg, localized hives, abdominal cramps, nausea, vomiting ▪ Edema of extremities ▪ Persistent coughing ▪ Tingling, itching of face, ears, nose ▪ History of allergy <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Consult IHP/ECP ▪ Observe student closely ▪ Administer prescribed Epi-Pen/Epi-Pen Jr if available and activate EMS ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Local reaction only ▪ Responsive to medications ▪ Nasal congestion ▪ Persistent sneezing <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Consult IHP/ECP ▪ Apply cold pack to site ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
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Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
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- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score	
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	To verbal command		To shout		3	
	To pain		To pain		2	
	No response		No response		1	
Best motor response	Obeys commands		Spontaneous		6	
	Localizes pain		Localizes pain		5	
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	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3	
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2	
	No response		No response		1	
Best verbal response	Older Than 5 Yr		2-5 Yr		Younger than 2 Yr	
	Oriented		Appropriate words/phrases	Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words	Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless		2
No response		No response	No response		1	
					Total Score	

Asthma Attack (Acute)/Reactive Airway Disease

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR ACUTE ASTHMA ATTACKS

- Airway inspection to R/O obstruction due to infection or foreign body aspiration
- Respiratory assessment
- Skin assessment

IMMEDIATE INTERVENTIONS

Even before you determine triage category, perform the following actions as indicated

- Help student into a position of comfort
- Administer prescribed bronchodilator or other medication as directed
- Perform peak flow assessment if possible
- **Note:** Use spacer or holding chamber with MDI/nebulizer, if available
- **Note:** Obtain peak expiratory flow reading before administering bronchodilator and again 20 min later (or per ECP orders)

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

<p style="text-align: center;">EMERGENT</p> <ul style="list-style-type: none"> ▪ S/S of severe asthma (see reverse) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Prepare to ventilate if necessary ▪ Activate EMS if S/S are not relieved by medication or if medication is not available ▪ Administer high-flow O₂ if available ▪ Repeat prescribed bronchodilator/ other medications ▪ Directly/continuously observe student ▪ Consult IHP/ECP ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">URGENT</p> <ul style="list-style-type: none"> ▪ S/S of moderate asthma (see reverse) ▪ Cannot tolerate normal activity ▪ No improvement within 15–30 min of bronchodilator administration ▪ Bronchodilator unavailable <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Administer high-flow O₂ if available ▪ Repeat prescribed bronchodilator/other medications ▪ Consult IHP/ECP ▪ Directly/continuously observe student ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<p style="text-align: center;">NONURGENT</p> <ul style="list-style-type: none"> ▪ S/S of mild asthma (see reverse) ▪ Symptoms respond to bronchodilator ▪ Student is able to maintain normal level of activity <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Repeat prescribed bronchodilator/other medications ▪ Consult IHP/ECP ▪ Monitor student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Assess need for parent/guardian–student asthma education ▪ Follow up
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Tools for Assessing Students

ASSESSMENT FINDINGS IN ASTHMA

Assessment	Mild Asthma	Moderate Asthma	Severe Asthma
PEFR	70%–90% of predicted or personal best	50%–70% of predicted or personal best	less than 50% of predicted or personal best
RR	Less than 30% above mean	30%–50% above mean	More than 50% above mean
LOC	Normal	Normal	Normal or decreased
Dyspnea	Absent or mild; able to speak in complete sentences	Moderate; speaks in phrases or partial sentences	Severe; speaks only in single words or short phrases
Accessory muscle use	None or mild intercostal retractions	Moderate intercostal retractions, suprasternal retractions	Severe intercostal retractions, suprasternal retractions, nasal flaring during inspiration
Color	Normal	Pallid	Pallid or cyanotic
Auscultation	End-expiratory wheeze only	Wheeze throughout expiration and inspiration	Decreasing or absent breath sounds
O ₂ saturation	Exceeds 95%	90%–95%	Less than 90%

LOC indicates level of consciousness; O₂, oxygen; PEFR, peak expiratory flow rate; RR, respiratory rate

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- **A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- **A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- **SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- **E**mergent ▪ **U**rgent ▪ **N**onurgent

^aDisability Assessment

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
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Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

Bites and Stings

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR BITES AND STINGS

- Time bite/sting occurred
- Location of bite/sting on body
 - Type of bite/sting
- Number of bites/stings
 - Intensity of pain
- Previous exposure/allergic reaction to same type of bite/sting
- Wound characteristics (erythema, edema, ecchymoses, drainage, size/depth)
- Inspection for foreign body (stinger, tooth, tick)

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ S/S of anaphylaxis or history of anaphylactic reaction (see <i>Anaphylaxis</i> protocol) ▪ S/S of respiratory distress ▪ Hypotension ▪ Cardiac arrest ▪ Loss of consciousness ▪ Known exposure to toxin (see <i>Toxic Exposure</i> protocol) ▪ Severe pain <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Perform CPR as appropriate ▪ Administer IM epinephrine as per ECP ▪ Directly/continuously observe student ▪ Report animal bites to appropriate local official ▪ Contact PCC as appropriate (800-222-1222) ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ S/S of mild systemic reaction with wheezing, progressive pain/edema but normal vital signs (see <i>Anaphylaxis</i> protocol) ▪ Deep puncture wounds ▪ Moderate pain ▪ Lacerations requiring sutures (see <i>Lacerations/Abrasions</i> protocol) ▪ Nausea/vomiting ▪ Human bite with broken skin <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Wash lacerations with soap and water; irrigate as indicated ▪ Observe student closely ▪ Report animal bites to appropriate local official ▪ Refer all incidents involving human bites to ED ▪ Contact PCC as appropriate (800-222-1222) ▪ Contact parent/guardian to transport to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Mild localized allergic reaction without systemic/respiratory S/S ▪ Mild pain ▪ Mild pruritus ▪ Stinger/tick present <p style="text-align: center;">INTERVENTIONS</p> <p style="text-align: center;">Stinger</p> <ul style="list-style-type: none"> ▪ Remove stinger by scraping with stiff cardboard/credit card; do not squeeze ▪ Apply cold pack ▪ Observe student for 20 min before returning to class <p style="text-align: center;">Tick</p> <ul style="list-style-type: none"> ▪ Grasp tick with fine-point tweezers as close to skin as possible ▪ Pull firmly ▪ Wash bite area and hands with soap and water <p style="text-align: center;">In All Cases</p> <ul style="list-style-type: none"> ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

First Aid Don'ts

- **Do not** apply a tourniquet, as it can lead to ischemia
- **Do not** incise wound or apply suction, as these measures are ineffective and potentially dangerous

NOTE

Refer student for tetanus booster if it has been 5 years or more since the last vaccination. Tetanus booster is recommended every 10 years.

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

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Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

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- Central cyanosis and coolness
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- Bradycardia (ominous sign)
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PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score	
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	To verbal command		To shout		3	
	To pain		To pain		2	
	No response		No response		1	
Best motor response	Obeys commands		Spontaneous		6	
	Localizes pain		Localizes pain		5	
	Flexion-withdrawal		Flexion-withdrawal		4	
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3	
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2	
	No response		No response		1	
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	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless		2
	No response		No response	No response		1
Total Score						

Burns

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see *Assessment* protocol), performing interventions **AS YOU GO**

KEY ASSESSMENT POINTS FOR BURN INJURIES

- Scene safety (eg, live electrical wire)
 - Burn characteristics (see reverse)
- Duration of contact with burn source
- Student's age, weight, and general health status
- Associated injuries
- Pediatric GCS score

IMMEDIATE INTERVENTIONS

Even before you determine triage category, perform the following actions as indicated

- Remove student from burn source (eg, heat/electricity)
 - Remove jewelry, rings, constricting clothing
(Do not remove clothing that has adhered to skin!)
- Begin irrigation of chemical burns with cool water
- Cool thermal burns if less than 20% BSA is involved
NOTE: Protect student from hypothermia

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS **AS SOON AS** the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Apnea or pulselessness ▪ Full-thickness burn (tough, brownish surface) ▪ Deep partial-thickness burn (charred/white) ▪ Burns involving face, hands or feet, eyes or ears, genitalia (see <i>Eye</i> or <i>Ear Emergencies</i> protocols) ▪ Electrical burns ▪ S/S of inhalation injury (singled nasal hair, carbonaceous sputum) or other complicating injuries ▪ Altered LOC ▪ Respiratory distress (see <i>Respiratory Distress</i> protocol) ▪ Suspected child maltreatment (see <i>Child Maltreatment</i> protocol after providing burn care) ▪ Severe pain <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS <p style="text-align: center;">Electrical burns</p> <ul style="list-style-type: none"> ▪ Safely remove student from burn source ▪ Initiate CPR as needed/have AED ready ▪ Inspect for entrance and exit wounds <p style="text-align: center;">Chemical burns</p> <ul style="list-style-type: none"> ▪ Continue copious irrigation of chemical burns with cool running water for at least 20 min ▪ Consider contacting PCC (800-222-1222) ▪ Send burn agent and MSDS to ED with student ▪ Do not apply cold packs <p style="text-align: center;">Thermal burns</p> <ul style="list-style-type: none"> ▪ Cover with dry, sterile dressings or clean sheet <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Superficial partial-thickness burn without complicating factors ▪ Moderate pain ▪ Erythema/edema, wet/oozing blisters ▪ Too large to cover with adhesive bandage ▪ Signs of associated infection <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Flush copiously with cool running water ▪ If unable to immerse, apply clean, wet, cool cloth ▪ Do not apply cold packs ▪ Do not break blisters ▪ Bandage loosely ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Superficial burn (eg, sunburn) ▪ Minor erythema ▪ Local, mild pain ▪ Student is alert <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Immerse area in cool water 2–5 min ▪ Apply tepid cloths ▪ Bandage loosely ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

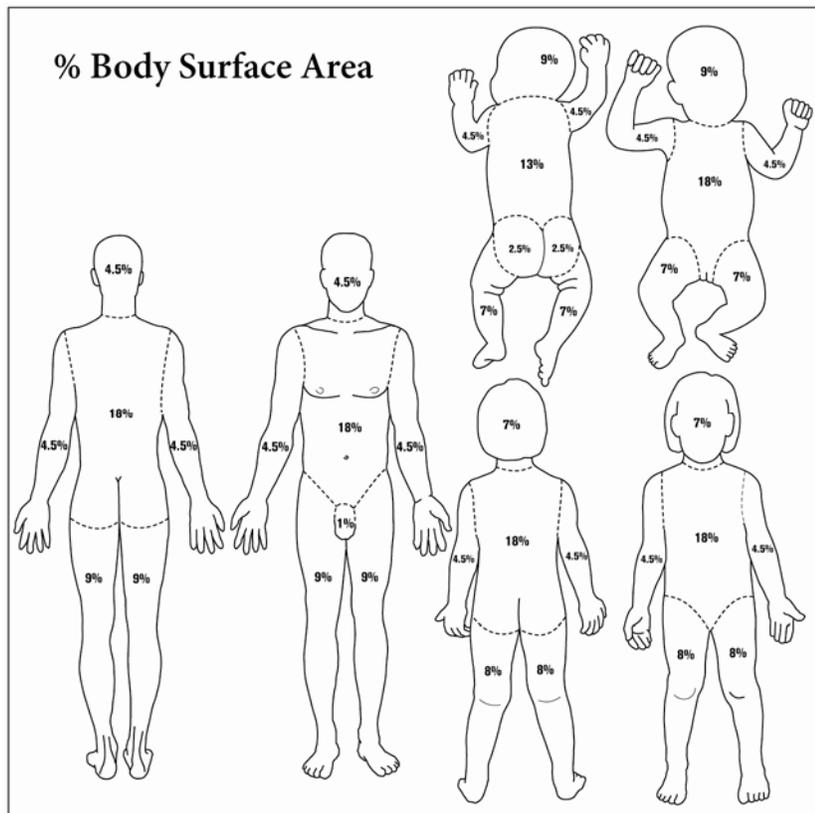
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Burn Assessment

The depth, extent, and location of a burn provide a consistent basis for conveying information about a burn injury to EMS and other health care providers. The following parameters are used to describe depth:

- A **superficial** burn involves only the epidermis. It is characterized by erythema and local pain.
- A **superficial partial-thickness** burn involves both the epidermis and the corium. This type of burn generally produces erythema and blisters.
- A **deep partial-thickness** burn may appear white and dry, with locally reduced sensitivity to touch and pain.
- A **full-thickness** burn has a tough brownish surface and a hard eschar. The area will be locally insensitive to touch or pain. This type of burn will not heal without intervention.

Extent is described as a percentage of the body surface area (%BSA). A quick way to determine %BSA for small or irregular burns is to use the student's hand (including the palm and fingers) as a reference, since this is roughly equal to 1% of the student's total body surface area. The figures below illustrate %BSA by anatomic area for an infant, child, and adult.



Chest Pain

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR CHEST PAIN

Consider etiology

- Cardiac
- Trauma
- Respiratory
- Psychosocial stress
- Musculoskeletal

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

<p style="text-align: center;">EMERGENT</p> <ul style="list-style-type: none"> ▪ Severe chest pain ▪ Bradycardia/tachycardia ▪ Cyanosis of lips and nail beds ▪ Decreased LOC ▪ Palpitations ▪ Dyspnea ▪ Peripheral pulses weak/thready/absent ▪ Diaphoresis; clammy, cool skin ▪ Restlessness ▪ Hypotension ▪ Nausea ▪ Weakness ▪ Capillary refill exceeds 2 sec <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Have AED readily available ▪ Maintain position of comfort ▪ Directly/continuously observe student ▪ Reassess vital signs every 5 min ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">URGENT</p> <ul style="list-style-type: none"> ▪ Moderate, persistent chest pain ▪ Anxiety ▪ Stable vital signs ▪ No history of <ul style="list-style-type: none"> • recent chest trauma • recent asthma attack • loss of consciousness <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Maintain position of comfort ▪ Observe student closely ▪ Reassess vital signs ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<p style="text-align: center;">NONURGENT</p> <ul style="list-style-type: none"> ▪ Mild chest pain ▪ Normal vital signs ▪ No history of <ul style="list-style-type: none"> • recent chest trauma • recent asthma attack • loss of consciousness <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Maintain position of comfort ▪ Monitor closely ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up
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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score		
Eye opening	Spontaneous		Spontaneous		4		
	To verbal command		To shout		3		
	To pain		To pain		2		
	No response		No response		1		
Best motor response	Obeys commands		Spontaneous		6		
	Localizes pain		Localizes pain		5		
	Flexion-withdrawal		Flexion-withdrawal		4		
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3		
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2		
	No response		No response		1		
Best verbal response	Older Than 5 Yr		2-5 Yr		Younger than 2 Yr		
	Oriented		Appropriate words/phrases		Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words		Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams		Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts		Grunts, agitated, restless		2
No response		No response		No response		1	
Total Score							

Chest Trauma

SYSTEMATIC ASSESSMENT

**Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO
Stabilize c-spine if head/spinal injury is suspected!**

KEY ASSESSMENT POINTS FOR CHEST TRAUMA

- Respiratory assessment
- Chest wall inspection for symmetry, wounds, ecchymoses

IMMEDIATE INTERVENTIONS

Even before you determine triage category, perform the following actions as indicated

- If student is apneic, perform rescue breathing using mouth-to-mask
 - If pulseless, initiate CPR; consider AED
- Apply clean dressing to open chest wounds (occlude on 3 sides only)
- Apply direct pressure for profuse hemorrhage

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ S/S of respiratory distress ▪ Open chest wound ▪ Crush injury ▪ Uncontrollable hemorrhage ▪ Muffled heart sounds ▪ S/S of pneumothorax or cardiac tamponade: <ul style="list-style-type: none"> • Apprehension • Rapid/shallow respiration • Painful respiration • Jugular vein distension • Cyanosis • Muffled heart sounds • Hypotension (late/ominous sign) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Maintain spinal stabilization ▪ Cover open chest wounds (occlude on 3 sides only) ▪ Elevate head and shoulders 30° unless neck injury is suspected ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Closed chest injury without respiratory distress ▪ S/S of closed rib fracture (shallow/painful but unimpaired respiration) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Monitor respiratory/cardiac status ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Stable vital signs ▪ Ecchymoses ▪ No S/S of rib fracture <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Apply cold packs as appropriate ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

NOTE

Pneumothorax/cardiac tamponade may develop slowly during a 24- to 48-hour period following chest trauma, making reassessment crucial.

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

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Initial assessment

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History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

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Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

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	Inappropriate words		Persistent cries/screams		Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts		Grunts, agitated, restless		2
No response		No response		No response		1	
Total Score							

Child Maltreatment, Suspected

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see *Assessment protocol*), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR SUSPECTED CHILD MALTREATMENT

Indications of neglect ▪ Indications of abuse (See reverse)

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Multiple new suspicious injuries (see <i>Trauma</i> protocol) ▪ History of chronic life-threatening illness without appropriate medical treatment 	<ul style="list-style-type: none"> ▪ New injuries and history of suspicious injuries (see <i>Trauma</i> protocol) ▪ Appears inadequately fed, clothed, or sheltered ▪ Inadequate medical care 	<ul style="list-style-type: none"> ▪ Student reports abandonment by parent/guardian ▪ Student reports maltreatment
<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Treat injuries ▪ Provide emotional support ▪ Directly/continuously observe student ▪ Report suspicions to DCFS: 800-25-ABUSE (22873) ▪ Notify crisis response team ▪ Notify school administrator ▪ Document all findings (see <i>Appendix B</i> for a written report form) ▪ Follow up 	<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Treat injuries ▪ Provide emotional support ▪ Observe student closely ▪ Report suspicions to DCFS: 800-25-ABUSE (22873) ▪ Notify crisis response team as appropriate ▪ Document all findings (see <i>Appendix B</i> for a written report form) ▪ Follow up 	<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Provide emotional support ▪ Report suspicions to DCFS: 800-25-ABUSE (22873) ▪ Notify crisis response team as appropriate ▪ Observe student ▪ Document all findings (see <i>Appendix B</i> for a written report form) ▪ Follow up

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Indications of Child Maltreatment

You are required by law to report any suspicion of child maltreatment (abuse or neglect) to the appropriate agency in your state. In Illinois, you can reach the Child Abuse Hotline maintained by the Department of Children and Family Services by calling **800-25-ABUSE (22873)**. The law provides immunity for mandated reporting.

INDICATORS OF ABUSE

The following findings should increase your suspicion of child abuse:

- The reported history of injury is inconsistent with the physical examination findings.
- Details of the reported history change from one telling to the next.
- There was a prolonged delay between the time of injury and the time medical assistance was sought.
- The child has a history of repeated trauma.
- The parent/guardian responds to questions inappropriately or does not comply with medical advice.

Suspicious injuries include

- Injuries involving soft tissue of the face, neck, abdomen, or similar areas
- Injuries involving areas that are normally shielded, including the back and chest
- Fractures of long bones in children younger than 3 years
- Old scars or injuries in different stages of healing
- Injuries with an appearance suggesting deliberate infliction, such as human bite marks, cigarette burns, rope marks, or the imprint of a belt or other object
- Trauma affecting the genital or perianal area
- Sharply demarcated burns in unusual areas
- Scald patterns that appear to involve dipping the area in hot water, such as burns to the hands, feet, or buttocks

INDICATORS OF NEGLECT

The following findings should increase your suspicion of child neglect:

- Unsafe conditions are evident in the home environment (eg, weapons within reach, open windows without screens or window guards, perilously unsanitary conditions).
- The parent/guardian has not provided for medical treatment, refuses to permit medical treatment, or fails to seek necessary and timely medical care for a child who has an acute or chronic life-threatening illness.
- A child younger than 10 years has been left unattended or unsupervised. (Although some situations permit a parent/guardian to leave a young child alone without endangerment, you cannot make this determination.)
- The child appears to be abandoned.
- The parent/guardian appears to be incapacitated due to intoxication, disabling psychiatric problems, debilitating illness, or similar impairment, and cannot adequately care for the child.
- The child appears to be malnourished (seriously underweight, emaciated, or dehydrated), inadequately clothed, or inadequately sheltered.
- The child is found to be intoxicated or under the influence of an illicit substance.

All instances of suspected child maltreatment must be reported to the DCFS for investigation. A sample form for reporting your suspicions in writing appears in *Appendix B*.

Cold-related Injuries (Hypothermia/Frostbite)

GENERAL GUIDELINES

- Hypothermia: rewarm slowly
- Frostbite: rewarm quickly
- Do not rub affected area
- When rewarming, use warm water, **never hot**

Educate students regarding susceptibility to hypothermic injury, need for precautions

FROSTBITE CATEGORIES^a

Frostnip

- Blanched, white skin, cold to touch

Superficial frostbite

- Firm, waxy skin, softer tissue underneath
- Blisters develop in 24 to 48 hours

Deep frostbite

- Mottled or gray-blue skin, firm to touch
- Severity not apparent until frostbitten area is rewarmed
- Sensory: cold; pruritus or paresthesia
- Necrosis develops over time

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR COLD-RELATED INJURIES

- Skin assessment
- Events preceding episode
- Duration of exposure
- Focused physical examination of extremities

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Altered LOC ▪ Cyanosis ▪ Slow/shallow respiration ▪ Weak, thready pulses, no pulses, or bradycardia ▪ Hypotension ▪ Extremities edematous and discolored ▪ No shivering (severe hypothermia) ▪ Slurred speech ▪ Abnormally low body temperature ▪ S/S of deep frostbite^a 	<ul style="list-style-type: none"> ▪ Normal LOC or drowsy ▪ Shivering (mild hypothermia) ▪ S/S of superficial frostbite or frostnip^a 	<ul style="list-style-type: none"> ▪ Alert ▪ Slight shivering ▪ Exposed skin feels cold ▪ No signs of frostbite or frostnip^a
<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Activate EMS ▪ Remove student's wet clothing ▪ Keep student warm and completely covered ▪ Assess vital signs for 1 full minute ▪ If pulseless, initiate CPR ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Remove wet clothing and keep student warm ▪ Determine need for EMS ▪ Observe student closely ▪ If alert, give sips of warm liquid ▪ Warm area with warm water ▪ Reinforce need for precautions when exposed to cold ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Remove wet clothing and replace with dry coverings ▪ If student is alert, give sips of warm liquid ▪ Warm cold skin with warm water ▪ Observe student ▪ Reinforce need for precautions when exposed to cold ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

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Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

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Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
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 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
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Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Older Than 5 Yr		2-5 Yr		
	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Dental, Oral, and Maxillofacial Emergencies

NOTE

Refer student for tetanus booster if it has been 5 years or more since the last vaccination. Tetanus booster is recommended every 10 years.

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions **AS YOU GO**
Stabilize c-spine if head/spinal injury is suspected!

KEY ASSESSMENT POINTS FOR DENTAL, ORAL, AND MAXILLOFACIAL EMERGENCIES

- Inspect teeth
- Assess ability to open and close mouth
- Assess facial bones, including mandible

IMMEDIATE INTERVENTIONS

Even *before* you determine triage category, ensure the adequacy of the student's airway

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS **AS SOON AS** the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Airway compromise ▪ Change in mental status, LOC ▪ Excessive bleeding ▪ Suspected fracture of mandible or other facial bones (see <i>Trauma</i> protocol as indicated) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Maintain c-spine stabilization ▪ Support ABCs ▪ Activate EMS ▪ Treat hemorrhage with direct pressure ▪ Apply cold packs to reduce pain/edema ▪ For suspected mandible fracture only, stabilize jaw by wrapping cravat around the point of the chin, securing it on top of the head, avoiding pressure on neck ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Displacement of multiple teeth ▪ Avulsion of permanent tooth^a ▪ Major chip/fracture of permanent tooth ▪ Broken orthodontic appliance ▪ Severe toothache <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ If possible, save large tooth chips; cover jagged edge of tooth with gauze ▪ For wire protruding from appliance, gently attempt to bend away from oral tissue; if unsuccessful, cover end with gauze or dental wax (do not remove embedded wire) ▪ Observe student closely ▪ Contact parent/guardian to transport student to dental care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Caries ▪ Exfoliation of primary tooth ▪ Eruption of permanent tooth ▪ Bleeding gums ▪ Minor chip/fracture of tooth <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ For minor tooth chip, have student rinse mouth with warm salt water ▪ Apply cold compress to edematous areas ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

^aAvulsion of permanent tooth

Note: Replantation is most likely to succeed if attempted within 60 minutes.

- Activate EMS or transport immediately to dentist
- Handle the tooth by the crown, not the root
- If the tooth is dirty, gently rinse in milk or water
- Gently replace tooth in socket (do not use force) **only** if student is alert and able to cooperate
- Instruct student to keep pressure on tooth by biting gently on clean gauze; if unable to do so, place tooth in milk for transport

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History/pain assessment

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Age	RR	HR	BP
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Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Older Than 5 Yr		2-5 Yr		
	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Diabetic Emergencies

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR DIABETIC EMERGENCIES

- Respiratory assessment
 - Skin assessment
- Last insulin dose/type of insulin used and route
- Last meal/carbohydrate intake
- Precipitating factors (exercise, change in eating habits/diet, stress, missed insulin dose, illness)
- Current blood glucose level

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<p style="text-align: center;">Severe hypoglycemia</p> <p>Glucose less than 60 mg/dL with loss of consciousness or seizures (see <i>Seizures</i> protocol)</p> <p style="text-align: center;">Severe hyperglycemia/DKA</p> <p>Glucose exceeds 250 mg/dL with at least 1 of the following:</p> <ul style="list-style-type: none"> ▪ Moderate to severe dehydration ▪ Abdominal pain/tenderness ▪ Kussmaul respiration, fruity breath odor ▪ Tachycardia ▪ Cool extremities ▪ Altered LOC (lethargic to comatose) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Directly/continuously observe student ▪ Place in left lateral recovery position to prevent aspiration ▪ Consult IHP/ECP <p style="text-align: center;">Hypoglycemia</p> <ul style="list-style-type: none"> ▪ Administer 1 mg glucagon IM/SQ if available per ECP <p style="text-align: center;">Severe hyperglycemia</p> <ul style="list-style-type: none"> ▪ Administer insulin per ECP <p style="text-align: center;">Diabetic ketoacidosis</p> <ul style="list-style-type: none"> ▪ Prepare for immediate transport ▪ Give nothing by mouth <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Contact parent/guardian ▪ Notify school administrator ▪ Determine need for diabetes education (parent/guardian, student, school personnel) ▪ Follow up 	<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Monitor student closely ▪ Consult IHP/ECP <p style="text-align: center;">Hypoglycemia</p> <ul style="list-style-type: none"> ▪ Give glucose tablets/instant glucose equivalent to 15 grams carbs or 4 oz regular soda or juice (orange/apple) followed by snack/next meal ▪ As indicated, give extra snack (eg, 2 peanut butter crackers or half sandwich and 8 oz milk) <p style="text-align: center;">Hyperglycemia</p> <ul style="list-style-type: none"> ▪ Administer insulin per ECP ▪ Increase intake of water ▪ Test for ketonuria <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Contact parent/guardian to transport student to medical care or home ▪ Determine need for diabetes education (parent/guardian, student, school personnel) ▪ Follow up 	<ul style="list-style-type: none"> ▪ S/S of mild hypoglycemia (glucose 60–80 mg/dL; student awake, alert) ▪ S/S of mild hyperglycemia (glucose 120–250; student awake, alert) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Consult IHP/ECP <p style="text-align: center;">Mild hypoglycemia</p> <ul style="list-style-type: none"> ▪ Give glucose tablets/instant glucose equivalent to 15 grams carbs or 4 oz regular soda or juice (orange/apple) followed by snack/next meal ▪ As indicated, give extra snack (eg, 2 peanut butter crackers or half sandwich and 8 oz milk) ▪ Recheck glucose in 15 min; if no improvement, repeat treatment ▪ If improvement is noted, return student to class or send home as indicated ▪ Instruct student to refrain from tasks requiring intense concentration or exertion for 1 hr <p style="text-align: center;">Mild hyperglycemia</p> <ul style="list-style-type: none"> ▪ Administer insulin per ECP ▪ Increase intake of water ▪ Return student to class or send home as indicated <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Contact parent/guardian ▪ Determine need for diabetes education (parent/guardian, student, school personnel) ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
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Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

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- Decreasing consciousness
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- Central cyanosis and coolness
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- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Older Than 5 Yr		2-5 Yr		Younger than 2 Yr
	Oriented	Appropriate words/phrases	Smiles/coos appropriately		5
	Disoriented/confused	Inappropriate words	Cries, inconsolable		4
	Inappropriate words	Persistent cries/screams	Persistent inappropriate cries/screams		3
	Incomprehensible sounds	Grunts	Grunts, agitated, restless		2
No response	No response	No response		1	
Total Score					

Disaster/Emergency Response: Mass-casualty Incidents

DEFINITION

A mass-casualty incident is a situation in which medical care requirements overwhelm local emergency response resources

IMMEDIATE ACTIONS

- Assess scene safety
- Activate EMS
- Determine approximate number of casualties
- Activate incident command

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

- Perform triage assessment using START/JumpSTART (see reverse)
- Assign appropriate triage categories
- Dispatch casualties to designated field treatment area

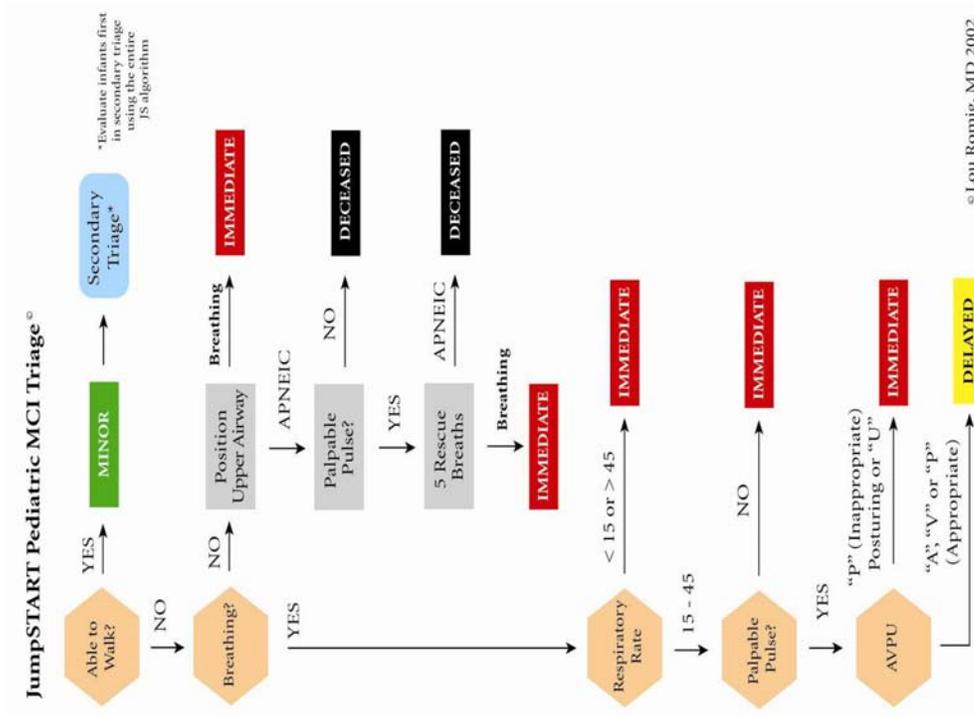
EMERGENT (RED)	URGENT (YELLOW)	NONURGENT (GREEN)	DELAY CARE (BLACK)
<p>Life-threatening</p> <ul style="list-style-type: none"> ▪ Shock ▪ Respiratory distress/failure ▪ Major burns ▪ Fracture of long bone with circulatory compromise <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Assign team members to multiple casualties ▪ Maintain ABCs ▪ Ensure direct, continuous observation until transfer of care ▪ Notify parent/guardian as specified in emergency response plan ▪ Assist EMS as appropriate ▪ Follow up 	<p>Care required within 2 hr</p> <ul style="list-style-type: none"> ▪ Fracture of long bone without circulatory compromise ▪ Laceration without significant blood loss ▪ Head injury without loss of consciousness <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Maintain ABCs ▪ Initiate appropriate care ▪ Notify parent/guardian as specified in emergency response plan ▪ Assist EMS as appropriate ▪ Provide for counseling ▪ Follow up 	<p>Nonacute/minor condition</p> <ul style="list-style-type: none"> ▪ Major abrasions/ecchymoses ▪ Muscle sprains/strains ▪ Emotional distress <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Initiate appropriate care ▪ Monitor for changes ▪ Notify parent/guardian as specified in emergency response plan ▪ Provide for counseling ▪ Follow up 	<p>Survival unlikely</p> <ul style="list-style-type: none"> ▪ Massive open head trauma ▪ Cardiac arrest <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Do not render care until adequate resources and personnel permit ▪ Follow up

EMS TRIAGE CATEGORIZATION FOR MASS-CASUALTY INCIDENTS

Category	Condition
Red	Potential threat to life or function requiring immediate intervention
Yellow	Acute condition that is not life- or limb-threatening, requiring care within 1–2 hours
Green	Nonacute or minor condition
Black	Catastrophic injury or condition such that survival is unlikely (in a disaster situation, resources do not allow for resuscitation of such patients)

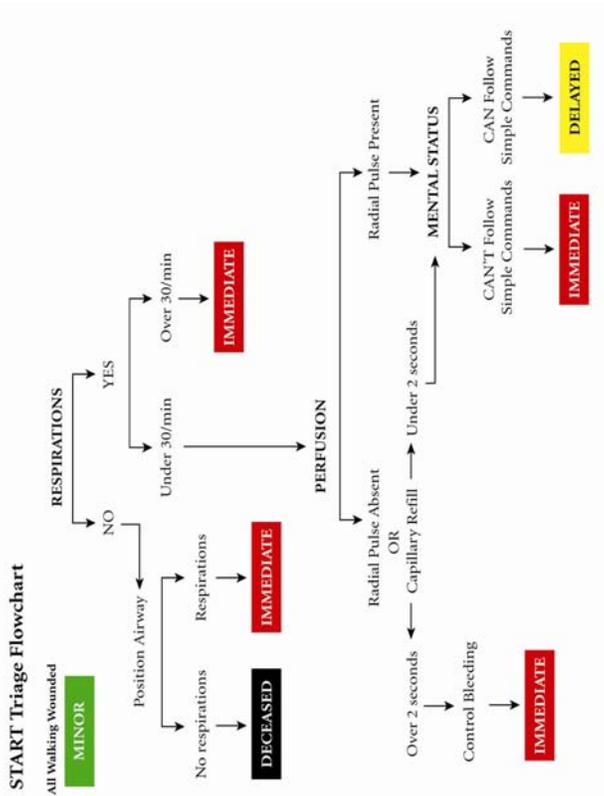
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START/JumpSTART Algorithms for MCI Triage



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MCI denotes mass-casualty incident



Ear Emergencies

SYSTEMATIC ASSESSMENT

**Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO
Stabilize c-spine if head/spinal injury is suspected!**

KEY ASSESSMENT POINTS FOR EAR EMERGENCIES

- Skin assessment for wounds, blisters, erythema, edema, hematomas, bleeding
- Focused physical assessment (external/otoscopic)
- Hearing evaluation

IMMEDIATE INTERVENTIONS

Even before you determine triage category, perform the following actions as indicated

- Control bleeding
- Apply appropriate dressing

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

<p style="text-align: center;">EMERGENT</p> <ul style="list-style-type: none"> ▪ Change in mental status, LOC ▪ Laceration/avulsion/hematoma of external ear with uncontrollable bleeding (see <i>Head/Spinal Cord</i> protocol as indicated) ▪ Burn or direct thermal injury ▪ Acute hearing loss <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Maintain spinal stabilization if applicable ▪ Support ABCs ▪ Activate EMS ▪ Directly/continuously observe student ▪ Maintain position of comfort ▪ Keep student calm ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">URGENT</p> <ul style="list-style-type: none"> ▪ Foreign body in ear ▪ Mild hematoma ▪ Abrasions/minor lacerations of external ear (see <i>Lacerations/Abrasions</i> protocol) <p style="text-align: center;">INTERVENTIONS</p> <p style="text-align: center;">Foreign body</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Do not attempt to remove unless object is visible and can be gripped with forceps or fingers ▪ If object is a live insect, instill 1–2 drops of mineral oil <p style="text-align: center;">In All Cases</p> <ul style="list-style-type: none"> ▪ Closely monitor student ▪ Contact parent/guardian to transport student to medical care or home ▪ Maintain position of comfort ▪ Observe student ▪ Follow up 	<p style="text-align: center;">NONURGENT</p> <ul style="list-style-type: none"> ▪ Mild earache without drainage ▪ Associated low-grade fever <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Send student home if pain is persistent or accompanied by fever ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up
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NOTE

Refer student for tetanus booster if it has been 5 years or more since the last vaccination. Tetanus booster is recommended every 10 years.

