chapter 71

Emergency Nursing

LEARNING OBJECTIVES

On completion of this chapter, the learner will be able to:

1. Describe emergency care as a collaborative, holistic approach that includes the patient, the family, and significant others.
2. Discuss priority emergency measures instituted for the patient with an emergency condition.
3. Describe the emergency management of patients with intra-abdominal injuries.
4. Identify the priorities of care for the patient with multiple injuries.
5. Compare and contrast the emergency management of patients with heat stroke, frostbite, and hypothermia.
6. Specify the similarities and differences of the emergency management of patients with swallowed or inhaled poisons, skin contamination, and food poisoning.
7. Discuss the emergency management of patients with drug overdose and with acute alcohol intoxication.
8. Describe the significance of crisis intervention in the care of rape victims.
9. Differentiate between the emergency care of patients who are overactive, those who are violent, those who are depressed, and those who are suicidal.

GLOSSARY

antivenin: antitoxin manufactured from venom of poisonous snakes to assist the patient's immune system response to an envenomation

carboxyhemoglobin: hemoglobin that is bound to carbon monoxide and therefore is unable to bind with oxygen, resulting in hypoxemia

corrosive poison: alkaline or acidic agent; causes tissue destruction after contact

cricothyroidotomy: surgical opening of the cricothyroid membrane to obtain an airway that is maintained with a tracheostomy or endotracheal tube

diagnostic peritoneal lavage: instillation of lactated Ringer's or normal saline solution into the abdominal cavity to detect red blood cells, white blood cells, bile, bacteria, amylase, or gastrointestinal contents indicative of abdominal injury

emergent: triage category signifying potentially life-threatening injuries or illnesses requiring immediate treatment

envenomation: injection of a poisonous material by sting, spine, bite, or other means

fasciotomy: surgical incision of the extremity to the level of the fascia to relieve pressure and restore neurovascular function to the extremity

Hare traction: portable in-line traction applied to the lower extremity to manage femur or hip fractures or dislocations

minor: triage category signifying non–life-threatening injuries or illnesses that can be routinely managed in a clinic or physician's office or that require no medical care

nonurgent: triage category signifying episodic or minor injury or illness in which treatment may be delayed several hours or longer without increased morbidity

resuscitation: triage category signifying life-threatening injuries or illnesses requiring immediate intervention

triage: process of assessing patients to determine management priorities

urgent: triage category signifying serious illness or injury that is not immediately life-threatening

The term *emergency management* traditionally refers to care given to patients with urgent and critical needs. However, because many people lack access to health care, the emergency department (ED) is increasingly used for nonurgent problems. Therefore, the philosophy of emergency management has broadened to include the concept that an emergency is whatever the patient or the family considers it to be.

Large numbers of people seek emergency care for serious life-threatening conditions, such as cardiac dysrhythmias, acute coronary syndrome (ACS), acute heart failure, pulmonary edema, and stroke. Priorities for managing these cardiac and other conditions are discussed in Chapters 27, 28, 30, and 62. Emergency management of trauma and conditions not found elsewhere in this book are discussed in this chapter. It is assumed that care and treatment are provided under the direction of a physician or emergency nurse practitioner. Facts about ED visits in the United States are presented in Chart 71-1.

SCOPE AND PRACTICE OF EMERGENCY NURSING

The emergency nurse has had specialized education, training, experience, and expertise in assessing and identifying patients' health care problems in crisis situations. In addition, the emergency nurse establishes priorities, monitors and continuously assesses acutely ill and injured patients, supports and attends to families, supervises allied health personnel, and teaches patients and families within a time-limited, high-pressured care environment. Nursing interventions are accomplished interdependently, in consultation with or under the direction of a physician or nurse practitioner. The roles of nursing and medicine are complementary in an emergency situation. Appropriate nursing and medical interventions are anticipated based on assessment data. The emergency health care staff members work as a team in performing the highly technical, hands-on skills required to care for patients in emergency situations.

The nursing process provides a logical framework for problem solving in this environment. Patients in the ED have a wide variety of actual or potential problems, and their condition may change. Therefore, nursing assessment must be continuous, and nursing diagnoses change with the patient's condition. Although a patient may have several diagnoses at a given time, the focus is on the most life-threatening ones; often, both independent and interdependent nursing interventions are required.

Issues in Emergency Nursing Care

Emergency nursing is demanding because of the diversity of conditions and situations that present unique challenges. These challenges include legal issues, occupational health and safety risks for ED staff, and the challenge of providing holistic care in the context of a fast-paced, technology-driven environment in which serious illness and death are encountered on a daily basis. Another dimension of emergency nursing is nursing in disasters. With the increasing use of weapons of terror and mass destruction, the emergency nurse must recognize and treat patients exposed to biologic and other weapons and anticipate nursing care in the event of a mass casualty incident (see Chapter 72).

Chart 71-1 • *Facts About Emergency Department Visits*

In 2005, there were 115.3 million visits to emergency departments (EDs), a 31% increase from 1995. This was accompanied by a 10% decrease in the number of EDs and an increased utilization by 7%.

- The highest rate of ED visits in people 65 years of age and older were from long-term care facilities.
- More than 15.5% of patients arrived at the ED by ambulance.
- Patients with Medicaid used EDs more often than patients with private health insurance, Medicare, or self-pay.
- Injuries accounted for 41.9% of all ED visits.
- The leading causes of injuries, including falls and motor vehicle crashes, accounted for 31% of injury-related ED visits. For those injured, 36.9% were transported to designated trauma centers.
- The average ED waiting time before being seen by a health care provider for definitive treatment was 2.4 hours, with 7 of 10 patients spending less than 4 hours in the ED.

Source: National Hospital Ambulatory Medical Care Survey. (2005). *2005 Emergency department summary.* Available at: www.cdc.gov/nchs/data/ad/ad386.pdf and www.cdc.gov/nchs/data/hus/hus07.pdf#091

Documentation of Consent and Privacy

Consent to examine and treat the patient is part of the ED record. The patient must consent to invasive procedures (eg, angiography, lumbar puncture) unless he or she is unconscious or in critical condition and unable to make decisions. If the patient is unconscious and brought to the ED without family or friends, this fact must be documented. Monitoring of the patient's condition, as well as all instituted treatments and the times at which they were performed, must be documented. After treatment, a notation is made on the record about the patient's condition, response to the treatment, and condition at discharge or transfer and about instructions given to the patient and family for follow-up care.

The patient is also provided with a statement of the privacy policy of the health care agency, according to federal law. Patients involved in violent events are often provided with an alias, and access to the medical record, both paper and electronic, is limited to protect the privacy of the patient. A patient may also request extra privacy by limiting access to his or her room and by choosing not to receive phone calls, mail, flowers, other gifts, or certain visitors. These practices relate to the federally mandated privacy policy stipulated in the Health Insurance Portability and Accountability Act (HIPAA).

Limiting Exposure to Health Risks

Because of the increasing numbers of people infected with hepatitis B and C, with human immunodeficiency virus (HIV), and other infectious diseases, health care providers are at an increased risk for exposure to communicable diseases through blood, respiratory droplets, or other body fluids. This risk is further compounded in

the ED because of the common use of invasive treatments in patients who may have a wide range of conditions and who frequently cannot provide a comprehensive medical history. All emergency health care providers must adhere strictly to standard precautions for minimizing exposure.

The reemergence of tuberculosis as a major health problem is complicated by multi–drug-resistant tuberculosis and by tuberculosis concomitant with HIV infection. Early identification and adherence to transmission-based precautions for patients who are potentially infectious are crucial. Nurses in the ED are usually fitted with personal high-efficiency particulate air (HEPA) filter masks to use when treating patients with airborne diseases.

The potential for exposure to highly contagious organisms, hazardous chemicals or gases, and radiation related to acts of terrorism or natural or manmade disasters presents additional risks to ED staff (see Chapter 72 for information about decontamination procedures).

Violence in the Emergency Department

Not only do ED staff members encounter patients who may be violent because of the effects of substance abuse, injury, or other emergencies, but they may also encounter other violent situations. Frequently, patients and families waiting for assistance are emotionally volatile. Often, waiting rooms are the sites where feelings of dissatisfaction, fear, and anger are channeled violently. Some EDs assign security officers to the area and have installed silent alarm systems or metal detectors to identify weapons in order to protect patients, families, and staff. Safety is the first priority.

It is not unusual for a patient or family member to come to the ED armed. To avoid angry confrontations, members of gangs and feuding families need to be separated in the ED, in the waiting room, and later in the inpatient nursing unit. Nurses and other personnel must be prepared to deal with these circumstances. The ED should be locked against entry if security is questionable.

Patients from prison and those who are under guard need to be handcuffed to the bed and appropriately assessed to ensure the safety of hospital staff and other patients. The following precautions are taken:

- The hand or ankle restraint (handcuff) is never released.
- A guard is always present in the room.
- The patient is placed face down on the stretcher to avoid injury from head-butting, spitting, or biting.
- Restraints are used on any violent patient as needed.
- Medication is administered as necessary to control violent behavior until definitive treatment can be obtained.

In the case of gunfire in the ED, self-protection is a priority. There is no advantage to protecting others if medical caregivers are injured. Security officers and police must gain control of the situation first, and then care is provided to the injured.

Providing Holistic Care

Patients and families experiencing sudden injury or illness are often overwhelmed by anxiety because they have not had time to adapt to the crisis. They experience real and terrifying fear of death, mutilation, immobilization, and other assaults on their personal identity and body integrity. When confronted with trauma, severe disfigurement, severe illness, or sudden death, the family experiences several stages of crisis. The stages begin with anxiety and progress through denial, remorse and guilt, anger, grief, and reconciliation. The initial goal for the patient and family is anxiety reduction, a prerequisite to effective and appropriate coping. During this stressful time, safety is of prime importance. Close observation and preplanning are essential and security personnel are stationed nearby in the event that a patient or family member responds to stress with physical violence.

Assessment of the patient and family's psychological function includes evaluating emotional expression, degree of anxiety, and cognitive functioning. Possible nursing diagnoses include:

- General anxiety or death anxiety related to uncertain potential outcomes of the illness or trauma
- Ineffective coping related to acute situational crisis

Possible nursing diagnoses for the family include:

- Grieving
- Interrupted family processes
- Compromised or disabled family coping related to acute situational crises

Patient-Focused Interventions

Clinicians caring for the patient should act confidently and competently to relieve anxiety and promote a sense of security. Explanations should be given that the patient can understand. Human contact and reassuring words reduce the panic of the severely injured or ill person and aid in dispelling fear of the unknown.

The unconscious patient should be treated as if conscious; that is, the patient should be touched, called by name, and given an explanation of every procedure that is performed. As the patient regains consciousness, the nurse should orient the patient by stating his or her name, the date, and the location. This basic information should be provided repeatedly, as needed, in a reassuring way.

Family-Focused Interventions

The family is kept informed about where the patient is, how he or she is doing, and the care that is being given. Allowing family members to stay with the patient, when possible, also helps allay their anxieties. In many facilities, family presence during resuscitation is permitted to assist the family to cope through this difficult time. Many family members respond very well to this approach, and it provides some answers to the question "Was everything done?" (Walker, 2008). Additional interventions are based on the assessment of the stage of crisis that the family is experiencing. Measures to help family members cope with sudden death are presented in Chart 71-2.

Anxiety and Denial. During these crises, family members are encouraged to recognize and talk about their feelings of anxiety. Asking questions is encouraged. Honest answers given at the level of the family's understanding must be provided. Although denial is an ego-defense mechanism that protects one from recognizing

Chart 71-2 • *Helping Family Members Cope With Sudden Death*

- Take the family to a private place.
- Talk to the family together, so that they can grieve together.
- Reassure the family that everything possible was done; inform them of the treatment rendered.
- Avoid using euphemisms such as "passed on." Show the family that you care by touching, offering coffee, water, and the services of a chaplain.
- Encourage family members to support each other and to express emotions freely (grief, loss, anger, helplessness, tears, disbelief).
- Avoid giving sedation to family members; this may mask or delay the grieving process, which is necessary to achieve emotional equilibrium and to prevent prolonged depression.
- Encourage the family to view the body if they wish; this action helps to integrate the loss. Cover disfigured and injured areas before the family sees the body. Go with the family to see the body. Show acceptance by touching the body to give the family "permission" to touch.
- Spend time with the family, listening to them and identifying any needs that they may have for which the nursing staff can be helpful.
- Allow family members to talk about the deceased and what he or she meant to them; this permits ventilation of feelings of loss. Encourage the family to talk about events preceding admission to the emergency department. Do not challenge initial feelings of anger or denial.
- Avoid volunteering unnecessary information (eg, the patient was drinking).

painful and disturbing aspects of reality, prolonged denial is not encouraged or supported. The family must be prepared for the reality of what has happened and what may come.

Remorse and Guilt. Expressions of remorse and guilt are common, with family members accusing themselves (or each other) of negligence or minor omissions. Family members are urged to verbalize their feelings to help them cope appropriately.

Anger. Expressions of anger, common in crisis situations, are a way of handling anxiety and fear. Anger is frequently directed by the family at the patient, but it is also often expressed toward the physician, the nurse, or admitting personnel. The therapeutic approach is to allow the anger to be expressed and to assist the family members to identify their feelings of frustration.

Grief. Grief is a complex emotional response to anticipated or actual loss. The key nursing intervention is to help family members work through their grief and to support their coping mechanisms, letting them know that it is normal and acceptable for them to cry, feel pain, and express loss. The hospital chaplain and social services staff serve as invaluable members of the team when assisting families to work through their grief.

Caring for Emergency Personnel

Concerted efforts have been made to focus on the needs of the ED staff, especially after serious and stressful events (Emergency Nurses Association [ENA], 2007). Events can range from a local trauma case involving children; to treating someone known to the emergency worker, such as a colleague or family member; to a more complex natural disaster or multicasualty situation. It is important to remember that all staff members may not necessarily respond in the same way; an event that is stressful for one person may not be as stressful for another. In addition, because stress is a daily occurrence in the ED, the staff may not recognize the personal effect of any one event. The availability of nonjudgmental counseling is essential to promoting a healthy staff. After serious events, critical incident stress debriefing necessary to critique individual and group performance. In addition, personal and group stress debriefing is also essential.

Emergency Nursing and the Continuum of Care

A key principle underlying emergency care is that the patient is rapidly assessed, treated, and referred to the appropriate setting for ongoing care. This makes the ED a temporary point on the continuum of care. Most patients who receive emergency care are discharged directly from the ED to their homes, and emergency nurses must plan and facilitate the patient's safe discharge and follow-up care in the home and the community.

Discharge Planning

Before discharge, verbal and written instructions for continuing care are given to the patient and the family or significant others. Many EDs have preprinted standard instruction sheets for the more common conditions, which can then be individualized. Discharge instructions should be available in a variety of languages. A language interpreter should be used as necessary to provide both written and verbal instructions.

Instructions should include information about prescribed medications, treatments, diet, activity, and when to contact a health care provider or schedule follow-up appointments. It is imperative that instructions are written legibly, use simple language, and are clear in their teaching. When providing discharge instructions, the nurse also considers any special needs the patient may have related to hearing or visual impairments. Alternate formats of instruction (eg, large print, Braille, audiotape) should be available to meet the needs of patients with hearing or visual impairments.

Community Services

Before discharge, some patients require the services of a social worker to help them meet continuing health care needs. Home care resources may be contacted before discharge to arrange services. This is particularly important for patients who are elderly or disabled and who need assistance. Identifying continuing health care needs and making arrangements for meeting these needs can prevent return visits to the ED or readmission to the hospital.

For patients who are returning to long-term care facilities and for those who already rely on community agencies for continuing health care, communication about the patient's condition and any changes in health care needs that have occurred must be provided to the appropriate facilities or agencies. This communication is essential to promote continuity of care and to ensure ongoing care to meet the patient's changing health care needs.

Gerontologic Considerations

The ED is a common point of entry into the health care system for patients 65 years and older. In fact, patients in this age group account for more than 41% of the admissions to the hospital from the ED. Of the 115 million ED visits in the United States in 2005, 2.2 million of these were patients from long-term care facilities (National Hospital Ambulatory Medical Care Survey, 2005) (see Chart 71-1). Elderly patients typically arrive with one or more presenting conditions. Nonspecific symptoms, such as weakness and fatigue, episodes of falling, incontinence, and change in mental status, may be manifestations of acute, potentially life-threatening illness in the elderly person. Emergencies in this age group may be more difficult to manage because elderly patients may have an atypical presentation, an altered response to treatment, a greater risk of developing complications, or a combination of these factors.

The elderly patient may perceive the emergency as a crisis signaling the end of an independent lifestyle or even resulting in death. The nurse should give attention to the patient's feelings of anxiety and fear.

The older patient may have limited sources of social and financial support during these times of crises. The nurse should assess the psychosocial resources of the patient (and of the caregiver, if necessary) and anticipate discharge needs. Referrals for support services (eg, to the social service department or a gerontologic nurse specialist) may be necessary.

PRINCIPLES OF EMERGENCY CARE

By definition, emergency care is care that must be rendered without delay. In an ED, several patients with diverse health problems—some life-threatening, some not—may present to the ED simultaneously. One of the first principles of emergency care is triage.

Triage

The word **triage** comes from the French word *trier,* meaning "to sort." In the daily routine of the ED, triage is used to sort patients into groups based on the severity of their health problems and the immediacy with which these problems must be treated.

A basic and widely used triage system that has been in use for many years has three categories: emergent, urgent, and nonurgent (Berner, 2005). **Emergent** patients have the highest priority—their conditions are life-threatening and they must be seen immediately. **Urgent** patients have serious health problems but not immediately life-threatening ones; they must be seen within 1 hour. **Nonurgent** patients have episodic illnesses that can be addressed within 24 hours without increased morbidity (Berner, 2005). A fourth category that is increasingly used is "fast-track." These patients require simple first aid or basic primary care and may be treated in the ED or safely referred to a clinic or physician's office.