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Older Than 5 Yr		2-5 Yr		
	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Eating Disorders

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR EATING DISORDERS

- History of food intake and level of exercise
- Skin assessment
- Menstrual history
- Mental status examination or other brief psychosocial profile
- Focused physical assessment of weight (have student remove shoes/bulky outer wear)

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Cardiac arrest ▪ Seizure activity (see <i>Seizures</i> protocol) ▪ Hypotension ▪ Bradycardia ▪ Lethargy <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Orthostatic vital signs^a ▪ Significant weight loss ▪ Tooth enamel erosion ▪ Weakness ▪ Poor skin turgor <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Encourage fluid intake in small quantities ▪ Provide nonthreatening environment ▪ Observe student closely ▪ Discuss the need for medical evaluation/counseling with parent/guardian ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Normal vital signs ▪ Suspicion or early signs of eating disorder^b <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Provide nonthreatening environment ▪ Observe student ▪ Discuss health consequences of behavior ▪ Contact parent/guardian ▪ Refer to school counselor ▪ Return student to class or send home as indicated ▪ Follow up

^aOrthostatic vital signs

Assess BP and HR while student is supine. Have student sit up or stand and reassess 1 min later. If BP decreases by more than 20 mm Hg or HR increases by 20 bpm, orthostasis is present.

^bEarly signs/psychosocial attributes associated with eating disorders

- High achiever/perfectionist
- Low self-esteem/depression
- History of substance abuse
- Intense fear of weight gain
- Evidence of body dysmorphia
- Rigid self-control
- Decreased food intake, self-induced vomiting, use of laxatives/diuretics/emetics
- Vigorous exercising to achieve weight loss rather than fitness
- Recent history of weight loss/weight fluctuations
- Preference for oversized clothing
- Amenorrhea
- Hypothermia
- Lanugo (downy hair)
- Weakness
- Poor skin turgor
- Esophagitis, oral lesions
- Dental caries, tooth enamel erosion

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

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History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

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- E**mergent ▪ **U**rgent ▪ **N**onurgent

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	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Eye Emergencies

SYSTEMATIC ASSESSMENT

**Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO
Stabilize c-spine if spinal injury is suspected!**

KEY ASSESSMENT POINTS FOR EYE EMERGENCIES

- Events leading up to injury (eg, chemical exposure, other burn)
- AS TOLERATED, focused physical examination of the eye/vision assessment for
 - visible wounds, drainage, foreign body
 - extraocular movement
 - PERRLA
 - visual acuity

IMMEDIATE INTERVENTIONS

For chemical burns involving the eye, IMMEDIATELY activate EMS, then ensure scene safety and begin flushing eye copiously with saline, eyewash solution, or water

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Change in mental status, LOC ▪ Penetrating injury ▪ Chemical/thermal burn ▪ Unequal/irregular pupils ▪ Blunt injury (see <i>Head/Spinal Cord</i> protocol) ▪ Embedded foreign body ▪ Hyphema (haze or blood in iris) ▪ Decreased visual acuity/loss of vision <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Maintain c-spine stabilization as applicable ▪ Support ABCs ▪ Activate EMS ▪ Protect eye from further injury <p style="text-align: center;">Chemical burns</p> <ul style="list-style-type: none"> ▪ Continue irrigation while awaiting EMS ▪ Send copy of MSDS to ED <p style="text-align: center;">Penetrating injuries</p> <ul style="list-style-type: none"> ▪ Stabilize object with gauze pads ▪ Tape disposable drinking cup over dressing (do not allow it to contact object) <p style="text-align: center;">Thermal burns</p> <ul style="list-style-type: none"> ▪ Do not inspect eyes ▪ Apply loose, moist dressing <p style="text-align: center;">Radiation burns (eg, from arc welder, sunlight, sun lamp)</p> <ul style="list-style-type: none"> ▪ Cover with eye patch <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Blunt trauma without vision changes ▪ S/S extraocular muscle entrapment ▪ Suspected corneal abrasion ▪ Laceration of lid ▪ Blurry/impaired vision ▪ Diplopia ▪ Eye pain/guarding ▪ Sensation of foreign body persisting more than 1 hr ▪ Bilateral periorbital ecchymoses (raccoon eyes) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ If no evidence of injury, apply cool compress for 20 min ▪ Instruct student not to move rapidly, bend over, or cough ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Superficial foreign body ▪ Subconjunctival hemorrhage (may follow violent coughing or vomiting) ▪ Minor periorbital lacerations ▪ Minor periorbital ecchymoses <p style="text-align: center;">INTERVENTIONS</p> <p style="text-align: center;">Foreign body</p> <ul style="list-style-type: none"> ▪ If foreign body is visible in sac of lower lid, remove with cotton-tipped applicator ▪ If unsuccessful after 2 attempts, or if foreign body is located elsewhere, flush with saline, eyewash solution, or water <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Older Than 5 Yr		2-5 Yr		
	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Foreign Body Airway Obstruction

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see *Assessment protocol*), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR FOREIGN BODY AIRWAY OBSTRUCTION

- Evaluation of airway/respiratory status
 - Suddenness of onset
- Events leading up to incident (eg, witnessed ingestion/aspiration of small object, toy, or food)

Note: Fever or S/S of respiratory illness decreases the likelihood of foreign body etiology

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<p style="text-align: center;">Severe airway obstruction</p> <ul style="list-style-type: none"> ▪ Choking, silent cough or ▪ Unable to cough, speak, or make any sound ▪ Apnea ▪ Pallor or cyanosis ▪ Loss of consciousness <p style="text-align: center;">INTERVENTIONS</p> <p style="text-align: center;">Severe Obstruction</p> <p>Begin AHA airway clearing maneuvers. See reverse for detailed procedure.</p> <ul style="list-style-type: none"> ▪ In infants younger than 1 yr, apply 5 back slaps and 5 chest thrusts ▪ In children older than 1 yr, perform abdominal thrusts (Heimlich maneuver) ▪ Continue until either the object is expelled or the infant or child becomes unresponsive ▪ Begin CPR, checking inside the mouth before each series of rescue breaths to see whether the object is visible and can be removed <p>Note: Do not attempt blind finger sweeps! Foreign body may be pushed further into the airway, exacerbating obstruction.</p> <ul style="list-style-type: none"> ▪ Activate EMS if efforts are unsuccessful after 1 minute ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">Mild airway obstruction</p> <ul style="list-style-type: none"> ▪ History of aspiration ▪ Fast breathing ▪ Intermittent wheezing or stridor ▪ Gagging, choking, coughing ▪ Pink skin color ▪ Mild to moderate dyspnea <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Encourage forceful cough ▪ Do not interfere in any other way ▪ Monitor for worsening distress, ineffective cough, inspiratory wheezing, labored breathing, tachycardia ▪ If signs of severe obstruction develop, triage as Emergent and begin AHA airway clearing maneuvers (see reverse) ▪ If student's efforts clear the obstruction, contact parent/guardian to transport student to medical care or home ▪ Notify school administrator ▪ Provide psychological support ▪ Follow up 	<ul style="list-style-type: none"> ▪ Witnessed ingestion/aspiration ▪ Student clears obstruction by coughing ▪ No S/S of continued obstruction <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Observe student at frequent intervals throughout day ▪ Contact parent/guardian ▪ Provide psychological support ▪ Return student to class or send home as indicated ▪ Follow up ▪ NOTE: If student continues to cough the next day, suspect retained bronchial foreign body, bronchitis, or pneumonia. ▪ Follow up

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AHA Airway Clearing Maneuvers

Responsive Infant

- Sit or kneel, holding the infant prone. Rest your forearm on your thigh and support the infant's head by firmly holding the infant's face and jaw. Place your other hand on the infant's back, supporting the occiput. The infant should be sandwiched between your forearms, with the head lower than the trunk.
- Using the heel of your hand, deliver 5 forceful back slaps (Figure 1).
- Turn the infant supine while continuing to support the head and neck. Position the infant on your thigh, keeping the head lower than the trunk.
- Continue to support the occiput with one hand. Place your other hand just below the intermammary line, as you would to deliver chest compressions. Deliver 5 quick downward chest thrusts (Figure 2).
- Continue to alternate back slaps and chest thrusts until either the object is expelled or the infant becomes unresponsive.

Unresponsive Infant

- Look in the infant's mouth. Attempt to remove the object **if it is visible**.
- Open the airway using a jaw-thrust maneuver. Attempt rescue breaths. If the breaths are not effective, reposition the infant's head and try again.
- Begin CPR, compressing the sternum with 2 fingers just below the intermammary line.
- Look inside the mouth before each series of rescue breaths and attempt to remove the object **if it is visible**. Repeat these steps up to 1 minute until either the object is dislodged or rescue breathing is successful.
- If attempts are not successful after 1 minute, activate EMS.
- Return to CPR until efforts are successful or EMS responders arrive.

Responsive Child

- Stand or kneel behind the child. Place your arms directly under the child's axillae, encircling the chest.
- Place the radial side of your fist against the child's abdomen at the midline, slightly above the navel and well below the tip of the xiphoid process.
- Grasp your fist with your other hand. Deliver a series of quick abdominal thrusts, directed inward and upward (Figure 3). Make each thrust separate and distinct. Use sufficient force to dislodge the obstruction, but do not compress the xiphoid process or the lower margins of the rib cage, as this could damage internal organs.
- Repeat the series of abdominal thrusts until the object is expelled or the child becomes unresponsive.

Unresponsive Child

- Look in the child's mouth. Attempt to remove the object **if it is visible**.
- Open the airway using a jaw-thrust maneuver. Attempt rescue breaths. If the breaths are not effective, reposition the child's head and try again.
- Position yourself either kneeling beside or straddling the child's hips. Begin CPR (Figure 4).
- Look inside the mouth before each series of rescue breaths and attempt to remove the object **if it is visible**. Continue CPR up to 1 minute, until either the object is dislodged or rescue breathing is successful.
- If attempts are not successful after 1 minute, activate EMS.
- Return to CPR until efforts are successful or EMS responders arrive.

Figure 1



Figure 2



Figure 3



Figure 4



Figs: American Heart Association, Pediatric Advanced Life Support Provider Manual, 2000

Headache

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR HEADACHES

- Mental status/neurologic assessment
- Past health history of headaches or recent head injury
- Events leading up to onset, such as stress, exposure to a known trigger, aura
- Focused physical assessment for neck stiffness
- Assessment for visual disturbances (see *Eye Emergencies* protocol)

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Change in mental status, LOC ▪ Acute neurologic deficit ▪ Seizure activity (see <i>Seizures</i> protocol) ▪ Severe headache (eg, c/o “worst headache of my life”) ▪ Stiff neck with fever ▪ Recent head injury ▪ Hypertension <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Consult IHP/ECP ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Moderate headache with vomiting ▪ History of aura ▪ Exposure to known trigger ▪ Blurred vision, dizziness, photophobia ▪ No neurologic deficit ▪ History of migraines <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Provide rest in quiet, darkened room ▪ Consult IHP/ECP ▪ Administer medication per IHP/ECP ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Generalized mild headache ▪ S/S of URI ▪ S/S of sinus infection <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Allow student to rest supine for 30 min ▪ Consult IHP/ECP ▪ Administer medication per IHP/ECP ▪ Observe student ▪ Reassess ▪ Educate about avoiding triggers ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score	
Eye opening	Spontaneous		Spontaneous		4	
	To verbal command		To shout		3	
	To pain		To pain		2	
	No response		No response		1	
Best motor response	Obeys commands		Spontaneous		6	
	Localizes pain		Localizes pain		5	
	Flexion-withdrawal		Flexion-withdrawal		4	
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3	
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2	
	No response		No response		1	
	Older Than 5 Yr		2-5 Yr	Younger than 2 Yr		
Best verbal response	Oriented		Appropriate words/phrases	Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words	Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless		2
	No response		No response	No response		1
Total Score						

Head/Spinal Cord Trauma

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO. Stabilize c-spine—DO NOT move student!

KEY ASSESSMENT POINTS FOR HEAD/SPINAL CORD TRAUMA

- Mental status/neurologic assessment
 - Events leading up to injury
 - Mechanism of injury
- Assessment for visual disturbances (see *Eye Emergencies* protocol)

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Change in mental status, LOC (including drowsiness, lethargy) ▪ Abnormal behavior/loss of normal abilities ▪ Seizure activity (see <i>Seizures</i> protocol) ▪ Loss of/decreased movement or sensation in extremities ▪ Blood/CSF discharge from nose/ears ▪ Significant trauma to head/neck or high-risk mechanism of injury ▪ Evidence of depressed skull fracture ▪ Paresthesia <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Maintain c-spine stabilization ▪ Apply direct pressure to bleeding except over depressed skull injury ▪ Keep student warm ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Brief period of confusion/amnesia ▪ Neck pain ▪ Dizziness ▪ Blurred vision/diplopia ▪ Headache ▪ Nausea/vomiting ▪ Laceration requiring sutures (see <i>Lacerations/Abrasions</i> protocol) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Maintain c-spine stabilization ▪ Control bleeding with direct pressure ▪ Apply cold packs to swollen areas ▪ Keep student warm ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Alert ▪ Minor abrasions, lacerations, or edema <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Apply cold packs as indicated ▪ Observe student closely ▪ Reassess after 15–30 min ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Advise parent/guardian, teachers, coaches of injury and emphasize need for observation over next 24–48 hours, seeking medical care if the student exhibits any of the following: <ul style="list-style-type: none"> • dizziness • headache • nausea • photophobia • diplopia • irritability • poor concentration • decline in academic ability • personality changes ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
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- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
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Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
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	Localizes pain		Localizes pain		5
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	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
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Best verbal response	Older Than 5 Yr		2-5 Yr		
	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Heat-related Injuries

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO
KEY ASSESSMENT POINTS FOR HEAT-RELATED INJURIES

- Skin assessment (eg, color, other skin findings)

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ S/S of heat stroke <ul style="list-style-type: none"> • Hyperthermia (T exceeding 104°F/40°C) • Confusion/diminished LOC • Hot/dry/red skin • Tachycardia/weak peripheral pulses • Syncope • Ataxia ▪ Seizure activity (see <i>Seizures</i> protocol) <p style="text-align: center;">INTERVENTIONS</p> <p style="text-align: center;">Heat stroke is a life-threatening emergency!</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Immediately remove from heat to a cool environment ▪ Immediately initiate cooling measures: <ul style="list-style-type: none"> • Loosen clothing • Apply cool, wet towels to neck, groin, axillae • Sponge with cool compresses • Fan student ▪ Place in left lateral recovery position in case of vomiting ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Oriented ▪ Mild tachycardia ▪ S/S of heat exhaustion <ul style="list-style-type: none"> • Cool, moist, pale skin • Dilated pupils • Mild to moderate headache • Nausea/vomiting • Muscle cramps • Weakness, dizziness • Normothermic to mildly hyperthermic (T less than 101°F/38.3°C) • Diaphoresis • Orthostatic vital signs^a <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Observe continuously ▪ Allow to rest in cool environment ▪ Loosen clothing ▪ Apply cool, wet towels ▪ Fan student ▪ In the absence of vomiting, encourage fluid replacement with water or a diluted electrolyte-replacement drink as permitted by applicable protocols ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Mild cramping of calves, thighs, shoulders ▪ Normothermic ▪ Awake and alert <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Allow to rest in cool environment ▪ Loosen clothing ▪ Observe student ▪ Encourage fluid replacement with water or a diluted electrolyte-replacement drink as permitted by applicable protocols ▪ Educate student about maintaining adequate hydration during higher-risk activities ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

^aOrthostatic vital signs

Assess BP and HR while student is supine. Have student sit up or stand and reassess 1 min later. If BP decreases by more than 20 mm Hg or HR increases by 20 bpm, orthostasis is present.

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

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Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

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- Vital signs, temperature, weight, blood glucose
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- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
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- Assess pupils
- Assess for transient paresthesia

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School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score		
Eye opening	Spontaneous		Spontaneous		4		
	To verbal command		To shout		3		
	To pain		To pain		2		
	No response		No response		1		
Best motor response	Obeys commands		Spontaneous		6		
	Localizes pain		Localizes pain		5		
	Flexion-withdrawal		Flexion-withdrawal		4		
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3		
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2		
	No response		No response		1		
Best verbal response	Older Than 5 Yr		2-5 Yr		Younger than 2 Yr		
	Oriented		Appropriate words/phrases		Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words		Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams		Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts		Grunts, agitated, restless		2
No response		No response		No response		1	
Total Score							

Hemophilia

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR HEMOPHILIA

- History relating to recent surgery, medical procedures, dental extractions, or injuries
- Focused physical examination for external bleeding, lacerations, ecchymoses, abrasions, hematomas

IMMEDIATE INTERVENTIONS

Even *before* you determine triage category, attempt to control external bleeding by applying firm pressure for 10 min

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ S/S of internal bleeding: <ul style="list-style-type: none"> • Headache • Dizziness • Visual disturbances • Neurologic deficit • Altered LOC/pupillary changes ▪ Signs of shock ▪ Profuse, uncontrollable hemorrhage ▪ Severe abdominal pain <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ For shock, place in Trendelenburg position ▪ Consult IHP/ECP ▪ Directly/continuously observe student ▪ Frequently reassess vital signs and AVPU ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Acute joint swelling/pain ▪ Abdominal discomfort, tenderness on palpation, nausea ▪ External bleeding not responsive to prolonged pressure ▪ Indications of intramuscular hematoma (most commonly felt in knees, ankles, elbows): tingling, pain, limited ROM, edema, increased warmth/tenderness <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Consult IHP/ECP ▪ Reassess vital signs ▪ Apply cold pack to swollen joint ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Minor lacerations, ecchymoses, abrasions ▪ Bleeding responds to pressure <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Apply firm, direct pressure ▪ Apply cold pack as indicated ▪ Consult IHP/ECP ▪ Observe student ▪ Contact parent/guardian ▪ Return to class when bleeding stops or send home as indicated ▪ Educate student parent/guardian and school personnel about playground/sport safety ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
	No response		No response	No response	1
Total Score					

Increased Intracranial Pressure in a Student With a Ventriculoperitoneal Shunt

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR STUDENTS WITH VP SHUNTS

- Facial symmetry
 - Gag reflex
- Pupil size/reactivity
- Extraocular eye movements
- Neurologic function
- Pediatric GCS score
- Symmetry of function/strength, posture, gait, balance, spontaneous movement

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Change in mental status, LOC ▪ Lethargy ▪ Acute neurologic deficit ▪ Inability to look up/roll eyes upward ▪ New onset eye deviation ▪ Seizure (see <i>Seizures</i> protocol) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Consult IHP/ECP ▪ Directly/continuously observe student ▪ Contact physician for instructions ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Early S/S of shunt dysfunction: <ul style="list-style-type: none"> ▪ Headache ▪ Irritability ▪ Vomiting ▪ Decreased appetite ▪ Change in personality ▪ Loss of existing skills or abilities ▪ Swelling/erythema along shunt path ▪ Seizures ▪ Loss of balance ▪ S/S of shunt tract infection <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Place student supine ▪ Elevate head ▪ Allow student to rest ▪ Reduce environmental stimuli ▪ Consult IHP/ECP ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Headache ▪ Normal neurologic assessment and PGCS score <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Consult IHP/ECP ▪ Allow student to rest 30 min, then reassess ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Reassess every 2 hours if student remains at school ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score	
Eye opening	Spontaneous		Spontaneous		4	
	To verbal command		To shout		3	
	To pain		To pain		2	
	No response		No response		1	
Best motor response	Obeys commands		Spontaneous		6	
	Localizes pain		Localizes pain		5	
	Flexion-withdrawal		Flexion-withdrawal		4	
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3	
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2	
	No response		No response		1	
	Older Than 5 Yr		2-5 Yr	Younger than 2 Yr		
Best verbal response	Oriented		Appropriate words/phrases	Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words	Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless		2
	No response		No response	No response		1
Total Score						

Lacerations/Abrasions

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR LACERATIONS AND ABRASIONS

- Inspection of wound
- Neurovascular assessment distal to injury:
 - Pain, pulse, pallor, paresthesia, paralysis (**5 Ps** mnemonic)
 - Capillary refill
 - Edema
 - Skin temperature

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Absent distal pulses ▪ Significant blood loss ▪ Crush injury ▪ Amputation (see <i>Trauma</i> protocol) ▪ Penetrating wound ▪ Capillary refill exceeds 2 sec ▪ Altered LOC ▪ S/S of respiratory distress <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Control hemorrhage ▪ Elevate/immobilize extremity ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Stable vital signs ▪ Pulses present distal to injury ▪ Significantly contaminated lacerations ▪ Facial lacerations ▪ Puncture wounds of foot ▪ Wounds requiring sutures ▪ Controllable bleeding <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Control bleeding with direct pressure ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Stable vital signs ▪ Superficial abrasion, scrape, or wound ▪ Small splinter or foreign body <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Remove splinter ▪ Cleanse wounds using aseptic technique^a ▪ Bandage wounds ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

^aGeneral wound care/aseptic cleansing

- Clean wounds thoroughly with soap.
 - Rub abrasions gently with 4x4 gauze to remove debris and crusts.
 - Rinse copiously with water.
 - Bandage abrasions loosely, using nonadherent gauze to allow air circulation.
 - Apply butterfly bandage to lacerations after bleeding has been controlled.
- Due to high risk of infection, all deep puncture wounds of the foot must be referred to a physician.

NOTE

Refer student for tetanus booster if it has been 5 years or more since the last vaccination. Tetanus booster is recommended every 10 years.

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
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- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

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Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
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- Decreasing consciousness
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PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
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	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Older Than 5 Yr		2-5 Yr		
	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Musculoskeletal Injury

SYSTEMATIC ASSESSMENT

**Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO
Stabilize c-spine if head/spinal injury is suspected!**

KEY ASSESSMENT POINTS FOR MUSCULOSKELETAL INJURIES

- | | |
|---|--|
| <p>Focused physical examination of affected area:</p> <ul style="list-style-type: none"> ▪ Bilateral symmetry <ul style="list-style-type: none"> ▪ ROM/strength ▪ Visual inspection for abnormalities | <p>Neurovascular status distal to injury:</p> <ul style="list-style-type: none"> ▪ Pain, pulse, pallor, paresthesia, paralysis (5 Ps) ▪ Edema ▪ Capillary refill ▪ Skin temperature |
|---|--|

IMMEDIATE INTERVENTIONS

Even before you determine triage category, immobilize and support affected area proximal and distal to injury

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

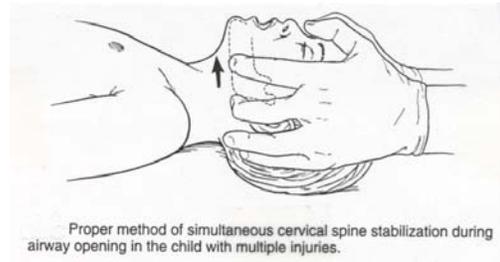
EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Open fracture ▪ Amputation (see <i>Trauma</i> protocol) ▪ Degloving injury ▪ Neurovascular compromise ▪ Severe edema/deformity at joint or extremity ▪ Joint deviation ▪ Suspected femoral fracture <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Instruct student to avoid weight-bearing/movement of injured area ▪ Immobilize and position suspected fractures/dislocations (see reverse) ▪ Reassess neurovascular status distal to injury every 5–10 min ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Stable vital signs ▪ Moderate deformity/discoloration without open wound ▪ Moderate edema at joint or extremity ▪ Moderate pain/guarding ▪ Normal neurovascular findings <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Immobilize and position suspected fracture/dislocation (see reverse) ▪ Elevate extremity ▪ Apply cold packs ▪ Observe student closely ▪ Reassess neurovascular status distal to injury every 5–10 min ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Normal vital signs ▪ No deformity ▪ Mild soft tissue edema ▪ Mild pain/point tenderness ▪ Able to bear weight ▪ Normal neurovascular findings <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Apply cold pack ▪ Elevate area ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

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Interventions for Musculoskeletal Injuries

MANUAL CERVICAL SPINE STABILIZATION

- Position student supine
- Place both hands along lateral aspect of student's head
- Position the head so that the neck is in neutral alignment with the spine
- Continue to support the head to maintain neutral cervical alignment



IMMOBILIZATION/POSITIONING OF FRACTURES AND DISLOCATIONS

Area/Injury	Treatment
Upper extremity	<ul style="list-style-type: none"> ▪ Apply sling/triangular bandage ▪ Swathe if additional immobilization is indicated
Clavicular injury/dislocation	<ul style="list-style-type: none"> ▪ Apply sling/triangular bandage ▪ Swathe if additional immobilization is indicated
Angulation with unimpaired circulation	<ul style="list-style-type: none"> ▪ Immobilize as presented ▪ Do not move extremity
Angulation with absent distal pulse, cyanosis	<ul style="list-style-type: none"> ▪ Return extremity to proper physiologic position ▪ Apply gentle traction until pulse is restored ▪ Splint or immobilize area, including joints proximal and distal to injury ▪ Reassess pulses every 5–10 minutes

SLING AND SWATHE IMMOBILIZATION



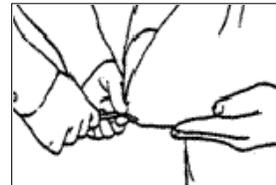
Place the arm across the chest and position as shown. Bring the bandage over the arm and behind the neck.



Adjust the length as necessary and tie the ends. The arm should be well supported, relieving pressure on the shoulder.



Place the knot so that it lies over the shoulder rather than against the cervical spine. Placing a pad under the knot will enhance comfort.



Secure the sling at the elbow with a safety pin or knot, creating a pocket in which the elbow rests securely. Reassess neurovascular integrity.



If further immobilization is needed to secure the extremity and a second bandage is available, swathe the arm as permitted by applicable protocols. Lay the second bandage flat, then fold it several times lengthwise. Use the folded bandage to swathe the injured arm against the chest wall, immobilizing it.

Near-drowning/Submersion

CAUTION

Ensure scene safety! Never attempt a water rescue unless you are trained to do so.

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR SUBMERSION INJURIES

- Skin assessment
- Duration of exposure
- Inspection for associated injuries

KEY FINDINGS

- Dyspnea, rales, rhonchi, wheezing, or apnea
 - Bradycardia or asystole
 - Cyanosis/pallor
- Altered LOC
- Fixed, dilated pupils
- Hypothermia, cool skin

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

The triage category for ALL instances of near-drowning is EMERGENT!

INTERVENTIONS

- Activate EMS
- **EMS transport to ED for evaluation is REQUIRED in all cases of near-drowning!**

If still in water

- Do not remove student without assistance
- Keep student afloat face-up
- Support head and neck in neutral alignment with spine
- Open airway using jaw thrust and support ventilation
- When adequate assistance is available, place student supine on backboard or other rigid support for removal from water

If out of water

- Support ABCs (use jaw thrust technique if spinal injury is suspected)
- Assess Pediatric Glasgow Coma Scale score
- Cover student and maintain warmth to prevent hypothermia

In all cases

- Directly/continuously observe student
- Contact parent/guardian
- Notify school administrator
- Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

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- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

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Adolescent (12 yr /up)	12-20	60-100	100-128

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PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score		
Eye opening	Spontaneous		Spontaneous		4		
	To verbal command		To shout		3		
	To pain		To pain		2		
	No response		No response		1		
Best motor response	Obeys commands		Spontaneous		6		
	Localizes pain		Localizes pain		5		
	Flexion-withdrawal		Flexion-withdrawal		4		
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3		
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2		
	No response		No response		1		
Best verbal response	Older Than 5 Yr		2-5 Yr		Younger than 2 Yr		
	Oriented		Appropriate words/phrases		Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words		Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams		Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts		Grunts, agitated, restless		2
No response		No response		No response		1	
Total Score							

Nose Emergencies

SYSTEMATIC ASSESSMENT

**Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO
Stabilize c-spine if head/spinal injury is suspected!**

KEY ASSESSMENT POINTS FOR EMERGENCIES INVOLVING THE NOSE

- Mechanism of injury/events preceding episode
- Airway status
- Physical assessment/inspection for abnormalities, bleeding, drainage

IMMEDIATE INTERVENTIONS

Even *before* you determine triage category, begin to control bleeding with pressure

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Suspected nasal fracture with potential head/neck injury (see <i>Head/Spinal Cord</i> protocol) ▪ Change in mental status, LOC ▪ Airway compromise ▪ CSF drainage 	<ul style="list-style-type: none"> ▪ Suspected nasal fracture, no possibility of head/neck injury ▪ Tenderness on palpation ▪ Epistaxis not controlled after 10 min ▪ Moderate periorbital edema 	<ul style="list-style-type: none"> ▪ Foreign body ▪ Controllable epistaxis ▪ S/S of acute sinusitis: <ul style="list-style-type: none"> • Pain/pressure over sinus areas • Throbbing • Headache, malaise, fever • Mucopurulent secretions • Mild periorbital edema
<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Maintain spinal stabilization as applicable ▪ Support ABCs ▪ Activate EMS ▪ Directly/continuously observe student ▪ Keep student calm ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS <p style="text-align: center;">Prolonged epistaxis</p> <ul style="list-style-type: none"> ▪ Pinch nostrils closed and apply pressure for 10 min ▪ If epistaxis continues, consider activating EMS <p style="text-align: center;">Suspected nasal fracture</p> <ul style="list-style-type: none"> ▪ Apply cold packs ▪ See <i>Lacerations/Abrasions</i> protocol for treatment of associated wounds <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<p style="text-align: center;">INTERVENTIONS</p> <p style="text-align: center;">Epistaxis</p> <ul style="list-style-type: none"> ▪ Pinch nostrils closed and apply pressure for 10 min <p style="text-align: center;">Foreign body</p> <ul style="list-style-type: none"> ▪ Have student blow nose while occluding unobstructed nostril ▪ Attempt removal only if object is visible and can be grasped with forceps or fingers ▪ During extraction, occlude nostril superior to object so that it cannot be pushed further in ▪ If object cannot be removed, reclassify as urgent <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Observe student ▪ Contact parent/guardian for referral to primary care physician ▪ Return student to class or send home as indicated ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score		
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	To verbal command		To shout		3		
	To pain		To pain		2		
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Best motor response	Obeys commands		Spontaneous		6		
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	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3		
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Best verbal response	Oriented		Appropriate words/phrases		Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words		Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams		Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts		Grunts, agitated, restless		2
	No response		No response		No response		1
Total Score							

Obstetric Emergencies

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see *Assessment protocol*), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR OBSTETRIC EMERGENCIES

- Obstetric history:**
- Anticipated due date
 - Recent drug use
 - Possibility of multiple births
 - Prenatal care (name/phone # of obstetrician)
 - Delivery hospital
 - Color of amniotic fluid (clear, red, green, yellow-tinged)
 - Progression of labor
 - Bloody show/expulsion of mucous plug
 - Timing/strength of contractions
 - Inspection for crowning
 - Reported urge to move bowels

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ S/S of shock ▪ Seizure activity (see <i>Seizures protocol</i>) ▪ S/S of preeclampsia: <ul style="list-style-type: none"> · BP equals or exceeds 140/90 or · BP elevated by 30 mm Hg (systolic) or 15 mm Hg (diastolic) above known baseline ▪ Crowning ▪ Breech presentation ▪ Prolapsed umbilical cord ▪ Abruptio placentae ▪ Placenta previa/vaginal bleeding ▪ Multigravida ▪ Premature labor ▪ Contractions less than 10 min apart <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ For signs of shock, if delivery is not imminent, place in left lateral recovery position ▪ If delivery is imminent, prepare for emergency delivery (see reverse for neonatal care) ▪ Directly/continuously observe student ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Pregnancy-induced hypertension ▪ History of trauma ▪ Active labor, amniotic sac intact ▪ Contractions more than 10 min apart <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Observe student closely ▪ Contact parent/guardian to transport student for medical care ▪ Monitor closely ▪ Follow up 	<ul style="list-style-type: none"> ▪ Variable contractions ▪ Amniotic sac intact ▪ Vomiting with stable vital signs <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Observe student ▪ Contact parent/guardian to transport student for medical care ▪ Follow up

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Emergency Neonatal Care

IMMEDIATE INTERVENTIONS

- Suction the infant’s mouth first, then the nose
- Dry the infant with a towel
- Rewrap the infant in a warmed, clean, dry towel or blanket; cover head
- Stimulate breathing by rubbing infant’s back or flicking feet
- Resuscitate if necessary according to current AHA guidelines
- Calculate Apgar score (below)

NOTE

Do not interrupt resuscitation procedures to calculate Apgar score.

- Directly/continuously observe student and infant
- Contact significant others per student’s request

APGAR SCORING CRITERIA

Unless resuscitation measures are needed, assess the baby’s Apgar score 1 minute after birth and again 5 minutes after birth. The Table summarizes categories and scoring.

APGAR EVALUATION OF THE NEONATE

	Sign	0	1	2
A	Appearance (color)	Cyanotic or pallid	Centrally pink, extremities cyanotic	Completely pink
P	Pulse rate	Absent	Slower than 100 bpm	Faster than 100 bpm
G	Grimace (reflex irritability) ^a	No response	Grimace	Cough/cry/sneeze
A	Activity (muscle tone)	Limp	Some flexion (extremities)	Active movement
R	Respiratory effort	Absent	Slow/irregular	Good; cries

^aIn response to nasal or oral stimulation. bpm indicates beats per minute

Respiratory Distress

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR RESPIRATORY DISTRESS

- Breathing assessment

IMMEDIATE INTERVENTIONS

Even before you determine triage category, perform the following actions as indicated

- Loosen restrictive clothing
- Help student into position of comfort
- Maintain airway patency

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ S/S of severe respiratory distress or failure ▪ Apnea or dyspnea ▪ Grunting, drooling ▪ S/S of impending respiratory failure <ul style="list-style-type: none"> • Cyanosis • Tachycardia • Shallow respiration • Decreasing LOC/restlessness • Hypotension ▪ S/S of airway obstruction (see <i>Foreign Body</i> protocol) ▪ Severe asthma attack (see <i>Asthma</i> protocol) ▪ S/S of epiglottitis (dysphagia, drooling, high fever, stridor, tripod positioning) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Maintain position of comfort ▪ Administer high-flow O₂ as tolerated if available <p style="text-align: center;">Epiglottitis</p> <ul style="list-style-type: none"> ▪ Do not inspect hypopharynx ▪ Keep student calm <p style="text-align: center;">Respiratory failure</p> <ul style="list-style-type: none"> ▪ Assist ventilation via mouth-to-mask ▪ Anticipate need for CPR <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ S/S of moderate respiratory distress ▪ Fever, chills ▪ Persistent or barking cough ▪ Stridor, wheezing ▪ Nasal flaring ▪ Retractions ▪ Pleural pain ▪ Mild to moderate asthma (see <i>Asthma Attack</i> protocol) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Maintain position of comfort ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Hyperventilation ▪ S/S of mild URI <ul style="list-style-type: none"> • Cough • Nasal congestion • Sore throat • Hoarseness • Low-grade fever <p style="text-align: center;">INTERVENTIONS</p> <p>For hyperventilation</p> <ul style="list-style-type: none"> ▪ Encourage student to relax <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated (send home for fever in which T exceeds 100° F/37.8°C) ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Older Than 5 Yr		2-5 Yr		
	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Seizures

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

- **Stabilize c-spine if head/spinal injury is suspected!**
- **Open airway as necessary, using jaw-thrust maneuver**

KEY ASSESSMENT POINTS FOR SEIZURES

- Past health history, particularly of
 - Epilepsy
 - Syncope
 - Diabetes
- Events preceding episode, particularly head injury
- Indicators of drug overdose, meningitis, hypoglycemia (see *Diabetic Emergencies* and *Substance Abuse* protocols)

IMMEDIATE INTERVENTIONS

During an active seizure, perform the following actions *before* you proceed with triage:

- Do not put anything in student's mouth—do not restrict movement in any way
- Provide privacy
- Protect student from injury

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ First-time seizure/no known history of seizures ▪ History of seizures and medication noncompliance with no recent seizures ▪ Seizure/series of seizures persisting more than 5 min ▪ Associated respiratory compromise ▪ Associated head injury or trauma <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Consult IHP/ECP ▪ Directly/continuously observe student ▪ Provide psychological support ▪ Document time, characteristics, duration of seizure ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Atypical seizure in student with history of seizures <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Consult IHP/ECP ▪ Check glucose if possible ▪ Allow to rest in left lateral recovery position ▪ Provide psychological support ▪ Observe student closely ▪ Document characteristics/duration of seizure ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Typical seizure in student with baseline history of frequent seizures <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Consult IHP/ECP ▪ Check glucose if possible ▪ Allow to rest in left lateral recovery position during postictal phase ▪ Provide psychological support ▪ Observe student ▪ Document characteristics/duration of seizure ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ For persistent drowsiness, notify parent/guardian to transport student home ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

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- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
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Best verbal response	Oriented	Appropriate words/phrases	Smiles/coos appropriately	5	
	Disoriented/confused	Inappropriate words	Cries, inconsolable	4	
	Inappropriate words	Persistent cries/screams	Persistent inappropriate cries/screams	3	
	Incomprehensible sounds	Grunts	Grunts, agitated, restless	2	
	No response	No response	No response	1	
Total Score					

Sexual Abuse/Assault, Teen Dating Violence

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR SEXUAL ABUSE OR ASSAULT

- Psychosocial history
- Focused physical examination for injuries
- Menstrual status/possibility of pregnancy

IMMEDIATE INTERVENTIONS

Even before you determine triage category, perform the following actions as indicated

- Provide a safe, nonthreatening environment
 - Ask questions that will help student recognize what has happened
 - Reinforce student's courage in seeking help
 - Try to ascertain whether sexual assault took place
- (NOTE: Any instance of suspected sexual assault requires ED treatment and local law enforcement notification)**

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Thoughts of death or suicide ▪ Severe/life-threatening injuries (see <i>Trauma</i> protocol) ▪ Suspected sexual assault <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Directly/continuously monitor student ▪ Refer to school counselor as appropriate ▪ Report suspicions to DCFS at 800-25-ABUSE (22873) and/or local law enforcement as appropriate (see <i>Appendix B</i> for a written report form) ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Ecchymoses/injuries, not life-threatening ▪ Alcohol/drug use ▪ Current, previous, or potential pregnancy <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Observe student closely ▪ Provide support ▪ Refer to school counselor ▪ Report suspicions to DCFS at 800-25-ABUSE (22873) and/or local law enforcement (see <i>Appendix B</i> for a written report form) ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ History of truancy ▪ Sudden change in dress or makeup ▪ Difficulty making decisions ▪ Abrupt changes in mood/personality ▪ Combative, possessive, or jealous behavior ▪ Withdrawal/self-isolation <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Refer to school counselor ▪ Observe student's behavior with others ▪ Document findings ▪ Provide support ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Report suspicions to DCFS at 800-25-ABUSE (22873) and/or local law enforcement (see <i>Appendix B</i> for a written report form) ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

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Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

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Initial assessment

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- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

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Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score		
Eye opening	Spontaneous		Spontaneous		4		
	To verbal command		To shout		3		
	To pain		To pain		2		
	No response		No response		1		
Best motor response	Obeys commands		Spontaneous		6		
	Localizes pain		Localizes pain		5		
	Flexion-withdrawal		Flexion-withdrawal		4		
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3		
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2		
	No response		No response		1		
Best verbal response	Older Than 5 Yr		2-5 Yr		Younger than 2 Yr		
	Oriented		Appropriate words/phrases		Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words		Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams		Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts		Grunts, agitated, restless		2
No response		No response		No response		1	
Total Score							

Sickle Cell Anemia

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR SICKLE CELL ANEMIA

- Past health history, including recent illness
- Last food/drink (likelihood of dehydration)
 - Events leading up to episode, including exposure to temperature extremes
- Focused physical examination/palpation for localized pain, edema, other abnormalities

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

<p style="text-align: center;">EMERGENT</p> <ul style="list-style-type: none"> ▪ Fever (T exceeds 100°F/37.8°C) ▪ S/S of infection, sepsis ▪ Severe, continuous pain in extremities, back, chest, or abdomen ▪ Seizure activity (see <i>Seizures</i> protocol) ▪ Change in mental status, LOC ▪ Dyspnea ▪ Chest pain ▪ Priapism/penile pain ▪ Severe splenomegaly and S/S of shock ▪ Pallor, lethargy with other abnormal findings ▪ S/S of impending respiratory collapse: <ul style="list-style-type: none"> • Cyanosis • Tachycardia • Shallow respiration • Decreasing LOC/restlessness • Hypotension • Decreased breath sounds ▪ Respiratory distress (acute chest syndrome) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Refer to IHP/ECP <li style="padding-left: 20px;">Respiratory distress/shock ▪ Administer high-flow O₂ if available ▪ Help to maintain position of comfort (shock position as indicated) <li style="padding-left: 20px;">In all cases ▪ Directly/continuously observe student ▪ Reassess vital signs every 5 min ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">URGENT</p> <ul style="list-style-type: none"> ▪ Fever (T exceeds 100°F/37.8°C) ▪ Mild to moderate pain ▪ Severe edema/tenderness of affected areas <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Refer to IHP/ECP ▪ Provide oral hydration (4–8 oz/hour) ▪ Allow to rest ▪ Elevate affected extremity ▪ Observe student closely ▪ Contact parent/guardian to transport student to medical care or home ▪ Educate student about need for good oral hydration, protection from temperature extremes ▪ Follow up 	<p style="text-align: center;">NONURGENT</p> <ul style="list-style-type: none"> ▪ Minor localized pain <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Refer to IHP/ECP ▪ Provide oral hydration (4–8 oz/hour) ▪ Allow to rest ▪ Reassess pain ▪ Contact parent/guardian ▪ Observe student ▪ Return student to class or send home as indicated ▪ Reassess every 2 hr if student remains at school ▪ Educate student about need for good hydration, protection from temperature extremes ▪ Follow up
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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
Best verbal response	Older Than 5 Yr		2-5 Yr		
	Oriented		Appropriate words/phrases	Smiles/coos appropriately	5
	Disoriented/confused		Inappropriate words	Cries, inconsolable	4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams	3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless	2
No response		No response	No response	1	
Total Score					

Substance Abuse

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR SUBSTANCE ABUSE

- Respiratory assessment
 - Orientation to person/place/time
 - Ability to recall event/injuries incurred
- Type/amount of substance involved (request medication/drug container if available)
- Time/route of exposure (dermal, ocular, inhalation, ingestion)
- Underlying health problems (**SAMPLE** history)
- Other students involved

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Respiratory/cardiac arrest ▪ Unconscious/can't be roused ▪ Change in LOC ▪ Labored/shallow breathing ▪ Hallucinations, violent behavior, extreme agitation ▪ S/S of trauma or injury ▪ Seizure activity (see <i>Seizures</i> protocol) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Initiate CPR as appropriate ▪ Activate EMS ▪ Place student in left lateral recovery position ▪ Directly/continuously observe student ▪ Monitor airway/respiratory status ▪ See <i>Trauma</i> protocol as appropriate ▪ Contact PCC as indicated^a ▪ Contact parent/guardian ▪ Notify school administrator ▪ Initiate counseling/support measures per school policy ▪ Follow up 	<ul style="list-style-type: none"> ▪ Somnolence, emesis, unusual behavior ▪ Unsteady gait ▪ Memory problems ▪ Mild agitation/restlessness ▪ Suspicious odors ▪ Needle marks/drug residue on skin, nose, clothes ▪ Previous loss of consciousness ▪ Complicating health problems <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Observe student continuously ▪ Give nothing by mouth ▪ Remain with student ▪ See <i>Trauma</i> protocol as appropriate ▪ Contact PCC as indicated^a ▪ Contact parent/guardian to transport student to medical care or home ▪ Notify school administrator ▪ Initiate counseling/support measures per school policy ▪ Follow up 	<ul style="list-style-type: none"> ▪ Coherent and oriented ▪ Stable vital signs ▪ No loss of consciousness <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Observe student ▪ Remain with student ▪ Contact PCC as indicated^a ▪ Notify school administrator ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Initiate counseling/support measures per school policy ▪ Follow up

^aWhen calling the Poison Control Center (800-222-1222), identify yourself as a health care professional and provide the following information: your name and phone number; student's name, age, weight, and vital signs; substance involved (if known); amount, time, route, and duration of exposure; abnormal S/S; first aid and immediate interventions rendered.

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score		
Eye opening	Spontaneous		Spontaneous		4		
	To verbal command		To shout		3		
	To pain		To pain		2		
	No response		No response		1		
Best motor response	Obeys commands		Spontaneous		6		
	Localizes pain		Localizes pain		5		
	Flexion-withdrawal		Flexion-withdrawal		4		
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3		
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2		
	No response		No response		1		
Best verbal response	Older Than 5 Yr		2-5 Yr		Younger than 2 Yr		
	Oriented		Appropriate words/phrases		Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words		Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams		Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts		Grunts, agitated, restless		2
No response		No response		No response		1	
Total Score							

Suicide Prevention

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR POTENTIAL SUICIDE

Focused Psychosocial Examination/Risk Factor Assessment

Precipitating events

- Parents recently divorced
 - Multiple life stressors
- Recent breakup with girlfriend or boyfriend
 - Unplanned pregnancy

Preparatory actions

- Acquiring the means
- Putting affairs in order
 - Suicide talk
- Giving away prized possessions
- Precautions against discovery

Current Symptoms

- Hopelessness/powerlessness
- Depressed mood
- Suicidal ideation
- Abrupt change in personality

History

- Previous suicide attempts
- Affective disorders or conduct disorder
- Family history of mental illness, suicidal behavior, or affective disorders
- Alcoholism or substance abuse
- Chronic health condition

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

<p style="text-align: center;">EMERGENT</p> <ul style="list-style-type: none"> ▪ Thoughts of death ▪ Suicide plan, preparations ▪ Suicide attempt ▪ Previous suicide attempt <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs as indicated ▪ Activate EMS ▪ Remove personal effects ▪ Do not leave student alone under any circumstances! ▪ Listen to student carefully ▪ Take conversation seriously ▪ Notify crisis response team ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">URGENT</p> <ul style="list-style-type: none"> ▪ Suicidal ideation ▪ Depression ▪ Withdrawal ▪ Self-blame ▪ Self-reproach <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Remain with student at all times ▪ Listen to student ▪ Notify crisis response team ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<p style="text-align: center;">NONURGENT</p> <ul style="list-style-type: none"> ▪ Frequent physical complaints ▪ Sad affect <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Observe student regularly ▪ Refer to school counselor ▪ Notify crisis response team of your concerns and findings ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up
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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
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Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score	
Eye opening	Spontaneous		Spontaneous		4	
	To verbal command		To shout		3	
	To pain		To pain		2	
	No response		No response		1	
Best motor response	Obeys commands		Spontaneous		6	
	Localizes pain		Localizes pain		5	
	Flexion-withdrawal		Flexion-withdrawal		4	
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3	
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2	
	No response		No response		1	
	Older Than 5 Yr		2-5 Yr	Younger than 2 Yr		
Best verbal response	Oriented		Appropriate words/phrases	Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words	Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless		2
	No response		No response	No response		1
Total Score						

Syncope/Unconsciousness

SYSTEMATIC ASSESSMENT

**Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO
Stabilize c-spine if head/spinal injury is suspected!**

KEY ASSESSMENT POINTS FOR SYNCOPE

- Mental status/neurologic assessment
 - Psychosocial history
- Past health history/current menstrual status
- Medications taken
- Events leading up to episode, including activities, weather conditions
- Last food/drink taken

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Acute change from baseline mental status/LOC ▪ Irregular pulse ▪ Acute neurologic deficit ▪ Head injury/headache with altered LOC or vomiting ▪ Severe headache with altered LOC ▪ Head injury/history of anemia, hemophilia, other coagulopathy ▪ Associated seizure activity (see <i>Seizures</i> protocol) <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Maintain c-spine stabilization as applicable ▪ Support ABCs ▪ Activate EMS ▪ Directly/continuously observe student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ Possible VP shunt dysfunction ▪ Orthostatic vital signs^a ▪ S/S of moderate hypoglycemia ▪ Signs of dehydration ▪ Severe headache without altered LOC ▪ Persistent or severe dizziness ▪ Exercise-induced syncope (possible cardiac etiology) ▪ Possible medication reaction without emergent findings ▪ History of substance abuse or eating disorder <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs as indicated ▪ Determine need for EMS ▪ Contact parent/guardian to transport student to medical care or home ▪ Closely observe student ▪ Follow up 	<ul style="list-style-type: none"> ▪ Hyperventilation ▪ Vasovagal reaction to anxiety/pain or other known trigger ▪ Exposure to ambient heat ▪ Evidence of carotid sinus reaction (eg, subsequent to neck hold by classmate) ▪ No associated injuries <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Place student supine ▪ Allow student to wake spontaneously ▪ For hyperventilation, encourage student to relax ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

^aOrthostatic vital signs

Assess BP and HR while student is supine. Have student sit up or stand and reassess 1 min later. If BP decreases by more than 20 mm Hg or HR increases by 20 bpm, orthostasis is present. **Note: Syncopal episodes that are not associated with rising or standing require further evaluation.**

See the following protocols as appropriate:

- *Diabetic Emergencies*
- *Head/Spinal Cord Trauma*
- *Heat-related Injuries*
- *Hemophilia*
- *Increased ICP in a Student With a VP Shunt*
- *Seizures*
- *Trauma*

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
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PEDIATRIC VITAL SIGNS BY AGE

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School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score
Eye opening	Spontaneous		Spontaneous		4
	To verbal command		To shout		3
	To pain		To pain		2
	No response		No response		1
Best motor response	Obeys commands		Spontaneous		6
	Localizes pain		Localizes pain		5
	Flexion-withdrawal		Flexion-withdrawal		4
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
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	Older Than 5 Yr		2-5 Yr	Younger than 2 Yr	
Best verbal response	Oriented	Appropriate words/phrases	Smiles/coos appropriately	5	
	Disoriented/confused	Inappropriate words	Cries, inconsolable	4	
	Inappropriate words	Persistent cries/screams	Persistent inappropriate cries/screams	3	
	Incomprehensible sounds	Grunts	Grunts, agitated, restless	2	
	No response	No response	No response	1	
Total Score					

Throat Emergencies

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see reverse), performing interventions AS YOU GO
KEY ASSESSMENT POINTS FOR THROAT EMERGENCIES

- Across-the-room assessment (note tripod positioning)
 - Respiratory assessment
- Events preceding illness/suddenness of onset
- Focused physical examination with inspection of pharynx, palpation of lymph nodes

IMMEDIATE INTERVENTIONS

Even before you determine triage category, perform the following actions as indicated

- Loosen restrictive clothing
- Help student into position of comfort
- Maintain airway patency

TRIAGE CATEGORY/ADDITIONAL INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Airway compromise ▪ Change in mental status, LOC ▪ S/S of epiglottitis: <ul style="list-style-type: none"> • Sudden onset • Stridor, drooling, dysphagia • High fever ▪ Anaphylactic reaction (see <i>Anaphylaxis</i> protocol) ▪ S/S of retropharyngeal abscess: <ul style="list-style-type: none"> • Fever • Stiff, painful neck • Asymmetric edema of posterior pharyngeal wall • Dyspnea <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Activate EMS ▪ Support ABCs ▪ Keep student calm ▪ Administer high-flow O₂ as tolerated if available <p style="text-align: center;">Epiglottitis</p> <ul style="list-style-type: none"> ▪ Do not inspect hypopharynx ▪ Maintain position of comfort <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Directly/continuously observe student ▪ Reassess vital signs every 5 min ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<ul style="list-style-type: none"> ▪ S/S of peritonsillar abscess: <ul style="list-style-type: none"> • Severe pain • Fever <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Determine need for EMS ▪ Maintain position of comfort ▪ Contact parent/guardian to transport student to medical care or home ▪ Observe student closely ▪ Follow up 	<ul style="list-style-type: none"> ▪ Swollen, tender lymph nodes ▪ S/S of tonsillitis/pharyngitis: <ul style="list-style-type: none"> • Tonsillar exudate • Erythema • Deviation of tonsils toward midline <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Observe student ▪ Contact parent/guardian ▪ Return student to class or send home as indicated (send home for fever exceeding 100°F/37.8°C) ▪ Follow up

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Tools for Assessing Students

SYSTEMATIC ASSESSMENT

NOTE: Perform interventions AS YOU GO. Determine triage/activate EMS at EARLIEST INDICATION of need.

Scene safety assessment

- Call for assistance as indicated

Across-the-room assessment

Use Pediatric Assessment Triangle (PAT)

- A**ppearance ▪ **B**reathing ▪ **C**irculation

Initial assessment

- Standard precautions ▪ C-spine stabilization
- A**irway ▪ **B**reathing ▪ **C**irculation ▪ **D**isability^a ▪ **E**xposure

History/pain assessment

- SAMPLE** history ▪ **PQRST**/other pain assessment

Focused physical examination

- Vital signs, temperature, weight, blood glucose
- Inspect ▪ auscultate ▪ palpate

Triage

- E**mergent ▪ **U**rgent ▪ **N**onurgent

^a**Disability Assessment**

- Assess responsiveness (**AVPU**):
 - A** Alert
 - V** Responds to **V**erbal stimulus
 - P** Responds to **P**ainful stimulus
 - U** Unresponsive
- Assess pupils
- Assess for transient paresthesia

PEDIATRIC VITAL SIGNS BY AGE

Age	RR	HR	BP
Neonate (0-30 days)	30-60	100-180	50-90
Infant (1-12 mo)	24-50	100-160	60-100
Toddler (1-3 yr)	24-40	90-150	80-105
Preschooler (3-5 yr)	20-30	80-140	95-105
School-aged (5-12 yr)	18-30	65-120	95-120
Adolescent (12 yr /up)	12-20	60-100	100-128

RR indicates respiratory rate; HR, heart rate; BP, systolic blood pressure (mm Hg)

INDICATORS OF CARDIOPULMONARY COMPROMISE IN CHILDREN

- Tachycardia
- Weak, thready, or absent peripheral pulses
- Decreasing consciousness
- Tachypnea/respiratory difficulty
- Central cyanosis and coolness
- Hypotension (late sign)
- Bradycardia (ominous sign)
- No palpable BP (ominous sign)

PEDIATRIC GLASGOW COMA SCALE

	1 Yr or Older		Younger than 1 Yr		Score	
Eye opening	Spontaneous		Spontaneous		4	
	To verbal command		To shout		3	
	To pain		To pain		2	
	No response		No response		1	
Best motor response	Obeys commands		Spontaneous		6	
	Localizes pain		Localizes pain		5	
	Flexion-withdrawal		Flexion-withdrawal		4	
	Flexion-abnormal (decorticate rigidity)		Flexion-abnormal (decorticate rigidity)		3	
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2	
	No response		No response		1	
	Older Than 5 Yr		2-5 Yr	Younger than 2 Yr		
Best verbal response	Oriented		Appropriate words/phrases	Smiles/coos appropriately		5
	Disoriented/confused		Inappropriate words	Cries, inconsolable		4
	Inappropriate words		Persistent cries/screams	Persistent inappropriate cries/screams		3
	Incomprehensible sounds		Grunts	Grunts, agitated, restless		2
	No response		No response	No response		1
Total Score						

Toxic Exposure (Ingestion/Environmental)

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see *Assessment protocol*), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR TOXIC EXPOSURES

- Assess/ensure scene safety (notify school administrator as indicated to activate hazmat protocols)
 - Respiratory assessment
 - Skin assessment
- LOC/neurologic assessment, including PERRLA
 - Type/amount of substance (get container if available)
 - Time/route of exposure (dermal, ocular, inhalation, ingestion)
- Location where exposure occurred
- Subsequent S/S, especially respiratory status, LOC, emesis
- Ability to recall event, including injuries incurred
- Underlying health problems (**SAMPLE** history)
- Focused physical assessment, including injury, odors
- Other students involved

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

Refer to Toxidrome table (see reverse)

<p style="text-align: center;">EMERGENT</p> <ul style="list-style-type: none"> ▪ Respiratory arrest ▪ Seizures (see <i>Seizures</i> protocol) ▪ Loss of consciousness ▪ Dyspnea, severe respiratory distress ▪ Signs of shock/hypotension <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Initiate CPR as necessary ▪ Contact PCC^a ▪ Refer for medical care as recommended by PCC ▪ Send MSDS and substance (if possible) to ED with student ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">URGENT</p> <ul style="list-style-type: none"> ▪ Unusual behavior ▪ History of emesis ▪ Minor abnormal findings <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS ▪ Contact PCC^a ▪ Refer for medical care as recommended by PCC ▪ Consult MSDS ▪ Contact parent/guardian to transport student to medical care or home ▪ Notify school administrator ▪ Follow up 	<p style="text-align: center;">NONURGENT</p> <ul style="list-style-type: none"> ▪ Asymptomatic ▪ Stable vital signs <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Observe student ▪ Consult MSDS ▪ Contact PCC^a ▪ Refer for medical care as recommended by PCC ▪ Provide supportive care as indicated ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Notify school administrator ▪ Follow up
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NOTE

^aWhen calling the Poison Control Center (800-222-1222), identify yourself as a health care professional and provide the following information: your name and phone number; student's name, age, weight, and vital signs; substance involved (if known); amount, time, route, and duration of exposure; abnormal S/S; first aid and immediate interventions rendered.

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Toxidromes

If assessment findings suggest a toxic ingestion and you do not know what substance is involved, it may be helpful to look for signs of identifiable toxic syndromes (*toxidromes*). Toxidromes involve a recognizable group of signs and symptoms that tend to occur consistently with particular toxins. The Table describes the 4 major toxidromes and provides mnemonics that can help you remember the associated findings. Examples of substances that can cause each toxidrome are also included.

TOXIDROMES

Toxidrome	Clinical Findings	Causative Substances
Opioid	<ul style="list-style-type: none"> ▪ Constricted pupils ▪ CNS depression ▪ Respiratory depression 	<ul style="list-style-type: none"> ▪ Heroin ▪ Codeine ▪ Fentanyl ▪ Methadone
Sympathomimetic	<ul style="list-style-type: none"> ▪ Hypertension ▪ Tachycardia ▪ Hyperthermia ▪ Diaphoresis ▪ Dilated pupils 	<ul style="list-style-type: none"> ▪ Epinephrine ▪ OTC diet aids ▪ Amphetamines ▪ Oral decongestants (eg, pseudoephedrine) ▪ Bronchodilators
Anticholinergic <i>Listed phrases may help you recall clinical findings</i>	<ul style="list-style-type: none"> ▪ Hyperthermia (<i>Hot as a hare</i>) ▪ Flushed skin (<i>Red as a beet</i>) ▪ Hypertension, dry skin (<i>Dry as a bone</i>) ▪ Delirium (<i>Mad as a hatter</i>) ▪ Dilated pupils (<i>Blind as a bat</i>) ▪ Urinary retention (<i>Full as a flask</i>) ▪ Tachycardia ▪ Absent bowel sounds 	<ul style="list-style-type: none"> ▪ Antihistamines ▪ GI antispasmodics ▪ Certain toxic plants (eg, jimson weed, deadly nightshade, amanita muscaria) ▪ Certain toxic mushrooms ▪ Atropine ▪ Tricyclic antidepressants
Cholinergic	<ul style="list-style-type: none"> ▪ Diarrhea ▪ Urination ▪ Miosis, Muscle fasciculations ▪ Bradycardia, Bronchorrhea ▪ Emesis ▪ Lacrimation ▪ Salivation, Sweating ▪ Weakness 	<ul style="list-style-type: none"> ▪ Organophosphate and carbamate insecticides ▪ Mushrooms containing muscarine (imocybe species, amanita species, ibotenic muscimol) ▪ Physostigmine

CNS indicates central nervous system; OTC, over-the-counter; GI, gastrointestinal

Trauma

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see *Assessment* protocol), performing interventions AS YOU GO
Ensure scene safety before approaching
Stabilize c-spine if head/spinal injury is suspected

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

EMERGENT	URGENT	NONURGENT
<ul style="list-style-type: none"> ▪ Slow or fast RR, other S/S of respiratory distress/failure ▪ Capillary refill exceeds 2 seconds, other S/S of shock ▪ Currently/previously unconscious ▪ Profuse hemorrhage ▪ Penetrating wound or significant blunt trauma to head, chest, or abdomen ▪ Open chest wound ▪ Suspected pelvic/femoral fracture ▪ Suspected spinal injury with paresthesia ▪ Amputation/crush injury ▪ S/S of intra-abdominal injury: <ul style="list-style-type: none"> • Hematuria • Grey Turner sign (bluish discoloration of flank/periumbilical area) • Abdominal asymmetry/distention • Tenderness/guarding/pain on gentle palpation <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Activate EMS ▪ Maintain spinal stabilization ▪ Place supine or in shock position ▪ Keep student warm ▪ Give nothing by mouth ▪ Stabilize impaled object with dressings—do not remove ▪ Splint/elevate suspected fracture ▪ Control hemorrhage ▪ Directly/continuously observe ▪ Frequently reassess vital signs/AVPU ▪ Contact parent/guardian ▪ Notify school administrator ▪ Follow up <p style="text-align: center;">Amputation management</p> <ul style="list-style-type: none"> ▪ Wrap part in gauze slightly moistened with sterile saline ▪ Place in plastic bag, seal securely, and label ▪ Place bag on cold packs for transport ▪ Follow up 	<ul style="list-style-type: none"> ▪ Stable vital signs ▪ No loss of consciousness ▪ Deformity/suspected closed fracture without neurovascular compromise ▪ Controllable bleeding ▪ Significant mechanism of injury without other significant abnormalities <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Support ABCs ▪ Reassess vital signs ▪ Determine need for EMS ▪ Control bleeding ▪ Proceed with detailed physical examination ▪ Splint/immobilize suspected fractures, elevate extremity, and apply cold packs <p style="text-align: center;">Blunt abdominal injury</p> <ul style="list-style-type: none"> ▪ Observe closely 15 min for S/S of intra-abdominal injury (listed under Emergent) ▪ Reassess in 1 hour or if S/S recur <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Contact parent/guardian to transport student to medical care or home ▪ Follow up 	<ul style="list-style-type: none"> ▪ Stable vital signs ▪ No deformity or suspicion of fracture ▪ Minor abrasions or lacerations ▪ Mild muscle strain or sprain <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Proceed with detailed physical examination ▪ Refer to appropriate protocol^a <p style="text-align: center;">Blunt abdominal injury</p> <ul style="list-style-type: none"> ▪ Observe closely 15 min for S/S of intra-abdominal injury (see Emergent) ▪ Reassess in 1 hour or if S/S recur <p style="text-align: center;">In all cases</p> <ul style="list-style-type: none"> ▪ Contact parent/guardian ▪ Return student to class or send home as indicated ▪ Follow up

^aSee protocols as appropriate: ▪ *Abdominal* ▪ *Burns* ▪ *Chest Trauma* ▪ *Head/Spinal Cord* ▪ *Lacerations/Abrasions* ▪ *Musculoskeletal*

NOTE

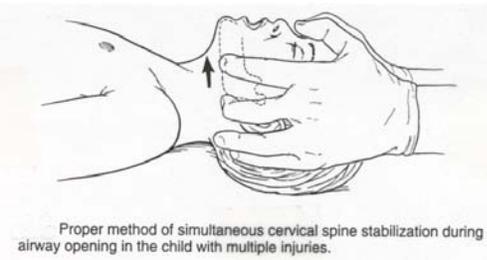
Refer student for tetanus booster if it has been 5 years or more since the last vaccination. Tetanus booster is recommended every 10 years.

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Interventions for Musculoskeletal Trauma

MANUAL CERVICAL SPINE STABILIZATION

- Position student supine
- Place both hands along lateral aspect of student's head
- Position the head so that the neck is in neutral alignment with the spine
- Continue to support the head to maintain neutral cervical alignment



IMMOBILIZATION/POSITIONING OF FRACTURES AND DISLOCATIONS

Area/Injury	Treatment
Upper extremity	<ul style="list-style-type: none"> ▪ Apply sling/triangular bandage ▪ Swathe if additional immobilization is indicated
Clavicular injury/dislocation	<ul style="list-style-type: none"> ▪ Apply sling/triangular bandage ▪ Swathe if additional immobilization is indicated
Angulation with unimpaired circulation	<ul style="list-style-type: none"> ▪ Immobilize as presented ▪ Do not move extremity
Angulation with absent distal pulse, cyanosis	<ul style="list-style-type: none"> ▪ Return extremity to proper physiologic position ▪ Apply gentle traction until pulse is restored ▪ Splint or immobilize area, including joints proximal and distal to injury ▪ Reassess pulses every 5–10 minutes

SLING AND SWATHE IMMOBILIZATION



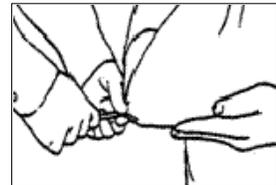
Place the arm across the chest and position as shown. Bring the bandage over the arm and behind the neck.



Adjust the length as necessary and tie the ends. The arm should be well supported, relieving pressure on the shoulder.



Place the knot so that it lies over the shoulder rather than against the cervical spine. Placing a pad under the knot will enhance comfort.



Secure the sling at the elbow with a safety pin or knot, creating a pocket in which the elbow rests securely. Reassess neurovascular integrity.



If further immobilization is needed to secure the extremity and a second bandage is available, swathe the arm as permitted by applicable protocols. Lay the second bandage flat, then fold it several times lengthwise. Use the folded bandage to swathe the injured arm against the chest wall, immobilizing it.

Violent Behavior

SYSTEMATIC ASSESSMENT

Begin the 5 components of assessment (see *Assessment protocol*), performing interventions AS YOU GO

KEY ASSESSMENT POINTS FOR VIOLENT INCIDENTS

- Assess/ensure scene safety before approaching (notify police liaison/security)
- Perform cross-the-room assessment followed by mental status examination (below)
 - **Appearance:** general; grooming; posture
 - **Mood:** cooperative, frightened, irritable
 - **Speech:** soft/loud, fast, slurred
 - **Behavior:** fidgeting, pacing, eye contact
 - **Memory:** recent memory/immediate recall
 - **Orientation:** realistically oriented to person/place/time
- **Thought process:** mental activity; evidence of delusions/hallucinations
- **Thought content:** what the student says; suicidal ideation, hopelessness
- **Insight:** recognizes responsibilities or blames others for problems
- **Judgment:** decision-making ability (superficial, impulsive)
- **Perception:** awareness of self and thoughts (guilt, indecisiveness)

TRIAGE CATEGORY/APPROPRIATE INTERVENTIONS

Determine triage category and activate EMS AS SOON AS the need becomes apparent!

<p style="text-align: center;">EMERGENT</p> <ul style="list-style-type: none"> ▪ Danger to self/others ▪ Brandishing weapon ▪ Physical cues indicate escalation ▪ Drug or alcohol intoxication ▪ Physical restraint necessary ▪ History of violence <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Initiate lockdown procedures ▪ Activate EMS/security ▪ Never intervene alone ▪ See reverse for safety tips ▪ Contact parent/guardian ▪ Notify school administrator ▪ Monitor behavioral progress ▪ Follow up 	<p style="text-align: center;">URGENT</p> <ul style="list-style-type: none"> ▪ Moderately agitated but not violent ▪ Expressing verbal anger without physical aggression <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Determine need for EMS/security ▪ Speak in low, measured tones ▪ Explain that you know something is bothering student and you will help student control behavior ▪ Walk with student to diffuse agitation ▪ Repeat/restate what student says: <ul style="list-style-type: none"> • “You’re feeling angry.” • “I’m concerned for you. I’m going to help you control yourself.” • “What do you need? What do you need to do?” • “When you felt like this before, what helped you?” ▪ Notify crisis response team ▪ Contact parent/guardian to transport student to medical care or home ▪ Monitor behavioral progress ▪ Follow up 	<p style="text-align: center;">NONURGENT</p> <ul style="list-style-type: none"> ▪ Mildly anxious or frightened ▪ Previously angry but now calm <p style="text-align: center;">INTERVENTIONS</p> <ul style="list-style-type: none"> ▪ Take student to a quiet area with backup support available ▪ Provide reassurance as needed ▪ Speak in low, measured tones ▪ Contact parent/guardian ▪ Allow student to return to class if student is calm, ready, and able to identify ways to deal with feelings; or send home as indicated ▪ Monitor behavioral progress ▪ Follow up
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Violent Behavior: Safety Tips

Emergent situation

- Do not invade student's personal space (stand back at least 5 ft)
- Stand at 45° angle to student, not directly in front
- Maintain open posture
- Maintain a clear exit route
- Be prepared to move quickly
- Do not make any abrupt moves unless necessary
- Be sure student has no weapons before approaching
- Give student brief, clear, assertive directions before any action
- Establish yourself as a concerned professional
- Proceed without hesitation
- Enlist adequate, trained assistance (at least 6 people, if possible) before attempting physical restraint

Urgent situation

- Speak in low, measured tones
- Explain that you know something is bothering student and you will help student control behavior
- Walk with student to diffuse agitation
- Repeat/restate what student says:
 - "You're feeling angry."
 - "I'm concerned for you. I'm going to help you control yourself."
 - "What do you need? What do you need to do?"
 - "When you felt like this before, what helped you?"