A more refined comprehensive triage system, which recognizes that EDs are used for both emergency and routine health care, has been implemented. This system has five levels: resuscitation, emergent, urgent, nonurgent, and minor (Tanabe, Gimbel, Yarnold, et al., 2004). The increased number of triage levels assists the triage nurse to more precisely determine the needs of the patient and the urgency for treatment. This five-level triage system is currently used throughout the United States, Australia, the United Kingdom, and Canada.

In the five-level system, patients in the emergent category identified in the previously used three-level system have been divided into two distinct groupings, resuscitation and emergent. Patients in the **resuscitation** category need treatment immediately to prevent death. Patients in the emergent category may deteriorate rapidly and develop a major life-threatening situation or require time-sensitive treatment. Patients in the urgent category have non–life-threatening conditions but require two or more resources (defined below) to provide their care. If these patients' vital signs deviate significantly from their baseline, they may require "up-triaging" to the emergent category. Patients in the nonurgent category have non–life-threatening conditions and likely need only one resource to provide for their needs. Patients in the **minor** category have no life-threatening conditions and likely require no resources to provide their evaluation and management.

Resources include imaging studies, medications administered by intravenous (IV) or intramuscular (IM) routes, and invasive procedures. Insertion of an indwelling catheter is an example of a one-resource procedure. Use of moderate sedation is a two-resource procedure because it requires frequent monitoring and IV medications.

Triage is an advanced skill. Emergency nurses spend many hours learning to classify different illnesses and injuries to ensure that patients most in need of care do not needlessly wait. Protocols may be followed to initiate laboratory or x-ray studies while the patient is in the triage area. Collaborative protocols are developed and used by the triage nurse based on his or her level of experience. Nurses in the triage area collect additional crucial baseline data: full vital signs including pain assessment, history of the current event and past medical history, neurologic assessment findings, weight, allergies (especially to latex and medications), domestic violence screening, and necessary diagnostic data. Some facilities collect these data in a computerized system, which helps guide the nurse through assessment and documentation. The following questions reflect the minimum information that should be obtained from the patient or from the person who accompanied the patient to the ED and then are documented.

- What were the circumstances, precipitating events, location, and time of the injury or illness?
- When did the symptoms appear?
- Was the patient unconscious after the injury or onset of illness?

- How did the patient get to the ED?
- What was the health status of the patient before the injury or illness?
- Is there a history of medical illness or previous surgeries? A history of admissions to the hospital?
- Is the patient currently taking any medications, especially hormones, insulin, digitalis, or anticoagulants? Is the patient using any complementary or alternative therapies such as herbology, naturopathy, reiki, massage, or acupuncture?
- Does the patient have any allergies, especially to latex, medications, eggs, or nuts?
- Does the patient smoke or use recreational drugs? How frequently? What type? When was the last time they were used?
- Does the patient have any fears? Does the patient feel that he or she is in danger or in an unsafe situation?
- When was the last meal eaten? (This is important if general anesthesia is to be given or if the patient is unconscious.)
- When was the last menstrual period?
- Is the patient under a physician's care? What are the name and contact information for the physician?
- What was the date of the patient's most recent tetanus immunization?

In addition to the collection of initial vital signs and medical history, triage consists of providing basic first aid, which may include application of ice, bleeding control, and basic wound care, as well as initiating protocol-based orders (eg, x-rays, administering antipyretics or mild analgesics, obtaining an electrocardiogram [ECG] or urinalysis, removing sutures). The triage nurse also is responsible for and monitors the waiting area, maintains a safe environment, reassesses waiting patients, and is the initial liaison to the families of patients.

Routine ED triage protocols differ significantly from the triage protocols used in disasters and mass casualty incidents (field triage). Routine triage directs all available resources to the patients who are most critically ill, regardless of potential outcome. In field triage (or hospital triage during a disaster), scarce resources must be used to benefit the most people possible. This distinction affects triage decisions (see Chapter 72).

Assess and Intervene

For the patient assigned to a resuscitation, emergent, or urgent triage category, stabilization, provision of critical treatments, and prompt transfer to the appropriate setting (intensive care unit, operating room, general care unit) are the priorities of emergency care. Although treatment is initiated in the ED, ongoing definitive treatment of the underlying problem is provided in other settings, and the sooner the patient is stabilized and moved to that area, the better the outcome.

A systematic approach to effectively establishing and treating health priorities is the primary survey/secondary survey approach. The primary survey focuses on stabilizing life-threatening conditions. The ED staff work collaboratively and follow the ABCD (***a***irway, ***b***reathing, ***c***irculation, ***d***isability) method:

- Establish a patent airway.
- Provide adequate ventilation, employing resuscitation measures when necessary. (Trauma patients must have the cervical spine protected and chest injuries assessed first, immediately after the airway is established.)
- Evaluate and restore cardiac output by controlling hemorrhage, preventing and treating shock, and maintaining or restoring effective circulation. This includes the prevention and management of hypothermia. In addition, peripheral pulses are examined, and any immediate closed reductions of fractures or dislocations are performed if an extremity is pulseless.
- Determine neurologic disability by assessing neurologic function using the Glasgow Coma Scale and a motor and sensory evaluation of the spine (see Chapter 60).

After these priorities have been addressed, the ED team proceeds with the secondary survey. This includes the following:

- A complete health history and head-to-toe assessment (includes a reassessment of airway and breathing parameters)
- Diagnostic and laboratory testing
- Insertion or application of monitoring devices such as ECG electrodes, arterial lines, or urinary catheters
- Splinting of suspected fractures
- Cleansing, closure, and dressing of wounds
- Performance of other necessary interventions based on the patient's condition

Once the patient has been assessed, stabilized, and tested, appropriate medical and nursing diagnoses are formulated, initial important treatment is started, and plans for the proper disposition of the patient are made. Many emergent and urgent conditions and priority emergency interventions are discussed in detail in the remaining sections of this chapter.

In addition to the management of the illness or injury, the ED nurse must also focus on providing comfort and emotional support to the patient and family. Included in this is pain management. Effective pain management must be instituted early and should include rapid-acting agents that result in minimal sedation so that the patient can continue to interact with the staff for continued assessment. Moderate sedation can help facilitate short procedures in the ED; the patient will not remember the procedure later. The patient is closely monitored during the procedure and then rapidly awakens when it is complete (see Chapter 19).

It is essential that family crisis intervention services are available for families of ED patients. Even if a patient's condition is not emergent, the situation may be perceived as such by the family. Every family needs attention and support. The chaplain and social worker may be available to assist with interventions.

AIRWAY OBSTRUCTION

Acute upper airway obstruction is a life-threatening medical emergency.

Pathophysiology

The airway may be partially or completely occluded. Partial obstruction of the airway can lead to progressive hypoxia, hypercarbia, and respiratory and cardiac arrest. If the airway is completely obstructed, permanent brain injury or death will occur within 3 to 5 minutes secondary to hypoxia. Air movement is absent in the presence of complete airway obstruction. Oxygen saturation of the blood decreases rapidly because obstruction of the airway prevents entry of air into the lungs. Oxygen deficit occurs in the brain, resulting in unconsciousness, with death following rapidly.

Upper airway obstruction has a number of causes, including aspiration of foreign bodies, anaphylaxis, viral or bacterial infection, trauma, and inhalation or chemical burns. For elderly patients, especially those in extended-care facilities, sedatives and hypnotic medications, diseases affecting motor coordination (eg, Parkinson's disease), and mental dysfunction (eg, dementia, mental retardation) are risk factors for asphyxiation by food. In adults, aspiration of a bolus of meat is the most common cause of airway obstruction. Peritonsillar abscesses, epiglottitis, and other acute infectious processes of the posterior pharynx can also result in airway obstruction (Marx, 2006).

Clinical Manifestations

Typically, a person with a foreign body airway obstruction cannot speak, breathe, or cough. The patient may clutch the neck between the thumb and fingers (ie, universal distress signal). Other common signs and symptoms include choking, apprehensive appearance, refusing to lie flat, inspiratory and expiratory stridor, labored breathing, use of accessory muscles (suprasternal and intercostal retraction), flaring nostrils, increasing anxiety, restlessness, and confusion. Cyanosis and loss of consciousness develop as hypoxia worsens. Cyanosis and loss of consciousness are late signs. Action must be taken before these manifestations develop, if possible, or immediately if the patient has already exhibited these signs.

Assessment and Diagnostic Findings

Assessment of the patient who has a foreign object occluding the airway may involve simply asking the person whether he or she is choking and requires help. If the person is unconscious, inspection of the oropharynx may reveal the offending object. X-rays, laryngoscopy, or bronchoscopy also may be performed.

Management

If the patient can breathe and cough spontaneously, a partial obstruction should be suspected. The victim is encouraged to cough forcefully and to persist with spontaneous coughing and breathing efforts as long as good air exchange exists. There may be some wheezing between coughs. If the patient demonstrates a weak, ineffective cough, high-pitched noise while inhaling, increased respiratory difficulty, or cyanosis, the patient should be managed as if there were complete airway obstruction.

After the obstruction is removed, rescue breathing is initiated. If the patient has no pulse, cardiac compressions are instituted. These measures provide oxygen to the brain, heart, and other vital organs until definitive medical treatment can restore and support normal heart and ventilatory activity.

Establishing an Airway

Establishing an airway may be as simple as repositioning the patient's head to prevent the tongue from obstructing the pharynx. Alternatively, other maneuvers, such as abdominal thrusts, the head-tilt–chin-lift maneuver, the jaw-thrust maneuver, or insertion of specialized equipment, may be needed to open the airway, remove a foreign body, or maintain the airway. In all maneuvers, the cervical spine must be protected from injury. After these maneuvers are performed, the patient is assessed for breathing by watching for chest movement and listening and feeling for air movement. In such a case, nursing diagnoses would include ineffective airway clearance related to obstruction of the airway by the tongue, an object, or fluids (blood, saliva) and ineffective breathing pattern related to airway obstruction or injury.

Abdominal Thrusts

The terms *subdiaphragmatic abdominal thrusts*, *abdominal thrusts*, and *Heimlich maneuver* are used interchangeably. This maneuver causes elevation of the diaphragm, forcing air from the lungs to create an artificial cough that can move and expel an obstructing foreign body from the airway. Chart 71-3 describes how to manage a foreign body obstruction using abdominal or chest thrusts.

Head-Tilt–Chin-Lift Maneuver

The patient is placed supine on a firm, flat surface. If the patient is lying face down, the body is turned as a unit so that the head, shoulders, and torso move simultaneously with no twisting (ie, logroll). Next, the airway is opened using either the head-tilt–chin-lift maneuver or the jaw-thrust maneuver. In the head-tilt–chin-lift maneuver, one hand is placed on the victim's forehead, and firm backward pressure is applied with the palm to tilt the head back. The fingers of the other hand are placed under the bony part of the lower jaw near the chin and lifted up. The chin and the teeth are brought forward almost to occlusion to support the jaw.

NURSING ALERT

The head-tilt–chin-lift maneuver, which helps tilt the head back, should be used only if it is determined that the patient's cervical spine is not injured.

Jaw-Thrust Maneuver

After one hand is placed on each side of the patient's jaw, the angles of the patient's lower jaw are grasped and lifted, displacing the mandible forward. This is a safe approach to opening the airway of a patient with suspected spinal cord injury because it can be accomplished without extending the neck.

Oropharyngeal Airway Insertion

An oropharyngeal airway is a semicircular tube or tubelike plastic device that is inserted over the back of the tongue into the lower posterior pharynx in a patient who is breathing spontaneously but who is unconscious (Chart 71-4). This type of airway prevents the tongue from falling back

Chart 71-3 • *Managing a Foreign Body Airway Obstruction*

Assess for Indications of Airway Obstruction

- Person may clutch the neck between thumb and fingers
- Weak, ineffective cough; high-pitched noises on inspiration
- Increased respiratory distress
- Inability to speak, breathe, or cough
- Collapse

Heimlich Maneuver (Subdiaphragmatic Abdominal Thrusts)

For Standing or Sitting Conscious Patient

Stand behind the patient, wrap your arms around the patient's waist, and proceed as follows:

1. Make a fist with one hand, placing the thumb side of the fist against the patient's abdomen, in the midline slightly above the umbilicus and well below the xiphoid process. Grasp the fist with the other hand.
2. Press your fist into the patient's abdomen with a quick inward and upward thrust. Each new thrust should be a separate and distinct maneuver. All thrusts should be in rapid sequence.

For Patient Lying Down (Unconscious)

1. Position patient on the back.
2. Kneel astride the patient's thighs, facing the head.
3. Place the heel of one hand against the patient's abdomen, in the midline slightly above the umbilicus and well below the tip of the xiphoid; place the second hand directly on top of the first.
4. Press into the abdomen with a quick upward thrust. All thrusts should be in rapid sequence.

Finger Sweep

1. Open the adult patient's mouth by grasping both the tongue and lower jaw between the thumb and fingers and lifting the mandible (tongue-jaw lift). This maneuver is to be used *only in the unconscious adult patient.* This action draws the tongue away from the back of the throat and away from the foreign body that may be lodged there.
2. If a foreign body is visible in the mouth, insert the index finger of the other hand down along the inside of the cheek and scrape across the back of the throat.
3. Use a hooking action to dislodge the foreign body and maneuver it into the mouth for removal. Care is used to avoid forcing the object deeper into the throat.

Chest Thrusts With Conscious Patient Standing or Sitting

This technique is to be used *only in the patient in advanced stages of pregnancy or in the markedly obese person.*

1. Stand behind the patient with your arms under the patient's axillae to encircle the patient's chest.
2. Place the thumb side of your fist on the middle of the patient's sternum, taking care to avoid the xiphoid process and the margins of the rib cage.
3. Grasp your fist with the other hand and perform backward thrusts until the foreign body is expelled or the patient becomes unconscious. Each thrust should be administered with the intent of relieving the obstruction. All thrusts should be in rapid sequence.

Chest Thrust With Patient Lying (Unconscious)

This maneuver is *used only in the patient in advanced stages of pregnancy or when the rescuer cannot apply the Heimlich maneuver effectively to the unconscious, markedly obese person.*

1. Place the patient on the back and kneel close to the side of the patient's body.
2. Place the heel of your hand on the lower half of the sternum.
3. Deliver each chest thrust slowly and distinctly with the intent of relieving the obstruction.

Adapted from American Heart Association. (2005). BLS for healthcare providers. Available at: www.americanheart.org.

against the posterior pharynx and obstructing the airway. It also allows health care providers to suction secretions.

Endotracheal Intubation

The purpose of endotracheal intubation is to establish and maintain the airway in patients with respiratory insufficiency or hypoxia. Endotracheal intubation is indicated to establish an airway for a patient who cannot be adequately ventilated with an oropharyngeal airway, bypass an upper airway obstruction, prevent aspiration, permit connection of the patient to a resuscitation bag or mechanical ventilator, or facilitate the removal of tracheobronchial secretions (Fig. 71-1). Because the procedure requires skill, endotracheal intubation is performed only by those who have had extensive training. These may include physicians, nurse anesthetists, respiratory therapists, flight nurses, and nurse practitioners. However, the emergency nurse is commonly called on to assist with intubation.

Rapid sequence intubation may be indicated, which provides management of the patient in a situation similar to that in the operating room. Medications used to facilitate rapid sequence intubation include a sedative, an analgesic, and a neuromuscular blockade agent; these are usually administered by the practitioner performing the intubation.

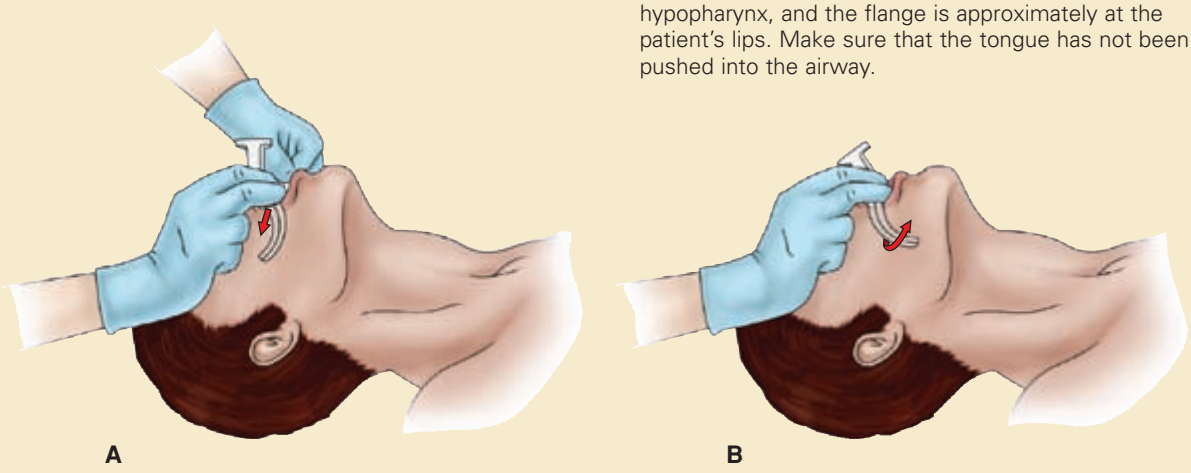
Intubation With a Combitube or Laryngeal Mask Airway

If the patient is not hospitalized and cannot be intubated in the field, emergency medical personnel may insert a Combitube, which rapidly provides pharyngeal ventilation. When the tube is inserted into the trachea, it functions like an endotracheal tube (Fig. 71-2).