APPENDIX

B

Resources, Forms, Tools

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Assessing Fit and Use of Crutches

When a student requires crutches, a physical therapist or orthopedic assistant should adjust the fit and provide training in their use before the student returns to school. These measures are essential to the student's safety, mobility, and comfort.

Your role is to make sure the student uses the crutches appropriately and safely at school. The student should schedule a visit to the health office so that you can assess the fit, observe the student's technique, and reinforce prior training.

NOTE | If adjustment or training are needed, refer the student to the physical therapist or prescribing health care provider. Do not undertake these tasks yourself.

Proper fit

Have the student stand upright on the crutches, grasping the handgrips. The tips of the crutches should be slightly anterior and lateral to the feet. The student's elbows should be slightly flexed. Ideally, in this position there should be a space about the width of 2 fingers between the crutch cushion and the axilla.

Proper gait

Have the student stand on the crutches for several moments to become accustomed to them. Make sure the pathway is clear of obstacles, then stand slightly behind and to the side of the student, providing support as necessary. While standing, see whether the student

- Adopts a tripod position
- Rests the lower body on the **uninjured** leg and the crutches at either side
- Uses the handgrips, not the underarm pads, to support the upper body
- Looks straight ahead, rather than down (it's a common tendency for those who are new to crutches to look at their feet)

When walking, see whether the student

- Begins with the weight on the **uninjured** leg
- Moves the **injured** leg and the crutches forward simultaneously
- Swings the **uninjured** leg through and slightly ahead of the crutches
- Returns the weight to the uninjured leg before moving the injured leg and the crutches forward again

Observe as the student moves about the room. A student who has difficulty using crutches will need further gait training before returning to school.

Additional considerations

- Encourage the student to treat the crutches as a medical assistive device that should not be used to roughhouse or play.
- Remind the student not to let friends try out the crutches or play with them.
- Make sure the student has a note from the prescribing physician.

Assessment Form: Allergy

Dear parent/guardian of _____

Our records show that your child has allergies. Help us in our efforts to provide appropriate care by completing this form and returning it to me. Thank you.

Sincerely,

School nurse _____ Date _____

Student's name _____ Parent/guardian phone _____

Allergy doctor's name _____ Phone _____

When is your child most affected by allergies? Fall Winter Spring Summer

What is your child allergic to? Milk Animal dander Trees/grasses/pollens Bee stings

Molds Dust Peanuts Tree nuts Latex Medicines (specify) _____

Other _____

Comments _____

Please check all allergy symptoms that your child experiences:

Stuffy, runny, itchy nose Sneezing Persistent cough Wheezing Rash/hives

Dark circles under eyes Pale appearance Hearing problems Breathing through mouth

Tiredness Headaches Irritability Severe, extensive swelling from stings

Anaphylactic shock reaction Other _____

Comments _____

How might your child's allergic condition affect school performance or participation in activities?

How often does your child see the doctor because of allergies? _____

What medical treatment has been provided for these allergies? _____

What medication(s) does your child use?

Name _____ Dose _____ How often? _____

Name _____ Dose _____ How often? _____

Will your child need medication at school for the allergic condition? No Yes

If yes, please contact the school nurse for assistance as soon as possible.

Parent/guardian signature _____ Date _____

Assessment Form: Asthma

Date _____

School _____

Grade _____

Dear parent/guardian of _____

According to our records, your child has a history of asthma or has shown symptoms of asthma. We would like to find out more about your child's current health status so that we can provide better care. Please complete the questionnaire below. I will be happy to schedule a meeting so that we can discuss strategies to help minimize your child's problems with asthma at school.

Thank you for your help. Feel free to call me if I can be of further assistance.

Sincerely,

_____ Best day/time to call _____

School nurse

Name of asthma physician _____ Phone _____

May we contact the physician about your child's asthma? Yes No

When was your child diagnosed as having asthma? _____

When was your child's last asthma attack? _____

What triggers an asthma attack? *Check all that apply:* Exercise Infections Food Environmental factors Seasonal factors Animals Medications

Allergies (list) _____ Irritants (list) _____

What medications does your child take for asthma?

Name _____ Name _____

Dose _____ Dose _____

Frequency _____ Frequency _____

Does your child use a peak flow meter? Yes No If so, what is the normal reading? _____Would you like your child to learn to use a peak flow meter at school? Yes No Don't know

What signs or symptoms occur during an asthma attack? _____

Last year, how many days of school did your child miss because of asthma? _____

How often does your child see the doctor each year because of asthma? _____

Has your child been hospitalized due to asthma? Yes No If so, when? _____

Last year, how many times was your child hospitalized because of asthma? _____

Has your child ever been placed on a ventilator because of asthma? Yes No*Please note additional comments on the back of this form. Thank you.*

Parent/guardian signature _____ Date _____

Assessment Form: Bee Sting Allergy

School _____ Date _____

Dear parent/guardian of _____

According to our health records, your child has a bee sting allergy. It would be helpful if you would provide us with more information by answering the questions below and returning this form to me. Thank you.

Sincerely,

School Nurse _____

Name of doctor treating student's bee sting allergy: _____

Phone _____ Address _____

When did you become aware that your child was allergic to bee stings?

Approximately when did your child last have a bee sting reaction?

Please describe how your child looked and acted during the reaction.

What medical treatment was provided and by whom?

If your child is stung on the way to school or at school, what procedure would you like us to follow?

Parent/guardian signature _____ Date _____

Thank you for your help!

Assessment Form: Seizure Disorder

Student's name _____ Date _____

School _____ Grade _____ Teacher _____

Parent/guardian _____ Daytime phone _____

Parent/guardian _____ Daytime phone _____

The following information will help the school nurse and staff determine your child's special needs. Please complete *all* questions. To provide additional information, please use the back of the form.

Nurse's name _____ School phone _____

1. When did your child's seizures begin? _____

2. What happens during a seizure? Describe: _____

3. Has seizure activity changed from the past? In what ways? _____

4. What causes your child to have more seizure activity? Illness Fever Asthma meds
 Allergy meds Other _____

5. What medications does your child take now? How much? How often?

Medication _____ How much _____ How often _____

Medication _____ How much _____ How often _____

Medication _____ How much _____ How often _____

6. What do you do if your child misses a dose of medicine? _____

7. Please note if your child needs special accommodations for Physical education classes Recess
 Field trips Other _____

8. When did your child last see the doctor who treats these problems? _____

When is the next appointment? _____

9. Please provide contact information for the doctor who treats your child:

Name _____

Address _____

City/state/zip _____ Phone _____

Parent/guardian signature _____

Date completed: _____

Updated: _____

Updated: _____

cc: Student health file

Teacher file

Parent

Physician

Assessment Form, Suspected Substance Use: Behavior

This form may be used to gather information from other school staff members when there are concerns about student substance use. Use the form alone or in conjunction with the *Impairment* and *Emergency* forms that follow.

Student _____ Date _____

Teacher/staff _____ Class _____

Please complete this form and return it to the school nurse in the health office by _____ (date).

Please check all that are true for this student.

- | | |
|---|---|
| <input type="checkbox"/> Frequently tardy | <input type="checkbox"/> Sometimes smells of marijuana |
| <input type="checkbox"/> Frequently absent | <input type="checkbox"/> Sometimes smells of alcohol |
| <input type="checkbox"/> Disruptive in class | <input type="checkbox"/> Exhibits silly behavior |
| <input type="checkbox"/> Grades are slipping | <input type="checkbox"/> Falls asleep in class |
| <input type="checkbox"/> Assignments turned in late | <input type="checkbox"/> Recent change in appearance |
| <input type="checkbox"/> Assignments poorly done | <input type="checkbox"/> Recent change in friends/peer group |
| <input type="checkbox"/> Not working up to potential | <input type="checkbox"/> Has been associated with drugs |
| <input type="checkbox"/> Low motivation, loss of interest | <input type="checkbox"/> Acknowledges use of drugs |
| <input type="checkbox"/> Unexplained gaps in schedule (eg, takes 15 minutes to get to next class) | <input type="checkbox"/> Promises to do better but does not change behavior |
| <input type="checkbox"/> Moody | <input type="checkbox"/> Denies existence of any problems |
| <input type="checkbox"/> Defensive | <input type="checkbox"/> Blames others for problems |
| <input type="checkbox"/> Intimidates other students | <input type="checkbox"/> Appears dazed |
| <input type="checkbox"/> Acts hostile or argumentative | <input type="checkbox"/> Avoids contact with concerned persons |
| <input type="checkbox"/> Does not keep appointments or meet responsibilities | |

Other comments or observations:

CONFIDENTIAL

Adapted from: *School Nurse Emergency Medical Services for Children (SNEMS-C) Course Manual*. Farmington, CT: University of Connecticut Health Center, Department of Pediatrics; 1996.

Assessment Form, Suspected Substance Use: Impairment

Use this form to aid in rapid evaluation of suspected impairment in a student with who appears medically stable.

Name _____ DOB _____

Behavior

Activity level Normal Hyperactive Irritable Belligerent Silly Restless Slow Dazed

Anxiety level Rank on a scale of 1 (lowest) to 10 (highest) _____

Speech Normal Rambling Slurred

Cognition Focused Attention wanders Paranoia Delusions Hallucinations

Appearance Neat, clean Disheveled, dirty

Balance Steady Unsteady

Odors None Alcohol Marijuana Other _____

Other observations _____

Other physical findings Tremors Runny nose Other _____

Assessment

Impaired Not impaired

Plan

Not impaired at present, returned to class at _____ AM/PM

Parent/guardian informed

Excused to home accompanied by _____

Administrative referral

Social worker referral

Counselor referral

Other agency referral

Additional comments

Adapted from: *School Nurse Emergency Medical Services for Children (SNEMS-C) Course Manual*. Farmington, CT: University of Connecticut Health Center, Department of Pediatrics; 1996.

Assessment Form, Suspected Substance Use: Emergency

Use this form to aid in rapid evaluation of a student suspected of substance use who appears medically unstable.

Name _____ DOB _____ Date _____

Vital signs

Time _____

BP _____

HR _____ Regular Irregular

RR _____ Regular Irregular

Temp _____

Orientation

Alert, oriented to time, place, person Confused Stuporous

Coordination

Normal (*can walk a straight line, touch finger to nose, touch toes*) Impaired

Eyes

Pupils Normal Constricted Dilated

Reactivity to light Normal Delayed Nonreactive

Sclera Normal Reddened

Chief complaint

Chest pain No Yes *Other complaints* No Yes

Other observations Vomiting Incontinence Other _____

Substance(s): 1 _____ 2 _____ 3 _____

1 Route _____ Amount _____ Time used _____

2 Route _____ Amount _____ Time used _____

3 Route _____ Amount _____ Time used _____

If vital signs, level of consciousness, and coordination show significant abnormalities, call 911 or your local emergency number. Monitor ABCDs. Be prepared to establish airway patency and perform CPR if status deteriorates.

Parent/guardian _____ Home phone _____

Address _____

Work phone (father) _____ (mother) _____

Disposition _____ Hospital of choice _____

Signature _____ RN, School Nurse

Phone _____

Adapted from: *School Nurse Emergency Medical Services for Children (SNEMS-C) Course Manual*. Farmington, CT: University of Connecticut Health Center, Department of Pediatrics; 1996.

Assessment Tools: **CIAMPEDS** Focused History

	Topic	Questions
C	Chief complaint	<ul style="list-style-type: none"> What problem brings the student to the health office? How long has the problem persisted? If an injury, how and when did it occur?
I	Immunizations, Isolation	<ul style="list-style-type: none"> Are immunizations up to date? Is isolation necessary? (pediculosis, varicella exposure, immunosuppression)
A	Allergies	<ul style="list-style-type: none"> Does the student have any known allergies to food, medications, latex, or bee stings?
M	Medications	<ul style="list-style-type: none"> Is the student using any prescription, over-the-counter, home, herbal, or cultural remedies? For what reasons? When was the last dose taken? Did the student take any medications before coming to the health office? What was the result? Has the student used any illicit drugs?
P	Past health history	<ul style="list-style-type: none"> Does the student have a chronic illness? (asthma, diabetes, hemophilia, seizure disorder) Does the student have special health care needs?^a Does the student rely on a medical device? (oxygen, tracheostomy, nebulizer, central venous line, gastrostomy tube)
E	Events preceding the problem	<ul style="list-style-type: none"> When did the problem begin? Were there precipitating factors? If an injury occurred, were there witnesses? What did they report?
D	Diet/elimination	<ul style="list-style-type: none"> Is the student able to eat? When was the last meal? Has there been any nausea, vomiting, diarrhea? Are bowel and bladder function normal?
S	Symptoms associated with the problem	<ul style="list-style-type: none"> Is the student having pain, apprehension, or guarding? What is the location, quality, and duration of the pain? Does positioning make the pain better or worse? What strategies make other symptoms better or worse? What is the student's impression of his or her condition?

^aYou may need to modify your evaluation of assessment findings for students with special needs, as their baseline findings may vary from accepted averages.

Assessment Tools: Glasgow Coma Scale, Adult

This scale may be used in students older than 5 years.

EYE RESPONSE

Automatic (Opens eyes spontaneously)	4	_____
To voice (Opens eyes when told to do so)	3	_____
To pain (Opens eyes only to painful stimulus)	2	_____
None (Does not open eyes to any stimulus)	1	_____

VERBAL RESPONSE

(When asked "What year is this?" or other age-appropriate question)		
Understands, responds appropriately (Gives correct answer)	5	_____
Confused, but responds appropriately (Gives correct answer)	4	_____
Inappropriate reply (Random answer)	3	_____
Unintelligible response (Incomprehensible words; moans)	2	_____
None (No verbal response)	1	_____

MOTOR RESPONSE

(When asked to show 2 fingers or other appropriate action)		
Obeys command (Performs requested action)	6	_____
Exhibits controlled movement (Localizes pain by pointing)	5	_____
Withdraws (Moves away from painful stimulus)	4	_____
Exhibits abnormal flexion (Decorticate posture; Figure 7-1)	3	_____
Exhibits abnormal extension (Decerebrate posture; Figure 7-2)	2	_____
None (Flaccid, no response)	1	_____

TOTAL POINTS _____

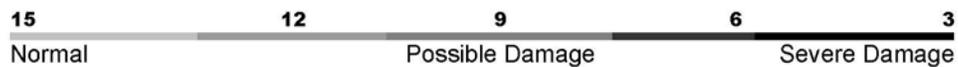


Figure 7-1. Decorticate Posture

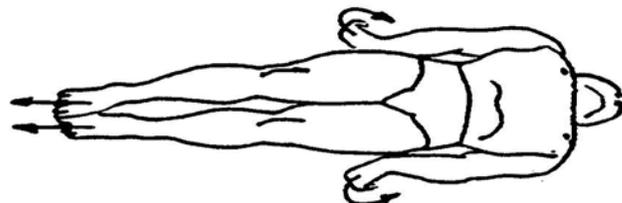


Figure 7-2. Decerebrate Posture

Assessment Tools: Glasgow Coma Scale, Modified

This scale has been adapted for younger children aged 2 through 5 years.

EYE RESPONSE

Automatic (Opens eyes spontaneously)	4	_____
To voice (Opens eyes when spoken to)	3	_____
To pain (Opens eyes only to a painful stimulus)	2	_____
None (Does not open eyes to any stimulus)	1	_____

VERBAL RESPONSE

(When spoken to or asked a simple, age-appropriate question)		
Responds with age-appropriate words or sounds	5	_____
Confused; responds with inappropriate words or sounds	4	_____
Cries or screams	3	_____
Grunts or moans	2	_____
No response	1	_____

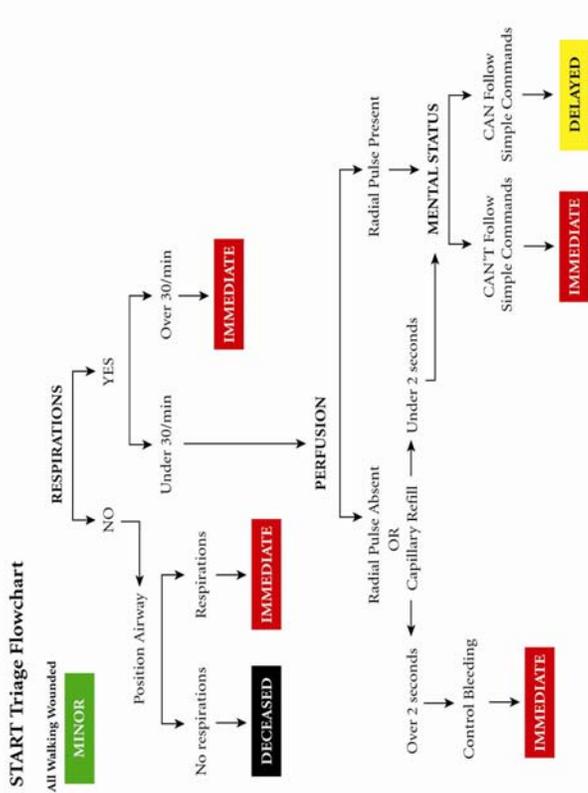
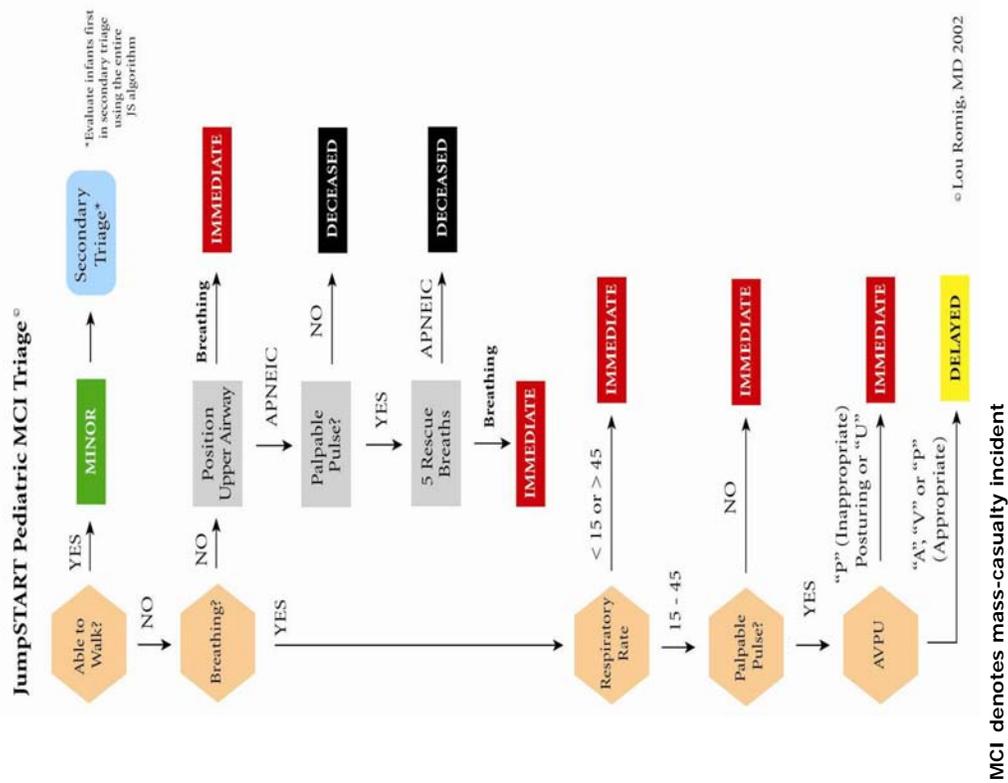
MOTOR RESPONSE

(When given a simple, age-appropriate command)		
Obeys command or responds spontaneously	6	_____
Exhibits controlled movement; withdraws from touch	5	_____
Withdraws from a painful stimulus	4	_____
Abnormal flexion (Decorticate posture; see previous page)	3	_____
Abnormal extension (Decerebrate posture; see previous page)	2	_____
No response; flaccid	1	_____

TOTAL POINTS _____



Assessment Tools: START / JumpSTART Algorithms for MCI Triage



Assessment Tools: Trauma

Revised Trauma Score for Adolescents and Adults

The Revised Trauma Score is an objective physiologic scoring mechanism to measure the severity of injuries. The tool is helpful in triaging older students, allocating medical resources, and evaluating care. **Lower scores are associated with higher mortality.**

REVISED TRAUMA SCORE FOR ADOLESCENTS AND ADULTS

Component	Method			Score	
Glasgow Coma Scale	Eye Opening	Best Verbal Response	Best Motor Response	GCS Total ^a	Component Score
	Spontaneous: 4	Oriented: 5	Obeys command: 6	13–15	4
	To voice: 3	Confused: 4	Localizes pain: 5	9–12	3
	To pain: 2	Inappropriate words: 3	Withdraws from pain: 4	6–8	2
None: 1	Incomprehensible words: 2	Abnormal flexion: 3	4–5	1	
	None: 1	Abnormal extension: 2	<4	0	0
		None: 1			
^a Add response scores in all 3 categories to get GCS total, then circle corresponding component score					
Systolic BP	Measure systolic cuff pressure in either arm by auscultation or palpation, then circle corresponding component score			89+	4
				76–89	3
				50–75	2
				1–49	1
				0	0
Respiratory Rate	Count respiratory rate for 15 seconds and multiply by 4, then circle corresponding component score			10–29	4
				29+	3
				6–9	2
				1–5	1
				0	0
Total Points					

Pediatric Trauma Score

This scoring system is both a rapid assessment tool and a reliable predictor of outcome; it can also be used to determine whether air transport is needed. The PTS is based on data collected from pediatric trauma victims across the United States. Possible scores range from –6 to +12. Statistics have shown that any child with a trauma score of 8 or less is severely injured and requires the type of care available at major trauma centers.

Component	+2	+1	–1	Score
Weight	more than 20 kg	10–20 kg	less than 10 kg	
Airway	Patent	Maintainable	Unmaintainable	
CNS	Awake	Obtunded	Comatose	
Systolic BP ^a	more than 90 mm Hg	50–90 mm Hg	less than 50 mm Hg	
Open wound	None	Minor	Major	
Skeletal injury	None	Closed fracture	Open/multiple fracture(s)	
Total Points				

A total score of 8 or less indicates the need for evaluation at a trauma center.

^aIf an appropriately sized blood pressure cuff is not available, BP is scored as follows: palpable at wrist: +2; palpable at groin: +1; no palpable pulse: –1.

Asthma Action Plan



General Information:

Name _____
 Emergency contact _____ Phone numbers _____
 Physician/healthcare provider _____ Phone numbers _____
 Physician signature _____ Date _____

Severity Classification	Triggers	Exercise
<input type="radio"/> Intermittent <input type="radio"/> Moderate Persistent <input type="radio"/> Mild Persistent <input type="radio"/> Severe Persistent	<input type="radio"/> Colds <input type="radio"/> Smoke <input type="radio"/> Weather <input type="radio"/> Exercise <input type="radio"/> Dust <input type="radio"/> Air Pollution <input type="radio"/> Animals <input type="radio"/> Food <input type="radio"/> Other _____	1. Premedication (how much and when) _____ 2. Exercise modifications _____

Green Zone: Doing Well

Peak Flow Meter Personal Best =

Symptoms

- Breathing is good
- No cough or wheeze
- Can work and play
- Sleeps well at night

Control Medications:

Medicine	How Much to Take	When to Take It
_____	_____	_____
_____	_____	_____

Peak Flow Meter

More than 80% of personal best or _____

Yellow Zone: Getting Worse

Contact physician if using quick relief more than 2 times per week.

Symptoms

- Some problems breathing
- Cough, wheeze, or chest tight
- Problems working or playing
- Wake at night

Continue control medicines and add:

Medicine	How Much to Take	When to Take It
_____	_____	_____
_____	_____	_____

Peak Flow Meter

Between 50% and 80% of personal best or _____ to _____

IF your symptoms (and peak flow, if used) return to Green Zone after one hour of the quick-relief treatment, THEN

- Take quick-relief medication every 4 hours for 1 to 2 days.
- Change your long-term control medicine by _____
- Contact your physician for follow-up care.

IF your symptoms (and peak flow, if used) DO NOT return to Green Zone after one hour of the quick-relief treatment, THEN

- Take quick-relief treatment again.
- Change your long-term control medicine by _____
- Call your physician/healthcare provider within _____ hour(s) of modifying your medication routine.

Red Zone: Medical Alert

Ambulance/Emergency Phone Number:

Symptoms

- Lots of problems breathing
- Cannot work or play
- Getting worse instead of better
- Medicine is not helping

Continue control medicines and add:

Medicine	How Much to Take	When to Take It
_____	_____	_____
_____	_____	_____

Peak Flow Meter

Less than 50% of personal best or _____ to _____

Go to the hospital or call for an ambulance if:

- Still in the red zone after 15 minutes.
- You have not been able to reach your physician/healthcare provider for help.
- _____

Call an ambulance immediately if the following danger signs are present:

- Trouble walking/talking due to shortness of breath.
- Lips or fingernails are blue.

Rev_July_2008

Source: American Lung Association. www.lungusa.org/lung-disease/asthma/living-with-asthma/take-control-of-your-asthma/AsthmaActionPlan-JUL2008-high-res.pdf.

Asthma Daily Management Plan

DAILY ASTHMA MANAGEMENT PLAN

• Identify the things which start an asthma episode (Check each that applies to the student.)

- | | | |
|---|--|--------------------------------------|
| <input type="checkbox"/> Exercise | <input type="checkbox"/> Strong odors or fumes | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Respiratory infections | <input type="checkbox"/> Chalk dust / dust | _____ |
| <input type="checkbox"/> Change in temperature | <input type="checkbox"/> Carpets in the room | |
| <input type="checkbox"/> Animals | <input type="checkbox"/> Pollens | |
| <input type="checkbox"/> Food _____ | <input type="checkbox"/> Molds | |

Comments _____

• Control of School Environment

(List any environmental control measures, pre-medications, and/or dietary restrictions that the student needs to prevent an asthma episode.) _____

• Peak Flow Monitoring

Personal Best Peak Flow number: _____

Monitoring Times: _____

• Daily Medication Plan

	Name	Amount	When to Use
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____

COMMENTS / SPECIAL INSTRUCTIONS

FOR INHALED MEDICATIONS

- I have instructed _____ in the proper way to use his/her medications. It is my professional opinion that _____ should be allowed to carry and use that medication by him/herself.
- It is my professional opinion that _____ should not carry his/her inhaled medication by him/herself.

Physician Signature

Date

Parent/Guardian Signature

Date

Asthma Peak Flow Record

PEAK FLOW RECORD

Name _____ Week beginning (date) _____

Peak Flow Zones Green Zone _____ Yellow Zone _____ Red Zone _____

Prescribed medications (including dose and frequency) _____

Peak Flow Recording Times _____ AM _____ PM

Day	Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
600														
550														
500														
450														
400														
350														
300														
250														
200														
150														
100														
Medication Changes														
NOTES														

Authorization for Release of Medical Information: Cover Letter
Information Request to Parent/Guardian

Date _____

Dear _____

We strive to protect the well-being of our students at school, especially those who have special health problems. Our goal in such cases is to work with teachers, students, and administrators so that they can understand and adapt to the student's special health needs.

If your child might need emergency or supportive care during the school day because of a health problem, we ask you to provide us with certain information about the condition, which will help us plan for your child's care and any necessary treatment. We will keep this information confidential, sharing it only with members of the professional staff who have direct responsibility for your child at school or during school activities.

Please complete the attached form, answering any questions that apply. The school nurse will be happy to help you with the form and answer your questions about how we will use the requested information.

When we receive the signed and completed form, the school nurse will contact the person completing the form to review or confirm the information. Then we will prepare an individualized health care plan for your child. The school nurse will provide training to help teachers understand your child's health condition and the specific emergency procedures that may be needed.

It is important that you notify the school nurse and your child's physician if there are any changes in your child's health status, medications, or recommended treatment during the school year so that we can revise your child's emergency care plan. We will monitor your child's progress in school and send you regular reports.

Maintaining open communication with parents and other caregivers is vital to the success of our student health and safety program, which helps us ensure a successful school experience for all students who have special needs or chronic health problems. Your questions are welcome and should be directed to the school nurse.

Sincerely,

 RN, School Nurse

 Principal

Authorization for Release of Medical Information: Form
School Health Services

Date _____

TO _____

AGENCY _____

ADDRESS _____

I, the undersigned parent/guardian, hereby authorize and request you to release information about my child to the school district listed below.

Child's name _____ DOB _____

Parent/guardian name _____

Relationship to child _____ Phone _____

Address _____

Please send to the attention of:

Name/title _____

School district _____

Address _____

Parent/guardian signature _____ Date _____

Be Proactive: The Awareness/Prevention Checklist

The *Awareness/Prevention Checklist* highlights areas of school operations, maintenance, security, and personnel that may pose opportunities for risk reduction. Use this checklist as a proactive tool to generate awareness of the potential for terrorist acts.

The recommendations contained in this checklist are not intended to represent or replace a comprehensive school security program. Such a program would include much more. Many of the procedures included in the checklist are routine in districts with full-time security operations. Whether your school district has full-time security coverage or minimal security resources, these recommendations may be used as a focal point around which to build an appropriately renewed sense of awareness.

Recommendation/ Participants	Steps	Date Completed
Review employment screening policy and procedure Participants <ul style="list-style-type: none"> ▪ Security ▪ Human resources 	<ul style="list-style-type: none"> ▪ Does your screening process include volunteers, cafeteria workers, mechanics, bus drivers, and security personnel, in addition to educational staff? ▪ Does your procedure allow for actual courthouse searches, rather than database searches, which are typically not accurate? ▪ Do your searchers do social security number traces to identify any out-of-state venues that should be checked? ▪ Do your outside contractors use due-diligence screening procedures to check the backgrounds of their workers who regularly visit your school? 	
Review the physical security of bus yards and garages; review transportation security in general Participants <ul style="list-style-type: none"> ▪ Health staff ▪ Drivers ▪ Security ▪ Contract bus operators 	<ul style="list-style-type: none"> ▪ Do vehicle garages have alarms, and are the alarms in working order? ▪ Are fenced-in areas gated, locked, and adequately illuminated at night? ▪ Do drivers do “pilot inspections” of their vehicles before placing them in service each day? Is this done again after each time the vehicle has been left unattended? ▪ Are bus drivers equipped with 2-way radios or cell phones? ▪ Are drivers trained to be aware of and report suspicious vehicles that appear to be following their buses during their routes? ▪ Do drivers keep a student roster for each bus route, to include student name, address, primary and secondary emergency contact numbers, and medical authorization information? 	

Recommendation/ Participants	Steps	Date Completed
<p>Review the adequacy of physical security in and around campus buildings</p> <p>Participants</p> <ul style="list-style-type: none"> ▪ Security ▪ Maintenance ▪ Operations 	<ul style="list-style-type: none"> ▪ Are alarm systems working and have they been tested? This should include main campus buildings as well as maintenance and storage facilities. ▪ Are keys to campus and administration buildings adequately controlled? ▪ Are alarm pass codes changed when an employee leaves the school district? Make sure codes are not shared. ▪ Is exterior lighting working and is illumination adequate? ▪ Is interior lighting (night lighting) working and is illumination adequate? 	
<p>Review access control procedures and heighten employee awareness</p> <p>Participants</p> <ul style="list-style-type: none"> ▪ Everyone 	<ul style="list-style-type: none"> ▪ Are doors that should remain locked from the outside during the day kept locked, and are these doors checked periodically to make sure they are secure? Train all employees to check these doors but consider assigning someone to check them as well. ▪ Are staff members trained to approach and to “assist” strangers of any age who are observed in and on school property? Report those who have difficulty explaining their presence. ▪ Has a system been implemented that incorporates visitor logs and ID badges? 	
<p>Train everyone to recognize and report suspicious activities on campuses</p> <p>Participants</p> <ul style="list-style-type: none"> ▪ Everyone 	<ul style="list-style-type: none"> ▪ Are those who take pictures or film campus activities questioned about their authorization to do so? ▪ Be alert for suspicious vehicles that seem to have no apparent reason to be on campus, or that come, go, and then reappear. ▪ Are specific individuals assigned to inspect the outside of campus buildings throughout the day, and to report unattended packages or vehicles near building perimeters? ▪ Have you developed a plan to handle reports of suspicious activity? ▪ Is everyone trained to report unattended or otherwise suspicious packages found inside campus buildings? Is this specific issue placed on routine checklists for maintenance and janitorial personnel? ▪ Do personnel know what to do if a suspicious package is found? ▪ Have you considered a policy that requires staff and students to place visible, luggage-style ID tags on backpacks, book bags, briefcases, and gym bags? 	

Recommendation/ Participants	Steps	Date Completed
Implement a “tip-line” program that allows students, teachers, parents, staff, and other members of the school community to report issues anonymously, if they choose Participants <ul style="list-style-type: none"> ▪ Student services ▪ Security ▪ Human resources 	<ul style="list-style-type: none"> ▪ Do you have a zero tolerance policy for verbal threats of any kind? ▪ Do all members of the school community know that any threat or information about a potential threat must be reported? Do they understand that there is no such thing as a threat intended as a joke? ▪ Do students and staff know that they are responsible for informing the building principal about any information or knowledge of a possible or actual terrorist threat or act? ▪ Have you communicated a hard stand on hoaxes intended to mimic terrorist acts? Do students know that these hoaxes are crimes in themselves? 	
Work closely with local law enforcement and health officials Participants <ul style="list-style-type: none"> ▪ Security ▪ Clinical staff ▪ Crisis response team 	<ul style="list-style-type: none"> ▪ Have you made local law enforcement a partner in your district’s plans? ▪ Are parking regulations, particularly fire zone regulations, strictly enforced? ▪ Does local law enforcement have copies of building blueprints, including ventilation system plans and electrical plans? ▪ Has local law enforcement been given the opportunity to conduct exercises on school property and on buses? ▪ Have you determined contact protocol with local health officials if bioterrorism is suspected? 	
Train staff to identify and handle suspicious packages and letters Participants <ul style="list-style-type: none"> ▪ Mail room ▪ Secretarial ▪ Security ▪ Parents/guardians ▪ Students 	<ul style="list-style-type: none"> ▪ Have you downloaded and posted the Department of Homeland Security/US Postal Service poster on identifying suspicious packages (from www.usps.com)? ▪ Have you considered publicizing the availability of this information to others in the school community for personal use? 	

Source: *The Proactive Guide for the Threat of Terrorism in Schools*. Texas School Safety Center (www.txssc.swt.edu).

Characteristics of Biologic, Nuclear, Incendiary, and Chemical Agents

BIOLOGIC AGENT CHARACTERISTICS

Disease	Transmitted Man to Man	Incubation Period	Duration of Illness	Lethality (approx case-fatality rates)	Persistence of Organism
Inhalation anthrax	No	1–6 days	3–5 days (usually fatal if untreated)	High	Very stable: spores remain viable >40 years in soil
Brucellosis	No	5–60 days (usually 1–2 m)	Weeks to months	<5% if untreated	Very stable
Pneumonic plague	High	2–3 days	1–6 days (usually fatal)	High unless treated within 12–24 h	Up to 1 year in soil; 270 days in live tissue
Tularemia	No	2–10 days (average 3–5)	≥2 weeks	Moderate if untreated	Months (in moist soil/other media)
Q Fever	Rare	10–40 days	2–14 days	Very low	Months (on wood and sand)
Smallpox	High	7–17 days (average 12)	4 weeks	High to moderate	Very stable
Venezuelan equine encephalitis	Low	2–6 days	Days to weeks	Low	Relatively unstable
Viral hemorrhagic fevers	Moderate	4–21 days	Death in 7–16 days	Zaire strain: high Sudan strain: moderate	Relatively unstable (depends on agent)
Botulism	No	1–5 days	Death in 24–72 hours; non-lethal illness lasts months	High unless respiratory support is provided	Weeks (in nonmoving water and food)
Staph enterotoxin B	No	3–12 hours after inhalation	Hours	<1%	Resistant to freezing
Ricin	No	18–24 hours	Days (death within 10–12 days for ingestion)	High	Stable
T-2 mycotoxins	No	2–4 hours	Days to months	Moderate	Years (at room temperature)

Source: Adapted from USAMRIID's *Medical Management of Biological Casualties Handbook* (www.usamriid.army.mil).

BIOLOGIC AGENT MATRIX

Signs/Symptoms by System		Anthrax	Plague	Tularemia	Brucellosis	Q Fever	Bacterial Diarrhea	Smallpox	Viral Encephalitis	Viral Hemorrhagic Fevers	Botulinum	Enterotoxins	Ricin	Mycotoxins
Respiratory	Nonproductive cough	X	X	X	X	X		X				X		
	Cough with bloody sputum		X											
	Chest discomfort	X	X	X	X	X				X				X
	Shortness of breath	X	X	X								X	X	X
	Respiratory failure/distress	X									X	X	X	X
Circulatory	Abdominal pain	X	X	X			X	X		X		X		X
	Hypotension									X		X	X	X
	Shock	X								X		X		
	Hemorrhage			X						X				X
GI	Nausea		X			X	X			X		X	X	
	Vomiting		X	X			X	X	X	X	X	X	X	X
	Diarrhea		X	X			X		X	X	X	X		X
Skin	Skin lesions	X	X	X				X						X
	Skin inflammation							X		X				X
Neuromuscular	Drowsiness								X					
	Weakness/prostration		X	X	X	X		X			X		X	
	Progressive weakness of extremities										X			
	Muscular pain		X	X	X	X				X		X		
	Muscle rigidity							X						
Flaccid paralysis, usually neck										X				
General	Chills		X	X	X	X		X		X		X		
	Fever	X	X	X	X	X	X	X	X	X		X	X	
	Fatigue	X			X									
	Headaches		X	X	X	X	X	X	X	X		X		
	Sore throat		X	X		X			X	X				
	Swollen lymph nodes	X	X	X									X	

X indicates signs/symptoms present.

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Content from US Department of Justice and modified by the MCHC CAPES (Clinical, Administrative, Professional and Emergency Services) EMS subcommittee.

Characteristics of Biologic, Nuclear, Incendiary, and Chemical Agents /2

NUCLEAR, INCENDIARY, AND CHEMICAL AGENT MATRIX

Signs/Symptoms by System		Nuclear Agent	Incendiary Agent	Nerve Agent	Blister Agent	Lewisite Agent	Blood Agents	Choking Agents	Irritant Agents
ENT	Pinpoint pupils			X					
	Involuntary closing of eyes								X
	Immediate eye pain								X
	Runny nose			X					
Respiratory	Nonproductive cough							X	X
	Shortness of breath					X	X		X
	Difficulty breathing			X					
	Choking							X	
	Increased respirations					X	X		
	Temporary respiratory cessation			X					
	Respiratory failure				X				
CV	Chest tightness							X	
	Cardiac symptoms					X	X		
GI	Nausea	X		X				X	
	Vomiting			X		X	X	X	
Skin	Blistering				X				
	Burns	X	X						
	Immediate skin pain								X
	Stinging sensation on moist skin								X
	Sweating			X					
Neuro	Dizziness					X	X		
	Loss of consciousness			X					
	Seizures			X					
	Convulsions			X	X	X	X		
General	Weakness			X		X	X		
	Sluggishness				X				
	Lethargy				X				
	Apathy				X				
	Headaches					X	X		
	Copious secretions			X					
	Fever				X				
Odor	Odor of bleach/chlorine/pool							X	
	Odor of burnt almonds					X	X		
	Odor of hair spray								X
	Odor of newly mown hay/grass							X	
	Odor of peach kernels					X	X		
	Odor of pepper								X

ENT indicates ears/nose/throat; CV, cardiovascular; GI, gastrointestinal; neuro, neurologic. X indicates signs/symptoms present.

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Content from US Department of Justice and modified by the MCHC CAPES (Clinical, Administrative, Professional & Emergency Services) EMS subcommittee.

Child Maltreatment, Suspected: Written Confirmation Form

Use this form to report suspected child maltreatment to the Department of Children and Family Services.

CANTS 4
Rev. 10/00

State of Illinois
Department of Children and Family Services

WRITTEN CONFIRMATION OF SUSPECTED CHILD ABUSE/NEGLECT REPORT: MEDICAL PROFESSIONALS

NOTE: Hospitals and medical personnel engaged in examination, care, and treatment of persons are required by the Abused and Neglected Child Reporting Act to report to the Illinois Department of Children and Family Services all suspected cases of child abuse or neglect. The Act provides that anyone participating in this report shall be presumed to be acting in good faith and in so doing shall be immune from liability, civil or criminal, that otherwise might be incurred or imposed.

Child's Name _____

Sex _____ Age _____

Address _____
(Street) (City) (Zip) (County)

Parent's/Custodian's Name _____

Address _____
(Street) (City) (Zip) (County)

Where first seen _____ Date _____

Brought In by _____ Relationship _____

Nature of child's condition:

Evidence of previous suspected abuse(s)/neglect:

Reporter's immediate plan for child including whereabouts:

Remarks:

Person presumed to have abused/neglected child:			
<input type="checkbox"/> Father <input type="checkbox"/> Mother <input type="checkbox"/> Stepfather <input type="checkbox"/> Stepmother <input type="checkbox"/> Sibling <input type="checkbox"/> Other _____			
PERSON MAKING REPORT Name (Please Print) _____ Medical Facility _____ Address _____ Date _____	PERSON MAKING REPORT (Check Appropriate Box) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <input type="checkbox"/> Attending Physician <input type="checkbox"/> Surgeon <input type="checkbox"/> Hospital Administrator <input type="checkbox"/> Medical Examiner <input type="checkbox"/> Coroner <input type="checkbox"/> Registered Nurse <input type="checkbox"/> Licensed Practical Nurse <input type="checkbox"/> Dentist <input type="checkbox"/> Osteopath </td> <td style="width: 50%; border: none;"> <input type="checkbox"/> Podiatrist <input type="checkbox"/> Chiropractor <input type="checkbox"/> Christian Science Practitioner <input type="checkbox"/> Social Worker <input type="checkbox"/> Social Services Administrator <input type="checkbox"/> Registered Psychologist <input type="checkbox"/> Psychiatrist <input type="checkbox"/> Advanced Practice Nurse <input type="checkbox"/> Other _____ </td> </tr> </table> Signature _____	<input type="checkbox"/> Attending Physician <input type="checkbox"/> Surgeon <input type="checkbox"/> Hospital Administrator <input type="checkbox"/> Medical Examiner <input type="checkbox"/> Coroner <input type="checkbox"/> Registered Nurse <input type="checkbox"/> Licensed Practical Nurse <input type="checkbox"/> Dentist <input type="checkbox"/> Osteopath	<input type="checkbox"/> Podiatrist <input type="checkbox"/> Chiropractor <input type="checkbox"/> Christian Science Practitioner <input type="checkbox"/> Social Worker <input type="checkbox"/> Social Services Administrator <input type="checkbox"/> Registered Psychologist <input type="checkbox"/> Psychiatrist <input type="checkbox"/> Advanced Practice Nurse <input type="checkbox"/> Other _____
<input type="checkbox"/> Attending Physician <input type="checkbox"/> Surgeon <input type="checkbox"/> Hospital Administrator <input type="checkbox"/> Medical Examiner <input type="checkbox"/> Coroner <input type="checkbox"/> Registered Nurse <input type="checkbox"/> Licensed Practical Nurse <input type="checkbox"/> Dentist <input type="checkbox"/> Osteopath	<input type="checkbox"/> Podiatrist <input type="checkbox"/> Chiropractor <input type="checkbox"/> Christian Science Practitioner <input type="checkbox"/> Social Worker <input type="checkbox"/> Social Services Administrator <input type="checkbox"/> Registered Psychologist <input type="checkbox"/> Psychiatrist <input type="checkbox"/> Advanced Practice Nurse <input type="checkbox"/> Other _____		

(MAILING INSTRUCTIONS ON REVERSE SIDE)

INSTRUCTIONS

The Abused and Neglected Child Reporting Act states that any hospital, clinic or private facility to which a child comes or is brought suffering from injury, physical abuse or neglect apparently inflicted upon him, other than by accidental means, shall promptly report or cause reports to be made in accordance with provisions of the Act.

The report should be made immediately by telephone to the IDCFS Child Abuse Hotline (800-252-2873) and confirmed in writing via the U.S. Mail, postage prepaid, within 48 hours of the initial report.

This form is provided for the convenience of the hospital, clinic or private facility in making the written report. A form must be completed for each child.

Enter the full name of the child, sex, age and address. Give the first and last names of the parents or persons having custody of the child. If the address is the same as that of the child, indicate by "same."

Where first seen: Give the date the child was first seen; indicate if in-patient, clinic, emergency room, doctor's office or another specified place within the hospital, and by whom the child was brought in.

Nature of the child's condition and evidence of previous suspected abuse(s)/neglect: Self-explanatory.

Reporter's plan for child: Indicate whether child is to remain in the hospital and for how long, or be released and, if so, to whom. State any other pertinent information as to the plan.

Remarks: If a report was also made to a local law enforcement agency, state to which agency report was made. Include any additional information deemed appropriate to the case.

Give the name of the Attending Physician, name and address of the hospital, if report is from the hospital.

Signature: The report is to be signed by the person making the report.

MAILING INSTRUCTIONS

Mail the original to the nearest office of the Illinois Department of Children and Family Services, Attention: Child Protective Services

DCFS is an equal opportunity employer, and prohibits unlawful discrimination in all of its programs and/or services.

Complications Involving Vascular Access Devices

External Catheters

UNINTENTIONAL REMOVAL

Signs: Catheter no longer protrudes from exit site.

Interventions: Apply pressure at catheter's entrance site, near upper incision where catheter enters vein—**not** at exit site. Notify parent/guardian and/or take student to nearby medical facility.

Precautions: Secure catheter with tape and keep covered with clothing at all times. Discourage student from playing with or tugging at catheter.

CATHETER DISLODGED

Signs: Edema, pain, numbness, or tingling in the neck, shoulder, arm, or hand on the same side of the body as the catheter, or signs that the catheter may have been pulled out (such as excessive length or protrusion compared with normal appearance).

Interventions: Call parent/guardian. If the catheter is dislodged, it will have to be removed and replaced.

Precautions: Instruct student to avoid vigorous activity that could dislodge the catheter. Keep external catheters secured with tape and covered with clothing at all times. Measure and document length of normally inserted catheter for baseline comparison.

AIR IN CATHETER

Signs: Dyspnea, chest pain.

Interventions: If damage to catheter is suspected, immediately clamp or bend it near the exit site. Have student lie down and remain quiet. Call for **emergency** medical assistance.

Precautions: Keep clamp nearby at all times. Never take cap off without clamping the catheter (except Groshong). Flush Groshong vigorously to prevent fibrin buildup, which could prevent valve from closing fully.

DISCONNECTED CAP

Signs: Uncapped end of catheter.

Interventions: Immediately clamp catheter. Clean proximal end of lumen with alcohol prep pad. Replace with new, clean cap.

Precautions: When replacing cap, secure it to catheter with tape. Cover catheter completely with dressing or clothing. This is particularly important with younger children. Educate student about the consequences of cap coming off.

BREAK OR CUT IN CATHETER

Signs: Fluid leakage; catheter feels sticky.

Interventions: Immediately clamp catheter between the break and the exit site. Cleanse the area with an alcohol

prep pad. Cover the torn area with sterile gauze if available. Call parent/guardian. The catheter will have to be repaired.

Precautions: Clamp catheter over the reinforced sleeve; tape tab or pad over catheter (except Groshong). Do not clamp the same spot repeatedly—rotate the location of the clamp, and always use smooth clamps. Never use scissors near catheter. Never flush catheter with excessive force. Do not allow catheter to dangle. Cover with tape or clothing.

INFECTION

Signs: Fever and chills; tiredness or lethargy, with or without fever; edema or erythema at insertion site and exit site; foul odor, purulent discharge, pain/tenderness, or heat at incision site.

Interventions: Change the dressing, then call parent/guardian.

Precautions: Wash hands before beginning any procedure. Perform all procedures in draft-free but well-ventilated area. Wear a mask around the student if you have a cold. Instruct student to avoid those who are ill.

OCCLUSION

Signs: Unable to flush/irrigate catheter using normal pressure.

Interventions: Do not use extra pressure. If catheter is kinked or bent, straighten it and try again. If you still meet resistance, call parent/guardian. Catheter may require special procedures to remove/dissolve occlusion.

Precautions: Flush catheter on a regular schedule and after each use or if blood is seen in catheter.

Surgically Implanted Devices

CATHETER DISLODGED FROM PORT

Signs: Edema, pain, numbness, or tingling at suture line.

Interventions: Call parent/guardian.

Precautions: Instruct student to avoid vigorous activity that could dislodge catheter from port. Discourage student from touching or fidgeting with port site.

INFECTION

Signs: Fever and chills; tiredness or lethargy, with or without fever; edema or erythema at insertion site and exit site; foul odor, purulent discharge, pain/tenderness, or heat at incision site.

Interventions: Call parent/guardian.

Precautions: Inspect incision daily.

Adapted with permission from: (1) *How to Care for Your Hickman® or Broviac® Catheter*. Cranston, RI: Davol, Inc. 1986. (2) Marcoux C, Fisher S, Wong DL. Central venous access devices in children. *Pediatr Nurs*. 1990;16,132.

Complications: School Precautions for a Student With a Shunt

Student's name _____ Date _____
 School _____ Grade _____ Teacher _____
 Parent/guardian _____ Daytime phone _____
 Physician _____ Phone _____

A shunt is a surgically implanted plastic tube that drains excess spinal fluid from the brain into the abdominal cavity, where it is absorbed. Shunt dysfunction causes fluid to build up, increasing pressure within the skull. **This is a medical emergency! Notify the parent/guardian immediately if you observe any signs of shunt dysfunction listed below.**

SIGNS OF SHUNT DYSFUNCTION

- Severe headache
- Irritability
- Projectile vomiting
- Decreased appetite
- Change in personality
- Loss of existing skills or abilities
- Eye deviation
- Inability to look up or roll eyes upward
- Swelling/redness along path of shunt
- Lethargy
- Seizures
- Loss of balance

SCHOOL PRECAUTIONS

- Guard against falls or impact to the head or shunt site
- Inspect shunt site for redness, swelling, or other signs of infection
- Prohibit contact sports and diving

Parent/guardian/student/teacher/nurse conference date _____

Participants _____

cc: Student health file
 Teacher file
 Parent/guardian
 Physician

Cultural Awareness and Clinical Assessment

It is important to ensure that your school's health program encompasses aspects of cultural awareness. Within diverse ethnic groups, you'll find that a range of commonalities as well as differences exists. It's impossible to memorize every aspect of each group, but you should maintain adequate resource information to supplement your knowledge. As student populations change, you'll need to adapt and expand your knowledge of cross-cultural health practices to maintain an accurate understanding of the beliefs held by all students and families. To enhance your own cultural competence, strive to attend seminars on cultural awareness and look for ways to align your clinical practices with students' cultural beliefs and values.

The Table lists some of the cultural factors that can affect your approach to student care. Also see *Cultural Diversity and Health Care*.

CULTURAL ASSESSMENT POINTS

Assessment Points	Special Considerations
Background	<ul style="list-style-type: none"> ▪ Where were the student and family members born? ▪ How long have the student and family members lived in this country? ▪ What are the family's ethnic, religious, and racial origins and heritage?
Family structure	<ul style="list-style-type: none"> ▪ Who are the dominant family members? Are grandparents, godparents, or nonfamily members involved in rearing the student?
Values	<ul style="list-style-type: none"> ▪ How do concepts of health, illness, and education affect the family's values?
Sanctions and restrictions	<ul style="list-style-type: none"> ▪ Are there special cultural rules governing physical examination or medical treatment?
Oral and written communication	<ul style="list-style-type: none"> ▪ What are the primary and secondary languages spoken? ▪ What are the speaking and reading abilities of the parents/guardians? Are they literate in their language? ▪ If a language barrier exists, can you call on a reliable interpreter?
Nonverbal communication	<ul style="list-style-type: none"> ▪ How would you characterize the nonverbal communication style? ▪ Do practices involving eye contact, personal space, and touch differ from your own?
Beliefs and practices	<ul style="list-style-type: none"> ▪ What causative factors are associated with illness? ▪ Does the family use traditional healers?
Nutrition	<ul style="list-style-type: none"> ▪ Do dietary restrictions exist? ▪ Is illness treated through diet?
Resources	<ul style="list-style-type: none"> ▪ What socioeconomic resources are available to the family? ▪ What health resources are available to the family?
Education	<ul style="list-style-type: none"> ▪ What is the education level of the parents/guardians?
Religion	<ul style="list-style-type: none"> ▪ Does religion play a significant role in health-related beliefs? ▪ Are there religious mandates that affect health care?

Cultural Diversity and Health Care

Region	Cultural Attitudes Toward Health and Medicine	Ethnic Susceptibilities	Social Organization	Communication/ Interaction
Asia Including • China • Hawaii • Philippines • Korea • Japan • Laos • Cambodia • Vietnam	Traditional beliefs, traditional medicine • Health is seen as a balance of yin and yang • Preventive measures: diet, exercise, amulets, religion, ancestors • Treatment: diet to balance yin and yang • Traditional healers: Chinese physician, herbalist, acupuncturist	Hepatic and stomach cancer, coccidioidomycosis, hypertension, lactose intolerance	Hierarchical family structure • Devoted to tradition • Religions include Taoism, Buddhism, Islam, Christianity • Stress social organizations, community	Languages include Cantonese, Pidgin, Tagalog, Korean, Haragei, French • Physical contact is avoided
Africa Including • Numerous African countries • West Indies • Dominican Republic • Haiti • Jamaica	Traditional beliefs, folk medicine • Health is seen as harmony with nature • Preventive measures: talismans, voodoo, religion, avoiding evil spirits • Treatment: prayer, laying on of hands, traditional remedies • Traditional healers: minister or priest, voodoo practitioner	Sickle cell anemia, hypertension, esophageal and stomach cancer, coccidioidomycosis, lactose intolerance	Many single-parent, female heads of household • Large extended families • Church strongly affiliated with community • Stress social organizations	Languages include Pidgin, Creole, Spanish, French, dialects • May stand very close
Europe Including • Germany • England • Italy • Ireland • other European countries	Modern or traditional beliefs, some folk medicine • Health is seen as physical wellness • Preventive measures: faith, cleanliness, amulets, prayer • Treatment measures: faith, prayer, homeopathic remedies, herbal teas • Traditional healers: priest or other religious leader	Breast cancer, heart disease, diabetes, thalassemia	Nuclear and extended families • Judeo-Christian religions • Stress community and social organizations	Many national languages; English is widely spoken • Physical contact generally avoided; less so in southern countries
North America Including • 170 Native American tribes • Aleuts • Eskimos	Traditional beliefs, folk medicine • Health is seen as harmony with nature • Preventive measures: avoiding witches, respecting the earth • Treatment: restoration of body's balance, conjuring, stargazing, sand paintings • Traditional healers: medicine man, powwow person	Unintentional injury, heart disease, cirrhosis, diabetes	Family-oriented • Biologic and extended families • Respect for traditions • Stress social organizations	Tribal languages, silence, body language • Physical space is important and has no boundaries
Hispanic countries Including • Spain • Cuba • Mexico • Central and South America	Traditional beliefs, folk medicine • Health is seen as reward for good behavior, balance of hot and cold • Preventive measures: diet, candles, amulets, avoiding harmful people • Treatment: restoring balance of hot and cold, herbal teas, prayer, faith • Traditional healers: herbalist, <i>curandero</i> , <i>santero</i>	Diabetes, parasites, coccidioidomycosis, lactose intolerance	Nuclear and extended families • <i>Compadrazzo</i> (godparents) • Stress community organizations	Languages include Spanish, Portuguese, dialects • Relationships are tactile: touch, handshake, embracing

Current Health Status of a Student With Special Needs

(To be completed by parent/guardian and student, when appropriate)

Student's name _____ Sex _____ DOB _____

Parent/guardian name _____ Daytime phone _____

Student's primary diagnosis or presenting problem _____

Student's **primary** care physician (**not** specialist) _____

Phone _____ Address _____

May the school nurse contact the physician for information that will help define your child's emergency care plan? Yes No

Does the child have allergies? Yes No

If yes, what is your child allergic to? _____

Please list below a step-by-step emergency plan for each of your child's health problems. The school nurse is available to help you.

Health Problem	Directions for an Emergency
1	1
	2
	3
	4
2	1
	2
	3
	4

Use a separate sheet if you need additional space.

Does your child regularly experience any particular health problems? Yes No

Are there signs that show your child is ill or about to become ill? Yes No

(If yes, please list them) _____

Continued

Current Health Status of a Student With Special Needs /2

Below, please list all medications your child is currently taking and the doctor who prescribes each one.

	Medication	How Often/How Taken	Health Problem	Physician
1				
2				
3				
4				
5				

Please list specialists, clinics, therapists, or other doctors involved in your child's care, the problems for which they are consulted, and the date of the most recent visit.

	Name	For Which Problem?	Date of Last Visit
1			
2			
3			
4			
5			

May the school nurse contact these health professionals with concerns or questions? Yes No

Please add your comments or additional information below.

Parent/guardian signature _____ Date _____

Adapted for use from the *School Nurse Emergency Medical Services for Children (SNEMS-C) Course Manual*. Farmington, CT: University of Connecticut Health Center, Department of Pediatrics; 1996.

Documentation and Referral Form

Student's name _____ Birth date _____

Address _____

Parent/guardian _____ Emergency phone _____

Time _____ Date _____ Grade _____ School _____

Allergies _____ Chronic health problems _____

Medications _____ Last tetanus shot _____

Additional information:

Referred to _____ Transported by _____

Please return form to school nurse at _____

School address _____

School phone _____ Signature of nurse _____

Physician Section**Findings:****Plan:**

Date student may return to school _____ Restrictions? Yes _____ No _____

List restrictions _____

Physician signature _____ Date _____

Documentation and Referral Form /2 (Transport to ED/Medical Clinic)

Name _____

Past history _____

Mechanism of injury (check all that apply)

<input type="checkbox"/> Blunt object/hard surface	<input type="checkbox"/> Firearm	<input type="checkbox"/> Sharp object/penetration
<input type="checkbox"/> Drug ingestion	<input type="checkbox"/> Fire/hot surface	<input type="checkbox"/> Smoke/toxic fumes
<input type="checkbox"/> Fall	<input type="checkbox"/> Machinery/shop	<input type="checkbox"/> Sports/PE
<input type="checkbox"/> Fight/violence	<input type="checkbox"/> Self-inflicted	<input type="checkbox"/> Other (specify)

Observations (check all that apply)

Location	I	P	NS	Location	I	P	NS	Location	I	P	NS	Location	I	P	NS
Head	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Face	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Neck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Back	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Abdomen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pelvis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Shoulder				Upper arm				Elbow				Forearm			
L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hand				Hip				Thigh				Knee			
L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lower leg				Foot				Comments							
L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

I indicates injured; P, pain; NS, no sensation

Assessment findings

Glasgow Coma Score	Time	Time	Time	Vital Signs	Time	Time	Time		
Eyes 4 Open spontaneously 3 Open to voice 2 Open to pain 1 No response				Blood pressure					
				Capillary refill Circle appropriate number	≤2 sec	>2 sec	≤2 sec	>2 sec	≤2 sec
Verbal 5 Oriented 4 Confused 3 Inappropriate words 2 Incomprehensible words 1 No response				Pulse rate/min					
				Quality of pulse Circle all that apply	Normal Weak Irregular Absent	Normal Weak Irregular Absent	Normal Weak Irregular Absent		
Motor 6 Obeys commands 5 Localizes pain 4 Withdraws from pain 3 Flexion (decorticate) 2 Extension (decerebrate) 1 No response/flaccid				Resp rate/min					
				Quality of resp Circle all that apply	Normal Distressed Labored Shallow Irregular	Normal Distressed Labored Shallow Irregular	Normal Distressed Labored Shallow Irregular		
TOTAL SCORE				Pupils Circle all that apply	Normal Constricted Dilated Unequal Nonreactive	Normal Constricted Dilated Unequal Nonreactive	Normal Constricted Dilated Unequal Nonreactive		
Comments									

Completed by _____ Date _____

Using the Daily Census

The notations on the Confidential Health Office Daily Census are explained below.

Client

Record a general designation for the individual receiving health care.

- **Student**—specify male or female
- **Staff**—any school employee
- **Other**—eg, volunteer, visitor, parent/guardian

Visit/Assessment

Specify the primary reason for the visit or assessment.

- **Chronic care:** medication, nursing procedures, or monitoring episodes of an illness that has existed for more than 3 weeks.
- **Illness:** treatment for a medical problem that has persisted for less than 3 weeks.
- **Injury:** problems resulting from any type of trauma.
- **Health maint:** health promotion, normal growth and development issues, or monitoring risk factors, such as hypertension or obesity.
- **Recheck:** return visit for a problem incurred previously, such as an injury.
- **Referral:** follow-up visit stemming from a previous referral.
- **Gym excl:** a visit to obtain an exclusion from gym class or a modification in class participation.
- **Consult:** a staff visit of more than 5 minutes' duration for professional advice about a student.
- **Ind screen:** a visit for individual screening outside of the regular screening program.

Visits for chronic care, illness, or injury are further categorized as shown:

- **E–U–N:** Determination of triage category (see Chapter 3). **Write appropriate letter in box.**
 - Emergent:** Requires immediate lifesaving action (eg, respiratory arrest).
 - Urgent:** Requires further interventions within 2 hours (eg, suspected wrist fracture).
 - Nonurgent:** May require care for minor illness or injury (eg, abrasions).
- **Home:** The injury or illness occurred at home.
- **School:** The problem occurred at school before, during, or after classes.
- **Other:** The problem began on the way to school or during a class trip.

Interventions

Record nursing interventions.

- **Nurse care:** Routine care for injury or illness.
- **Meds:** Any medication given by any route under physicians' orders.
- **Special proc:** A special health care procedure ordered by a physician, such as catheterization.
- **Emerg care:** Nursing response to a life-threatening injury or illness, such as airway obstruction.
- **Counseling:** Advice or guidance of more than 5 minutes' duration related to health issues.
- **Crisis interv:** Response to a crisis situation, such as a suicide threat.
- **IHP/ECP:** Carrying out specifications of an individualized health care plan or emergency care plan.
- **Teaching:** Individual health teaching, such as self-catheterization.
- **Other:** Any intervention that does not fit the categories listed above.
- **Consult/Refer:** Performing a consultation with or making a referral to:
 - Agency:** Any community agency, such as child guidance or social services.
 - Dental:** Any dental service.
 - Medical:** Local or regional medical resources, whether private or public.
 - In-school:** Service providers within the school, such as a social worker.
 - SBHC:** A school-based health center that provides primary care for students.
 - Other:** Any service that does not fit the categories listed above.

Disposition

Record the client's disposition as follows:

- **ED/MD:** Transport to emergency department or hospital by parent/guardian.
- **911:** Transport by ambulance to a hospital for emergency treatment.
- **Home:** Student is sent home.
- **Sch monitor:** Monitor for sequelae after illness or injury.
- **Health Rm >2 hr:** Nursing supervision in the health room for 2 hours or more.
- **RTC:** Return to class after assessment and intervention in the health office.

Source: The *School Nurse EMSC Course Manual*. University of Connecticut Health Center, Department of Pediatrics; 1996.

Do Not Resuscitate Form (Illinois Uniform DNR Form)

UNIFORM DNR ADVANCE DIRECTIVE ■ UNIFORM DNR ADVANCE DIRECTIVE ■ UNIFORM DNR ADVANCE DIRECTIVE ■			
Illinois Department of Public Health UNIFORM DO-NOT-RESUSCITATE (DNR) ADVANCE DIRECTIVE PHYSICIAN ORDERS FOR LIFE-SUSTAINING TREATMENT (POLST)			
HIPAA (HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT of 1996) PERMITS DISCLOSURE TO HEALTH CARE PROFESSIONALS AS NECESSARY FOR TREATMENT			
Follow these orders until changed. These medical orders are based on the patient's medical condition and preferences. Any section not completed does not invalidate the form and implies initiating all treatment for that section. With significant change of condition, new orders may need to be written. See also Guidance for Health Care Professionals at http://www.idph.state.il.us/public/books/advin.htm .	Patient Last Name	Patient First Name	MI
	Date of Birth (mm/dd/yy)	Gender <input type="checkbox"/> M <input type="checkbox"/> F	
	Address (street/city/state/ZIPcode)		
A	CARDIOPULMONARY RESUSCITATION (CPR) Patient has no pulse <i>and</i> is not breathing. <input type="checkbox"/> Attempt Resuscitation/CPR (<i>Selecting CPR means Intubation and Mechanical Ventilation in Section B is selected</i>) <input type="checkbox"/> Do Not Attempt Resuscitation/DNR		
<i>When not in cardiopulmonary arrest, follow orders B and C.</i>			
B	MEDICAL INTERVENTIONS Patient has pulse and/or is breathing. <input type="checkbox"/> Comfort Measures Only (Allow Natural Death). Relieve pain and suffering through the use of medication by appropriate route, positioning, wound care and other measures. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. Patient prefers no transfer to hospital for life-sustaining treatments. Transfer if comfort needs cannot be met in current location. Treatment Plan: Maximize comfort through symptom management. <input type="checkbox"/> Limited Additional Interventions In addition to care described in Comfort Measures Only, use medical treatment, antibiotics, IV fluids and cardiac monitor as indicated. No intubation or mechanical ventilation. May consider less invasive airway support (e.g., CPAP, BiPAP). Transfer to hospital if indicated. Generally avoid the intensive care unit. Treatment Plan: Provide basic medical treatments. <input type="checkbox"/> Intubation and Mechanical Ventilation In addition to care described in Comfort Measures Only and Limited Additional Interventions, use intubation and mechanical ventilation as indicated. Transfer to hospital and/or intensive care unit if indicated. Treatment Plan: Life support measures, including intubation, in the intensive care unit. <input type="checkbox"/> Additional Orders _____		
C	ARTIFICIALLY ADMINISTERED NUTRITION Offer food by mouth, if feasible and as desired. <input type="checkbox"/> No artificial nutrition by tube. Additional Instructions (e.g., length of trial period) <input type="checkbox"/> Defined trial period of artificial nutrition by tube. _____ <input type="checkbox"/> Long-term artificial nutrition by tube. _____		
D	DOCUMENTATION OF DISCUSSION (Check all appropriate boxes below) <input type="checkbox"/> Patient <input type="checkbox"/> Agent under health care power of attorney <input type="checkbox"/> Parent of minor <input type="checkbox"/> Health care surrogate decision maker (See Page 2 for priority list) Signature of Patient or Legal Representative Signature (<i>required</i>) _____ Name (print) _____ Date _____ Signature of Witness to Consent (Witness required for a valid form) I am 18 years of age or older and acknowledge the above person has had an opportunity to read this form and have witnessed the giving of consent by the above person or the above person has acknowledged his/her signature or mark on this form in my presence. Signature (<i>required</i>) _____ Name (print) _____ Date _____		
E	SIGNATURE OF ATTENDING PHYSICIAN My signature below indicates to the best of my knowledge and belief that these orders are consistent with the patient's medical condition and preferences. Print Attending Physician Name (<i>required</i>) _____ Phone _____ _____ () _____ - _____ Attending Physician Signature (<i>required</i>) _____ Date (<i>required</i>) _____		
SEND A COPY OF FORM WITH PATIENT WHENEVER TRANSFERRED OR DISCHARGED			
			Page 1

Do Not Resuscitate Form (Illinois Uniform DNR Form) /2

THIS SIDE FOR INFORMATIONAL PURPOSES ONLY										
Patient Last Name	Patient First Name	MI								
<p>The Illinois Department of Public Health (IDPH) Uniform Do Not Resuscitate (DNR) Advance Directive is always voluntary and is for persons with advanced or serious illness or frailty. This order records your wishes for medical treatment in your current state of health. Once initial medical treatment is begun and the risks and benefits of further therapy are clear, your treatment wishes may change. Your medical care and this form can be changed to reflect your new wishes at any time. However, no form can address all the medical treatment decisions that may need to be made. The Power of Attorney for Health Care Advance Directive form (POAHC) is recommended for all capable adults, regardless of their health status. A POAHC allows you to document, in detail, your future health care instructions and name a Legal Representative to speak for you if you are unable to speak for yourself.</p>										
Advance Directive Information										
I also have the following advance directives (OPTIONAL)										
<input type="checkbox"/> Health Care Power of Attorney <input type="checkbox"/> Living Will Declaration <input type="checkbox"/> Mental Health Treatment Preference Declaration										
Contact Person Name	Contact Phone Number									
Health Care Professional Information										
Preparer Name	Phone Number									
Preparer Title	Date Prepared									
<p>Completing the IDPH Uniform Do Not Resuscitate (DNR) Advance Directive Form</p> <ul style="list-style-type: none"> • The completion of a DNR form is always voluntary, cannot be mandated and may be changed at any time. • A DNR form should reflect current preferences of persons with advanced or serious illness or frailty. Also, encourage completion of a POAHC. • Verbal/phone orders are acceptable with follow-up signature by attending physician in accordance with facility/community policy. • Use of original form is encouraged. Photocopies and faxes on any color of paper also are legal and valid forms. 										
<p>Reviewing a Do Not Resuscitate (DNR) Advance Directive Form</p> <p>This DNR form should be reviewed periodically and if:</p> <ul style="list-style-type: none"> • The patient is transferred from one care setting or care level to another, • or there is a substantial change in the patient's health status, • or the patient's treatment preferences change, • or the patient's primary care professional changes. 										
<p>Voiding or revoking a Do Not Resuscitate (DNR) Advance Directive Form</p> <ul style="list-style-type: none"> • A patient with capacity can void or revoke the form, and/or request alternative treatment. • Changing, modifying or revising a DNR form requires completion of a new DNR form. • Draw line through sections A through E and write "VOID" in large letters if any DNR form is replaced or becomes invalid. Beneath the written "VOID" write in the date of change and re-sign. • If included in an electronic medical record, follow all voiding procedures of facility. 										
<p>Illinois Health Care Surrogate Act (755 ILCS 40/25) Priority Order</p> <table style="width: 100%;"> <tr> <td>1. Patient's guardian of person</td> <td>5. Adult sibling</td> </tr> <tr> <td>2. Patient's spouse or partner of a registered civil union</td> <td>6. Adult grandchild</td> </tr> <tr> <td>3. Adult child</td> <td>7. A close friend of the patient</td> </tr> <tr> <td>4. Parent</td> <td>8. The patient's guardian of the estate</td> </tr> </table>			1. Patient's guardian of person	5. Adult sibling	2. Patient's spouse or partner of a registered civil union	6. Adult grandchild	3. Adult child	7. A close friend of the patient	4. Parent	8. The patient's guardian of the estate
1. Patient's guardian of person	5. Adult sibling									
2. Patient's spouse or partner of a registered civil union	6. Adult grandchild									
3. Adult child	7. A close friend of the patient									
4. Parent	8. The patient's guardian of the estate									
<p>For more information, visit the IDPH Statement of Illinois law at http://www.idph.state.il.us/public/books/advin.htm</p>										
<p>HIPAA (HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT of 1996) PERMITS DISCLOSURE TO HEALTH CARE PROFESSIONALS AS NECESSARY FOR TREATMENT</p>										
<p> IOCI 13-361</p>		<p> Page 2</p>								
<p>SEND A COPY OF FORM WITH PATIENT WHENEVER TRANSFERRED OR DISCHARGED</p>										

Emergency Care Plan: Sample

Student John Paul Smith **DOB** 3/15/90 **Parent/guardian** John & Marion Smith
Tel home (555) 123-1234 **Work** (555) 321-4321 (mother) (555) 246-2468 (father)
Allergies NONE **Medications** NONE

J.P. has had 2 surgical procedures: 1) Insertion of a gastrostomy tube. 2) Formation of a spit-fistula. As a result, he may require specialized emergency care during the school day. This plan addresses 3 potential problems and the actions for each.