The two balloons that surround the tube are inflated after the tube is inserted. One balloon is large (100 mL) and occludes the oropharynx. This permits ventilation by forcing air through the larynx. The smaller balloon is inflated with 15 mL of air and is supposed to anchor the device in the esophagus at a site distal to the glottis; however, it can occlude the trachea if it is inadvertently placed there. Breath sounds are auscultated after balloon inflation to make sure that the oropharyngeal balloon (or cuff) does not obstruct the glottis. The patient can be ventilated through either one of the two ports (eg, tracheal or esophageal) of

Chart 71-4 • *Inserting an Oropharyngeal Airway*

1. Measure the oral airway alongside the head. The airway should reach from lip to ear.
2. Extend the patient's head by placing one hand under the bony chin (*only if the cervical spine is uninjured*). With the other hand, tilt the head backward by applying pressure to the forehead while simultaneously lifting the chin forward.
3. Open the patient's mouth.
4. **(A)** Insert the oropharyngeal airway with the tip facing up toward the roof of the mouth until it passes the uvula. **(B)** Rotate the tip 180 degrees so that the tip is pointed down toward the pharynx. This displaces the tongue anteriorly, and the patient then breathes through and around the airway.
5. The distal end of the oropharyngeal airway is in the hypopharynx, and the flange is approximately at the patient's lips. Make sure that the tongue has not been pushed into the airway.



the tube, depending on whether the tube is placed in the trachea or esophagus.

If it is difficult to establish an airway, a laryngeal mask airway (LMA) may be inserted as an interim airway device. The design of the LMA provides a "mask" in the subglottic airway with a cuff inflated within the esophagus. It allows easy insertion for rapid airway control until a more definitive airway can be placed. Some LMAs also permit removal of secretions from the esophagus (see Chapter 19).

Cricothyroidotomy (Cricothyroid Membrane Puncture)

Cricothyroidotomy is the opening of the cricothyroid membrane to establish an airway. This procedure is used in emergency situations in which endotracheal intubation is either not possible or contraindicated, as in airway obstruction from extensive maxillofacial trauma, cervical spine injuries, laryngospasm, laryngeal edema (after an allergic reaction or extubation), hemorrhage into neck tissue, or obstruction of the larynx. A cricothyroidotomy is replaced with a formal tracheostomy when the patient is able to tolerate this procedure.

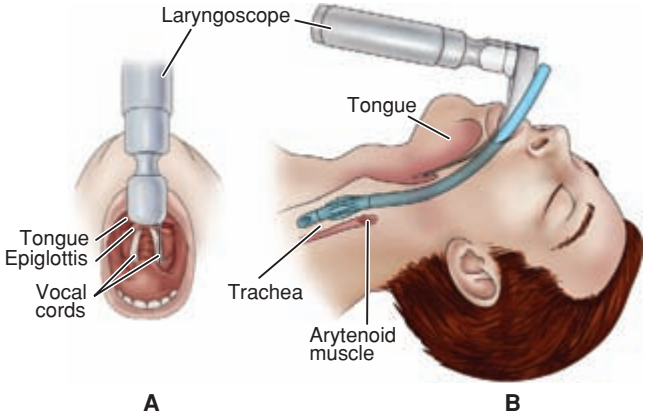


Figure 71-1 Endotracheal intubation in a patient without a cervical spine injury. **A,** The primary glottic landmarks for tracheal intubation as visualized with proper placement of the laryngoscope. **B,** Positioning the endotracheal tube.

Maintaining Ventilation

Only a few conditions, such as an obstructed airway or a sucking wound of the chest, take precedence over the immediate control of hemorrhage. After the airway is determined to be unobstructed, the nurse must ensure that ventilation is adequate by checking for equal bilateral breath sounds. Satisfactory management of ventilations may prevent hypoxia and hypercapnia. The nurse must quickly assess for absent or diminished breath sounds, open chest wounds, and difficulty delivering artificial breaths for the patient. The nurse should monitor pulse oximetry, capnography, and arterial blood gases if the patient requires airway or ventilatory assistance. A tension pneumothorax can mimic hypovolemia, so ventilatory assessment precedes assessment for hemorrhage. A pneumothorax (both simple and tension) or sucking (open) chest wound is managed with a chest tube; immediate relief of increasing positive intrathoracic pressure and maintenance of adequate ventilation should occur immediately.

HEMORRHAGE

Stopping bleeding is essential to the care and survival of patients in an emergency or disaster situation. Hemorrhage that results in the reduction of circulating blood

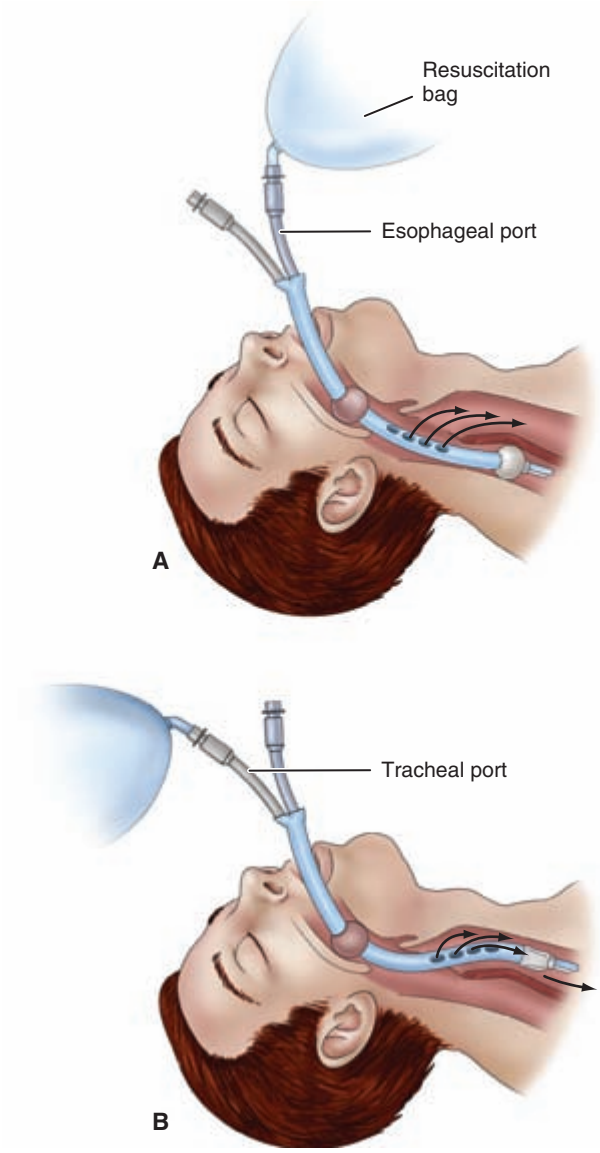


Figure 71-2 **A,** Combitude in esophageal position. **B,** Combitude tracheal position.

volume is a primary cause of shock. Minor bleeding, which is usually venous, generally stops spontaneously unless the patient has a bleeding disorder or has been taking anticoagulants.

The patient is assessed for signs and symptoms of shock: cool, moist skin (resulting from poor peripheral perfusion), decreasing blood pressure, increasing heart rate, delayed capillary refill, and decreasing urine volume (see Chapter 15). The goals of emergency management are to control the bleeding, maintain adequate circulating blood volume for tissue oxygenation, and prevent shock. Patients who hemorrhage are at risk for cardiac arrest caused by hypovolemia with secondary anoxia. Nursing interventions are carried out collaboratively with other members of the emergency health care team.

Management

Fluid Replacement

Whenever a patient is hemorrhaging—whether externally or internally—a loss of circulating blood results in a fluid volume deficit and decreased cardiac output. Therefore, fluid replacement is imperative to maintain circulation. Typically, two large-gauge IV catheters are inserted to provide a means for fluid and blood replacement, and blood samples are obtained for analysis, typing, and cross-matching. Replacement fluids are administered as prescribed, depending on clinical estimates of the type and volume of fluid lost. Replacement fluids may include isotonic electrolyte solutions (eg, lactated Ringer's, normal saline), colloids, and blood component therapy.

Packed red blood cells are infused when there is massive blood loss, which may also necessitate transfusion of other blood components, including platelets and clotting factors. (See Chapter 33 for full discussion of blood component therapy indications and treatment.)

NURSING ALERT

The infusion rate is determined by the severity of the blood loss and the clinical evidence of hypovolemia. If massive blood replacement is necessary, the blood must be warmed in a commercial blood warmer, because administration of large amounts of blood that has been refrigerated has a core cooling effect that may lead to cardiac arrest and coagulopathy.

Control of External Hemorrhage

If a patient is hemorrhaging externally (eg, from a wound), a rapid physical assessment is performed as the patient's clothing is cut away in an attempt to identify the area of hemorrhage. Direct, firm pressure is applied over the bleeding area or the involved artery at a site that is proximal to the wound (Fig. 71-3). Most bleeding can be stopped or at least controlled by application of direct pressure. Otherwise, unchecked arterial bleeding results in death. A firm pressure dressing is applied, and the injured part is elevated to stop venous and capillary bleeding if possible. If the injured area is an extremity, the extremity is immobilized to control blood loss.

A tourniquet is applied to an extremity only as a *last resort* when the external hemorrhage cannot be controlled in any other way and immediate surgery is not feasible. Care must be taken when applying a tourniquet because of the risk of loss of the extremity. The tourniquet is applied just proximal to the wound and tied tightly enough to control arterial blood flow. The patient is tagged with a skin-marking pencil or on adhesive tape on the forehead with a "T," stating the location of the tourniquet and the time applied (Lakstein, Blumenfeld, Sokolov, et al., 2003). If there is no arterial bleeding, the tourniquet is removed and a pressure dressing is applied. If the patient has suffered a traumatic amputation with uncontrollable hemorrhage, the tourniquet remains in place until the patient is in the operating room.

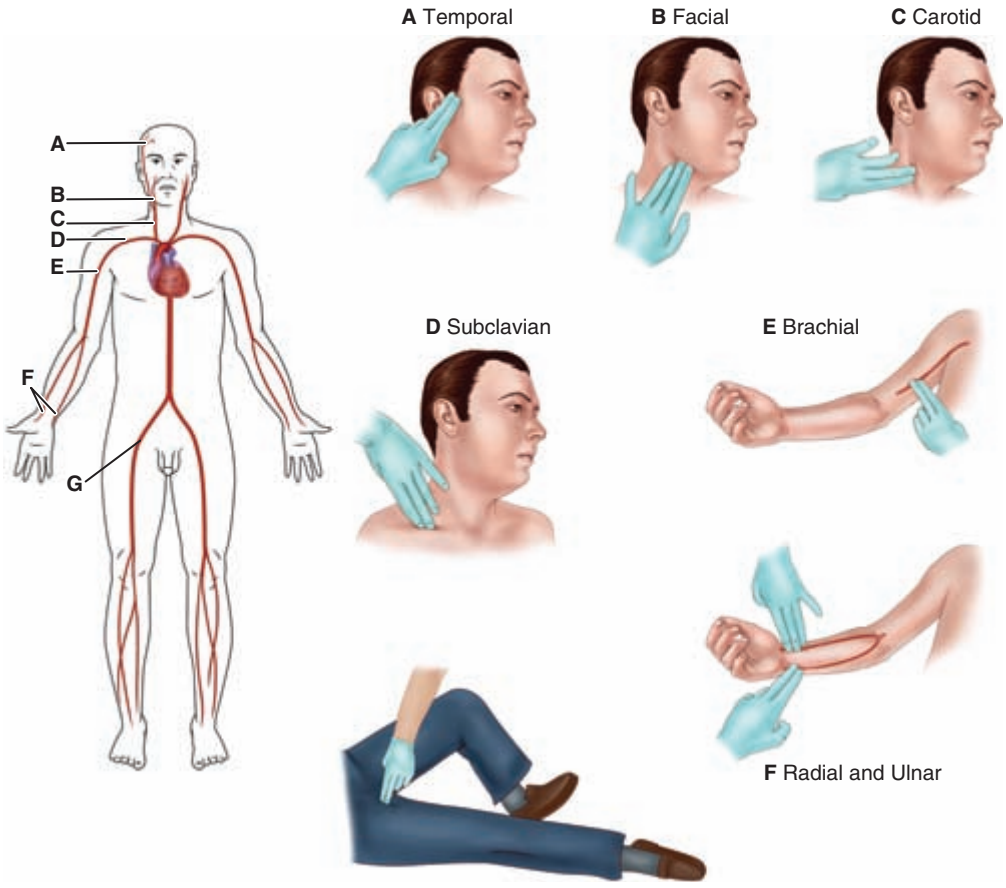


Figure 71-3 Pressure points for control of hemorrhage.

Control of Internal Bleeding

If the patient shows no external signs of bleeding but exhibits tachycardia, falling blood pressure, thirst, apprehension, cool and moist skin, or delayed capillary refill, internal hemorrhage is suspected. Typically, packed red blood cells are administered at a rapid rate, and the patient is prepared for more definitive treatment (eg, surgery, pharmacologic therapy). In addition, arterial blood gas specimens are obtained to evaluate pulmonary function and tissue perfusion and to establish baseline hemodynamic parameters, which are then used as an index for determining the amount of fluid replacement the patient can tolerate and the response to therapy. The patient is maintained in the supine position and monitored closely until hemodynamic or circulatory parameters improve, or until he or she is transported to the operating room or intensive care unit.

HYPOVOLEMIC SHOCK

Shock is a condition in which there is loss of effective circulating blood volume. Inadequate organ and tissue perfusion follows, ultimately resulting in cellular metabolic derangements. In any emergency situation, the onset of shock should be anticipated by assessing all injured people immediately. The underlying cause of shock (hypovolemic, cardiogenic, neurogenic, anaphylactic or septic) must be determined. Of these, hypovolemia is the most common cause (see Chapter 15 for further discussion of management of hypovolemic shock).

WOUNDS

Wounds involving injury to soft tissues can vary from minor tears to severe crushing injuries. The types of wounds that may occur are defined in Chart 71-5. The primary goal of treatment is to restore the physical integrity and function of the injured tissue while minimizing scarring and preventing infection. Proper documentation of the characteristics of the wound, using precise descriptions and correct terminology, is essential. Such information may be needed in the future for forensic evidence. Photographs are helpful because they provide an accurate, visible depiction of the wound. Photographs also become important for exigent wounds (ie, wounds that will eventually heal). Patients involved in domestic violence or trauma may need the photographs later to visually describe the extent of injury.

Determining *when* and *how* the wound occurred is important because a treatment delay increases infection risk. Using aseptic technique, the clinician inspects the wound to determine the extent of damage to underlying structures

Chart 71-5 • *Definition of Terms: Wounds*

Laceration: skin tear with irregular edges and vein bridging
Avulsion: tearing away of tissue from supporting structures
Abrasion: denuded skin
Ecchymosis/contusion: blood trapped under the surface of the skin
Hematoma: tumorlike mass of blood trapped under the skin
Stab: incision of the skin with well-defined edges, usually caused by a sharp instrument; a stab wound is typically deeper than long
Cut: incision of the skin with well-defined edges, usually longer than deep
Patterned: wound representing the outline of the object (eg, steering wheel) causing the wound

or the presence of a foreign body. Sensory, motor, and vascular function is evaluated for changes that might indicate complications.

Management

Wound Cleansing

Hair around the wound may be clipped (only as directed) if it is anticipated that the hair will interfere with wound closure. Typically, the area around the wound is cleansed with normal saline solution or a polymer agent (eg, Shur-Clens). Antibacterial agents, such as povidone-iodine (Betadine) or hydrogen peroxide, should not be allowed to get deep into the wound without thorough rinsing. These agents are used only for the initial cleansing because they injure exposed and healthy tissue, resulting in further tissue damage.

If indicated, the area is infiltrated with a local intradermal anesthetic through the wound margins or by regional block. Patients with soft tissue injuries usually have localized pain at the site of injury. The nurse then assists with cleaning and débriding the wound. The wound is irrigated gently and copiously with sterile isotonic saline solution to remove surface dirt. Devitalized tissue and foreign matter are removed because they impede healing and may promote infection. Any small bleeding vessels are clamped, tied, or cauterized. After wound treatment, a nonadherent dressing is applied to protect the wound and to serve as a splint and as a reminder to the patient that the area is injured.

Primary Closure

The decision to suture a wound depends on the nature of the wound, the time since the injury was sustained, the degree of contamination, and the vascularity of tissues. If primary closure is indicated, the wound is sutured or stapled, usually by the physician, with the patient receiving either local anesthesia or moderate sedation (see Chapter 19). Wound closure begins when subcutaneous fat is brought together loosely with a few sutures to close off the dead space. The subcuticular layer is then closed, and finally the epidermis is closed. Sutures are placed near the wound edge, with the skin edges leveled carefully to promote optimal healing. Instead of sutures, sterile strips of reinforced microporous tape or a bonding agent (skin glue) may be used to close clean, superficial wounds.

Delayed Primary Closure

Delayed primary closure may be indicated if tissue has been lost or there is a high potential for infection. A thin layer of gauze (to ensure drainage and prevent pooling of exudate), covered by an occlusive dressing, may be used. The wound is splinted in a functional position to prevent motion and decrease the possibility of contracture.

If there are no signs of suppuration (formation of purulent drainage), the wound may be sutured (with the patient receiving a local anesthetic). Use of antibiotics to prevent infection depends on factors such as how the injury occurred, the age of the wound, and the risk of contamination. The site is immobilized and elevated to limit accumulation of fluid in the interstitial spaces of the wound.

Tetanus prophylaxis is administered as prescribed, based on the condition of the wound and the patient's immunization status. If the patient's last tetanus booster was administered more than 5 years ago, or if the patient's immunization status is unknown, a tetanus booster must be given (American College of Surgeons [ACS], 2008). The patient is instructed about signs and symptoms of infection and is instructed to contact the health care provider or clinic if there is sudden or persistent pain, fever or chills, bleeding, rapid swelling, foul odor, drainage, or redness surrounding the wound.

TRAUMA

Trauma (an unintentional or intentional wound or injury inflicted on the body from a mechanism against which the body cannot protect itself) is the fourth leading cause of death in the United States. Trauma is the leading cause of death in children and in adults younger than 44 years of age. The incidence is increasing in adults older than 44 years of age. Alcohol and drug abuse are often implicated as factors in both blunt and penetrating trauma (McQuillan, VonReuden, Hartsock, et al., 2008).

Collection of Forensic Evidence

In assessing and managing any patient with an emergency condition, but especially the patient experiencing trauma, meticulous documentation is essential. Included in documentation are descriptions of all wounds, mechanism of injury, time of events, and collection of evidence. In trauma care, the nurse must be exceedingly careful with all potential evidence, handling and documenting it properly.

The basics of care management for patients with traumatic injury include an understanding that trauma in any patient (living or dead) has potential legal or forensic implications if criminal activity is suspected. Hence, proper management from both a medical and forensic perspective is essential.

When clothing is removed from the patient who has experienced trauma, the nurse must be careful not to cut through or disrupt any tears, holes, blood stains, or dirt present on the clothing if criminal activity is suspected. Each piece of clothing should be placed in an individual paper bag. If the clothing is wet, it should be hung to dry. Clothing should not be given to families. Valuables should be inventoried and either

placed in the hospital safe or it should be clearly documented to which family member they were given. If a police officer is present to collect clothing or any other items from the patient, each item is labeled. The transfer of custody to the officer, the officer's name, the date, and the time are documented.

If suicide or homicide is suspected in a deceased trauma patient, the medical examiner examines the body on site or has the body moved to the coroner's office for autopsy. All tubes and lines must remain in place. The patient's hands must be covered with paper bags to protect evidence on the hands or under the fingernails. In the surviving patient, tissue specimens may be swabbed from the hands and nails as potential evidence. Photographs of wounds or clothing are essential and should include a reference ruler in one photo and one without the ruler.

Documentation should also include any statements made by the patient in the patient's own words and surrounded by quotation marks. A chain of evidence is essential. If the patient's case is reviewed in a court of law in the future, clear documentation assists the judicial process and helps to identify the activities that occurred in the ED.

Injury Prevention

Any discussion of trauma management must address injury prevention. A component of the emergency nurse's daily role is to provide injury prevention information to every patient with whom there is contact, including patients admitted for reasons other than injury. The only way to reduce the incidence of trauma is through prevention.

There are three components of injury prevention. The first is education. Providing information and materials to help prevent violence and to maintain safety at home and in vehicles is important. Involvement in local injury prevention organizations, nursing organizations, and health fairs promotes wellness and safety. In practice, nursing and other health care professionals should avoid using the word "accident," because trauma events are *preventable* and should be viewed as such rather than as "fate" or "happenstance." Responsibility and accountability must be assigned to traumatic incidents, particularly because of the high rate of trauma recidivism (repeated trauma). People who are at risk for trauma and trauma recidivism should be identified and provided with education and counseling directed toward altering risky behaviors and preventing further trauma (ENA, 2007).

The second component of injury prevention is legislation. Nurses should be actively involved in safety legislation at the local, state, and federal levels. Such legislation is meant to provide universal safety measures, not to infringe on rights.

The third component is automatic protection. Airbags and automotive design are included in this category. These mechanisms provide for safety without requiring personal intervention.

Multiple Trauma

Multiple trauma is caused by a single catastrophic event that causes life-threatening injuries to at least two distinct organs or organ systems. Patients with single-system trauma still receive full assessment, because even single-system injuries can be life-threatening or more severe than they initially appear. Mortality in patients with multiple trauma is related to the severity of the injuries and the number of systems and organs involved. Immediately after injury, the body is hypermetabolic, hypercoagulable, and severely stressed.

Care of the patient with multiple injuries requires a team approach, with one person responsible for coordinating the treatment. The nursing staff assumes responsibility for assessing and monitoring the patient, ensuring airway and IV access, administering prescribed medications, collecting laboratory specimens, and documenting activities and the patient's subsequent responses.

Assessment and Diagnostic Findings

Evidence of trauma may be sparse or absent. Patients with multiple trauma should be assumed to have a spinal cord injury until it is proven otherwise. The injury regarded as the least significant in appearance may be the most lethal. For example, the pelvic fracture not identified until an x-ray is obtained may cause rapid and massive hemorrhage into the pelvic cavity, but an obvious amputation of the arm may have already stopped bleeding from the body's normal response of vasoconstriction.

Management

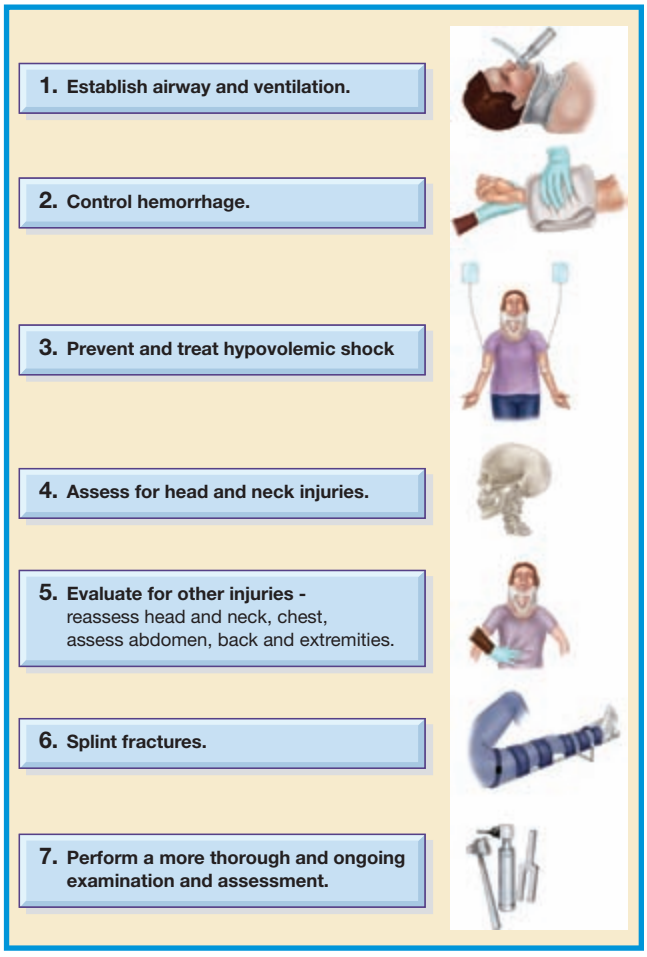
The goals of treatment are to determine the extent of injuries and to establish priorities of treatment. Any injury interfering with a vital physiologic function (eg, airway, breathing, circulation) is an immediate threat to life and has the highest priority for immediate treatment. Essential life-saving procedures are performed simultaneously by the emergency team. As soon as the patient is resuscitated, clothes are removed or cut off and a rapid physical assessment is performed. Transfer from field management to the ED must be orderly and controlled, with attention given to the verbal report from emergency medical services. Treatment in a trauma center is appropriate for patients experiencing major trauma. Treatment priorities are presented in Chart 71-6.

Intra-Abdominal Injuries

Intra-abdominal injuries are categorized as penetrating or blunt trauma. *Penetrating* abdominal injuries (ie, gunshot wounds, stab wounds) are serious and usually require surgery. Penetrating abdominal trauma results in a high incidence of injury to hollow organs, particularly the small bowel. The liver is the most frequently injured solid organ. In gunshot wounds, the most important prognostic factor is the velocity at which the missile enters the body. High-velocity missiles (bullets) produce extensive tissue damage. All abdominal gunshot wounds that cross the peritoneum or are associated with peritoneal signs require surgical exploration. On the other hand, some stab wounds may be managed nonoperatively due to low velocity and less penetration of the implement (ie, weapon).

Blunt trauma to the abdomen may result from motor vehicle crashes, falls, blows, or explosions. Blunt trauma is commonly associated with extra-abdominal injuries to the chest, head, or extremities. Patients with blunt trauma are a

Chart 71-6 • *Priority Management in Patients with Multiple Injuries*



challenge because injuries may be difficult to detect. The incidence of delayed and trauma-related complications is greater than for penetrating injuries. This is especially true of blunt injuries involving the liver, kidneys, spleen, or blood vessels, which can lead to massive blood loss into the peritoneal cavity.

Assessment and Diagnostic Findings

As the history of the traumatic event is obtained, the abdomen is inspected as a part of the secondary survey for obvious signs of injury, including penetrating injuries, bruises, and abrasions. Abdominal assessment continues with auscultation of bowel sounds to provide baseline data from which changes can be noted. Absence of bowel sounds may be an early sign of intraperitoneal involvement, although stress can also decrease or halt peristalsis and bowel sounds. Further abdominal assessment may reveal progressive abdominal distention, involuntary guarding, tenderness, pain, muscular rigidity, or rebound tenderness along with changes in bowel sounds, all of which are signs of peritoneal irritation. Hypotension and signs and symptoms of shock may also be noted. Additionally, the chest and other body systems are assessed for injuries that frequently accompany intra-abdominal injuries.

Laboratory studies that aid in assessment include the following:

- Urinalysis to detect hematuria (indicative of a urinary tract injury)
- Serial hemoglobin and hematocrit levels to evaluate trends reflecting the presence or absence of bleeding
- White blood cell (WBC) count to detect elevation (generally associated with trauma)
- Serum amylase analysis to detect increasing levels, which suggest pancreatic injury or perforation of the gastrointestinal tract

Internal Bleeding

Hemorrhage frequently accompanies abdominal injury, especially if the liver or spleen has been traumatized. Therefore, the patient is assessed continuously for signs and symptoms of external and internal bleeding. The front of the body, flanks, and back are inspected for bluish discoloration, asymmetry, abrasion, and contusion. Abdominal computed tomography (CT) scans permit detailed evaluation of abdominal contents and retroperitoneal examination. Abdominal ultrasounds can rapidly assess hemodynamically unstable patients to detect intraperitoneal bleeding. This is referred to as the focused assessment sonography for trauma (FAST) examination (Kirkpatrick, Sirois, Laupland, et al., 2005). Pain in the left shoulder is common in a patient with bleeding from a ruptured spleen, whereas pain in the right shoulder can result from laceration of the liver. During the resuscitation period, pain is managed using administration of small dosages of opioids (ACS, 2008).

Intraperitoneal Injury

The abdomen is assessed for tenderness, rebound tenderness, guarding, rigidity, spasm, increasing distention, and pain. Referred pain is a significant finding because it suggests intraperitoneal injury. To determine if there is intraperitoneal injury and bleeding, the patient is usually prepared for diagnostic procedures, such as peritoneal lavage, abdominal ultrasonography, or abdominal CT scanning. **Diagnostic peritoneal lavage** (DPL), although no longer the standard diagnostic study used to evaluate a traumatized abdomen, remains a backup procedure that is easily performed and is very useful during mass casualty situations when CT scanners may not be readily available. DPL involves the instillation of 1 L of warmed lactated Ringer's or normal saline solution into the abdominal cavity. After a minimum of 400 mL has been returned, a fluid specimen is sent to the laboratory for analysis. Positive laboratory findings include a red blood cell count greater than 100,000/mm^3; a WBC count greater than 500/mm^3; or the presence of bile, feces, or food.

In patients with stab wounds, sinography may be performed to detect peritoneal penetration; a purse-string suture is placed around the wound and a small catheter is introduced through the wound. A contrast agent is then introduced through the catheter, and x-rays are taken to identify any peritoneal penetration.

Genitourinary Injury

A focused genitourinary examination, which typically includes a rectal and/or vaginal examination, is performed to determine any injury to the pelvis, bladder, urethra, or intestinal

wall. To decompress the bladder and monitor urine output, an indwelling catheter is inserted after a rectal examination has been completed (not before). In the male patient, a high-riding prostate gland (abnormal position) discovered during a rectal examination indicates a potential urethral injury.

NURSING ALERT

Urethral catheter insertion with a possible urethral injury is contraindicated; a urology consultation and further evaluation of the urethra are required.

Management

As indicated by the patient's condition, resuscitation procedures (restoration of airway, breathing, and circulation) are initiated as previously described.

With blunt trauma, the patient is kept on a stretcher to immobilize the spine. A backboard may be used for transporting the patient to the x-ray department, to the operating room, or to the intensive care unit. Cervical spine immobilization is maintained until cervical x-rays have been obtained and cervical spine injury has been ruled out. Likewise, once the patient has arrived at the definitive destination, the backboard is removed, and logrolling can be used to protect the spine until x-rays are obtained and confirm there is no evidence of injuries.

Knowing the mechanism of injury (eg, penetrating force from a gunshot or knife, blunt force from a blow) is essential to determining the type of management needed. All wounds are located, counted, and documented. If abdominal viscera protrude, the area is covered with sterile, moist saline dressings to keep the viscera from drying.

Typically, oral fluids are withheld in anticipation of surgery, and the stomach contents are aspirated with a nasogastric tube to reduce the risk of aspiration and to decompress the stomach in preparation for diagnostic procedures.

Trauma predisposes the patient to infection by disruption of mechanical barriers, exposure to exogenous bacteria from the environment at the time of injury, aspiration of vomitus, and diagnostic and therapeutic procedures (hospital-acquired infection). Tetanus prophylaxis and broad-spectrum antibiotics are administered as prescribed.

Throughout the stay in the ED, the patient's condition is continuously monitored for changes. If there is continuing evidence of shock, blood loss, free air under the diaphragm, evisceration, hematuria, severe head injury, or suspected or known abdominal injury, the patient is rapidly transported to surgery. In most cases, blunt liver and spleen injuries are managed nonsurgically.

Crush Injuries

Crush injuries occur when a person is caught between opposing forces (eg, run over by a moving vehicle, crushed between two cars, crushed under a collapsed building).

Assessment and Diagnostic Findings

The patient is observed for the following:

- Hypovolemic shock resulting from extravasation of blood and plasma into injured tissues after compression has been released
- Paralysis of a body part
- Erythema and blistering of skin
- Damaged body part (usually an extremity) appearing swollen, tense, and hard
- Renal dysfunction (prolonged hypotension causes kidney damage and acute renal insufficiency; myoglobinuria secondary to muscle damage can cause acute tubular necrosis and acute renal failure)

Management

In conjunction with maintaining the airway, breathing, and circulation, the patient is observed for acute renal insufficiency. Injury to the back can cause kidney damage. Severe muscular damage may cause rhabdomyolysis, which signifies a release of myoglobin from ischemic skeletal muscle, resulting in acute tubular necrosis. In addition, major soft tissue injuries are splinted promptly to control bleeding and pain. The serum lactic acid level is monitored; a decrease to less than 2.5 mmol/L is an indication of successful resuscitation (Blow, Magliore, Claridge, et al., 1999).

If an extremity is injured, it is elevated to relieve swelling and pressure. If compartment syndrome develops, the physician may perform a **fasciotomy** (ie, surgical incision to the level of the fascia) to restore neurovascular function (see Chapter 69). Medications for pain and anxiety are then administered as prescribed, and the patient is quickly transported to the operating suite for wound débridement and fracture repair. A hyperbaric oxygen chamber (if available) may be used to hyperoxygenate crushed tissue, if indicated.

Fractures

Immediate appropriate management of a fracture may determine the patient's eventual outcome and may mean the difference between recovery and disability. When the patient is being examined for fracture, the body part is handled gently and as little as possible. Clothing is cut off to visualize the affected body part. Assessment is conducted for pain over or near a bone, swelling (from blood, lymph, and exudate infiltrating the tissue), and circulatory disturbance. The patient is assessed for ecchymosis, tenderness, and crepitation (see Chapter 69). The nurse must remember that the patient may have multiple fractures accompanied by head, chest, spine, or abdominal injuries.

Management

Immediate attention is given to the patient's general condition. Assessment of airway, breathing, and circulation (which includes pulses in the extremities) is conducted. The patient is also evaluated for neurologic or abdominal injuries before the extremity is treated, unless a pulseless extremity is detected.

If a pulseless extremity is identified, repositioning of the extremity to proper alignment is required. If the pulseless extremity involves a fractured hip or femur, **Hare traction** (a portable in-line traction device) may be applied to assist with alignment. If repositioning is ineffective in restoring the pulse, a rapid total-body assessment must be completed, followed by transfer of the patient to the operating room for arteriography and possible arterial repair.

After the initial evaluation has been completed, all injuries identified are evaluated and treated. The fractured body part is inspected. Using a systematic head-to-toe approach, the nurse inspects the entire body, observing for lacerations, swelling, and deformities, including angulation (bending), shortening, rotation, and asymmetry. All peripheral pulses, especially those distal to the fractured extremity, are palpated. The extremity is also assessed for coolness, blanching, and decreased sensation and motor function, which are indicative of injury to the extremity's neurovascular supply.

A splint is applied before the patient is moved. Splinting immobilizes the joint at a site distal and proximal to the fracture, relieves pain, restores or improves circulation, prevents further tissue injury, and prevents a closed fracture from becoming an open one. To splint an extremity, one hand is placed distal to the fracture and some traction is applied while the other hand is placed beneath the fracture for support. The splints should extend beyond the joints adjacent to the fracture. Upper extremities must be splinted in a functional position. If the fracture is open, a moist, sterile dressing is applied.

After splinting, the vascular status of the extremity is checked by assessing color, temperature, pulse, and blanching of the nail bed. In addition, the patient is assessed for neurovascular compromise if pain or pressure is reported. (See Chapter 69 for a complete description of fracture management.)

ENVIRONMENTAL EMERGENCIES

Heat Stroke

Heat stroke is an acute medical emergency caused by failure of the heat-regulating mechanisms of the body. The most common cause of heat stroke is prolonged exposure to an environmental temperature of greater than 39.2°C (102.5°F). It usually occurs during extended heat waves, especially when they are accompanied by high humidity.

People at risk for heat stroke are those not acclimatized to heat, those who are elderly or very young, those unable to care for themselves, those with chronic and debilitating diseases, and those taking certain medications (eg, major tranquilizers, anticholinergics, diuretics, beta-blockers). Exertional heat stroke occurs in healthy individuals during sports or work activities (eg, exercising in extreme heat and humidity). Hyperthermia results because of inadequate heat loss. This type of heat stroke can also cause death. Strategies used to prevent heat stroke are reviewed in Chart 71-7.