Problem 1	Blockage of Spit-Fistula
Symptoms	Buildup of saliva in mouth.
Action	Suction mouth and fistula opening.
Plan	1. Teacher alerts nurse.
	2. Nurse attempts to clear spit-fistula by suctioning.
	3. If unsuccessful, J.P. is taken to nurse's office.
	4. Nurse calls parent/guardian for transport to medical care.
	5. Nurse documents incident on appropriate form; copy to parent/guardian.

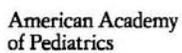
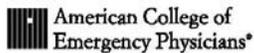
Problem 2	Disruption of gastrostomy tube
Symptoms	Fluid leakage from stomach. Tube dislodged or broken.
Action	Protect tube site for transport to medical facility.
Plan	1. Teacher alerts nurse.
	2. J.P. is taken to nurse's office.
	3. (a) If tubing is in place, splint with bulky dressing and secure. (b) If tubing is dislodged, cover site with thick, sterile dressing.
	4. Call parent to transport to medical facility for tube evaluation/repair.
	5. Nurse documents incident on appropriate form; copy to parent/guardian.

Problem 3	Nausea or stomach distress
Symptoms	J.P. complaining of nausea, pain in stomach, or general distress.
Action	Nursing assessment and relief of discomfort if possible.
Plan	1. Teacher alerts nurse.
	2. J.P. is taken to nurse's office.
	3. Nurse assesses for cause of complaint.
	4. Patency of tube is evaluated.
	5. Notify parent/guardian.
	6. Call physician (Dr. Sung, 555-1708) for nurse intervention or call parent/guardian for transport to medical care.
	7. Nurse documents incident on appropriate form; copy to parent/guardian.

Emergency Information Form

Emergency Information Form for Children With Special Needs

Last name:



Date form completed	Revised	Initials
By Whom	Revised	Initials

Name:		Birth date:	Nickname:
Home Address:		Home/Work Phone:	
Parent/Guardian:		Emergency Contact Names & Relationship:	
Signature/Consent*:			
Primary Language:		Phone Number(s):	
Physicians:			
Primary care physician:		Emergency Phone:	
		Fax:	
Current Specialty physician: Specialty:		Emergency Phone:	
		Fax:	
Current Specialty physician: Specialty:		Emergency Phone:	
		Fax:	
Anticipated Primary ED:		Pharmacy:	
Anticipated Tertiary Care Center:			

Diagnoses/Past Procedures/Physical Exam:	
1. _____	Baseline physical findings:
_____	_____
2. _____	_____
_____	_____
3. _____	Baseline vital signs:
_____	_____
4. _____	_____
_____	_____
Synopsis:	Baseline neurological status:
_____	_____
_____	_____
_____	_____

*Consent for release of this form to health care providers

Last name:

Diagnoses/Past Procedures/Physical Exam continued:	
Medications:	Significant baseline ancillary findings (lab, x-ray, ECG):
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	Prostheses/Appliances/Advanced Technology Devices:
5. _____	_____
6. _____	_____

Management Data:	
Allergies: Medications/Foods to be avoided	and why:
1. _____	_____
2. _____	_____
3. _____	_____
Procedures to be avoided	and why:
1. _____	_____
2. _____	_____
3. _____	_____

Immunizations											
Doses	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
DPT											
OPV											
MMR											
HIB											
Antibiotic prophylaxis:		Indication:				Medication and dose:					

Common Presenting Problems/Findings With Specific Suggested Managements		
Problem	Suggested Diagnostic Studies	Treatment Considerations

Comments on child, family, or other specific medical issues:	
Physician/Provider Signature:	Print Name:

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Emergency Equipment / Supplies: Classroom Go-Kit

Teachers should have the following items readily available in a backpack or duffle bag in case of emergency evacuation or lockdown.

- Current class roster
- School emergency response and crisis management plan
- Safety vest
- First aid kit
- Flashlight and batteries
- Large tarp
- Whistle
- Paper and pens
- Light sticks
- Rain ponchos
- Bottled water
- Age-appropriate student activities
- Clipboard and status cards
- Portable radio
- Cellular telephone
- Heat-reflective emergency blankets (Space blankets)
- Energy bars
- Student release forms

Emergency Equipment / Supplies for School Disaster Preparedness

Recommended Emergency Supplies

(Drawn from lists created by the California Senate Select Committee on the Northridge Earthquake, 1994; Emergency Management Institute, 1999; Maloney et al., 2000.)

General Recommendations

Water

1 Gallon/person/day for 3 days, with 3-oz. paper cups, 5/person/day

Food

The bulk of stored food should be nonperishable and not need refrigeration or heating after opening. Food generally is considered a low-priority item except for individuals with diabetes and certain other specific medical conditions. One method used by schools is to purchase food at the beginning of the school year and donate it to charity at the end of the year. A supply of granola bars, power bars, or similar food that is easy to distribute may be helpful. The recommended amount is 3 days' supply for each student and staff member.

First Aid

- ♦ Antiseptic hand gel
- ♦ 4 x 4 inch compress: 1000 per 500 students
- ♦ 8 x 10 inch compress: 150 per 500 students
- ♦ Kerlix bandaging: 1 per student
- ♦ Ace wrap: 2-inch, 12 per campus; 4-inch, 12 per campus
- ♦ Triangular bandage: 24 per campus
- ♦ Cardboard splints: 24 each, small, medium, large
- ♦ Steri-strips or butterfly bandages: 50/campus
- ♦ Aqua-Blox (water) cases: 0.016 x students + staff = no. cases (for flushing wounds)

- ♦ Antibiotic ointment: 144 squeeze packs/campus
- ♦ Hydrogen peroxide: 10 pints/campus
- ♦ Space blankets: 1/student and staff
- ♦ Bleach, 1 small bottle
- ♦ Plastic basket or wire basket
- ♦ stretchers or backboards: 1.5/100
- ♦ Scissors, paramedic: 4 per campus
- ♦ Tweezers: 3 assorted per campus
- ♦ Triage tags: 50 per 500 students
- ♦ Latex/non-latex gloves: 100 per 500 students
- ♦ Oval eye patch: 50 per campus
- ♦ Tapes: 1-inch cloth, 50 rolls per campus; 2-inch cloth, 24 per campus
- ♦ Dust masks: 25/100 students
- ♦ Disposable blanket: 10 per 100 students
- ♦ First aid books: 2 standard and 2 advanced per campus
- ♦ Heavy-duty rubber gloves, 4 pairs

Sanitation Supplies

- ♦ 1 Toilet kit per 100 students/staff, to include
- ♦ 1 portable toilet, privacy shelter
- ♦ 20 rolls toilet paper
- ♦ Antiseptic hand gel
- ♦ 300 plastic bags with ties
- ♦ 10 large plastic trash bags
- ♦ Soap and water in addition to the wet wipes are strongly advised.

Equipment / Supplies for School Disaster Preparedness /2

Search and Rescue Equipment

Search and rescue activities in and around damaged buildings requires specialized training. There are many hazards in this kind of environment including damaged electric and gas lines, unstable structures, broken glass and other sharp debris. If a school plans to have a search and rescue team, it is vital that each team member receive training in search and rescue techniques and in the proper use of all the team's tools.

Store search and rescue supplies with the emergency supplies. Supplies to outfit one team/1000.

Protective gear per team member

- ◆ Hard hat, OSHA approved
- ◆ Identification vest
- ◆ Gloves, leather work and latex/vinyl
- ◆ Safety goggles
- ◆ Dust mask
- ◆ Flashlight, extra batteries (attach flashlight to hard hat)
- ◆ Duffle or tote bag to carry equipment

Gear per search and rescue team

- ◆ Back pack with first aid supplies
- ◆ Master keys
- ◆ Pliers, adjustable, 10-inch
- ◆ Pliers, lineman, 8-inch
- ◆ Pry bar, 24-inch
- ◆ Hacksaw, mini folding
- ◆ Bolt cutters, 18-inch
- ◆ Hammer, no. 3

Tools per campus

- ◆ 2 Pry bars 5- to 6-foot
- ◆ Pick ax, no. 6
- ◆ Sledge hammer, no. 10
- ◆ Square shovel
- ◆ Round shovel
- ◆ Utility shut-off wrench, 1/utility
- ◆ 3 rolls barrier tape 3 inch x 1000 inch
- ◆ Broom, street grade
- ◆ Angle head flashlight
- ◆ Screwdriver, 6-inch
- ◆ Utility knife

- ◆ Container to hold tools
- ◆ Cribbing: 18, 2 inch x 4 inch; 15, 4 inch x 4 inch; 6 wedges
- ◆ Duct tape 6
- ◆ Plastic bags
- ◆ Folding shovel

Classroom Kit (One per Classroom)

- ◆ Leather work gloves
- ◆ Latex/non-latex gloves, 3 pairs
- ◆ Safety goggles, 1 pair 3
- ◆ Pressure dressings
- ◆ 3 Space blankets
- ◆ Tarp or ground cover
- ◆ Blank student accounting forms
- ◆ Student disaster cards
- ◆ Buddy classroom list
- ◆ Pens, paper
- ◆ Whistle
- ◆ Student activities
- ◆ Suitable container for supplies
- ◆ Push broom, 1 per building

Equipment / Supplies for School Disaster Preparedness /4

Storage

All storage containers for supplies must be organized, bug-free, watertight, secure from vandals, and, if possible, kept cool. Ventilators on the roofs of storage containers allow vandals access. Some schools have purchased used refrigerated cargo containers or sprayed insulation inside the container. Containers should be located on a paved, level surface, away from hazards, preferably in a shaded area. It is highly recommended that shelves be installed to hold and organize the supplies. All supplies should be secured from damage during ground shaking. Local fire departments should have keys to the storage container for access to supplies in the event of any local disaster with an agreement to replace the supplies within 72 hours.

School District Emergency Kit**Heavy Duty Emergency Kit:**

- ◆ Duct tape, 2 rolls
- ◆ Scissors
- ◆ Towels
- ◆ Water in containers
- ◆ Toilet supplies
- ◆ Portable radio, batteries
- ◆ Flashlight
- ◆ 1 Crow bar (full size)
- ◆ 1 Spool gray tape
- ◆ 1 Orange plastic whistle
- ◆ 1 Small box safety matches
- ◆ 3 Small votive candles
- ◆ 1 Swiss army knife
- ◆ 3 AAA batteries
- ◆ 1 AM/FM portable radio
- ◆ 50 feet of nylon cord (braided)
- ◆ 1 12-hour snap light (friction)
- ◆ 1 5.5-lb fire extinguisher
- ◆ 1 Pair leather gloves
- ◆ 1 Small first aid kit
- ◆ Personal items for 1 person (e.g., comb, tissue, toothbrush, toothpaste, soap)
- ◆ 3 Individual handheld packets of *hothands*—shake to activate
- ◆ 1 Plastic cup
- ◆ 1 Aluminum space blanket
- ◆ 10 1/8 quart water packets
- ◆ 3 CPR pocket masks deluxe
- ◆ 1 Pair protective glasses
- ◆ 1 Can opener

Classroom Emergency Buckets

- ◆ 1 Sharpie marker
- ◆ 1 Note pad
- ◆ Nonperishable food for each student such as granola bars
- ◆ 1 Flashlight
- ◆ 2 Flashlight batteries
- ◆ 20 3-oz. paper cups
- ◆ 50-foot braided nylon cord
- ◆ 1 Pair leather gloves
- ◆ 1 sanitation kit (includes emergency bucket, deodorant/plastic bag, toilet paper, and adhesive tape sealer)
- ◆ Antiseptic hand gel
- ◆ 1 Red cloth
- ◆ Several plastic gloves
- ◆ Medium-sized first aid kit
- ◆ Reflective thermal blanket
- ◆ Several large garbage bags

Equipment / Supplies for School Disaster Preparedness /5

School Nurse Disaster Preparedness Kit

General note: Supplies should be available at all times. Supplies for 3 days are needed. Keep items in an easy-to carry container, such as a backpack or duffle bag.

Water

- ✦ 1 Gallon of water per day for 3 days

Food

- ✦ 3-day supply of nonperishable food
- ✦ Foods should require no refrigeration, cooking, or preparation
- ✦ Items should be compact and lightweight.
- ✦ Foods may include canned meats, fruits and vegetables, soups, juices, smoked or dried meats, and high-energy foods such as trail mix, and granola bars.

Special Items

- ✦ A 3-day supply of medications
- ✦ Contact lenses and supplies
- ✦ Extra glasses

Tools and Supplies

- ✦ Non-electric can opener, utility knife
- ✦ Flashlight and extra batteries
- ✦ Whistle
- ✦ Dust mask
- ✦ Work gloves
- ✦ Hard hat

Sanitation

- ✦ Toilet paper, antiseptic hand gel
- ✦ Feminine supplies
- ✦ Personal hygiene items

Clothing and Bedding

- ✦ Sturdy shoes or work boots
- ✦ Comfortable work clothes
- ✦ Blanket

Emergency Bag or Crisis Kit

General Note: The general bag should be kept in the main office with instructions for the office staff to take it to the evacuation area.

General Bag: Items to Include Additional Supplies Needed

- ✦ Copy of students' emergency phone numbers
- ✦ Student emergency list
- ✦ Bus lists
- ✦ Class lists
- ✦ Copy of crisis plan
- ✦ Physical plan layout
- ✦ Walkie-talkie
- ✦ Megaphone
- ✦ Whistle
- ✦ Paper and pen
- ✦ Basic first aid supplies
- ✦ Medical alert list
- ✦ Cake icing gel
- ✦ Glucose tablets
- ✦ Juice boxes
- ✦ One-way resuscitation facemask
- ✦ Stethoscope

SOURCE: Doyle J, Loyacono T. *Disaster Preparedness Guidelines for School Nurses 2007*. Silver Spring, MD: National Association of School Nurses Inc; 51-55. Reprinted with permission.

Emergency Equipment / Supplies: Health Office

Recommended school health office equipment and supplies are listed below:

- | | |
|---|---|
| <input type="checkbox"/> ABD/surgical pads | <input type="checkbox"/> Mouth-to-mask resuscitator with 1-way valve |
| <input type="checkbox"/> Adhesive bandage strips with nonstick pads, assorted sizes | <input type="checkbox"/> Muslin triangles for slings/compresses, 3-ft square |
| <input type="checkbox"/> Adhesive skin closures (Steri-Strips) | <input type="checkbox"/> Obstetric delivery kit |
| <input type="checkbox"/> Alcohol wipes | <input type="checkbox"/> Office supplies |
| <input type="checkbox"/> Analgesics, nonprescription (acetaminophen, ibuprofen) NOTE: Administration requires consent of parent/guardian and physician order | <input type="checkbox"/> Paper cups |
| <input type="checkbox"/> Antimicrobial wound dressings | <input type="checkbox"/> Pillow with washable or disposable cover |
| <input type="checkbox"/> Antiseptic solutions or creams | <input type="checkbox"/> Pitcher |
| <input type="checkbox"/> Baby wipes | <input type="checkbox"/> Plastic bags, small |
| <input type="checkbox"/> Basins, small and large | <input type="checkbox"/> Povidone-iodine swabs (Betadine) |
| <input type="checkbox"/> Bee/insect sting kit | <input type="checkbox"/> Red bag for hazardous waste |
| <input type="checkbox"/> Blankets, washable or disposable | <input type="checkbox"/> Refrigerator |
| <input type="checkbox"/> Bleach | <input type="checkbox"/> Rubbing alcohol |
| <input type="checkbox"/> Cabinet with lockable storage | <input type="checkbox"/> Safety glasses or goggles |
| <input type="checkbox"/> Cold packs | <input type="checkbox"/> Safety pins |
| <input type="checkbox"/> Conforming gauze bandage rolls (Kling) | <input type="checkbox"/> Saline solution |
| <input type="checkbox"/> Cot or bed | <input type="checkbox"/> Salt |
| <input type="checkbox"/> Cotton-tip applicators | <input type="checkbox"/> Sanitary napkins |
| <input type="checkbox"/> Cups, disposable, 8-ounce measure | <input type="checkbox"/> Scissors (bandage, EMS) |
| <input type="checkbox"/> Dental floss | <input type="checkbox"/> Sharps disposal container (optional) |
| <input type="checkbox"/> Dental wax | <input type="checkbox"/> Sheets, washable or disposable |
| <input type="checkbox"/> Disinfectant solution (for equipment) | <input type="checkbox"/> Sink with running water |
| <input type="checkbox"/> Documentation forms | <input type="checkbox"/> Soap |
| <input type="checkbox"/> Elastic bandage rolls (Ace) | <input type="checkbox"/> Splints, various lengths: 1-, 2-, and 3-foot |
| <input type="checkbox"/> Electrolyte-replacement drinks (sport drinks) | <input type="checkbox"/> Spoons, measuring |
| <input type="checkbox"/> Eye pads, sterile | <input type="checkbox"/> Stethoscope |
| <input type="checkbox"/> Fingernail clippers | <input type="checkbox"/> Sphygmomanometer with BP cuffs (child, adult, large adult) |
| <input type="checkbox"/> Flashlight with spare batteries and bulb | <input type="checkbox"/> Sugar |
| <input type="checkbox"/> Gauze dressings with nonstick pads, sterile, 3"x3" | <input type="checkbox"/> Tape, adhesive, hypoallergenic |
| <input type="checkbox"/> Gauze bandage, sterile rolls, 1" and 2" | <input type="checkbox"/> Tape, cloth, assorted widths |
| <input type="checkbox"/> Gloves, disposable, preferably latex-free | <input type="checkbox"/> Thermometers, oral or tympanic, with disposable sheaths |
| <input type="checkbox"/> Glucose, instant (or cake frosting) | <input type="checkbox"/> Tooth-saver solution |
| <input type="checkbox"/> Health records, stored in a locked cabinet to ensure confidentiality | <input type="checkbox"/> Towels and washcloths |
| <input type="checkbox"/> Irrigation solution (ocular, topical) | <input type="checkbox"/> Tourniquet |
| <input type="checkbox"/> Juices | <input type="checkbox"/> Tongue depressors |
| <input type="checkbox"/> Magnifying glass | <input type="checkbox"/> Trauma dressings |
| <input type="checkbox"/> Mineral oil or petrolatum gel | <input type="checkbox"/> Tweezers |
| | <input type="checkbox"/> Warm/hot packs |

NOTE: All medication and equipment should be locked in a childproof cabinet. A portable emergency kit as described on the back of this page should also be available.

Emergency Equipment / Supplies: Health Office Portable Kit

Recommended items to stock a portable emergency kit are listed below:

- | | |
|--|---|
| <input type="checkbox"/> ABD/surgical pads, 3 | <input type="checkbox"/> Glucose, instant (or cake frosting) |
| <input type="checkbox"/> Adhesive bandage strips, various sizes | <input type="checkbox"/> Mouth-to-mask resuscitator with 1-way valve |
| <input type="checkbox"/> Antimicrobial wound dressing, 4.5", 3 rolls | <input type="checkbox"/> Obstetric delivery kit (optional) |
| <input type="checkbox"/> Bandage scissors | <input type="checkbox"/> Ocular irrigation solution |
| <input type="checkbox"/> Blanket | <input type="checkbox"/> Plastic bags, small, 3 |
| <input type="checkbox"/> Cloth tape, 0.5", 2 rolls | <input type="checkbox"/> Red bag for hazardous waste |
| <input type="checkbox"/> Cloth tape, 1", 1 roll | <input type="checkbox"/> Safety glasses or goggles |
| <input type="checkbox"/> Cold packs, 2 | <input type="checkbox"/> Sharps disposal container (optional) |
| <input type="checkbox"/> Conforming gauze bandage (Kling), 2", 3 rolls | <input type="checkbox"/> Sphygmomanometer with BP cuffs (large adult, adult, child) |
| <input type="checkbox"/> Disposable gloves, preferably latex-free, 3 pairs | <input type="checkbox"/> Stethoscope |
| <input type="checkbox"/> Documentation forms, 2, with pen | <input type="checkbox"/> Thermometers, disposable, 2 |
| <input type="checkbox"/> Elastic bandage rolls (Ace), 2" and 4", 2 each | <input type="checkbox"/> Tongue depressors, 6 |
| <input type="checkbox"/> EMS scissors | <input type="checkbox"/> Trauma dressing |
| <input type="checkbox"/> Eye pads, 4 | <input type="checkbox"/> Triangular muslin bandages for slings, 2 |
| <input type="checkbox"/> Flashlight, small, with extra batteries | <input type="checkbox"/> Tweezers |
| <input type="checkbox"/> Gauze pads, 3" x 3", 12 | |

NOTE: Keep the kit ready for use and easily accessible at all times. Check and restock the emergency kit on a regular basis and after every use.

Emergency Equipment / Supplies: Administrator's Disaster Kit

The school incident commander should have the following items readily accessible in case of a large-scale disaster:

- Emergency and crisis operations plan
- Maps and floor plans
- Master key, access card, or door codes
- Emergency contact numbers
- Portable radio with channel list
- Utility shutoff procedures
- Aerial photographs of school property and surrounding area
- ICS safety vests and placards
- Student and staff photographs
- Building photographs
- Cellular telephone and extra batteries
- Laptop computer
- Evacuation plan
- Alternate evacuation plan
- Student and staff master schedule
- Current daily attendance roster
- Bus route schedules and student roster
- Press release templates
- Parent/guardian notification templates
- Student release forms
- ICS assignment forms
- Basic emergency supplies

Emergency Medical Services: Overview

OPERATION OF A LOCAL EMS SYSTEM

This section follows a hypothetical ill or injured student to show how emergency care needs are met by increasingly skilled responders as the incident unfolds. A well-organized EMS agency with prompt response times is presumed. The outline can help orient you as you learn about services provided by your school's local EMS system.

Onset of emergency

During the first minute or two, a **CITIZEN** or **BYSTANDER** responder, commonly referred to as a Good Samaritan, encounters the patient, provides immediate assistance, and calls for help. In some cases, action by a trained bystander can stabilize a life-threatening situation or prevent further injury. Most valuable are bystanders who have been trained in basic first aid or cardiopulmonary resuscitation (CPR) by the American Red Cross or the American Heart Association.

Initial EMS response

Within 4 to 6 minutes, a medical **FIRST RESPONDER** arrives and either assists the bystander or initiates care, as circumstances dictate. Even in the presence of adequate cardiopulmonary function, the first responder must try to control bleeding, prevent or treat shock, and assess and treat acute medical conditions. Medical first responders may be law enforcement officers, firefighters, members of a company first aid brigade, or others recognized by the EMS system. In most jurisdictions, they are certified as first responders following training in basic first aid and CPR in accordance with the nationally approved first responder curriculum. They can assess the patient and provide immediate care, move patients when necessary, and properly transfer clinical care and patient information when appropriate personnel arrive. (A school nurse is, in essence, a highly trained first responder who can perform these functions at a higher skill level and from a more comprehensive knowledge base.)

Ambulance response

Next on the scene are **EMERGENCY MEDICAL TECHNICIANS** who respond with the ambulance. They evaluate the patient for medical or traumatic conditions, establish management priorities based on their findings, and provide noninvasive treatment, such as bandaging, splinting, oxygen administration, and airway insertion, while preparing the patient for transport. Ambulances are staffed by at least 2 EMTs whose level of education and skills varies according to local or state requirements. Ambulance companies and their personnel, vehicles, and equipment are regulated by state agencies and, in some cases, by local ordinance.

The most seriously ill and injured patients benefit from care provided by EMTs with advanced training and certification at the **INTERMEDIATE** or **PARAMEDIC** level, which gives them enhanced assessment and treatment capabilities. Paramedics can provide such interventions as intravenous and drug therapy, endotracheal

intubation, application of pneumatic antishock garments, and cardiac defibrillation. These interventions are performed through standing orders or under authorization from an emergency department physician in direct radio contact with the rescuers.

Children with emergent conditions will be transported to the nearest hospital unless a more qualified alternative is designated.

Arrival at hospital

On arrival at the *point-of-entry* hospital, the patient is met in the emergency department by a **REGISTERED NURSE** who performs rapid triage. The registered nurse identifies the chief complaint, assigns the patient a treatment priority, and initiates tests and examinations. The **EMERGENCY PHYSICIAN** who examines the patient next is usually an emergency medicine specialist. Physicians in this field specialize in treatment of acute illness and injury. The physician determines the extent of treatment warranted and makes the initial decision to admit or discharge the patient. If the emergency physician determines the need, **MEDICAL** or **SURGICAL SPECIALISTS** are called to confer.

Interfacility transfer

Interfacility transfer may be indicated for patients who require interventions that exceed the capabilities of the point-of-entry hospital. These transfers are directly influenced by the local physicians' awareness of specialized capabilities in other hospitals and the degree of formality with which trauma centers, burn centers, and other facilities have been designated by regulatory authorities.

The referring hospital retains responsibility for the patient until personnel from the receiving hospital or the arranged transport service arrive to provide transport.

Communications and medical direction

The sequence of events just described is made possible by sophisticated **COMMUNICATIONS** systems and **MEDICAL DIRECTION**.

Communications are most often accomplished by 2-way radios operating on reserved frequencies that connect the emergency department with prehospital personnel. Transmissions on these frequencies are recorded, which allows medical audits of patient care as well as legal documentation. In those areas where all ambulances and hospitals have compatible radio

systems, interfacility transfers and field coordination of multiple ambulance responses and mass-casualty incidents are expedited.

Medical direction is the basis for clinical care throughout the EMS system, from prearrival instructions and dispatch to data collection for quality improvement.

Clinical direction is provided by emergency physician specialists who participate in training, controlling, and evaluating care delivered by EMTs and paramedics. Physicians are assisted in these efforts by EMS coordinators, emergency communication RNs, and other professionals committed to the advancement of prehospital care.

ROLES AND RESPONSIBILITIES OF A LOCAL EMS SYSTEM

Some of the important programs common to most EMS systems are recruiting and training, dispatch, data collection, preventive education, and disaster planning.

Recruiting and training

The EMS system depends on the involvement of an array of individuals, from the citizen who takes a CPR class to those who train as EMTs and volunteer with the local ambulance company. In much of the country, volunteers are the mainstay of the EMS system.

Notably, recruits come forward more readily when the public perceives the system as working well and having a positive impact on daily life and health.

Citizen first aid and CPR courses are given by the American Red Cross and the American Heart Association. First responder and EMT courses are offered by colleges, technical schools, hospitals, and ambulance companies. Most states have some method for accrediting these courses through their departments of public health or public safety. Continuing education for periodic relicensure or recertification is also provided so that emergency personnel can renew their skills and obtain current information in a field that is rapidly evolving.

EMS access and dispatch

Communication centers that receive calls for EMS assistance and dispatch responders are called *public safety access points*. While most centers are activated through 911, the national emergency number, some areas of the country still rely on a 7-digit phone number. Medically trained dispatchers may relay instructions to callers so that they can help patients until the first responder or ambulance arrives.

Specialized transportation services, including intensive care ambulances, helicopters, and fixed-wing aircraft, are generally reserved for patients who are in very critical condition. These services are often provided through regional dispatch, as they usually cover a wide geographic area. Special transport staff includes nurses, respiratory therapists, and other personnel with education and enhanced skills in the treatment of critically ill or injured neonates, children, and adults. Helicopters are now used nationwide to bring high-technology capabilities directly to patients at the scene of a crash or other event.

Coordinated record-keeping and data collection

Comprehensive data systems permit the systematic collection and analysis of emergency care information.

This information is essential to the continuing enhancement of patient care. The data system encompasses prehospital dispatch, patient care records submitted by the ambulance crew, emergency department records, in-hospital information, and discharge data.

Preventive education

The most effective way to reduce morbidity and mortality is to eliminate the conditions that cause illness and injury. Providing preventive education to the public is an important EMS responsibility. Local ambulance companies will send representatives to your school to give presentations that are geared toward children of different ages, focusing on such topics as bicycle safety, first aid, and CPR. Ambulance tours and mock crash extrications are highlights of these programs. You may augment these presentations with public service messages, posters, and informational materials for classroom use, which are available from many sources.

Mass-casualty incident planning

Disasters and mass-casualty incidents are not necessarily synonymous. An airplane crash in which scores of passengers are killed is a disaster, but it may not materially affect EMS operations. A multicar crash on a major highway may be a mass-casualty incident, but it is unlikely to be considered a disaster. Similarly, a mass-casualty incident may occur in which all patients are under hospital care within 3 hours, precluding the need for local officials to formally declare a disaster.

When a disaster or mass-casualty incident occurs, the EMS system's primary concern is patient care. The fire service is generally charged with directing most disaster operations through an incident command system, which provides a framework for delegating responses to various team members. In a well-coordinated response, mass-casualty operations integrate with an overall multidisciplinary disaster operation. Such a response depends on a written plan that outlines the roles and responsibilities of all responding agencies. The plan must be based on a realistic assessment of the system's daily functional capacity, as this helps to determine what components will be available during the first 30 minutes of any operation. The plan often hinges on deployment of the first 10 staffed ambulances to the scene, which is documented by mutual aid agreements with ambulance companies in neighboring towns.

REGIONAL PLANNING THROUGH EMS ADVISORY COMMITTEES

Local EMS operations are coordinated through an interagency network of advisory committees whose members consolidate the expertise of

- The town government
- The municipal health director
- Visiting nurse organizations
- The police and fire departments
- EMS providers
- The department of education or school board
- Local chapters of the American Red Cross or American Heart Association
- Emergency department nurses
- Hospital administrators
- Emergency medical staff

A local EMS advisory committee actively maintains its liaison with regional and state agencies so that it can contribute to the decision-making process and keep up with changes in policies and practices. To operate effectively, members of the advisory committee must have the authority and stature within their own

organizations to bring about changes the committee recommends.

The advisory committee's authority and responsibilities must be clearly defined. The chief elected official can stipulate this authority through executive policy, but a stronger mandate is achieved if the policy is passed as a resolution or local ordinance from the town's governing body.

Once the EMS advisory committee has defined its parameters, it establishes accountability by reporting periodically to the governing board; alternatively, the committee can be made a formal subcommittee of the governing board.

The advisory committee prepares a written document that delineates exactly how the local EMS system will respond during an emergency and submits the plan to the chief elected official, who is ultimately responsible for the provision of emergency care in the community. Policy decisions that affect the response system are written into revised versions of the plan and again submitted for approval.

SPECIAL EMS INITIATIVES

The EMS system includes special initiatives that focus on advanced trauma care, pediatric care, critical incident stress management, and management of incidents involving hazardous materials.

Trauma systems

States are encouraged by federal and national agencies to develop comprehensive systems of trauma care based on a model trauma system plan. The chief components involved in system development include

- Defining a lead agency to administer the system
- Designating levels of capability for facilities providing trauma care
- Developing triage protocols for transport of trauma patients to appropriate facilities
- Providing for interfacility transfer of patients as necessary
- Collecting and analyzing data to monitor the system's effectiveness and efficiency

In areas with formal trauma systems, patients may be transported directly to the hospital that can best care for their injuries, bypassing local hospitals. EMS providers must be aware of appropriate transport destinations or confer by radio with local emergency physicians for medical direction.

Emergency Medical Services for Children

This program, which is administered by the Maternal and Child Health Bureau within the Department of Health and Human Services, provides grant funding to states that are working to enhance the quality and availability of emergency care for children. Grantees have developed numerous educational and

operational resources that are available to school nurses. Through EMSC, you can often obtain prevention and education programs suitable for pediatric care at little or no cost. For more information, check the EMSC website at <http://bolivia.hrsa.gov/emsc/index.aspx>.

Critical incident stress management

Emergency situations involving children often cause critical stress among health care providers. In most states, critical incident stress debriefing teams are available on 24-hour call. Teams are made up of EMS personnel who have special training in peer counseling. They come into a community and conduct private, confidential sessions with all responders who were involved in the critical incident. You should expect to be included in debriefings when you are involved in the emergency situation.

Hazardous materials

Specialized hazmat teams, which respond to situations involving potentially dangerous substances, are on call at all times in most jurisdictions. These teams are usually part of the local fire department, but in some areas, teams with members from several local towns respond throughout the region. If you suspect that an incident may involve hazardous chemicals, clear the area immediately and call for assistance. Give the dispatcher as much specific information as possible. This will help team members take proper precautions when they enter the area.

Recommended Job Description: Certified School Nurse

QUALIFICATIONS

- Illinois Type 73 Pupil Personnel Services Certificate
- Baccalaureate Degree
- Registered Nurse licensure, Illinois
- Current First Aid and Cardiopulmonary Resuscitation program completion
- Illinois Certification as a Vision and Hearing Screening technician
- Computer literacy and competency in use of existing technology
- Prior professional nursing experience, preferably pediatric, adolescent, community or mental health nursing, and health program management.