Another form of heat stroke is heat exhaustion in which the patient's temperature may be normal to 40°C (104°F). The patient demonstrates weakness, hypotension, increased heart rate, and increased thirst.

Gerontologic Considerations

Most heat-related deaths occur in the elderly because their circulatory systems are unable to compensate for stress imposed by heat. Elderly people have a decreased ability to perspire as well as a decreased ability to vasodilate and vasoconstrict. They have less subcutaneous tissue, a decreased thirst mechanism, and a diminished ability to concentrate urine to compensate for heat. Many elderly people do not drink adequate amounts of fluid, partly because of fear of incontinence, and thus have a greater risk of heat stroke. In addition, many elderly people fear being victims of crime, so they tend to keep windows closed, even when the temperature and humidity levels are high.

CHART 71-7 HEALTH PROMOTION

Preventing Heat Stroke

- Advise the patient treated for heat stroke to avoid immediate reexposure to high temperatures; hypersensitivity to high temperatures may remain for a considerable time.
- Emphasize the importance of maintaining adequate fluid intake, wearing loose clothing, and reducing activity in hot weather.
- Advise athletes to monitor fluid losses and weight loss during workout activities or exercise and to replace fluids and electrolytes.
- Advise the patient to use a gradual approach to physical conditioning, allowing sufficient time for return to baseline temperature.
- Direct frail elderly patients living in urban settings with high environmental temperatures to places where air conditioning is available (eg, shopping mall, library, church).
- Advise patients to plan outdoor activities to avoid the hottest part of the day (between 10 A.M. and 2 P.M.).

Assessment and Diagnostic Findings

Heat stroke causes thermal injury at the cellular level, resulting in coagulopathies and widespread damage to the heart, liver, and kidneys. Recent patient history reveals exposure to elevated ambient temperature or excessive exercise during extreme heat. When assessing the patient, the nurse notes the following symptoms: profound central nervous system (CNS) dysfunction (manifested by confusion, delirium, bizarre behavior, coma); elevated body temperature (40.6°C [105°F] or higher); hot, dry skin; and usually anhidrosis (absence of sweating), tachypnea, hypotension, and tachycardia.

Management

The primary goal is to reduce the high body temperature as quickly as possible, because mortality is directly related to the duration of hyperthermia. Simultaneous treatment focuses on stabilizing oxygenation using the ABCs (*a*irway, *b*reathing, and circulation) of basic life support. This includes establishing IV access for fluid administration.

After the patient's clothing is removed, the core (internal) temperature is reduced to 39°C (102°F) as rapidly as possible, preferably within 1 hour (Hoyt & Selfridge-Thomas, 2007). One or more of the following methods may be used as prescribed:

- Cool sheets and towels or continuous sponging with cool water
- Ice applied to the neck, groin, chest, and axillae while spraying with tepid water
- Cooling blankets
- Immersion of the patient in a cold water bath (if possible) (Auerbach, 2007)

During cooling procedures, an electric fan is positioned so that it blows on the patient to augment heat dissipation by convection and evaporation. The patient's temperature is constantly monitored with a thermistor placed in the rectum, bladder, or esophagus to evaluate core temperature. Caution is used to avoid hypothermia and to prevent hyperthermia, which may recur spontaneously within 3 to 4 hours. The cooling process should stop at 38.8°C (102°F) in order to avoid iatrogenic hypothermia (Hoyt & Selfridge-Thomas, 2007).

Throughout treatment, the patient's status is monitored carefully, including vital signs, ECG findings (for possible myocardial ischemia, myocardial infarction, and dysrhythmias), central venous pressure (CVP), and level of responsiveness, all of which may change with rapid alterations in body temperature. A seizure may be followed by recurrence of hyperthermia. To meet tissue needs exaggerated by the hypermetabolic condition, 100% oxygen is administered. Endotracheal intubation and mechanical ventilation to support failing cardiopulmonary systems may be required.

IV infusion therapy of normal saline or lactated Ringer's solution is initiated as directed to replace fluid losses and maintain adequate circulation. Fluids are administered carefully because of the dangers of myocardial injury from high body temperature and poor renal function. Cooling redistributes fluid volume from the periphery to the core.

Urine output is also measured frequently, because acute tubular necrosis may occur as a complication of heat stroke from rhabdomyolysis (myoglobin in the urine). Blood specimens are obtained for serial testing to detect bleeding disorders, such as disseminated intravascular coagulation (DIC), and for serial enzyme studies to estimate thermal hypoxic injury to the liver, heart, and muscle tissue. Permanent liver, cardiac, and CNS damage may occur.

Additional supportive care may include dialysis for renal failure, antiseizure medications to control seizures, potassium for hypokalemia, and sodium bicarbonate to correct metabolic acidosis. Benzodiazepines (eg, diazepam [Valium]) or chlorpromazine (Thorazine) may be prescribed to suppress seizure activity. Patient education regarding the prevention of heat stroke (see Chart 71-7) is also important to prevent a recurrence.

Frostbite

Frostbite is trauma from exposure to freezing temperatures and freezing of the intracellular fluid and fluids in the intercellular spaces. It results in cellular and vascular damage. Frostbite can result in venous stasis and thrombosis. Body parts most frequently affected by frostbite include the feet, hands, nose, and ears. Frostbite ranges from first degree (redness and erythema) to fourth degree (full-depth tissue destruction).

Assessment and Diagnostic Findings

A frozen extremity may be hard, cold, and insensitive to touch and may appear white or mottled blue-white. The extent of injury from exposure to cold is not always initially known. The patient history should include environmental temperature, duration of exposure, humidity, and the presence of wet conditions.

Management

The goal of management is to restore normal body temperature. Constrictive clothing and jewelry that could impair circulation are removed. Wet clothing is removed as rapidly as possible. If the lower extremities are involved, the patient should not be allowed to ambulate.

Controlled yet rapid rewarming is instituted. Frozen extremities are usually placed in a 37°C to 40°C (98.6°F to 104°F) circulating bath for 30- to 40-minute spans. This treatment is repeated until circulation is effectively restored. Early rewarming appears to decrease the amount of ultimate tissue loss. During rewarming, an analgesic for pain is administered as prescribed, because the rewarming process may be very painful. To avoid further mechanical injury, the body part is not handled. Massage is contraindicated.

Once rewarmed, the part is protected from further injury and is elevated to help control swelling. Sterile gauze or cotton is placed between affected fingers or toes to prevent maceration, and a bulky dressing is placed on the extremity. A foot cradle may be used to prevent contact with bedclothes if the feet are involved. Hemorrhagic blebs, which may develop 1 hour to a few days after rewarming, are left intact and not ruptured. Nonhemorrhagic blisters are débrided to decrease the inflammatory mediators found in the blister fluid.

A physical assessment is conducted with rewarming to observe for concomitant injury, such as soft tissue injury, dehydration, alcohol coma, or fat embolism. Problems such as hyperkalemia (eg, from release of potassium in the damaged cells) and hypovolemia, which occur frequently in people with frostbite, are corrected. Risk of infection is also great; therefore, strict aseptic technique is used during dressing changes, and tetanus prophylaxis is administered as indicated. Nonsteroidal anti-inflammatory medication is prescribed for its anti-inflammatory effects and to control pain.

Additional measures that may be carried out when appropriate include the following:

- Whirlpool bath for the affected body parts to aid circulation and débridement of necrotic tissue to help prevent infection
- Escharotomy (incision through the eschar) to prevent further tissue damage, to allow for normal circulation, and to permit joint motion
- Fasciotomy to treat compartment syndrome

After rewarming, hourly active motion of any affected digits is encouraged to promote maximal restoration of function and to prevent contractures. Discharge instructions also include encouraging the patient to avoid tobacco, alcohol, and caffeine because of their vasoconstrictive effects, which further reduce the already deficient blood supply to injured tissues.

Hypothermia

Hypothermia is a condition in which the core (internal) temperature is 35°C (95°F) or less as a result of exposure to cold or an inability to maintain body temperature in the

absence of low ambient temperatures. Urban hypothermia (extreme exposure to cold in an urban setting) is associated with a high mortality rate; elderly people, infants, people with concurrent illnesses, and the homeless are particularly susceptible. Alcohol ingestion increases susceptibility because it causes systemic vasodilation. Some medications (eg, phenothiazines) or medical conditions (eg, hypothyroidism, spinal cord injury) decrease the ability to shiver, hampering the body's innate ability to generate body heat. Trauma victims are also at risk for hypothermia resulting from treatment with cold fluids, unwarmed oxygen, and exposure during examination. The patient may also have frostbite, but hypothermia takes precedence in treatment.

Assessment and Diagnostic Findings

Hypothermia leads to physiologic changes in all organ systems. There is progressive deterioration, with apathy, poor judgment, ataxia, dysarthria, drowsiness, pulmonary edema, acid–base abnormalities, coagulopathy, and eventual coma. Shivering may be suppressed at a temperature of less than 32.2°C (90°F), because the body's self-warming mechanisms become ineffective. The heartbeat and blood pressure may be so weak that peripheral pulses become undetectable. Cardiac dysrhythmias may also occur. Other physiologic abnormalities include hypoxemia and acidosis.

Management

Management consists of removal of wet clothing, continuous monitoring, rewarming, and supportive care.

Monitoring

The ABCs of basic life support are a priority. The patient's vital signs, CVP, urine output, arterial blood gas levels, blood chemistry determinations (blood urea nitrogen, creatinine, glucose, electrolytes), and chest x-rays are evaluated frequently. Body temperature is monitored with an esophageal, bladder, or rectal thermistor. Continuous ECG monitoring is performed, because cold-induced myocardial irritability leads to conduction disturbances, especially ventricular fibrillation. An arterial line is inserted and maintained to record blood pressure and to facilitate blood sampling.

Rewarming

Rewarming methods include active internal (core) rewarming and passive or active external (spontaneous) rewarming.

Active internal (core) rewarming methods are used for moderate to severe hypothermia (less than 28°C to 32.2°C [82.5°F to 90°F]) and include cardiopulmonary bypass, warm fluid administration, warm humidified oxygen by ventilator, and warmed peritoneal lavage. Monitoring for ventricular fibrillation as the patient's temperature increases from 31°C to 32°C (88°F to 90°F) is essential.

Passive or active external rewarming is used for mild hypothermia (32.2°C to 35°C [90°F to 95°F]). Passive active rewarming uses over-the-bed heaters to the extremities and increases blood flow to the acidotic, anaerobic extremities. The cold blood from peripheral tissues has high lactic acid levels. As this blood returns to the core, it causes a significant drop in the core temperature (ie, core temperature afterdrop) and can potentially cause cardiac dysrhythmias and electrolyte disturbances. Active external rewarming uses forced air warm blankets. Care must be taken to prevent extremity burn from these devices, because the patient may not have effective sensation to feel the burn.

Supportive Care

Supportive care during rewarming includes the following as directed:

- External cardiac compression (typically performed only as directed in patients with temperatures higher than 31°C [88°F]).
- Defibrillation of ventricular fibrillation. A patient whose temperature is less than 32°C [90°F] experiences spontaneous ventricular fibrillation if moved or touched. Defibrillation is ineffective in patients with temperatures lower than 31°C (88°F); therefore, the patient must be rewarmed first.
- Mechanical ventilation with positive end-expiratory pressure (PEEP) and heated humidified oxygen to maintain tissue oxygenation.
- Administration of warmed IV fluids to correct hypotension and to maintain urine output and core rewarming, as described previously.
- Administration of sodium bicarbonate to correct metabolic acidosis if necessary.
- Administration of antiarrhythmic medications.
- Insertion of an indwelling urinary catheter to monitor urinary output and renal function.

Near Drowning

Near drowning is defined as survival for at least 24 hours after submersion that caused a respiratory arrest. The most common consequence is hypoxemia. Drowning is the second most common cause of unintentional death in children younger than 14 years. An estimated 8000 drownings and 90,000 near drownings occur yearly in the United States (Hoyt & Selfridge-Thomas, 2007).

Factors associated with drowning and near drowning include alcohol ingestion, inability to swim, diving injuries, hypothermia, and exhaustion. The majority of drowning events occur in pools, lakes, and bathtubs. Suicide by drowning rarely occurs in pools and rarely involves alcohol (Auerbach, 2007).

Efforts to save the patient should not be abandoned prematurely. Successful resuscitation with full neurologic recovery has occurred in near-drowning patients after prolonged submersion in cold water. This is possible because of a decrease in metabolic demands and/or the diving reflex. The near-drowning process involves the onset of hypoxia, hypercapnia, bradycardia, and dysrhythmias. If there is a violent struggle associated with the near-drowning episode, exercise-induced acidosis and tachypnea can result in aspiration. Hypoxia and acidosis cause eventual apnea and loss of consciousness. When the victim loses consciousness and makes a final effort to breathe, the terminal gasp occurs. Water then moves passively into the airways prior to death.

After resuscitation, hypoxia and acidosis are the primary complications experienced by a person who has nearly

drowned; immediate intervention in the ED is essential. Resultant pathophysiologic changes and pulmonary injury depend on the type of fluid (fresh or salt water) and the volume aspirated. Fresh water aspiration results in a loss of surfactant and, therefore, an inability to expand the lungs. Salt water aspiration leads to pulmonary edema from the osmotic effects of the salt within the lungs. If a person survives submersion, acute respiratory distress syndrome (ARDS), resulting in hypoxia, hypercarbia, and respiratory or metabolic acidosis, can occur.

Management

Therapeutic goals include maintaining cerebral perfusion and adequate oxygenation to prevent further damage to vital organs. Immediate cardiopulmonary resuscitation is the factor with the greatest influence on survival. The most important priority in resuscitation is to manage the hypoxia, acidosis, and hypothermia. Prevention and management of hypoxia are accomplished by ensuring an adequate airway and respiration, thus improving ventilation (which helps correct respiratory acidosis) and oxygenation. Arterial blood gases are monitored to evaluate oxygen, carbon dioxide, bicarbonate levels, and pH. These parameters determine the type of ventilatory support needed. Use of endotracheal intubation with PEEP improves oxygenation, prevents aspiration, and corrects intrapulmonary shunting and ventilation–perfusion abnormalities (caused by aspiration of water). If the patient is breathing spontaneously, supplemental oxygen may be administered by mask. However, an endotracheal tube is necessary if the patient does not breathe spontaneously.

Because of submersion, the patient is usually hypothermic. A rectal probe is used to determine the degree of hypothermia. Prescribed rewarming procedures (eg, extracorporeal warming, warmed peritoneal dialysis, inhalation of warm aerosolized oxygen, torso warming) are started during resuscitation. The choice of warming method is determined by the severity and duration of hypothermia and available resources. Intravascular volume expansion and inotropic agents are used to treat hypotension and impaired tissue perfusion. ECG monitoring is initiated, because dysrhythmias frequently occur. An indwelling urinary catheter is inserted to measure urine output. Hypothermia and accompanying metabolic acidosis may compromise renal function. Nasogastric intubation is used to decompress the stomach and to prevent the patient from aspirating gastric contents.

Even if the patient appears healthy, close monitoring continues with serial vital signs, serial arterial blood gas values, ECG monitoring, intracranial pressure assessments, serum electrolyte levels, intake and output, and serial chest x-rays. After a near-drowning, the patient is at risk for complications such as hypoxic or ischemic cerebral injury, ARDS, pulmonary damage secondary to aspiration, and life-threatening cardiac arrest.

Decompression Sickness

Decompression sickness, also called "the bends," occurs in patients who have engaged in diving (lake, as well as ocean, diving), high-altitude flying, or flying in commercial aircraft within 24 hours after diving. It occurs relatively infrequently in the United States, but its effects can be hazardous. Being aware of decompression sickness and assessing the patient properly ensures proper management and results in the least morbidity possible.

Decompression sickness results from formation of nitrogen bubbles that occur with rapid changes in atmospheric pressure. They may occur in joint or muscle spaces, resulting in musculoskeletal pain, numbness, or hypesthesia. More significantly, nitrogen bubbles can become air emboli in the bloodstream and thereby produce stroke, paralysis, or death. Taking a rapid history about the events preceding the symptoms is essential. Recompression is necessary as soon as possible and may necessitate a low-altitude flight to the nearest hyperbaric chamber.

Assessment and Diagnostic Findings

To identify decompression sickness, a detailed history is obtained from the patient or diving partner. Evidence of rapid ascent, loss of air in the tank, buddy breathing, recent alcohol intake or lack of sleep, or a flight within 24 hours after diving suggests possible decompression sickness. Some patients describe a perfect dive yet still have the signs and symptoms of decompression sickness, and they must receive treatment for the condition.

Signs and symptoms include joint or extremity pain, numbness, hypesthesia, and loss of range of motion. Neurologic symptoms mimicking those of a stroke or spinal cord injury can indicate an air embolus. Cardiopulmonary arrest can also occur in severe cases and is usually fatal. Any neurologic symptoms should be rapidly assessed. All patients with decompression sickness need rapid transfer to a hyperbaric chamber.

Management

A patent airway and adequate ventilation are established, as described previously, and 100% oxygen is administered throughout treatment and transport. A chest x-ray is obtained to identify aspiration, and at least one IV line is started with lactated Ringer's or normal saline solution.

The cardiopulmonary and neurologic systems are supported as needed. If an air embolus is suspected, the head of the bed should be lowered. The patient's wet clothing is removed, and the patient is kept warm. Transfer to the closest hyperbaric chamber for treatment is initiated. If air transport is necessary, low-altitude flight (below 1000 feet) is required. However, the patient who is awake and alert without central neurologic deficits may be able to travel by ground ambulance or by automobile, depending on the severity of symptoms. Throughout treatment, the patient is continually assessed, and changes are documented. If aspiration is suspected, antibiotics and other treatment may be prescribed.