REPORTS TO

- Health Services Coordinator
- Administrator—Principal, Student Services Director, or as designated by the district

SUPERVISES

- Non Certified Registered Nurses working in the school
- One to one nurses and other health care providers for students
- Health aides, Clerical assistants, and Health Services volunteers

JOB GOAL

To coordinate a comprehensive school health program including the delivery of services to students and staff members in order to enhance health and wellness in the school community. Duties are to be performed in accordance with standards of professional school nurse practice, district/state board of education policies and procedures and Illinois State law regarding nurse practice.

PERFORMANCE RESPONSIBILITIES

Coordination

- Develops and administers a comprehensive school health program.
- Collects and analyzes epidemiological and other school health information and makes recommendations based upon statistical data.
- Establishes an accident/injury prevention program to facilitate school safety.
- Assesses the health and safety needs of the school environment in compliance with Occupational Safety and Health Administration (OSHA) guidelines, implementing the Bloodborne Pathogen Control Plan and other interventions as indicated.
- Establishes a communicable disease prevention and control program in cooperation with local and state public health agencies.
- Manages school health records in accordance with Illinois School Student Records Act, providing efficient retrieval of information and other related archival responsibilities.
- Participates in Child Find programs and establishes and manages health

screening programs according to state mandates and guidelines.

- Participates in the development of health-related policies and procedures in compliance with state mandates and current health practices.

Teaching

- Participates as a member of the curriculum committee as a resource and specialist in health issues.
- Provides staff inservice programs on health topics including blood borne pathogens and the district exposure control plan.
- Provides health related classroom instruction.

Clinical Practice

- Provides and/or delegates direct professional nursing services, first aid, illness, and emergency care to students and staff including nursing assessment, identifying health problems, making referrals for diagnosis and treatment, recommending educational modifications, providing follow-up and evaluation, and maintaining appropriate documentation.
- Provides health information and counseling for students, parents, and staff.
- Develops a medication protocol to safely store, administer, document, and monitor the effectiveness of medication given at school.
- Supervises and/or provides screening and follow up for deficits in vision, hearing, growth and development, and other physical deficits.
- Maintains accurate medical records to assure compliance with state mandates including immunizations, physical examinations, and medical conditions.
- Participates as crisis team member and provides crisis intervention for students and staff in the advent of sudden illness or injury.
- Makes appropriate assessments and referrals for suspected abuse/neglect as a mandated reporter.

Health Office Management

- Maintains a user friendly and organized health services facility conducive to confidential communication and services.
- Purchases and maintains health and OSHA supplies and equipment as indicated for the health office and school.
- Manages and makes recommendations for the health services annual budget and critical needs requests.

Communication

- Maintains communication with administrators, teachers, other school personnel, and parents/guardians to enhance cooperative action, which will meet the health and safety needs of students.
- Initiates contact with and acts as a liaison between the home, school, community health agencies and the private medical sector to enhance the health and wellness of the school community.
- Maintains confidentiality regarding all school and health-related issues.

Special Education

- Participates as a member of the multidisciplinary team in the identification, evaluation, and placement of students into special education programs. Writes the health component of the Individual Education Plan as indicated.

- Recommends modifications of the school program for students who require accommodations due to a health deficit.
- Develops and maintains current health care plans for students who need special nursing interventions during the school day.

Professional Development

- Participates as a member of her professional school nursing and education organizations and utilizes continuing education opportunities to enhance professional knowledge in both nursing and education fields.
- Participates as a member of the faculty on district committees and association activities.
- Participates as an active member of the school community, representing health/wellness.

Terms of Employment

Placement on Certified pay scale at a level commensurate with education and nursing and school nursing experience.

Evaluation

Performance of this job will be evaluated in accordance with provisions of the Board of Education policy and contractual requirements for Certified personnel.

IASN BOD approved 25 January 2000; edited 1 December 2002.

Recommended Job Description: Registered Nurse

QUALIFICATIONS

- Baccalaureate Degree Preparation
- Current Registered Nurse licensure in State of Illinois
- Current First Aid and Cardiopulmonary Resuscitation program completion
- Experience in nursing and completion of a school health orientation program preferred
- Illinois Certification as a Vision and Hearing screening technician
- Computer literacy and competency in use of existing technology

REPORTS TO

- Health Services Coordinator, Certified (IL Type 73) School Nurse—Direct Supervisor
- Administrator—Principal, Student Services Director, or as designated by the district.

SUPERVISES

Not Applicable

JOB GOAL

To provide direct nursing services to students and staff members to maximize health and wellness in the school community. All duties are performed in accordance with district/state board of education policies and procedures and state law regarding nurse practice.

PERFORMANCE RESPONSIBILITIES

Nursing Care

- Provides direct professional nursing services, first aid, illness, and emergency care to students and staff in response to the nursing assessment and in accordance with professional standards, school policy and procedures, and state and local mandates.
- Administers medication with appropriate documentation.
- Participates in maintaining accurate medical records to assure compliance with state mandates including immunizations, physical examinations, and medical conditions, and the related archival responsibilities.
- Performs mandated screening procedures for vision and hearing (requires state credentials as a screener).
- Makes appropriate assessment and referrals for suspected abuse/neglect as a mandated reporter.

Communication

- Maintains communication with the Certified school nurse, teachers, other school personnel, and parents/guardians to enhance cooperative action which will meet the health and safety needs of students.
- Provides health services, information, and counseling in an effective and positive manner to enhance the health and wellness of the school community.

- Completes accident/incident reports for students/staff.
- Compiles data for statistical purposes.
- Maintains confidentiality regarding all school and health-related issues.

Organization

- Maintains a daily log of student/staff visits and documentation on individual health records
- Maintains the daily environment of the health office facility and supplies
- Utilizes existing technology effectively in the performance of duties.
- Performs other health or school related work as required.

Professional Development

- Maintains contact with a professional nursing organization and utilizes continuing education opportunities to enhance professional knowledge
- Participates as an active member of the school community, representing health/wellness.

TERMS OF EMPLOYMENT

Hourly pay in accordance with the Educational Support Personnel Contract Schedule at a step in consideration of nursing experience.

EVALUATION

Performance of this job will be evaluated in accordance with provisions of the Board policy and contractual requirements for Educational Support Personnel.

IASN BOD approved 25 January 2000; edited 1 December 2002.

Recommended Job Description: Health Office Clerical Worker

QUALIFICATIONS

- High school graduate, college experience recommended
- Completion of an approved Red Cross First Aid/CPR class current program completion
- Exemplary interpersonal, communication, technology, organizational, clerical skills.

REPORTS TO

- Certified School Nurse
- Administrator as designated by the district

JOB GOAL

To provide reception services, clerical assistance and technical support to the Certified School Nurse in order to optimize the delivery of comprehensive school health services. All duties are to be performed in accordance with district and state Board of Education policies and guidelines.

PERFORMANCE RESPONSIBILITIES

Clerical

- Assists with collection and maintenance of health records and data.
- Perform clerical duties such as: data entry, duplicating, filing, and preparing files, folders, rosters, emergency cards, health protocols, etc. utilizing appropriate technology.
- Assists with weekly, monthly, and annual reports.

Office Maintenance

- Serves as receptionist including greeting clients, answering telephone, and maintaining logs.
- Monitors health office traffic flow.
- Inventories and maintains health office supplies.
- Assists in maintaining a safe, clean and neat environment.

Clinical Assistance Under the Direction of a Certified School Nurse

- Provides first aid assistance.
- Assists with vision and hearing screening and other screening as directed, i.e. height/weight, growth, and blood pressure, and inspection for pediculosis when indicated.
- Encourages communicable disease prevention practices, i.e. handwashing, good hygiene, covering cough/sneezes, etc.
- Accompanies ill or injured students when directed and retrieves students as needed for health services.

Communication

- Maintains open communication with the Certified School Nurse, relaying messages as directed to teachers, other school personnel, and parents/guardians in order that a cooperative action will meet the health needs of pupils.

- Maintains confidentiality regarding all school and health-related issues.
- Documents phone and other communications.

TERMS OF EMPLOYMENT

Hourly pay in accordance with the Educational Support Personnel Contract Schedule in consideration of previous experience.

EVALUATION

Performance of this job will be evaluated in accordance with provisions of the Board policy and contractual requirements for Educational Support Personnel.

IASN BOD Approved 25 January 2000; edited 1 December 2002.

Registered Professional Nurse vs Certificated School Nurse (Illinois)

Definition Duties/Comparison

The December 9, 1997 special edition issue of the ISBE

Superintendent's Bulletin summarized the provisions of HB 452. In it, Mary Jayne Broncato, Associate Superintendent for Educational Innovation and Reform stated, "School districts may now employ registered nurses who do not have school nurse certification to perform professional nursing services in the schools. If the nurse's responsibilities require teaching, exercising instructional judgment or evaluating pupils, school nurse certification is still required. (Previously this option was only available to school districts that had requested a waiver for it.)"

NOTE | **It should be noted that** this legislation did not authorize anything which was not previously available to school districts which requested a waiver of the certification requirement, and the key words to focus on when speaking with administrators and school board members are to perform professional nursing services" and "exercising instructional judgment or evaluating pupils".

The ***Illinois Nursing Act*** defines Registered Professional Nursing practice as "the performance of any nursing act based upon professional knowledge, judgment, and skills acquired by means of completion of an approved registered professional nursing education program. The registered professional nurse provides holistic nursing care through the nursing process to individuals, groups, families, or communities which includes but is not limited to: (1) the assessment of the healthcare needs, diagnosis, planning, implementation, and evaluation; (2) the promotion, maintenance, and restoration of health; (3) counseling, patient education, health education, and patient advocacy; (4) the administration of medications and treatments as prescribed by any person so authorized by state law; (5) the coordination and management of the nursing plan of care".

NOTE | Key phrases include "acquired by means of completion of an approved registered professional nursing program" and "coordination and management of the nursing plan of care."

The 23 Ill. Administrative Code. Section 1.760 includes these duties of the school nurse:

1. screening for deficits in vision, hearing, growth and development, immunization status, and other physical defects (e.g.) scoliosis, hernia).
3. recommending modification of the school programs for a student who requires a change because of a health deficit and developing health care plans when students need special physical health care procedures to be provided at school.

NOTE | Key words "modification of the school programs" and "developing health care plans")

4. establishing a communicable disease prevention and control program
5. monitoring medication given in school

NOTE | Key words “monitoring medication”, recognizing the need to assess the medication’s efficacy and impact on how the child functions at school and performs educationally, **not** just its physiological effects).

8. establish an accident prevention program
9. acting as liaison between the home, school, community health agencies and the private medical sector.
10. Participating in the identification, evaluation and placement of students into special education programs, e.g. as a referring agent, a consultant to parents, teachers, etc. and/or as a member of a multidisciplinary team pursuant to the provisions of 23Ill. Administrative Code 226 (Special Education).
11. collecting and analyzing health-related data (e.g. immunization records, medical records, incidence of specific diseases) and making recommendations based upon these data:
12. maintaining accurate school health records in accord with the Illinois School Student Records Act (Ill. Rev Statutes 1985, ch 122.par 50-1 et seq.) and 23 Ill Administrative Code 375 (Student Records).
13. Carrying out other specified duties which the school nurse is qualified to perform, provided that the school nurse shall not be assigned teaching duties unless the nurse holds the appropriate teaching certificate.

NOTE | Educational preparation for these duties of the school nurse are not a part of “an approved registered professional nursing education program”. They are included in all approved school nurse certification programs.

23 Ill. Administrative Code Ch. 1, Section 226.870

Necessary noncertified personnel employed in classes, programs, or services in all areas of special education shall be under the direct supervision of a qualified specialist.

NOTE | Only certificated school nurses are specialists qualified to supervise professional nursing services provided by RNs. “Direct supervision” is usually defined as “on-site” supervision.

23 ILLINOIS ADMINISTRATIVE CODE Ch. I.S.I./60 SUBTITLE A SUBCHAPTER a

Section 1.760 Standards for Pupil Personnel Services

- a) School psychologists, social workers in schools, and school guidance counselors, and school nurses, except as provided in subsection (c) of this Section, shall hold a Type 10 or Type 73 Certificate with the appropriate endorsement.
- b) Registered Professional Nurse means any nurse who is licensed to practice professional nursing in Illinois in accord with the Illinois Nursing Act (ILL. Rev. Stat. 1985, ch. 111, par. 3401 et seq.) whose license is active and in good standing as determined by the Illinois Department of Registration and Education.
- c) School Nurse means any registered professional nurse who holds a Type 73 School Service Personnel Certificate with an endorsement in school

nursing, or any noncertificated registered professional nurse who was employed in the school district or current employment before July 1, 1976.

- d) School boards that employ school nurses shall be responsible for verifying that each such person holds a valid license and certificate except as provided in subsection (c) of this Section.
- e) School boards that employ one or more school nurses for the purpose of providing professional nursing services shall develop and keep on file a written job description defining the duties of said school nurse(s).
- f) Any job description prepared pursuant to subsection (e) of this Section will be accepted by the State Board of Education as complying with Section 10-22.23 of The School Code (Ill. Rev. Stat. 1985, ch. 122, par. 10-22.23) if it contains at least:
 - 1) the duty to provide professional nursing services as defined in the Illinois Nursing Act (Ill. Rev. Stat. 1985, ch. 111, par. 3405 (4)(1); and
 - 2) at least one or more additional duties as the school board shall select from subsection (g) of this Section.
- g) Additional duties of the school nurse shall include one or more of the following:
 - 1) screening for deficits in vision, hearing, growth and development, immunization status, and other physical defects (e.g. scoliosis, hernia);
 - 2) identifying student health problems, making referrals for their diagnosis, treatment and remediation, providing follow-up for each referral;
 - 3) recommending modification of the school programs for a student who requires a change because of health deficit and developing health care plans when students need special physical health care procedures to be provided at school;
 - 4) establishing a communicable disease prevention and control program;
 - 5) assessing the health status of students and providing health counseling (e.g. on diet, exercise) for students, parent and school staff;
 - 6) administering and monitoring medication and treatment given in school (subject to local policy regarding the administration of medication at school);
 - 7) providing crisis intervention for students and/or staff in the advent of sudden illness or injury;
 - 8) establishing an accident prevention program;
 - 9) acting as liaison between the home, school, community health agencies and the private medical sector;
 - 10) participate in the identification, evaluation and placement of students into special education programs, e.g. as a referring agent, a consultant to parents, and/or as a member of a multidisciplinary team pursuant to the provisions of 23 Ill. Adm. Code 226 (Special Education);
 - 11) collecting and analyzing health-related data (e.g. immunization records, medical records, incidence of specific diseases) and making recommendations based upon these data;

- 12) maintaining accurate school health records in accord with the Illinois School Student Records Act (Ill. Rev. Stat. 1985, ch. 122, par. 50-1 et seq.) and 23 Ill. Adm. Code 375 (Student Records);
- 13) carrying out other specified duties which the school nurse is qualified to perform, provided that the school nurse shall not be assigned teaching duties unless the nurse holds the appropriate teaching certificate.
- h) The duty to provide professional nursing services as defined in “The Illinois Nursing Act” shall not be Included among the functions assigned to any school district personnel not covered by the job description required for school nurses.

Source: Amended at 11 Ill. Reg. 3073, effective February 2, 1987.

Illinois School Statute

(105 ILCS 5/10–22.23) (from Ch. 122, par. 10–22.23)

Sec 10–22.23. *School Nurse.* To employ a registered professional nurse and define the duties of the school nurse within the guidelines of rules and regulations promulgated by the State Board of Education. Any school nurse first employed on or after July 1, 1976, whose duties require teaching or the exercise of instructional judgment or educational evaluation of pupils, must be certificated under Section 21–25 of this Act. School districts may employ non-certificated registered professional nurses to perform professional nursing services.

Source: P.A. 90–548, eff. 1–1–98.

Standards of School Nursing Practice

Standards from the National Association of School Nurses and the American Nurses Association

The school nurse . . .

- Collects comprehensive data pertinent to the client's health or the situation.
- Analyzes the assessment data to determine the diagnoses or issues
- Identifies expected outcomes for a plan individualized to the client or the situation
- Develops a plan that prescribes strategies and alternatives to attain expected outcomes
- Implements the identified plan
- Coordinates care delivery
- Provides health education and employs strategies to promote health and a safe environment
- Provides consultation to influence the identified plan, enhance the abilities of others, and effect change

The advanced practice registered nurse. . .

- Uses prescriptive authority, procedures, referrals, treatments, and therapies in accordance with state and federal laws and regulations
- Evaluates progress towards achievement of outcomes
- Systematically enhances the quality and effectiveness of nursing practice
- Attains knowledge and competency that reflects current school nursing practice
- Evaluates one's own nursing practice in relation to professional standards and guidelines, relevant statutes, rules, and regulations
- Interacts with, and contributes to the professional development of, peers and school personnel as colleagues
- Collaborates with the client, the family, school staff, and others in the conduct of school nursing practice
- Integrates ethical provisions in all areas of practice
- Integrates research findings into practice
- Considers factors related to safety, effectiveness, cost, and impact on practice in the planning and delivery of school nursing services
- Provides leadership in the professional practice setting and the profession.
- Manages school health services

Source: School Nursing Scope and Standards of Practice. National Association of School Nurses, Inc. 2005

School Bus Emergency Plan (Students With Special Needs)

Example of a school bus emergency plan for students with special needs. The school nurse must complete a form for each student before bus transport can be provided.

Student's name _____ Date _____

School _____ Grade _____ Teacher _____

Should an emergency occur while this student is in transport on the bus, please follow these steps:

1. _____ (nurse or designee) will inform the bus driver that there is an emergency requiring assistance.
2. Depending on the type of emergency and the location of the bus, the nurse and driver will
 - a. Proceed to the nearest emergency department, **or**
 - b. Pull to the side of the road and wait for emergency medical assistance.

Note that the following hospitals are prepared to receive this student:

_____ Phone _____

_____ Phone _____

Note that the following EMS agencies are prepared to treat this student:

_____ Phone _____

_____ Phone _____

3. The bus driver will radio the transportation office to report that
 - a. The student is en route to the nearest hospital, **or**
 - b. The student requires assistance on location.

NOTE

The driver must be able to identify the municipality in which the bus is located so that appropriate emergency personnel can be notified.

4. The transportation office will notify the EMS agency that covers the area involved.
5. The transportation office will notify _____ (school staff member) so that the parent/guardian and school nurse can be contacted; EMS will notify the hospital emergency department.

Parent/guardian signature _____ Date _____

School Emergency Plan Evaluation Checklist

Every school should have a plan in place that specifies policies and procedures for managing emergency situations. There is no standard model that can be applied universally, as the variables from one school to the next are too great.

This evaluation form lists 10 essential areas that form the framework for a viable emergency plan. While it is not all-inclusive, the form serves as a guide that you can adapt and modify to meet your needs. Use the form to identify strengths and weaknesses in your school's or school district's existing emergency response capabilities or to develop a new plan. Try to involve school health staff and administrators, local EMS agencies, hospital personnel, the public health department, and parent/guardian organizations in the process, as this will improve coordination of responses when the plan is needed.

Use the following status ratings to complete this form:

F = Fully met

P = Partially met

U = Unmet

Evaluation Checklist	Status	Comments
1 The school district has written policies for emergency care.		
A Policies are reviewed on a regular basis and are kept current.		
B Policies are approved by school administration and the school medical adviser (if applicable).		
C Policies are coordinated with local EMS services and hospital services.		
D Policies are distributed to all school employees and students.		
E Share information with students and parents/guardians in the Parent/Student Handbook.		

Evaluation Checklist	Status	Comments
2 The duties of school employees during emergencies are clearly defined in writing.		
A Responsibilities are based on each employee’s qualifications to provide emergency care.		
B A coordinator or manager of emergency situations has been designated within each building.		
C All employees are expected to provide immediate care during an emergency and follow an action plan that describes how to mobilize additional help.		
D The school nurse provides emergency care.		
E The school medical adviser is available for consultation during emergencies.		
F At least one individual other than the nurse is qualified in first aid, CPR, and use of an AED.		
G Teachers working in high-risk areas (labs, gyms, shops) are trained in first aid, CPR, and use of an AED.		
H A designated staff person will stay with an injured or seriously ill student until the parent/guardian assumes responsibility.		
I Employees receive in-service training so that they can maintain adequate skills to provide designated emergency care.		

Evaluation Checklist	Status	Comments
3 A written action plan to initiate appropriate emergency care has been developed.		
A Emergency telephone numbers are displayed near all phones.		
B All employees are familiar with emergency telephone numbers.		
C Emergency information for each student (telephone number of parent/guardian, physician, dentist) is kept current and available in a central location.		
D At least 1 school employee is designated to notify the parent/guardian if a student is injured or seriously ill.		
4 Transportation for an injured or ill student is clearly described in the written policy.		
A Coordination has been established with the local EMS system for emergent or urgent care.		
B Parents/guardians are notified of their responsibility to transport an ill or injured student home or to an appropriate care facility.		
C An alternate plan has been developed to transport a student if the parents/guardians are unavailable.		
5 Written standing orders are maintained for common emergency problems.		
A The school medical adviser reviews, updates, and signs standing orders annually.		
B Standing orders are distributed to all employees designated to carry them out.		
6 Emergency care supplies and equipment are adequate to meet needs.		
A Selection of supplies and equipment is based on the needs of the school population and recommendations from school health personnel.		
B First aid kits are available in central locations and high-risk areas and are taken along during extracurricular activities.		

Evaluation Checklist	Status	Comments
7 Incident/injury reports are completed and filed according to written policy.		
A All injuries are documented in an organized format that describes the provision of emergency care.		
B A school employee is designated to complete incident reports and maintain files.		
8 Written policy describes financial responsibility for charges incurred during emergency care.		
A Health/accident insurance is available for students.		
B The school district maintains adequate liability insurance for injuries or incidents occurring at school functions.		
C School employees providing emergency care have personal liability insurance.		
9 A plan for follow-up is described in the written policy.		
A A school employee is designated to contact the parent/guardian within 24 hours following an emergency.		
B Communication between school and home/physician is maintained during the recuperation period.		
C Readmission to school requires a note from the physician that describes restricted activities and care that will be needed at school.		
10 An injury prevention program has been established.		
A Incident reports are reviewed on a regular basis to revise policy and remedy hazards.		
B Incidents are reviewed for safety risks and hazards to prevent recurrence, if possible.		
C Injury prevention strategies are communicated to students and staff.		

Screening: Audiogram Record/Treating Physician's Report

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
in cooperation with

Date _____

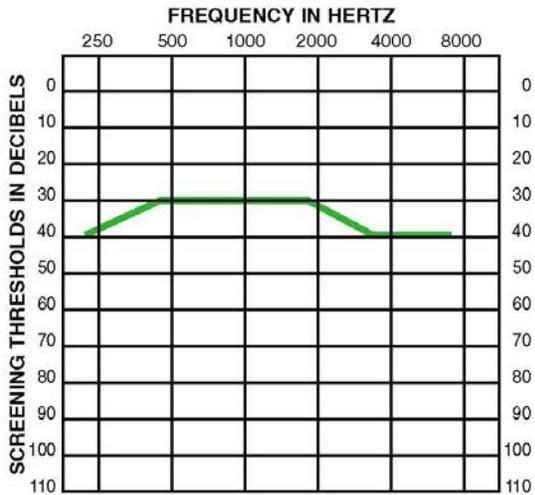
Test Number _____

Name _____ Birth date _____ Sex _____ Grade _____
(last) (first) (initial) (month) / (day) / (year)

Parent/Guardian _____ Phone (_____) _____
(last) (first)

Address _____ County _____
(number/street) (city) (ZIP code)

Testing location _____ Testing agency _____



Tester _____

Audiometer and Serial number _____

Audiogram Code
(Air Conduction)

Right ear - O (red)

Left ear - X (blue)

NOTE: This screening audiogram is plotted on ISO or ANSI reference levels.

Pure tone average of the speech frequencies
(500 - 1000 - 2000 Hz.)

Right _____ dB Left _____ dB

Test environment (check one) Satisfactory Unsatisfactory

Responses (check one) Reliable Unreliable

Comments _____

For referral purposes – CHECK AND SIGN WHERE APPROPRIATE

Minimum criteria for referral (medical/educational)

- 1. Any two speech frequencies (500 - 1000 - 2000 Hz.) in the same ear that fall on or below the solid green line, OR
- 2. Any two consecutive frequencies ([250-500] [2000 - 4000] [4000 - 8000] Hz.) in the same ear that fall on or below the solid green line.

Referred on _____
(date)

Signature _____ Title _____

Screening: Roster for Hearing Screening

**Illinois Department of Public Health
Hearing Screening Roster**

PROGRAM _____ SCREENING SITE _____

SCHOOL DISTRICT _____ TECHNICIAN(S) _____

DATE _____ CITY _____ COUNTY _____

TEACHERS NAME _____ ROOM # _____

	NAME	GRADE	PASS	RESCREEN	COMMENTS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Screening: Vision Screening Worksheet/Report Form

**Illinois Department of Public Health
VISION SCREENING WORKSHEET**

LOCATION _____ GRADE _____ ROOM _____

SCREENING TECHNICIAN'S NAME _____ DATE _____

NAME	GRADE OR AGE	PASS	TEST SCORES						COLOR P-F	BINOCULAR TEST						GLASSES	REFERRAL GLASSES/OBSERVATION				
			PHORIA		V.A.		+LENS			NEAR			FAR								
			N	F	R	L	R	L		L	B	R	L	B	R						
1.																					
2.																					
3.																					
4.																					
5.																					
6.																					
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8.																					
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28.																					
29.																					
30.																					
		RECORDING RESULTS P - IN PASS COLUMN IF ALL TESTS ARE PASSED V - IN APPROPRIATE TEST COLUMN IF FAILURE CRITERIA WAS MET						CRITERIA 4 OR MORE CORRECT PASS V.A. M.P.S. B.R.L. H.O.T.V. M.J.S. FAIL +LENS						PHORIA CRITERIA FAIL ONE OUT FIRST GRADE BOTH OUT							

Seizure Action Plan



Effective Date _____

This student is being treated for a seizure disorder. The information below should assist you if a seizure occurs during school hours.

Student's Name	Date of Birth	
Parent/Guardian	Phone	Cell
Other Emergency Contact	Phone	Cell
Treating Physician	Phone	
Significant Medical History		

Seizure Information

Seizure Type	Length	Frequency	Description

Seizure triggers or warning signs:

Student's response after a seizure:

Basic First Aid: Care & Comfort

Please describe basic first aid procedures:

Does student need to leave the classroom after a seizure? Yes No

If YES, describe process for returning student to classroom:

Basic Seizure First Aid

- Stay calm & track time
- Keep child safe
- Do not restrain
- Do not put anything in mouth
- Stay with child until fully conscious
- Record seizure in log

For tonic-clonic seizure:

- Protect head
- Keep airway open/watch breathing
- Turn child on side

A seizure is generally considered an emergency when:

- Convulsive (tonic-clonic) seizure lasts longer than 5 minutes
- Student has repeated seizures without regaining consciousness
- Student is injured or has diabetes
- Student has a first-time seizure
- Student has breathing difficulties
- Student has a seizure in water

Emergency Response

A "seizure emergency" for this student is defined as:

Seizure Emergency Protocol

(Check all that apply and clarify below)

- Contact school nurse at _____
- Call 911 for transport to _____
- Notify parent or emergency contact
- Administer emergency medications as indicated below
- Notify doctor
- Other _____

Treatment Protocol During School Hours (include daily and emergency medications)

Emerg. Med. ✓	Medication	Dosage & Time of Day Given	Common Side Effects & Special Instructions

Does student have a Vagus Nerve Stimulator? Yes No If YES, describe magnet use:

Special Considerations and Precautions (regarding school activities, sports, trips, etc.)

Describe any special considerations or precautions:

Physician Signature _____ Date _____

Parent/Guardian Signature _____ Date _____

DPC772

Copyright 2008 Epilepsy Foundation of America, Inc.

Seizure Observation Record



Student Name:			
Date & Time			
Seizure Length			
Pre-Seizure Observation (Briefly list behaviors, triggering events, activities)			
Conscious (yes/no/altered)			
Injuries (briefly describe)			
Muscle Tone/Body Movements	Rigid/clenching		
	Limp		
	Fell down		
	Rocking		
	Wandering around		
	Whole body jerking		
Extremity Movements	(R) arm jerking		
	(L) arm jerking		
	(R) leg jerking		
	(L) leg jerking		
	Random Movement		
Color	Bluish		
	Pale		
	Flushed		
Eyes	Pupils dilated		
	Turned (R or L)		
	Rolled up		
	Staring or blinking (clarify)		
	Closed		
Mouth	Salivating		
	Chewing		
	Lip smacking		
Verbal Sounds (gagging, talking, throat clearing, etc.)			
Breathing (normal, labored, stopped, noisy, etc.)			
Incontinent (urine or feces)			
Post-Seizure Observation	Confused		
	Sleepy/tired		
	Headache		
	Speech slurring		
	Other		
Length to Orientation			
Parents Notified? (time of call)			
EMS Called? (call time & arrival time)			
Observer's Name			

Please put additional notes on back as necessary.

Seizure Questionnaire for Parents/Guardians



Please complete all questions. This information is essential for the school nurse and school staff in determining your child's special needs and providing a positive and supportive learning environment. If you have any questions about how to complete this form, please contact your child's school nurse.

Contact Information

Student's Name	School Year	Date of Birth	
School	Grade	Classroom	
Parent/Guardian	Phone	Work	Cell
Parent/Guardian Email			
Other Emergency Contact	Phone	Work	Cell
Child's Neurologist	Phone	Location	
Child's Primary Care Doctor	Phone	Location	
Significant Medical History or Conditions			

Seizure Information

1. When was your child diagnosed with seizures or epilepsy? _____

2. Seizure type(s)

Seizure Type	Length	Frequency	Description

3. What might trigger a seizure in your child? _____

4. Are there any warnings and/or behavior changes before the seizure occurs? YES NO
If YES, please explain: _____

5. When was your child's last seizure? _____

6. Has there been any recent change in your child's seizure patterns? YES NO
If YES, please explain: _____

7. How does your child react after a seizure is over? _____

8. How do other illnesses affect your child's seizure control? _____

Basic First Aid: Care & Comfort

9. What basic first aid procedures should be taken when your child has a seizure in school?

10. Will your child need to leave the classroom after a seizure? YES NO
If YES, what process would you recommend for returning your child to classroom: _____

Basic Seizure First Aid

- Stay calm & track time
 - Keep child safe
 - Do not restrain
 - Do not put anything in mouth
 - Stay with child until fully conscious
 - Record seizure in log
- For tonic-clonic seizure:**
- Protect head
 - Keep airway open/watch breathing
 - Turn child on side

Seizure Questionnaire for Parents/Guardians /2

Seizure Emergencies

11. Please describe what constitutes an emergency for your child? (Answer may require consultation with treating physician and school nurse.) _____
12. Has child ever been hospitalized for continuous seizures? YES NO
If YES, please explain: _____

A seizure is generally considered an emergency when:

- Convulsive (tonic-clonic) seizure lasts longer than 5 minutes
- Student has repeated seizures without regaining consciousness
- Student is injured or has diabetes
- Student has a first-time seizure
- Student has breathing difficulties
- Student has a seizure in water

Seizure Medication and Treatment Information

13. What medication(s) does your child take? _____

Medication	Date Started	Dosage	Frequency and Time of Day Taken	Possible Side Effects

14. What emergency/rescue medications are prescribed for your child? _____

Medication	Dosage	Administration Instructions (timing* & method**)	What to Do After Administration

* After 2nd or 3rd seizure, for cluster of seizure, etc. ** Orally, under tongue, rectally, etc.

15. What medication(s) will your child need to take during school hours? _____
16. Should any of these medications be administered in a special way? YES NO
If YES, please explain: _____
17. Should any particular reaction be watched for? YES NO
If YES, please explain: _____
18. What should be done when your child misses a dose? _____
19. Should the school have backup medication available to give your child for missed dose? YES NO
20. Do you wish to be called before backup medication is given for a missed dose? YES NO
21. Does your child have a Vagus Nerve Stimulator? YES NO
If YES, please describe instructions for appropriate magnet use: _____

Special Considerations & Precautions

22. Check all that apply and describe any consideration or precautions that should be taken:
- | | |
|---|--|
| <input type="checkbox"/> General health _____ | <input type="checkbox"/> Physical education (gym/sports) _____ |
| <input type="checkbox"/> Physical functioning _____ | <input type="checkbox"/> Recess _____ |
| <input type="checkbox"/> Learning _____ | <input type="checkbox"/> Field trips _____ |
| <input type="checkbox"/> Behavior _____ | <input type="checkbox"/> Bus transportation _____ |
| <input type="checkbox"/> Mood/coping _____ | <input type="checkbox"/> Other _____ |

General Communication Issues

23. What is the best way for us to communicate with you about your child's seizure(s)? _____
24. Can this information be shared with classroom teacher(s) and other appropriate school personnel? YES NO

Parent/Guardian Signature _____ Date _____

Dates _____
Updated _____

DPC776

Student Incident Report

School _____ ID# _____
 (See confidentiality note below)

PART I: To be completed by staff member in charge

1. Student name _____ M F DOB _____ Grade _____
2. Date of incident _____ Time of incident _____
3. What specific part of the body was injured? _____
4. How did the incident occur? (Be specific) _____

5. Where did the incident occur? (Be specific) _____
6. Type of activity: PE _____ Athletics (name sport) _____
 Other activity _____
7. Was first aid administered? _____ By whom? _____
8. Staff member in charge when incident occurred _____ Date _____

PART II: To be completed by school nurse/trainer

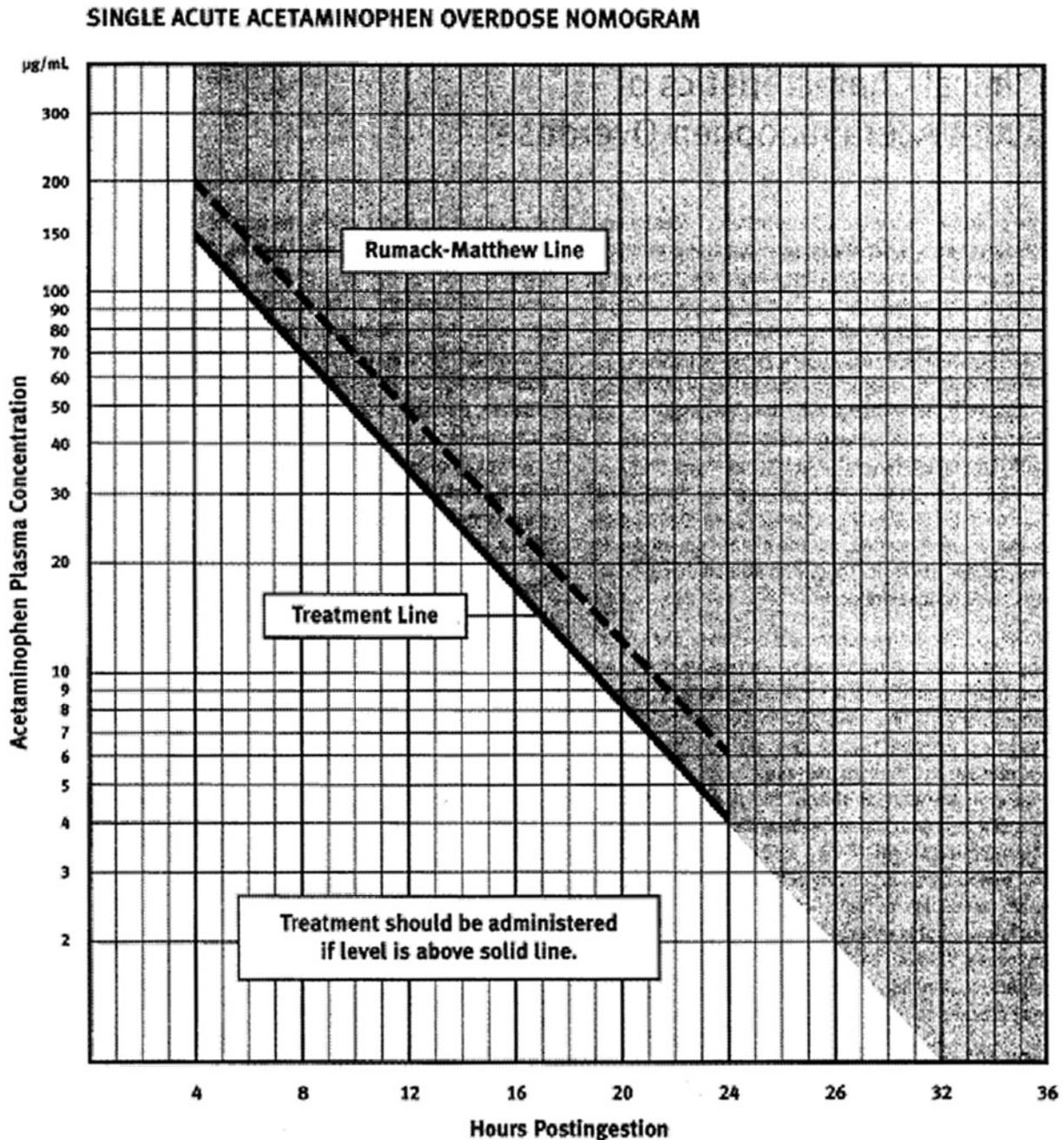
1. Was parent/guardian notified of incident? _____ By whom? _____ Time _____
2. Was student taken for medical attention? _____ By whom? _____ Time _____
3. Disposition:
 Return to class _____ Home _____ MD _____ Hospital _____ Ambulance _____
4. Comments _____

Signature of nurse/trainer _____ Date _____

Note: print on school letterhead. To ensure confidentiality, follow school/district policies regarding type of student identification to include on form.