Anaphylactic Reaction

An anaphylactic reaction is an acute systemic hypersensitivity reaction that occurs within seconds or minutes after exposure to certain foreign substances, such as medications (eg, penicillin, iodinated contrast material), and other agents, such as latex, insect stings (eg, bee, wasp, yellow jacket, hornet), or foods (eg, eggs, peanuts). Repeated administration

Chart 71-8 • *Nursing Interventions for Preventing Anaphylactic Reactions*

- Be aware of the danger of anaphylactic reactions and the early signs of anaphylaxis.
- Ask the patient about previous allergies to medications, foods, stings, latex, pollen, peanuts, nuts from trees, eggs, and so on.
- Before giving a foreign serum or other type of antigenic agent, ask the patient or caregiver whether the agent was received at some earlier time.
- Avoid giving medications to patients with hay fever, asthma, or other allergic disorders unless necessary.
- Avoid giving parenteral medications unless absolutely necessary, because anaphylactic reactions are more likely to occur when the agent is given parenterally.
- Perform a skin test before administration of certain materials known to produce anaphylactic reactions (eg, horse serum). Remember that negative skin test results do not always indicate safety and that skin testing can precipitate anaphylaxis in highly sensitive patients. Have epinephrine, intravenous infusions, and intubation and tracheostomy equipment available as precautionary measures.
- If the patient is an outpatient, keep him or her in the office, hospital, or clinic for at least 30 minutes after injection of any agent. Caution the patient to return if symptoms develop.
- Caution patients who are highly sensitive (eg, to insect bites and stings) to carry kits equipped to treat insect stings (epinephrine). Instruct the patient, family, and significant others in the use of the emergency supplies.
- Encourage patients with allergies to wear medical identification tags or bracelets.

of parenteral or oral therapeutic agents (eg, repeated exposures to penicillin) may also precipitate an anaphylactic reaction when initially only a mild allergic response occurred. Anaphylaxis prevention strategies are given in Chart 71-8.

An anaphylactic reaction is the result of an antigen–antibody interaction in a sensitized person who, as a consequence of previous exposure, has developed a special type of antibody (immunoglobulin) that is specific for that particular allergen. Immunoglobulin E (IgE) is responsible for most of the immediate types of human allergic responses. A second exposure to the same antigen results in a more severe and more rapid response (see Chapter 53).

An anaphylactic reaction produces a wide range of clinical manifestations, especially respiratory symptoms (difficulty breathing and stridor secondary to laryngeal edema), fainting, itching, swelling of mucous membranes, and a sudden decrease in blood pressure secondary to massive vasodilation that may progress to shock (Chart 71-9). (See Chapters 15 and 53 for additional discussion and management of anaphylactic reactions.)

Insect Stings

A person may have an extreme sensitivity to the venoms of insects in the order Hymenoptera (bees, hornets, yellow jackets, fire ants, and wasps). Venom allergy is thought to be

CHART 71-9 *Assessing for Anaphylaxis*

Be alert for the following signs and symptoms:

Respiratory Signs

- Nasal congestion
- Itching
- Sneezing and coughing
- Possible respiratory distress that progresses rapidly (caused by bronchospasm or edema of the larynx)
- Chest tightness
- Other respiratory difficulties, such as wheezing, dyspnea, and cyanosis

Skin Manifestations

- Flushing with a sense of warmth and diffuse erythema
- Generalized itching over the entire body (indicates developing general systemic reaction)
- Urticaria (hives)
- Massive facial angioedema possible with accompanying upper respiratory edema

Cardiovascular Manifestations

- Tachycardia or bradycardia
- Peripheral vascular collapse as indicated by
  - Pallor
  - Imperceptible pulse
  - Decreasing blood pressure
  - Circulatory failure, leading to coma and death

Gastrointestinal Problems

- Nausea
- Vomiting
- Colicky abdominal pains
- Diarrhea

an IgE-mediated reaction, and it constitutes an acute emergency. Although stings in any area of the body can trigger anaphylaxis, stings of the head and neck or multiple stings are especially serious.

Clinical manifestations range from generalized urticaria, itching, malaise, and anxiety due to laryngeal edema to severe bronchospasm, shock, and death. Generally, the shorter the time between the sting and the onset of severe symptoms, the worse the prognosis.

Management includes stinger removal if the sting is from a bee because the venom is associated with sacs around the barb of the stinger itself. The stinger is removed with one quick scrape of a fingernail over the site. Wound care with soap and water is sufficient for stings. Scratching is avoided because it results in a histamine response. Ice application reduces swelling and also decreases venom absorption. An oral antihistamine and analgesic will decrease the itching and pain.

In the case of an anaphylactic or severe allergic response, the patient is treated as discussed previously in Chapter 53. Desensitization therapy should be given to people who have had systemic or significant local reactions. Patient and family education is an important measure in preventing exposure to stinging insects (Chart 71-10).

CHART 71-10 PATIENT EDUCATION

Limiting Exposure to Stinging Insects

To Minimize Your Chances of Being Stung:

- Avoid places where stinging insects congregate, such as camp and picnic sites, and insect feeding areas, such as flower beds, ripe fruit orchards, garbage, and fields of clover.
- Wear covering on the feet, and avoid going barefoot outdoors, because yellow jackets nest and pollinate on the ground.
- Avoid perfumes, scented soaps, and bright colors, which attract bees.
- Keep car windows closed.
- Spray garbage cans with quick-acting insecticide.
- Secure a professional exterminator to dispose of wasp and hornet nests or beehives in the home area.
- Remain motionless if an insect is buzzing around. Motion, especially running, increases the likelihood of being stung.
- If allergic, carry a self-treatment kit containing injectable (EpiPen) and inhalant forms of epinephrine, an oral antihistamine, and written instructions. Carry it with you at all times.

If You are Stung, Do the Following:

1. Inject self immediately with epinephrine if allergy is known or allergic response occurs.
2. Remove the stinger with one quick scrape of the fingernail. *Do not* squeeze the venom sac because this may cause injection of additional venom.
3. Clean the area with soapy water, and apply ice.
4. Report to the nearest health care facility for further examination if allergic response or allergy is suspected.

Animal and Human Bites

Bites are a common reason for visits to the ED. Dog bites constitute 90% of these bites and are responsible for the majority of deaths from bites by a nonvenomous animal. Cat bites have a high risk of infection because of the presence of *Pasteurella* in their saliva. All animal bites must be reported to public health authorities, which must provide follow-up screening of the offending animal for rabies. If the animal cannot be located and rabies vaccination verified, rabies prophylaxis for the person who has been bitten must be instituted.

Human bites are frequently associated with rapes, sexual assaults, or other forms of battery. The human mouth contains more bacteria than that of most other animals, so a high risk of bite-related infection exists. Depending on the circumstances surrounding the event, the victim may delay seeking treatment. The ED nurse should inspect any bitten tissue for pus, erythema, or necrosis. A health care provider should take photographs, which can be used as evidence in criminal and legal proceedings. Cleansing with soap and water is then necessary, followed by the administration of antibiotics and tetanus toxoid as prescribed.

Snake Bites

Venomous (poisonous) snakes cause 7000 to 8000 bites in the United States each year and result in 10 to 15 deaths (Hoyt & Selfridge-Thomas, 2007). Children between 1 and 9 years of age are the most likely victims. The greatest number of bites occurs during the daylight hours and early evening of the summer months. The most frequent poisonous snake bite occurs from pit vipers (Crotalidae). The most common site is the upper extremity. Of these bites, only 20% to 25% result in **envenomation** (injection of a poisonous material by sting, spine, bite, or other means). Venomous snake bites are medical emergencies (Daley & Barbee, 2008).

Nineteen different species of venomous snakes are found in various regions within the United States. Nurses should be familiar with the types of snakes common to the geographic region in which they practice.

Clinical Manifestations

Snake venom consists primarily of proteins and has a broad range of physiologic effects. It may affect multiple organ systems, especially the neurologic, cardiovascular, and respiratory systems.

Classic clinical signs of envenomation are edema, ecchymosis, and hemorrhagic bullae, leading to necrosis at the site of envenomation. Symptoms include lymph node tenderness, nausea, vomiting, numbness, and a metallic taste in the mouth. Without decisive treatment, these clinical manifestations may progress to include fasciculations, hypotension, paresthesias, seizures, and coma (Daley & Barbee, 2008).

Management

Initial first aid at the site of the snake bite includes having the person lie down, removing constrictive items such as rings, providing warmth, cleansing the wound, covering the wound with a light sterile dressing, and immobilizing the injured body part below the level of the heart. Airway, breathing, and circulation are the priorities of care. Ice or a tourniquet is *not* applied. Initial evaluation in the ED is performed quickly and includes information about the following:

- Whether the snake was venomous or nonvenomous; if the snake is dead, it should be transported to the ED with the patient for identification. However, caution should be taken when handling the transported snake. Frequently, the patient and family transport the snake in a stunned, not dead, state.
- Where and when the bite occurred and the circumstances of the bite
- Sequence of events, signs and symptoms (fang punctures, pain, edema, and erythema of the bite and nearby tissues)
- Severity of poisonous effects
- Vital signs
- Circumference of the bitten extremity or area at several points; the circumference of the extremity that was bitten is compared with the circumference of the opposite extremity

- Laboratory data (complete blood count, urinalysis, and coagulation studies)

The course and prognosis of snake bite injuries depend on the kind and amount of venom injected, where on the body the bite occurred, and the general health, age, and size of the patient. There is no one specific protocol for treatment of snake bites. Generally, ice, tourniquets, heparin, and corticosteroids are not used during the acute stage. Corticosteroids are contraindicated in the first 6 to 8 hours after the bite because they may depress antibody production and hinder the action of **antivenin** (antitoxin manufactured from the snake venom and used to treat snake bites).

Parenteral fluids may be used to treat hypotension. If vasopressors are used to treat hypotension, their use should be short term. Surgical exploration of the bite is rarely indicated. Typically, the patient is observed closely for at least 6 hours. The patient is *never* left unattended.

Administration of Antivenin (Antitoxin)

Although envenomation is rare, it can occur with snake bites. An assessment of progressive signs and symptoms is essential before considering administration of antivenin, which is most effective if administered within 4 hours and no greater than 12 hours after the snake bite. Two antivenins are available: Antivenin Polyvalent (ACP) and Crotalidae Polyvalent Immune Fab Antivenin (FabAV) (Auerbach, 2007). The dose depends on the type of snake and the estimated severity of the bite. Indications for antivenin depend on the progression of symptoms, including coagulopathy and systemic reaction. Children may require more antivenin than adults because their smaller bodies are more susceptible to the toxic effects of venom.

A skin or eye test should be performed before the initial dose to detect allergy to the antivenin, because as many as 33% of patients who are given ACP (horse serum–derived antivenin) develop hypersensitivity reactions to it. Because even the skin test can cause an anaphylactic reaction, patients should not be tested unless antivenin will be given. If the dose exceeds 10 vials, serum sickness will most likely occur. Serum sickness is a type of hypersensitivity response that results in fever, arthralgias, pruritus, lymphadenopathy, and proteinuria and can progress to neuropathies.

FabAV is more potent than ACP, with less associated hypersensitivity and serum sickness (Auerbach, 2007). However, FabAV must be administered cautiously to patients receiving anticoagulation therapy. Administration of FabAV may result in a recurring coagulopathy. The dosage and administration of FabAV are different from ACP and should be reviewed carefully before the medication is given.

Before administering antivenin and every 15 minutes thereafter, the circumference of the affected part is measured. Premedication with diphenhydramine (Benadryl) or cimetidine (Tagamet) is indicated because these antihistamines may decrease the allergic response to antivenin. Antivenin is administered as an IV infusion whenever possible, although IM administration can be used.

Depending on the severity of the snake bite, the antivenin is diluted in 500 to 1000 mL of normal saline solution. The infusion is started slowly, and the rate is increased after 10 minutes if there is no reaction. The total dose should be infused during the first 4 to 6 hours after the bite. The initial dose is repeated until symptoms decrease. After symptoms decrease, the circumference of the affected part should be measured every 30 to 60 minutes for the next 48 hours to detect symptoms of compartment syndrome (swelling, loss of pulse, increased pain, and paresthesias).

The most common cause of allergic reaction to the antivenin is too-rapid infusion, although about 3% of patients with negative skin test results develop reactions unrelated to infusion rate. Reactions may consist of a feeling of fullness in the face, urticaria, pruritus, malaise, and apprehension. These symptoms may be followed by tachycardia, shortness of breath, hypotension, and shock. In this situation, the infusion should be stopped immediately and IV diphenhydramine administered. Vasopressors are used for patients in shock, and resuscitation equipment must be on standby while antivenin is infusing.

Spider Bites

There are two venomous spiders found in the United States that typically interact with humans: the brown recluse and the black widow. Both are usually found in dark places such as closets, woodpiles, and attics, as well as in shoes.

Brown recluse spider bites are painless. Systemic effects such as fever and chills, nausea and vomiting, malaise, and joint pain develop within 24 to 72 hours. The site of the bite may appear reddish to purple in color within 2 to 8 hours after the bite. Necrosis occurs in the next 2 to 4 days in approximately 10% of cases. The center of the bite may become necrotic, and surgical débridement may be necessary. Wound care consists of cleansing with soap and water, and hyperbaric oxygen treatments may be helpful. Most wounds heal within 2 to 3 months.

Black widow spider bites feel like pinpricks. Systemic effects usually occur within 30 minutes—much more rapidly than with brown recluse spider bites. Signs and symptoms include abdominal rigidity, nausea and vomiting, hypertension, tachycardia, and paresthesias. Severe pain also develops within 60 minutes and increases over 1 to 2 days. Treatment involves application of ice to the site to decrease systemic toxin delivery. Cardiopulmonary monitoring is essential. Antivenin is effective for black widow spider bites. This antivenin is horse serum–based; therefore, testing for sensitivity must be performed prior to administration (Auerbach, 2007).

Tick Bites

Tick bites are common in many areas of the United States, and they usually occur in grassy or wooded areas. It is important to learn the place where the bite occurred as well as the location of the bite on the body. The patient may demonstrate weakness; joint pain; skin rash, especially on the palms and soles of feet; headache; and fever. Ticks can carry diseases such as Rocky Mountain spotted fever, tularemia, and Lyme disease. The tick bite itself is not usually the problem; rather, it is the pathogen transmitted by the tick that can cause serious disease. The tick should be removed, and the patient should be informed of the signs and

symptoms of diseases carried by ticks, especially if the patient lives in an area endemic for tick-related diseases (eg, Lyme disease).

Lyme disease has three stages. Stage I presents with a "bull's eye" rash (ie, erythema migrans) that typically can be found in the axilla, groin, or thigh area and that appears within 4 weeks after the tick bite, with a peak manifestation time of 7 days after the bite. Classically, this rash is at least 5 cm in diameter with bright red borders. It is accompanied by flulike signs and symptoms that may include chills, fever, myalgia, fatigue, and headache. Without treatment, the rash subsides within 3 to 4 weeks. However, the rash and flulike manifestations can be significantly reduced within days if prompt treatment with antibiotics is initiated. If antibiotics are not administered, stage II Lyme disease may present within 4 to 10 weeks following the tick bite and may manifest with joint pain, memory loss, poor motor coordination, and meningitis. Stage III can begin anywhere from weeks to more than a year after the bite and has serious long-term chronic sequelae, including arthritis, neuropathy, myalgia, and myocarditis.

POISONING

A poison is any substance that, when ingested, inhaled, absorbed, applied to the skin, or produced within the body in relatively small amounts, injures the body by its chemical action. Poisoning from inhalation and ingestion of toxic materials, both intentional and unintentional, constitutes a major health hazard and an emergency situation. Emergency treatment is initiated with the following goals:

- To remove or inactivate the poison before it is absorbed
- To provide supportive care in maintaining vital organ function
- To administer a specific antidote to neutralize a specific poison
- To implement treatment that hastens the elimination of the absorbed poison

Ingested (Swallowed) Poisons

Swallowed poisons may be corrosive. **Corrosive poisons** include alkaline and acid agents that can cause tissue destruction after coming in contact with mucous membranes. Alkaline products include lye, drain cleaners, toilet bowl cleaners, bleach, nonphosphate detergents, oven cleaners, and button batteries (batteries used to power watches, calculators, or cameras). Acid products include toilet bowl cleaners, pool cleaners, metal cleaners, rust removers, and battery acid.

Control of the airway, ventilation, and oxygenation are essential. In the absence of cerebral or renal damage, the patient's prognosis depends largely on successful management of respiration and circulation. Measures are instituted to stabilize cardiovascular and other body functions. ECG, vital signs, and neurologic status are monitored closely for changes. Shock may result from the cardiodepressant action of the substance ingested, from venous pooling in the lower extremities, or from reduced circulating blood volume resulting from increased capillary permeability. An indwelling urinary catheter is inserted to monitor renal function. Blood specimens are obtained to determine the concentration of drug or poison.

Efforts are made to determine what substance was ingested; the amount; the time since ingestion; signs and symptoms, such as pain or burning sensations, any evidence of redness or burn in the mouth or throat, pain on swallowing or an inability to swallow, vomiting, or drooling; age and weight of the patient; and pertinent health history.

NURSING ALERT

The local poison control center should be called if an unknown toxic agent has been taken or if it is necessary to identify an antidote for a known toxic agent.

Measures are instituted to remove the toxin or decrease its absorption. The patient who has ingested a corrosive poison, which can be a strong acid or alkaline substance, is given water or milk to drink for dilution. However, dilution is not attempted if the patient has acute airway edema or obstruction or if there is clinical evidence of esophageal, gastric, or intestinal burn or perforation. The following gastric emptying procedures may be used as prescribed:

- Syrup of ipecac to induce vomiting in the alert patient (*never* use with corrosive poisons)
- Gastric lavage for the obtunded patient (Chart 71-11); gastric aspirate is saved and sent to the laboratory for testing (toxicology screens)
- Activated charcoal administration if the poison is one that is absorbed by charcoal
- Cathartic, when appropriate

NURSING ALERT

Vomiting is never induced after ingestion of caustic substances (acid or alkaline) or petroleum distillates.