Adapted for use from the *School Nurse Emergency Medical Services for Children (SNEMS-C) Course Manual*.

Toxicity, Acetaminophen: Rumack-Matthew Nomogram



Nomogram: acetaminophen plasma concentration vs time after acetaminophen ingestion (adapted from Rumack and Matthew, 1975, with permission).

The nomogram has been developed to estimate the probability of whether a plasma acetaminophen concentration in relation to the interval postingestion will result in hepatotoxicity and, therefore, whether acetylcysteine therapy should be administered.

CAUTIONS FOR USE OF THIS CHART:

1. Time coordinates refer to time postingestion.
2. Graph relates only to plasma concentrations following a single, acute overdose ingestion.
3. The Treatment Line is plotted 25% below the Rumack-Matthew Line to allow for potential errors in plasma acetaminophen assays and estimated time from ingestion of an overdose.

For additional emergency information, call your regional poison control center. For special consultation, call the Rocky Mountain Poison and Drug Center toll-free number, 1-800-525-6125, available 24 hours a day.

APPENDIX

C

Key Points by Chapter

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1 Your Role in Emergency Care

- Learning Objectives
- Describe the key steps in planning for individual health emergencies.
 - Identify unique challenges in the emergency care of students with special needs.
 - Discuss the importance of nursing protocols, written procedures, and individual care plans in the delivery of optimal care.
 - Explain the function of triage in determining disposition.
 - Describe telephone triage techniques.
 - Describe communication during an emergency.
 - Discuss the role of documentation, data collection, and postincident evaluation in maintaining and improving your emergency care program.

KEY POINTS

- 1.1 Developing plans and protocols for health-related emergencies that may arise at school is the key to ensuring appropriate care and preventive action.
- 1.2 The emergency care plan should incorporate physicians' orders authorizing necessary interventions and medications that the student may require at school.
- 1.3 Be sure to maintain current CPR/AED skills and see that other school staff members receive CPR/AED training.
- 1.4 Make sure emergency supplies and portable emergency kits are stocked and placed in easily accessible locations.
- 1.5 Unless you have specific protocols in place for ordering interventions, you will not be able to direct medical care by phone.
- 1.6 If you have any doubt about the urgency of a student's condition, always have the student transported to the nearest medical facility.
- 1.7 You are an important agent in maintaining communication among all those involved in an emergency incident.
- 1.8 Postincident activities, such as documentation, data collection, and evaluation sessions, are essential to the continuing improvement of the school's emergency health care program.
- 1.9 If it isn't documented, it didn't happen in the eyes of the law.

2 Legal Issues in Nursing

- Learning Objectives
- Describe how nursing and the law interact for appropriate delivery of emergency care.
 - Define your legal liabilities when providing emergency care to school students.
 - Incorporate your knowledge of medicolegal issues as you develop care plans and interventions for emergency situations.
 - Discuss legally defensible documentation strategies.
 - Describe students' legal rights within the school as they apply to health-related issues.
 - Understand the protections that HIPAA and FERPA regulations provide.
 - Identify unique challenges in emergency care of students with special needs.

KEY POINTS

- 2.1 **As a school nurse, you are accountable for all actions and judgments you make in the course of your practice. Neither the school's policies nor a physician's orders relieve you of this responsibility.**
- 2.2 **Maintain familiarity with emergency care standards. If you should render care that is not reasonable or not within the applicable standard of care, you may be liable for negligence.**
- 2.3 **In general, it is best to activate EMS when transport is needed for a student whose condition is emergent.**
- 2.4 **Good Samaritan statutes generally do not apply when there is a preexisting duty to respond, as in your duty to render emergency care to students.**
- 2.5 **During an emergency, *always* provide necessary care to students, regardless of whether you have a written authorization form on file.**
- 2.6 **Documentation can be the key to preventing malpractice lawsuits or defending against litigation. A detailed student health record substantiates exactly what took place when you rendered care.**
- 2.7 **The laws governing search and seizure are subject to change and vary from state to state. Keep abreast of all legal ramifications that affect your practice.**
- 2.8 **Delegation is defined as "transferring the responsibility of performing a nursing activity to another person *while retaining accountability for the outcome.*"**
- 2.9 **A DNR order does not prohibit all care, but rather provides for comfort measures while limiting resuscitative interventions.**

3 Assessment and Triage

- Learning Objectives
- Discuss the importance of performing a systematic, prioritized assessment.
 - Describe 5 components of a systematic assessment process.
 - Compare and contrast the 3 categories of triage.
 - Apply systematic assessment techniques to make accurate triage decisions in selected case studies.
 - Discuss the unique issues involved in assessment and triage of students with special needs.

KEY POINTS

- 3.1 Remember to use developmentally appropriate language when addressing students, especially younger children.
- 3.2 If possible, gather focused history information as you perform each step of the assessment.
- 3.3 It is essential to take any necessary actions before moving on to the next step of the assessment.
- 3.4 Never place yourself in danger. If you cannot control a hazard, do not approach the student.
- 3.5 The **across-the-room assessment** is a quick overall appraisal of the student's condition based on appearance, breathing, and circulation.
- 3.6 The goal of the **initial assessment** is to identify and treat life-threatening emergencies. Activate EMS as soon as the need becomes evident.
- 3.7 Do not delegate tasks related to the initial assessment and triage. Only an experienced registered nurse has the expertise to categorize ill and injured students.

4 Trauma

- Learning Objectives
- Discuss how mechanism of injury affects your evaluation of an injured student and may help to identify potential injuries.
 - Describe special assessment considerations for injured students of various ages.
 - Based on assessment findings, develop and prioritize a plan of care for selected injuries.
 - Describe specific traumatic injuries and appropriate emergency care.
 - Discuss the unique challenges in assessment and treatment of injuries sustained by students with special needs.

KEY POINTS

- 4.1 It is important to identify the mechanism of injury, as this will allow you to focus your assessment on potential problems.
- 4.2 It is important to maintain a high index of suspicion for internal injuries associated with significant blunt force.
- 4.3 Any time a student sustains a major kinetic injury to a single area, assume that multiple injuries are present.
- 4.4 Injury prevention should be one of your top priorities. Focus your efforts on injuries that are common, severe, and readily preventable.
- 4.5 Even a mild traumatic brain injury may lead to long-term problems that impinge on quality of life.
- 4.6 Whenever a head injury occurs, **suspect spinal injury as well.**
- 4.7 If an injured student complains of pain in the head, neck, or back, or paresthesia or numbness in the extremities, assume that the student has sustained a spinal injury.
- 4.8 Pain in the left upper quadrant that radiates to the left shoulder indicates potential injury to the spleen.
- 4.9 Consider the possibility of child maltreatment whenever an injured student reports to the health office.

5 Respiratory Emergencies

- Learning Objectives
- Define the most common types of respiratory emergencies in school-aged children.
 - List the steps in assessing a student who is experiencing respiratory distress.
 - Discuss appropriate interventions for selected respiratory emergencies.
 - Identify unique issues that may arise during respiratory emergencies involving students with special needs.

KEY POINTS

- 5.1 **Management of respiratory emergencies is a critical aspect of school nursing practice; failure to recognize and treat respiratory distress can lead to cardiac failure and death.**
- 5.2 **In a student with signs of respiratory distress, a slow breathing rate indicates deterioration rather than improvement.**
- 5.3 **Activate EMS if you have any doubt about the student's condition.**
- 5.4 **Increasingly rapid breathing and tachycardia with retractions are ominous findings.**
- 5.5 **Always attach a spacer when administering asthma medications with a metered dose inhaler, as it dramatically increases drug delivery into the lungs.**

6 Shock

- Learning Objectives
- Define shock.
 - Discuss the most common causes and types of shock seen in children.
 - Describe key differences between the pediatric and adult circulatory system and how they affect assessment and treatment of shock in children.
 - Explain how to assess for pediatric shock.
 - List appropriate interventions for pediatric shock.
 - Discuss the unique challenges in assessment and treatment of shock among students with special needs.

KEY POINTS

- 6.1** Maintain a high index of suspicion for shock in the presence of any mechanism likely to cause it.
- 6.2** Hypotension and bradycardia are late, ominous signs of shock in children.
- 6.3** A significant reduction in the level of consciousness indicates advanced decompensated shock.
- 6.4** Tachycardia is often the earliest indicator of shock in children.
- 6.5** The skin is one of the first organs affected by decreased perfusion during shock.
- 6.6** In a student with signs of shock or a mechanism that could cause it, a deteriorating level of consciousness indicates the need for immediate lifesaving interventions.

7 Neurologic Emergencies

- Learning Objectives
- Describe assessment considerations for a student who exhibits an altered level of consciousness.
 - List assessment findings that indicate a neurologic problem requiring urgent or emergent care.
 - Describe appropriate interventions for a student with abnormal neurologic findings.
 - Discuss the unique challenges in assessment and treatment of neurologic emergencies involving students with special needs.

KEY POINTS

- 7.1 An accurate neurologic assessment allows you to identify acute neurologic deficits, track changes in level of consciousness, and assess the student's risk for neurologic deterioration.
- 7.2 Assume that any injury above the clavicle involves a concurrent c-spine injury!
- 7.3 For an accurate assessment of a student's condition, always interpret Pediatric Glasgow Coma Scale (PGCS) scores in conjunction with other clinical findings.
- 7.4 Be sure to ask age-appropriate questions when assessing orientation to person, place, and time.
- 7.5 Assume that any injury above the clavicle involves a concurrent c-spine injury!
- 7.6 A PGCS score that decreases by 2 or more points indicates a significant change in condition, requiring reassessment of ABCDs.
- 7.7 Assume that any student with a significant head injury has a cervical spine injury as well.
- 7.8 Initiate full spinal stabilization if there are signs of spinal cord injury or if the mechanism carries a high risk for spinal cord injury.
- 7.9 Immediately activate EMS for students with
 - first-time seizure or no known history of seizure
 - seizure or series of seizures persisting for more than 5 minutes
 - seizure with respiratory compromise
 - seizure following head injury
 - unexpected or atypical seizure in a student with a known seizure disorder.
- 7.10 A severe headache warrants a thorough assessment, with referral to a physician as necessary.
- 7.11 Remember that you may encounter students who have neurologic deficits that have not been recognized or formally diagnosed.

8 Eye, Ear, Nose, Throat, and Dental Emergencies

- Learning Objectives
- Identify common eye, ear, nose, throat, and dental emergencies.
 - Describe interventions for specific emergencies involving the eyes, ears, nose, throat, and mouth.
 - Identify specific dental, oral, and maxillofacial trauma and describe appropriate interventions.
 - Identify school activities that place students at risk for facial and dental emergencies and encourage preventive practices.
 - Identify the unique issues that may accompany eye, ear, nose, throat, or dental emergencies involving students with special needs.

KEY POINTS

- 8.1 Physical assessment of an eye injury should proceed systematically *except* in the case of a chemical splash, which should be flushed immediately.
- 8.2 Familiarize yourself with eye problems that require emergency referral to an ED or ophthalmologist for immediate evaluation.
- 8.3 Never remove an object that is impaled in the eye. Stabilize it with gauze pads and secure a disposable cup over the dressing.
- 8.4 A suspected chemical burn of the eye is an *emergent* injury. Activate EMS, assess scene safety, then begin irrigation of the eye immediately. Do not delay irrigation to identify the exact chemical involved.
- 8.5 Students who participate in high-risk sports should wear well-fitting padding and helmets at all times.
- 8.6 Pain, discomfort, or deviation during mandibular movement is a potentially serious sign. It may indicate a fracture of the facial bones, an infection, or a tumor.
- 8.7 When treating a student for trauma to dental, oral, or maxillofacial structures, it is important to remain calm and attentive to airway status.
- 8.8 Under no circumstances should an impaled object be removed. Stabilize it in place and activate EMS.
- 8.9 If more than one tooth is avulsed, or if the student is not alert and reliable, do not place the tooth in the mouth for transport.
- 8.10 A student with suspected Le Forte fracture requires immediate transport for emergency medical care.
- 8.11 Any student participating in contact sports should be fitted with an appropriate mouth guard.

9 Environmental Emergencies

- Learning Objectives
- List the critical components in assessing, treating, and documenting a bite or sting.
 - Describe appropriate interventions for the 4 categories of burns.
 - Describe primary interventions for the 3 types of heat-related illness.
 - Identify early signs of hypothermia.
 - State appropriate interventions and triage for a near-drowning submersion episode.
 - Describe the role of the poison specialist in evaluating and treating student poisonings.
 - List signs and symptoms associated with specific toxic syndromes.
 - Identify ways in which students with special needs may have unique vulnerabilities and heightened risks for environmental emergencies.

KEY POINTS

- 9.1 Identifying the specific animal or insect that caused a bite or sting may be helpful in providing treatment and preventing complications.
- 9.2 The depth of a thermal burn depends on the intensity of heat and the duration of contact with skin or tissue. It is difficult to determine the depth of a burn by inspecting the skin surface.
- 9.3 If clothing adheres to burned skin, do not remove it!
- 9.4 Any deep partial-thickness or full-thickness burn should be classified as an emergent injury. Initiate immediate EMS transport.
- 9.5 Never apply additional chemicals to neutralize a caustic substance on the skin, as this can cause a thermal reaction that exacerbates the injury.
- 9.6 A suspected chemical burn is an emergent injury. Activate EMS, assess scene safety, and begin irrigation. Do not delay irrigation to identify the exact chemical involved.
- 9.7 Do not touch a student who is in contact with a live wire or power source. Call for immediate assistance and keep bystanders at a safe distance.
- 9.8 Individuals at particular risk for heat-related illness include the very young, the elderly, athletes, those who are medically fragile, those who take certain medications, and those who use alcohol or illicit drugs.
- 9.9 Heat stroke is a potentially lethal condition requiring immediate interventions.

- 9.10 Heat cramps are muscle spasms that may arise when a combination of strenuous exercise, diaphoresis, and copious water intake creates a sodium imbalance. They can occur during relatively cool conditions.
- 9.11 Treatment of hypothermia always takes precedence over frostbite.
- 9.12 Near-drowning/submersion injuries are always emergent! Call EMS immediately for assistance and transport.
- 9.13 Herbal preparations can be very toxic and potentially dangerous.
- 9.14 Never apply additional chemicals to neutralize a caustic substance on the skin, as this can cause a thermal reaction that exacerbates the injury.
- 9.15 In ocular exposures, it is critical to act quickly. Immediately irrigate the eyes for 15 to 20 minutes with a gentle stream of tepid or room-temperature water.
- 9.16 Products that are potentially caustic or corrosive demand immediate consultation with a poison control center. Do not give fluids, as they increase the risk of emesis and aspiration.

10 Abdominal and Genitourinary Emergencies

- Learning Objectives
- Describe the steps in a systematic assessment of abdominal or genitourinary complaints.
 - Discuss assignment of appropriate triage categories for abdominal or genitourinary complaints.
 - Identify specific interventions for selected abdominal or genitourinary problems.
 - Describe emergent complications that may arise in the pregnant student.
 - Describe the procedure for emergency childbirth at school and interventions for potential complications affecting the mother and infant.
 - Identify unique issues that may arise during abdominal or genitourinary emergencies involving students with special needs.

KEY POINTS

- 10.1 All abdominal and genitourinary complaints should be taken seriously, regardless of presentation.
- 10.2 The student's self-assessment of pain can help you determine whether it is getting better or worse.
- 10.3 Begin palpation in the areas furthest from the pain and progress toward the areas where pain is present.
- 10.4 Signs of acute pelvic inflammatory disease with peritonitis include rebound tenderness, guarding, and decreased bowel sounds. This is an emergent condition.
- 10.5 In acute gastroenteritis, diarrhea can cause significant fluid loss with the potential for electrolyte imbalance.
- 10.6 If an out-of-hospital delivery appears imminent, activate EMS immediately and proceed according to applicable protocols.
- 10.7 Explain what you are doing as the delivery progresses, communicating at all times in a calm, reassuring, and encouraging tone. Gentle repetition of instructions is the most crucial component in facilitating a controlled birth.
- 10.8 To prevent neonatal cold stress, quickly dry the infant with a towel, then wrap the infant in a second, dry towel.
- 10.9 Do not delay necessary resuscitation measures to check the Apgar score.
- 10.10 Consider any breech presentation a serious complication that necessitates emergency transport.

11 Musculoskeletal Emergencies

- Learning Objectives
- Identify important focused history points and physical assessment techniques for evaluating musculoskeletal injuries.
 - Differentiate soft tissue injuries from skeletal injuries.
 - Demonstrate appropriate nursing interventions for various types of musculoskeletal trauma.
 - Identify unique issues that may arise when students with special needs incur musculoskeletal injuries.

KEY POINTS

- 11.1 Assume that any open fracture is contaminated, making wound care an emergent priority.
- 11.2 Always suspect epiphyseal damage when a long bone is injured.
- 11.3 Assume that any injury above the clavicle involves a concurrent c-spine injury!
- 11.4 It is essential to investigate the mechanism that caused an injury.
- 11.5 Any deformity or evidence of restricted mobility noted during your focused physical examination may indicate an urgent condition.
- 11.6 It is critical to immobilize musculoskeletal injuries. This will increase comfort and reduce morbidity.
- 11.7 Any immobilized area should be closely monitored for continuing neurovascular integrity. Use the **5 Ps** mnemonic to guide frequent reassessments.
- 11.8 Separation of the epiphysis from the head of the femur should be considered urgent or emergent, with immediate activation of EMS.
- 11.9 Consider any open fracture emergent due to the likelihood of bacterial infection or other contamination of the wound.

12 Emergencies Involving Mental or Behavioral Health

- Learning Objectives
- Identify common pediatric mental and behavioral health emergencies.
 - Identify characteristics predictive of mental health disorders, violent behavior, or suicide risk in students.
 - Conduct a brief screening examination to assess a behavioral health emergency.
 - Describe appropriate steps to take during a behavioral health emergency.
 - Demonstrate techniques for communicating effectively with a violent or suicidal student.
 - Identify the need for community resources and referral planning for the student.
 - Identify unique issues that may arise during mental or behavioral health emergencies involving students with special needs.

KEY POINTS

- 12.1** If the likelihood of suicide is high, the parent/guardian *must* be called. The student is *never* to be left alone. Collect the student's book bag and other personal effects, and check the student's pockets carefully.
- 12.2** Many parents/guardians do not recognize the significance of suicidal ideation. Help them understand the seriousness of the situation.
- 12.3** In the case of a completed suicide, open communication is essential. *Do not* act as though nothing has happened.
- 12.4** Bullying is *never* benign. It is *always* damaging to the bully, the bullied, and the bystander.
- 12.5** During any violent incident, safety is your first priority. Ensure your own safety as well as the safety of the student involved, other students in the school, and school personnel.
- 12.6** Publicize the school's zero-tolerance policy toward violence and ensure that every student understands its stipulations. This alone can decrease violent incidents.

13 Medical Emergencies

- Learning Objectives
- Assess changes in the health status of students who have chronic conditions.
 - Provide appropriate emergency intervention during exacerbations of these students' medical conditions.
 - Follow up with these students to prevent recurrences of medical emergencies.
 - Identify strategies to help these students cope with their conditions and maintain optimum wellness.
 - Describe the unique challenges that may arise during medical emergencies involving students with special needs.

KEY POINTS

- 13.1 **Anaphylaxis can occur within minutes or be delayed for several hours.**
- 13.2 **Be sure to inform EMS personnel if a student is sensitive to latex.**
- 13.3 **Always activate EMS for a student who has received epinephrine.**
- 13.4 **In students with emergent anaphylaxis, never delay intervention or transport to contact the parent/guardian or primary health care provider!**
- 13.5 **Generally, 15 grams of carbohydrates will raise the blood glucose level 50 points in 15 minutes.**
- 13.6 **If a student with severe hypoglycemia loses consciousness or has a seizure, emergent action is required to prevent permanent cognitive impairment.**
- 13.7 **Before you develop an IHP for a student who has HIV or AIDS, be sure to find out whether the student is aware of the diagnosis.**
- 13.8 **Parvovirus B 19 (fifth disease) causes aplastic anemia in students who have sickle cell disease. Notify parents/guardians when there is a case of fifth disease at school.**
- 13.9 **Prompt analgesia is crucial for a student experiencing extreme pain during a sickle cell crisis.**

14 Planning for Students With Special Needs

- Learning Objectives
- Understand the federal laws that affect students with chronic health conditions or physical impairments.
 - Develop an individualized health care plan, an emergency care plan, or both for students who have special needs.
 - Understand how the Individuals With Disabilities Education Act, the Americans With Disabilities Act, and Section 504 of the Rehabilitation Act relate to the various care plans.
 - Understand the implications and special challenges posed by pediatric do not resuscitate orders.

KEY POINTS

- 14.1** Developing an individualized health care plan (IHP) is a nursing function that cannot be delegated.
- 14.2** A comprehensive health history is essential in developing an IHP. Remember that a good history starts with good questions.
- 14.3** IHPs are only as useful as the information they contain. Create a detailed plan and update it regularly.
- 14.4** In schools that do not have a full-time nurse, the emergency care plan (ECP) becomes a document for delegation of care.
- 14.5** Meet with your local EMS coordinator to discuss special considerations for dispatch, equipment, and evacuation of students with special needs.
- 14.6** For students with 504 plans, make it a priority to implement the care plan within the regular classroom environment.
- 14.7** A DNR order does not prohibit all care, but rather provides for comfort measures while limiting resuscitative interventions.

15 School Emergency Response and Crisis Management

- Learning Objectives
- Describe situations that constitute a disaster at school.
 - Describe the 4 phases of emergency planning.
 - Understand the general concepts of the Incident Command System.
 - Describe key differences between routine triage and mass-casualty triage.
 - Discuss your role and nursing responsibilities during and after a school disaster.
 - Discuss the composition and activation of the crisis response team.
 - Understand the ways in which students are more vulnerable to terrorist weapons than adults.
 - Identify specific issues that must be addressed in the emergency response and crisis management plan to accommodate students with special needs.

KEY POINTS

- 15.1 Preparing for disasters requires a comprehensive schoolwide *emergency response and crisis management plan*.
- 15.2 Developing a comprehensive emergency response plan is a team effort. As a health professional, you are a valuable resource in this process.
- 15.3 All members of the school community must be familiar with their roles within the organizational structure of the Incident Command System **before** an emergency arises.
- 15.4 Remember that scene safety is always the first consideration in any emergency situation.
- 15.5 When you identify a suspicious pattern of illness, report it promptly to public health authorities.

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APPENDIX

E

Acronyms and Abbreviations

NOTE

In 2005, the Joint Commission on Accreditation of Healthcare Organizations (now The Joint Commission) established an official “Do Not Use” list of symbols, acronyms, and abbreviations that can be easily confused or misinterpreted in clinical practice. The School Nurse Emergency Care Course has adopted these recommendations in this manual. For more information and current recommendations, visit the Joint Commission’s Web site at <http://www.jointcommission.org/patientsafety/donotuselist/>.

Numbers ■ Symbols

- %BSA: percentage of body surface area, used to assess burn injuries
- **5 Ps**: **P**ain, **P**ulse, **P**allor, **P**aresthesia, **P**aralysis: an assessment mnemonic
- 504 plan: a health care plan that addresses the requirements of Section 504 of the Rehabilitation Act of 1973

A ■ B

- AAP: American Academy of Pediatrics
 - ABA: American Burn Association
 - **ABC, ABCD, ABCDE**: **A**irway, **B**reathing, **C**irculation, **D**isability, **E**xposure: a mnemonic for conducting the initial assessment
 - ABD: abdominal
 - AC: acromioclavicular (ligament)
 - ACEP: American College of Emergency Physicians
 - ADA: American Diabetes Association; Americans With Disabilities Act
 - ADHD: attention-deficit/hyperactivity disorder
 - ADL: activity of daily living
 - AED: automated external defibrillator
 - AHA: American Heart Association
 - AIDS: acquired immune deficiency syndrome
 - ALS: advanced life support
 - ANSI Z87.1: safety standard set by the American National Standards Institute for eye and face protection worn during certain school activities
 - ANA: American Nurses Association
 - anti-IgE: anti-immunoglobulin E
 - ARC: American Red Cross
 - **AVPU**: **A**lert, **V**erbal, **P**ainful, **U**nresponsive: neurologic assessment mnemonic
-
- BG: blood glucose
 - BLS: basic life support
 - BP: blood pressure
 - bpm: beats per minute

C ■ D

- C: centigrade
- C1, C2...: cervical vertebrae
- CA-MRSA: community-acquired **or** community-associated methicillin-resistant *Staphylococcus aureus*
- CBC: complete blood count
- cc: carbon copy (denotes those receiving a copy of a communication)
- c-spine: cervical spine
- CD: conduct disorder
- CDC: Centers for Disease Control and Prevention
- CERT: community emergency response team
- CHF: congestive heart failure
- **CIAMPEDS**: **C**hief complaint, **I**mmunizations/**I**solation, **A**llergies, **M**edications, **P**ast health history, **E**vents preceding the problem, **D**iet/elimination, **S**ymptoms associated with the problem: an assessment mnemonic
- CNS: central nervous system
- c/o: complains of
- CO: carbon monoxide

- CPR: cardiopulmonary resuscitation
- CSF: cerebrospinal fluid
- CSII: continuous subcutaneous insulin infusion
- CV: cardiovascular
- CVA: cerebrovascular accident

- dB: decibel
- DCFS: Department of Children and Family Services
- DHHS: Department of Health and Human Services
- DIP: distal interphalangeal (joint)
- DKA: diabetic ketoacidosis
- DNR: do not resuscitate
- DOB: date of birth
- DOJ: Department of Justice
- DPH: diphenhydramine
- **DUMBELS**: **D**iarrhea, **U**rination, **M**iosis/**M**uscle fasciculations, **B**radycardia/**B**ronchorrhea, **E**mesis, **L**acrimation, **S**alivation/**S**weating: mnemonic for signs/symptoms associated with cholinergic toxidrome

E • F

- ECG: electrocardiogram
- ECP: emergency care plan
- ed: edition, editor (in citations)
- ED: emergency department
- EENT: eye, ear, nose, throat
- eg: for example
- EIB: exercise-induced bronchospasm
- EIF: emergency information form
- EMS: emergency medical services
- EMSC: Emergency Medical Services for Children
- EMT: emergency medical technician
- ENA: Emergency Nurses Association
- ENT: ear, nose, throat
- EOM: extraocular movement
- EPA: Environmental Protection Agency
- E–U–N: **E**mergent (most severe); **U**rgent; **N**onurgent (least severe): the 3 triage classifications

- F: Fahrenheit
- FBAO: foreign body airway obstruction
- FDA: Food and Drug Administration
- FEMA: Federal Emergency Management Agency
- FERPA: Family Educational Rights and Privacy Act
- **FGHI**: **F**ull set of vital signs, **G**ive comfort measures, **H**ead-to-toe assessment, **I**solate/**I**njuries/additional **I**nterventions: assessment mnemonic used in focused physical examination
- FK506: tacrolimus
- ft: foot, feet

G • H

- GCS: Glasgow Coma Scale
- GI: gastrointestinal
- GU: genitourinary

- hazmat: hazardous materials
- HbA1c: glycated hemoglobin
- Hb S: hemoglobin S (defective hemoglobin in sickle cell disease)
- **HEADSS**: **H**ome environment, **E**ducation/**E**mployment, **E**ating/**E**xercise, **A**ctivities and peer relationships, **D**rugs, **S**exuality, **S**uicide/depression/mood screen, **S**afety: a risk assessment survey tool
- Hib: *Haemophilus influenzae* type b
- HIPAA: Health Insurance Portability and Accountability Act
- HIV: human immunodeficiency virus
- HPV: human Papillomavirus
- hr: hour, hours
- HR: heart rate
- HVA: hazard vulnerability assessment

I • J

- ICP: intracranial pressure
 - ICS: Incident Command System
 - ID: identification
 - IDEA: Individuals With Disabilities Education Act of 2004
 - IDPH: Illinois Department of Public Health
 - ie: that is
 - IEP: individualized education program
 - IgE: immunoglobulin E
 - IgG: immunoglobulin G
 - IHP: individualized health care plan
 - IM: intramuscular
 - in: inch, inches
 - INH: isoniazid
 - iPod: trade name for a portable music player manufactured by Apple Corporation
 - IV: intravenous
- JumpSTART: pediatric version of the *simple triage and rapid treatment* (START) algorithm

K • L

- kg: kilogram
- L: left
- LABA: long-acting beta-2 agonist
 - LCL: lateral collateral ligament
 - LLQ: left lower quadrant
 - LOC level of consciousness
 - LPD: lymphoproliferative disease
 - LTRA: leukotriene receptor antagonist
 - LUMC: Loyola University Medical Center
 - LUQ: left upper quadrant

M • N

- MAOI: monoamine oxidase inhibitor (antidepressant agent)
- MCHB: Maternal and Child Health Bureau
- MCI: mass-casualty incident
- MCL: medial collateral ligament

- MCP: metacarpophalangeal (joint)
- MDI: metered dose inhaler
- mg: milligram, milligrams
- mg/dL: milligrams per deciliter
- min: minute, minutes
- mL: milliliter, milliliters
- mm: millimeter, millimeters
- mm Hg: millimeters of hydrogen (blood pressure measurement)
- mo: month, months
- MP3: a standard of compression for digitized audiovisual files, such as music files
- mph: miles per hour
- MRSA: methicillin-resistant *Staphylococcus aureus*
- MSDS: material safety data sheet
- MSE: mental status examination (specific to psychological test)
- MTBI: mild traumatic brain injury
- MVC: motor vehicle crash

- NASN: National Association of School Nurses
- NIHL: noise-induced hearing loss
- NIMS: National Incident Management System
- NPH: Neutral Protamine Hagedorn

O ■ P ■ Q

- O₂: oxygen
- ODD: oppositional defiant disorder
- OSHA: Occupational Safety and Health Administration
- OTC: over-the-counter
- oz: ounce, ounces

- PAT: Pediatric Assessment Triangle
- PBA: Prevent Blindness America
- PCC: Poison Control Center
- PE: physical education
- PEFr: peak expiratory flow rate
- PERRLA: pupils equal, round, and reactive to light and accommodation
- PGCS: Pediatric Glasgow Coma Scale
- pH: potential of hydrogen (measurement of acidity/alkalinity)
- PICC: peripheral indwelling central catheter
- PID: pelvic inflammatory disease
- PIP: proximal interphalangeal (joint)
- **PQRST**: **P**rovoke, **Q**uality, **R**adiation, **S**everity, **T**iming; expanded to **P**roblem/**P**rovoke/**P**alliate, **Q**uality, **R**adiate, **S**everity/**S**igns/**S**ymptoms, **T**iming: an assessment mnemonic for pain
- PTS: Pediatric Trauma Score
- PTSD: posttraumatic stress disorder

R ■ S

- R: right
- RAP: recurrent abdominal pain
- **RICES**: **R**est, **I**ce (cold packs), **C**ompress, **E**levate, **S**upport: an intervention mnemonic
- RLQ: right lower quadrant
- R/O: rule out
- ROM: range of motion

- RR: respiratory rate
- RSV: respiratory syncytial virus
- RTC: return to class
- RUQ: Right upper quadrant

- SABA: short-acting beta-2 agonist
- **SAMPLE**: **S**ymptoms, **A**llergies, **M**edications, **P**ast health history, **L**ast meal, **E**vents preceding incident: an assessment mnemonic for the focused history
- SBHC: school-based health center
- SCD: sickle cell disease
- SCIWORA: spinal cord injury without radiographic abnormality
- sec: second, seconds
- SIDS: sudden infant death syndrome
- SNRI: selective norepinephrine reuptake inhibitor
- SQ: subcutaneous
- S/S: signs and symptoms
- SSRI: selective serotonin reuptake inhibitor
- START: simple triage and rapid treatment, an algorithm for mass-casualty triage
- STD: sexually transmitted disease

T • U • V

- T: temperature
- TB: tuberculosis
- TBI: traumatic brain injury
- TCA: tricyclic antidepressant
- T cell: T lymphocyte

- URI: upper respiratory infection
- UTI: urinary tract infection
- UV: ultraviolet

- VF: ventricular fibrillation
- VNS: vagal nerve stimulator
- VP: ventriculoperitoneal

W • X • Y • Z

- WBC: white blood cell count
- WNL: within normal limits
- WNV: West Nile virus

- yr: year/years

APPENDIX

F

Consolidated List of References

The following is a consolidated list of the references and information resources that appear at the end of each chapter of the manual, collated here in alphabetical order. Refer to the individual chapters for topic-specific references.

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