If there is a specific chemical or physiologic antagonist (antidote), it is administered as early as possible to reverse or diminish the effects of the toxin. If this measure is ineffective, procedures may be initiated to remove the ingested substance. These procedures include administration of multiple doses of charcoal, diuresis (for substances excreted by the kidneys), dialysis, or hemoperfusion. Hemoperfusion involves detoxification of the blood by processing it through an extracorporeal circuit and an adsorbent cartridge containing charcoal or resin, after which the cleansed blood is returned to the patient.

Throughout detoxification, the patient's vital signs, CVP, and fluid and electrolyte balance are monitored closely. Hypotension and cardiac dysrhythmias are possible. Seizures are also possible because of CNS stimulation from the poison or from oxygen deprivation. If the patient complains of pain, analgesics are administered cautiously. Severe pain causes vasomotor collapse and reflex inhibition of normal physiologic functions.

After the patient's condition has stabilized and discharge is imminent, written material should be given to the patient

CHART 71-11

Guidelines for Assisting With Gastric Lavage

Gastric lavage is the aspiration of stomach contents and washing out of the stomach by means of a large-bore gastric tube. Gastric lavage is contraindicated after acid or alkali ingestion, in the presence of seizures, or after ingestion of hydrocarbons or petroleum distillates. It is particularly dangerous after ingestion of strong corrosive agents.

Purposes:

- For urgent removal of ingested substance to decrease systemic absorption
- To empty the stomach before endoscopic procedures
- To diagnose gastric hemorrhage and to arrest hemorrhage

Equipment:

Large-bore Levin tubes or large-bore Ewald tube
Large irrigating syringe with adapter
Large plastic funnel with adapter to fit tube
Water-soluble lubricant
Tap water or appropriate antidote (milk, saline solution, sodium bicarbonate solution, fruit juice, activated charcoal)
Container for aspirate; suction apparatus
Nasotracheal or endotracheal tubes with inflatable cuffs
Containers for specimens

During gastric lavage, the patient is positioned on the left side, which allows the gastic contents to pool and decreases the passage of fluid into the duodenum.

Action	Rationale
1. Remove dentures and inspect the oral cavity for loose teeth.	1. This will prevent aspiration of teeth.
2. Measure the distance between the bridge of the nose and the xiphoid process. Mark the tube with indelible pencil or tape.	2. This distance is a rule-of-thumb measurement of the distance the tube must be passed to reach the stomach. This avoids curling and kinking of excess tubing in the stomach.
3. Lubricate the tube with water-soluble lubricant.	3. Lubrication eases insertion of the tube.
4. If comatose, the patient is intubated with a cuffed nasotracheal or endotracheal tube before placement of the nasogastric tube.	4. A cuffed nasotracheal or endotracheal tube decreases the risk of aspiration of gastric contents.
5. Place the patient in a left lateral position with the head lowered about 15 degrees.	5. This position decreases passage of gastric contents into the duodenum during lavage.
6. Pass the tube orally while keeping the patient's head in a neutral position. Pass the tube to the adhesive marking or about 50 cm (20 in). Encourage patient to swallow to assist with passage of the tube. Then lower the head of the stretcher or bed. Have standby suction available.	6. The depth of insertion of the tube varies according to the size of the patient. If the tube enters the trachea instead of the esophagus, the patient will experience coughing, dyspnea, stridor, and cyanosis. Positive confirmation of tube placement is accomplished by x-ray.
7. Aspirate the stomach contents with the syringe attached to the tube before instilling water or an antidote. Save the specimen for analysis. Ensure correct placement before installation.	7. Aspiration is carried out to determine that the tube is in the stomach and to remove the stomach contents. Positive confirmation of tube placement is accomplished by x-ray.
8. Remove the syringe. Attach the funnel to the end of the tube, or use a 50-mL syringe to instill solution in the gastric tube. The volume of fluid placed in the stomach should be small.	8. Overfilling of the stomach may cause regurgitation and aspiration or force the stomach contents through the pylorus.
9. Elevate the funnel above the patient's head and pour 150 to 200 mL of solution into the funnel.	9. Gravity allows the solution to flow into the tube.
10. Lower the funnel and siphon the gastric contents into the container or connect to suction.	10. The fluid should flow in freely and drain by gravity.
11. Save samples of the first two washings.	11. Keep the first washing sample isolated from other washings for toxicologic analysis.
12. Repeat the lavage procedure until the returns are relatively clear and no particulate matter is seen.	12. This usually requires a total volume of at least 2 L; some clinicians advocate the use of 5 to 20 L.

Continued

CHART 71-11 *Guidelines for Assisting With Gastric Lavage (Continued)*

Action	Rationale
13. At the completion of lavage:	13.
a. The stomach may be left empty.	a. The stomach is kept empty if no further medications are required.
b. An adsorbent (powder form of activated charcoal mixed with water to form a liquid the consistency of thick soup) may be instilled in the tube and allowed to remain in the stomach.	b. Activated charcoal reduces absorption by adsorbing (attaching to its surface) a wide range of substances; it renders the poison inaccessible to the circulation, thereby reducing its toxicity.
c. A saline cathartic may be instilled in the tube.	c. A cathartic may be given to hasten the elimination of remaining ingested material.
14. Pinch off the tube during removal or maintain suction while the tube is being withdrawn. Keep the patient's head lower than the body.	14. Pinching off the tube prevents aspiration and the initiation of the gag reflex. Keeping the patient's head lower than the body also helps to prevent initiation of the gag reflex.
15. Warn the patient that his stools will turn black from the charcoal.	15. Patient teaching is important to reduce anxiety.

indicating the signs and symptoms of potential problems related to the poison ingested and signs or symptoms requiring evaluation by a physician. If poisoning was determined to be a suicide or self-harm attempt, a psychiatric consultation should be requested before the patient is discharged. In cases of inadvertent poison ingestion, poison prevention and home poison-proofing instructions should be provided to the patient and family.

Carbon Monoxide Poisoning

Carbon monoxide poisoning may occur as a result of industrial or household incidents or attempted suicide. It is implicated in more deaths than any other toxin except alcohol. Carbon monoxide exerts its toxic effect by binding to circulating hemoglobin and thereby reducing the oxygen-carrying capacity of the blood. Hemoglobin absorbs carbon monoxide 200 times more readily than it absorbs oxygen. Carbon monoxide–bound hemoglobin, called **carboxyhemoglobin,** does not transport oxygen.

Clinical Manifestations

Because the CNS has a critical need for oxygen, CNS symptoms predominate with carbon monoxide toxicity. A person with carbon monoxide poisoning may appear intoxicated (from cerebral hypoxia). Other signs and symptoms include headache, muscular weakness, palpitation, dizziness, and confusion, which can progress rapidly to coma. Skin color, which can range from pink or cherry-red to cyanotic and pale, is not a reliable sign. Pulse oximetry is also not valid, because the hemoglobin is well saturated. It is not saturated with oxygen, but the pulse oximeter indicates only if the hemoglobin is saturated; in this case, it is saturated with carbon monoxide rather than with oxygen.

Management

Exposure to carbon monoxide requires immediate treatment. Goals of management are to reverse cerebral and myocardial hypoxia and to hasten elimination of carbon monoxide. Whenever a patient inhales a poison, the following general measures apply:

- Carry the patient to fresh air immediately; open all doors and windows.
- Loosen all tight clothing.
- Initiate cardiopulmonary resuscitation if required; administer 100% oxygen.
- Prevent chilling; wrap the patient in blankets.
- Keep the patient as quiet as possible.
- Do not give alcohol in any form or permit the patient to smoke.

In addition, for the patient with carbon monoxide poisoning, carboxyhemoglobin levels are analyzed on arrival at the ED and before treatment with oxygen if possible. One hundred percent oxygen is administered at atmospheric or preferably hyperbaric pressures to reverse hypoxia and accelerate the elimination of carbon monoxide. Oxygen is administered until the carboxyhemoglobin level is less than 5%. The patient is monitored continuously. Psychoses, spastic paralysis, ataxia, visual disturbances, and deterioration of mental status and behavior may persist after resuscitation and may be symptoms of permanent brain damage.

When unintentional carbon monoxide poisoning occurs, the health department should be contacted so that the dwelling or building in question can be inspected. A psychiatric consultation is warranted if poisoning was determined to be a suicide attempt.

Skin Contamination Poisoning (Chemical Burns)

Skin contamination injuries from exposure to chemicals are challenging because of the large number of possible offending agents with diverse actions and metabolic effects. The severity of a chemical burn is determined by the mechanism of action, the penetrating strength and concentration, and the amount and duration of exposure of the skin to the chemical.

The skin should be drenched immediately with running water from a shower, hose, or faucet, except in the case of lye and white phosphorus, which should be brushed off the skin, dry.

NURSING ALERT

Water should not be applied to burns from lye or white phosphorus because of the potential for an explosion or for deepening of the burn. All evidence of these chemicals should be brushed off the patient before any flushing occurs.

The skin should be flushed with a constant stream of water as the patient's clothing is removed. The skin of health care personnel assisting the patient should be appropriately protected if the burn is extensive or if the agent is significantly toxic or is still present. Prolonged lavage with generous amounts of tepid water is important.

Attempts to determine the identity and characteristics of the chemical agent are necessary in order to specify future treatment. The standard burn treatment appropriate for the size and location of the wound (antimicrobial treatment, débridement, tetanus prophylaxis, antidote administration as prescribed) is instituted. (see Chapter 57) The patient may require plastic surgery for further wound management. The patient is instructed to have the affected area reexamined at 24 and 72 hours and in 7 days because of the risk of underestimating the extent and depth of these types of injuries.

Food Poisoning

Food poisoning is a sudden illness that occurs after ingestion of contaminated food or drink. Botulism is a serious form of food poisoning that requires continual surveillance (see Chapter 72). Assessment questions for patients with food poisoning are discussed in Chart 71-12.

CHART 71-12 *Assessment for Food Poisoning*

Use the following questions to elicit information about the circumstances surrounding the possibility of food poisoning:

- How soon after eating did the symptoms occur? (Immediate onset suggests chemical, plant, or animal poisoning.)
- What was eaten in the previous meal? Did the food have an unusual odor or taste? (Most foods causing bacterial poisoning *do not* have unusual odor or taste.)
- Did anyone else become ill from eating the same food?
- Did vomiting occur? What was the appearance of the vomitus?
- Did diarrhea occur? (Diarrhea is usually absent with botulism and with shellfish or other fish poisoning.)
- Are any neurologic symptoms present? (These occur in botulism and in chemical, plant, and animal poisoning.)
- Does the patient have a fever? (Fever is characteristic in salmonella, ingestion of fava beans, and some fish poisoning.)

The key to treatment is determining the source and type of food poisoning. If possible, the suspected food should be brought to the medical facility and a history obtained from the patient or family.

Food, gastric contents, vomitus, serum, and feces are collected for examination. The patient's respirations, blood pressure, level of consciousness, central venous pressure (CVP) (if indicated), and muscular activity are monitored closely. Measures are instituted to support the respiratory system. Death from respiratory paralysis can occur with botulism, fish poisoning, and some other food poisonings.

Because large volumes of electrolytes and water are lost by vomiting and diarrhea, fluid and electrolyte status should be assessed. Severe vomiting produces alkalosis, and severe diarrhea produces acidosis. Hypovolemic shock may also occur from severe fluid and electrolyte losses. The patient is assessed for signs and symptoms of fluid and electrolyte imbalances, including lethargy, rapid pulse rate, fever, oliguria, anuria, hypotension, and delirium. Weight and serum electrolyte levels are obtained for future comparisons.

Measures to control nausea are also important to prevent vomiting, which could exacerbate fluid and electrolyte imbalances. An antiemetic medication is administered parenterally as prescribed if the patient cannot tolerate fluids or medications by mouth. For mild nausea, the patient is encouraged to take sips of weak tea, carbonated drinks, or tap water. After nausea and vomiting subside, clear liquids are usually prescribed for 12 to 24 hours, and the diet is gradually progressed to a low-residue, bland diet.

SUBSTANCE ABUSE

Substance abuse is the misuse of specific substances, such as drugs or alcohol, to alter mood or behavior. Drug abuse is the use of drugs for other than legitimate medical purposes. People who abuse drugs often take a variety of drugs simultaneously (such as alcohol, barbiturates, opioids, and tranquilizers), and the combination may have additive and addictive effects. "Rave" parties are large-scale parties attended by hundreds of teenagers involved in drug use. At these events, one of the most commonly used drugs is 3,4-methylenedioxymethamphetamine (MDMA), or Ecstasy, a methamphetamine-based drug that users believe produces a "harmless high." ED nurses should be aware of "rave" parties in their geographic area so they can prepare for a potential influx of patients who abuse this drug. Others may combine Ecstasy with sildenafil (Viagra); this drug combination is nicknamed "sextasy." People who abuse IV/injection drugs are at increased risk for HIV infection, acquired immunodeficiency syndrome (AIDS), hepatitis B and C, and tetanus.

Clinical manifestations vary with the substance used, but the underlying principles of management are essentially the same. Table 71-1 identifies commonly abused drugs, listing their clinical manifestations and therapeutic management. Treatment goals for a patient with a drug overdose are to support the respiratory and cardiovascular functions, to enhance clearance of the agent, and to provide for safety of the patient and staff.

Table 71-1 EMERGENCY MANAGEMENT OF PATIENTS WITH DRUG OVERDOSE

Drug	Clinical Manifestations	Therapeutic Management
Stimulants		
Cocaine Intranasally ("snorting"): inhaled into nostrils through straws By smoking ("freebasing"): cocaine hydrochloride dissolved in ether to yield a pure cocaine alkaloid base (called "crack," "rocks"); smoking in a small pipe delivers large quantities of cocaine to lungs Intravenously Polysubstance (cocaine and heroin)	Cocaine is a central nervous system (CNS) stimulant that can increase heart rate and blood pressure and cause hyperpyrexia, seizures, increased energy, agitation, aggression, and ventricular dysrhythmias. It produces intense euphoria, then anxiety, sadness, insomnia, and sexual indifference; cocaine hallucinations with delusions; psychosis with extreme paranoia and ideas of persecution; and hypervigilance. Chronic psychotic symptoms may persist. Overall psychotic symptoms are short-lived compared to methamphetamines	1. Maintain airway and provide respiratory support 2. Control seizures. 3. Monitor cardiovascular effects; have lidocaine and defibrillator available. 4. Treat for hyperthermia. 5. If cocaine was ingested, evacuate stomach contents and use activated charcoal to treat. Whole bowel irrigation may be necessary to treat body packers ("mules"). 6. Refer for psychiatric evaluation and treatment in an inpatient unit that eliminates access to the drug. Include drug rehabilitation counseling.
Opioids		
Heroin Opium or paregoric Morphine, codeine, semisynthetic derivatives: oxycodone (OxyContin), methadone, meperidine (Demerol), propoxyphene (Darvon), tramadol (Ultram), fentanyl (Sublimaze)	Acute intoxication (overdose) Pinpoint pupils (may be dilated with severe hypoxia); decreased blood pressure Marked respiratory depression/ arrest Pulmonary edema Stupor → coma Seizures Fresh needle marks along course of any superficial vein; skin abscesses	1. Support respiratory and cardiovascular functions. 2. Establish an intravenous (IV) line; obtain blood for chemical and toxicologic analysis. Patient may be given bolus of glucose to eliminate possibility of hypoglycemia. 3. Give narcotic antagonist (naloxone hydrochloride IV, IM [Narcan]) as prescribed to reverse severe respiratory depression and coma. 4. Continue to monitor level of responsiveness and respirations, pulse, and blood pressure. Duration of action of naloxone hydrochloride is shorter than that of heroin; repeated dosages may be necessary. 5. Send urine for analysis; opioids can be detected in urine. 6. Obtain an electrocardiogram. 7. Do not leave patient unattended; he or she may lapse back into coma rapidly. Clinical status may change from minute to minute. Hemodialysis may be indicated for severe drug intoxication. Activated charcoal may be considered if opioids were taken orally and if the patient is alert. 8. Monitor for pulmonary edema, which is frequently seen in patients who abuse/overdose on narcotics. 9. Refer patient for psychiatric and drug rehabilitation evaluation before discharge.
Barbiturates		
Pentobarbital (Nembutal), secobarbital (Seconal), amobarbital (Amytal), gamma-hydroxybutyrate (GHB, "liquid Ecstasy")	Acute intoxication (may mimic alcohol intoxication): • Respiratory depression • Flushed face • Decreased pulse rate; decreased blood pressure • Increasing nystagmus • Depressed deep tendon reflexes • Decreasing mental alertness • Difficulty in speaking • Poor motor coordination • Coma, death GHB: • Sexual disinhibition • Amnesia, myoclonus, agitation • Overdoses when mixed with alcohol	1. Maintain airway and provide respiratory support. 2. Endotracheal intubation or tracheostomy is considered if there is any doubt about the adequacy of airway exchange. a. Check airway frequently. b. Perform suctioning as necessary. 3. Support cardiovascular and respiratory functions; most deaths result from respiratory depression or shock. 4. Start infusion through large-gauge needle or IV catheter to support blood pressure; coma and dehydration result in hypotension and respond to infusion of intravenous fluids with elevation of blood pressure. Sodium bicarbonate may be prescribed to alkalinize urine; it promotes excretion of barbiturates. 5. Evacuate stomach contents or lavage as soon as possible to prevent absorption; repeated doses of activated charcoal may be administered.

Continued on following page

Table 71-1 EMERGENCY MANAGEMENT OF PATIENTS WITH DRUG OVERDOSE (Continued)

Drug	Clinical Manifestations	Therapeutic Management
		6. Assist with hemodialysis for severely overdosed patient. 7. Maintain neurologic and vital sign flow sheet. 8. Patient awakening from overdose may demonstrate combative behavior. 9. Refer for psychiatric and drug rehabilitation consultation to evaluate suicide potential and drug abuse.
Inhalants		
Amyl nitrate Freon Propane Trichloroethylene Gasoline Perchloroethylene Toluene (metallic paint spray)	Effects mimic those of alcohol, with dizziness and imbalance Euphoria, headache, altered level of consciousness to coma Renal, hepatic, and cardiac toxicity Aplastic anemia Fetal growth retardation Respiratory depression Vasodilation Nosebleeding Circumoral red spots	1. Provide airway support, ventilation, and oxygen. 2. Treat cardiac dysrhythmias and hypotension. 3. Provide advanced cardiac life support (ACLS) as needed. 4. Monitor for profound hypotension when amyl nitrate is combined with MDMA and sildenafil.
Amphetamine-Type Drugs (pep pills, "uppers," "speed," "crystal meth")		
Amphetamine (Benzedrine) Dextroamphetamine (Dexedrine) Methamphetamine (Desoxyn, "speed") 3,4-Methylenedioxymethamphetamine (MDMA) ("Ecstasy," "Adam")* 3,4-Methylenedioxymethamphetamine (MDEA) ("Eve") 3,4-Methylenedioxyamphetamine (MDA) methylphenidate (Ritalin) "ice," "rocks," "crystal meth"	Nausea, vomiting, anorexia, palpitations, tachycardia, increased blood pressure, tachypnea, anxiety, nervousness, diaphoresis, mydriasis Repetitive or stereotyped behavior Irritability, insomnia, agitation Visual misperceptions, auditory hallucinations Fearfulness, anxiety, depression, hostility, paranoia Hyperactivity, rapid speech, euphoria, hyperalertness Decreased inhibition Seizures, coma, hyperthermia, cardiovascular collapse, rhabdomyolysis MDMA is both a hallucinogenic and stimulant	1. Provide airway support, ventilation, cardiac monitoring; insert IV line. 2. Use gastrointestinal (GI) evacuation in cases of oral overdose; activated charcoal, gastric lavage. 3. Keep in calm, cool, quiet environment; elevated temperature potentiates amphetamine toxicity. Maintain normothermia cooling the patient as necessary. 4. Use small doses of diazepam (Valium) (IV) or haloperidol (Haldol) as prescribed for CNS and muscular hyperactivity. 5. Administer appropriate pharmacologic therapy as prescribed for severe hypertension and ventricular dysrhythmias. 6. Treat seizures with benzodiazepines (eg, diazepam) as prescribed. 7. Treat sympathetic stimulation with beta-blocker agents as prescribed. 8. Try to communicate with patient if delusions or hallucinations are present. 9. Place in a protective environment (preferably psychiatric security room with video monitoring) to observe for suicide attempt. 10. Refer for psychiatric and drug rehabilitation evaluation.
Hallucinogens or Psychedelic-Type Drugs		
Lysergic acid diethylamide (LSD) Phencyclidine HCl (PCP, "angel dust") Mescaline, psilocybin Cannabinoids (marijuana) Ketamine ("special K")	Nystagmus Mild hypertension Marked confusion bordering on panic Incoherence, hyperactivity Withdrawn Combative behavior; delirium, mania, self-injury (lasts 6 to 12 hours) Hallucinations, body image distortion Hypertension, hyperthermia, renal failure Flashback: recurrence of LSD-like state without having taken the drug; may occur weeks or months after drug was taken Ketamine: "out-of-body" experience; increased aggressiveness	1. Evaluate and maintain patient's airway, breathing, and circulation. 2. Determine by urine or serum drug screen whether the patient has ingested hallucinogenic drug or has a toxic psychosis. 3. Try to communicate with and reassure the patient. a. "Talking down" involves understanding the process through which the patient is proceeding and helping him overcome his fears while establishing contact with reality. b. Remind the patient that fear is common with this problem.

Continued

Table 71-1 EMERGENCY MANAGEMENT OF PATIENTS WITH DRUG OVERDOSE (Continued)

Drug	Clinical Manifestations	Therapeutic Management
		c. Reassure the patient that he is not losing his mind but is experiencing the effect of drugs and that this will wear off. d. Instruct the patient to keep the eyes open; this reduces the intensity of reaction. e. Reduce sensory stimuli: minimize noise, lights, movement, tactile stimulation. 4. Sedate the patient as prescribed if hyperactivity cannot be controlled; diazepam (Valium) or a barbiturate may be prescribed. 5. Search for evidence of trauma; hallucinogen users have a tendency to "act out" their hallucinations. 6. Manage seizures with benzodiazepines (eg, diazepam) as necessary. 7. Observe patient closely; patient's behavior may become hazardous. Have safety officers stationed near the patient's room. 8. Monitor for hypertensive crisis if patient has prolonged psychosis due to drug ingestion. 9. Place patient in a protected environment under proper medical supervision to prevent self-inflicted bodily harm. **Management for Phencyclidine Abusers** 1. Place patient in a calm, supportive environment to minimize stimuli; protect from self-injury. 2. Avoid talking down. 3. Do not leave patient unobserved. Treat symptoms as they occur. a. Drug effects are unpredictable and prolonged. b. Symptoms are likely to exacerbate; patient becomes out of control. 4. Refer all patients in this category for psychiatric and drug evaluation/rehabilitation.
Drugs Producing Sedation, Intoxication, or Psychological and Physical Dependence (nonbarbiturate sedatives)		
Diazepam (Valium) Chlordiazepoxide (Librium) Oxazepam (Serax) Lorazepam (Ativan) Midazolam (Versed) Flunitrazepam (Rohypnol, "roofies," "date rape drug")*	Seizures, coma, circulatory collapse, death Acute intoxication: • Respiratory depression • Decreasing mental alertness • Confusion • Slurred speech, decreased blood pressure • Ataxia • Pulmonary edema • Coma, death **Flunitrazepam:** • Disinhibition with antegrade amnesia • Weakness and unsteadiness with impaired judgment • Powerlessness	1. Endotracheal tube is inserted as a precaution; use assisted ventilation to stabilize and correct respiratory depression. Observe for sudden apnea and laryngeal spasm. 2. Assess for hypotension a. Insert indwelling urinary catheter for comatose patient; decreased urinary volume is an index of reduced renal flow associated with reduced intravascular volume or vascular collapse. b. Start volume expansion with saline or dextrose as prescribed. 3. Evacuate stomach contents; emesis; lavage; activated charcoal; cathartic. 4. Start ECG monitoring. Observe for dysrhythmias. 5. Administer flumazenil (Romazicon), a benzodiazepine antagonist (reversal agent). 6. Refer patient for psychiatric evaluation (potential suicide intent).

Continued on following page

Table 71-1 EMERGENCY MANAGEMENT OF PATIENTS WITH DRUG OVERDOSE (Continued)

Drug	Clinical Manifestations	Therapeutic Management
Salicylate Poisoning		
Aspirin (present in compound analgesic tablets) Toxic levels (150–200 mg/kg body weight) Chronic toxicity (occurs in elderly due to decreased renal function) Long-term intoxication (>100 mg/kg/day for more than 2 days)	Restlessness, tinnitus, deafness, blurring of vision Hyperpnea, hyperpyrexia, sweating Epigastric pain, vomiting, dehydration Respiratory alkalosis and metabolic acidosis Disorientation, coma, cardiovascular collapse Coagulopathy	1. Treat respiratory depression. 2. Induce gastric emptying by lavage. 3. Give activated charcoal to adsorb aspirin; a cathartic may be administered with charcoal to help ensure intestinal cleansing. 4. Support patient with IV infusions as prescribed to establish hydration and correct electrolyte imbalances, including administration of sodium bicarbonate. 5. Enhance elimination of salicylates as directed by forced diuresis, alkalinization of urine, peritoneal dialysis, or hemodialysis, according to severity of intoxication. 6. Monitor serum salicylate level for efficacy of treatment. 7. Administer specific prescribed pharmacologic agent for bleeding and other problems. 8. Concretions formed in the gut may result in prolonged exposure as they are digested. 9. Refer patient for psychiatric evaluation (potential suicide intent).
Acetaminophen (present in prescription and nonprescription analgesics, antipyretics, and cold remedies)	Lethargy to encephalopathy and death GI upset, diaphoresis Right upper quadrant pain Abnormal liver function tests, prolonged prothrombin time, increased bilirubin, disseminated intravascular coagulation Hepatomegaly leading to liver failure Metabolic acidosis Hypoglycemia	1. Maintain airway. 2. Obtain acetaminophen level. Levels ≥140 mg/kg are toxic. 3. Laboratory studies—liver function tests, prothrombin time/partial thromboplastin time, complete blood count, blood urea nitrogen, creatinine. 4. Administer syrup of ipecac and follow emesis with activated charcoal. 5. Prepare for possible hemodialysis, which clears acetaminophen but does not halt liver damage. 6. Administer *N*-acetylcysteine (NAC, Mucomyst) as soon as possible. NAC replenishes essential liver enzymes and requires a total of 18 doses every 4 hours. Charcoal absorbs NAC; do not administer together. Repeat NAC dose if patient vomits. 7. Refer patient for psychiatric evaluation (potential suicide intent).
Tricyclic Antidepressants (TCAs)		
Amitriptyline (Elavil) Doxepin (Sinequan) Nortriptyline (Aventyl) Imipramine (Tofranil)	Dysrhythmia: ventricular fibrillation/tachycardia, tachycardia Hypotension Pulmonary edema, hypoxemia, acidosis Confusion, agitation, coma Visual hallucinations Clonus, tremors, hyperactive reflexes, nystagmus, myoclonic jerking Seizures Blurred vision, flushing, hyperthermia	1. Provide airway support, ventilation, cardiac monitoring; insert IV line with normal saline solution. 2. If within 1–2 hours after overdose, insert a nasogastric tube and instill activated charcoal with sorbitol every 4 hours × 3. 3. Administer a sodium bicarbonate drip to decrease dysrhythmias; the alkaline environment increases the protein binding of the metabolite. 4. Administer vasopressors. 5. Use only Class IB antiarrhythmics (eg, lidocaine), as some other types of antiarrhythmics have the same effect as TCA. 6. Manage seizure activity with benzodiazepines (eg, diazepam) as necessary. 7. Refer patient for psychiatric evaluation for potential suicide intent and evaluation of medication regimen for effectiveness.

Continued

Table 71-1 EMERGENCY MANAGEMENT OF PATIENTS WITH DRUG OVERDOSE (Continued)

Drug	Clinical Manifestations	Therapeutic Management
Selective Serotonin Reuptake Inhibitors (SSRIs) and Other Antidepressants Trazodone (Desyrel) Fluoxetine (Prozac) Paroxetine (Paxil) Sertraline (Zoloft) Venlafaxine (Effexor) Escitalopram (Lexapro) Bupropion (Wellbutrin)	Decreased level of consciousness, confusion Respiratory depression Increased heart rate **Serotonin syndrome:** Agitation, seizures Hyperthermia, diaphoresis Hypertension	1. Administer activated charcoal with possibly whole-bowel irrigation if a sustained-release medication was taken. 2. Use seizure precautions and administer benzodiazepines (eg, diazepam) as ordered. 3. Serotonin syndrome may occur if the SSRI was taken in conjunction with dextromethorphan or meperidine.

*Polydrug use at "rave clubs" frequently involves MDMA, alcohol, amphetamines, LSD, and sometimes dextromethorphan. Terms such as "Ecstasy" may refer to flunitrazepam (Rohypnol), GHB, ephedrine, and/or caffeine, in addition to MDMA. The Web site www.clubdrugs.gov provides more information about possible drug abuse and how it may relate to emergency nursing care.

Acute Alcohol Intoxication

Alcohol is a psychotropic drug that affects mood, judgment, behavior, concentration, and consciousness. Many heavy drinkers are young adults or people older than 60 years of age. There is a high prevalence of alcoholism among ED patients. Because patients who abuse alcohol return frequently to the ED, they often frustrate and tax the patience of the health care professionals who care for them. Their management requires patience and thoughtful, accurate, long-term treatment (Thompson, Lande & Kalapatapu, 2008).

Alcohol, or ethanol, is a multisystem toxin and CNS depressant that causes drowsiness, impaired coordination, slurring of speech, sudden mood changes, aggression, belligerence, grandiosity, and uninhibited behavior. In excess, it can also cause stupor, coma, and death. Increasingly, underage minors and college students arrive at the ED with alcohol poisoning from binge drinking. All too frequently, the result is death.

In the ED, the patient is assessed for head injury, hypoglycemia (which mimics intoxication), and other health problems. Possible nursing diagnoses include ineffective breathing pattern related to CNS depression and risk for violence (self-directed or other-directed) related to severe intoxication from alcohol.

Treatment involves detoxification of the acute poisoning, recovery, and rehabilitation. Commonly, the patient uses mechanisms of denial and defensiveness. The nurse should approach the patient in a nonjudgmental manner, using a firm, consistent, accepting, and reasonable attitude. Speaking in a calm and slow manner is helpful because alcohol interferes with thought processes. If the patient appears intoxicated, hypoxia, hypovolemia, and neurologic impairment must be ruled out before it is assumed that the patient is intoxicated. Typically, a blood specimen is obtained for analysis of the blood alcohol level.

If drowsy, the patient should be allowed to sleep off the state of alcoholic intoxication. During this time, maintenance of a patent airway and observation for symptoms of CNS depression are essential. The patient should be undressed and kept warm with blankets. On the other hand, if the patient is noisy or belligerent, sedation may be necessary. If sedation is used, the patient should be monitored carefully for hypotension and decreased level of consciousness.

In addition, the patient is examined for alcohol withdrawal delirium and also for injuries and organic disease (such as head injury, seizures, pulmonary infections, hypoglycemia, and nutritional deficiencies) that may be masked by alcoholic intoxication. People with alcoholism suffer more injuries than the general population. Also, acute alcohol intoxication is the cause of trauma for many nonalcoholic patients. Pulmonary infections are also more common in patients with alcoholism, resulting from respiratory depression, an impaired defense system, and a tendency toward aspiration of gastric contents. The patient may show little increase in temperature or WBC count. The patient may be hospitalized or admitted to a detoxification center in an effort to examine problems underlying the substance abuse.

Alcohol Withdrawal Syndrome/Delirium Tremens

Alcohol withdrawal syndrome is an acute toxic state that occurs as a result of sudden cessation of alcohol intake after a bout of heavy drinking or, more typically, after prolonged intake of alcohol. Severity of symptoms depends on how much alcohol was ingested and for how long. Delirium tremens may be precipitated by acute injury or infection (pneumonia, pancreatitis, hepatitis) and is the most severe form of alcohol withdrawal syndrome (Larson, 2008).

Patients with alcohol withdrawal syndrome show signs of anxiety, uncontrollable fear, tremor, irritability, agitation, insomnia, and incontinence. They are talkative and preoccupied and experience visual, tactile, olfactory, and auditory hallucinations that often are terrifying. Autonomic overactivity occurs and is evidenced by tachycardia, dilated pupils, and profuse perspiration. Usually, all vital signs are elevated in the alcoholic toxic state. Delirium tremens is a life-threatening condition and carries a high mortality rate.

The goals of management are to give adequate sedation and support to allow the patient to rest and recover without danger of injury or peripheral vascular collapse. A physical examination is performed to identify preexisting or contributing illnesses or injuries (eg, head injury, pneumonia).

A drug history is obtained to elicit information that may facilitate adjustment of any sedative requirements. Baseline blood pressure is determined, because the patient's subsequent treatment may depend on blood pressure changes.

Usually, the patient is sedated as directed with a sufficient dosage of benzodiazepines to establish and maintain sedation, which reduces agitation, prevents exhaustion, prevents seizures, and promotes sleep. The patient should be calm, able to respond, and able to maintain an airway safely on his or her own. A variety of medications and combinations of medications are used (eg, chlordiazepoxide [Librium], lorazepam [Ativan], and clonidine [Catapres]). Haloperidol (Haldol) or droperidol (Inapsine) may be administered for severe acute alcohol withdrawal syndrome. Dosages are adjusted according to the patient's symptoms (agitation, anxiety) and blood pressure response.

The patient is placed in a calm, nonstressful environment (usually a private room) and observed closely. The room remains lighted to minimize the potential for illusions (visual misrepresentations) and hallucinations. Homicidal or suicidal responses may result from hallucinations. Closet and bathroom doors are closed to eliminate shadows. Someone is designated to stay with the patient as much as possible. The presence of another person has a reassuring and calming effect, which helps the patient maintain contact with reality. To orient the patient to reality, any illusions are explained.

NURSING ALERT

Restraints are used as prescribed, if necessary, if the client is aggressive or violent, but only when other alternatives have been unsuccessful. The least restrictive device that will prevent the patient from injuring self or others is used. Caution is taken to ensure that restraints are applied properly and that they are not impairing circulation to any part of the body or interfering with respirations. Restraints should be used in tandem with verbal intervention to calm the patient and promote compliance. Restraints must be released according to protocol. Physical observation (eg, skin integrity, circulatory status, respiratory status) is ongoing, and the patient's response is documented.

Fluid losses may result from gastrointestinal losses (vomiting), profuse perspiration, and hyperventilation. In addition, the patient may be dehydrated as a result of alcohol's effect of decreasing antidiuretic hormone. The oral or IV route is used to restore fluid and electrolyte balance.

Temperature, pulse, respiration, and blood pressure are recorded frequently (every 30 minutes in severe forms of delirium) to monitor for peripheral circulatory collapse or hyperthermia (the two most serious complications). Phenytoin (Dilantin) or other antiseizure medications may be prescribed to prevent repeated withdrawal seizures.

Frequently seen complications include infections (eg, pneumonia), trauma, hepatic failure, hypoglycemia, and cardiovascular problems. Hypoglycemia may accompany alcohol withdrawal, because alcohol depletes liver glycogen stores and impairs gluconeogenesis; many patients with alcoholism also are malnourished. Parenteral dextrose may be prescribed if the liver glycogen level is depleted. Orange juice, Gatorade, or other sources of carbohydrates are given to stabilize the blood glucose level and counteract tremulousness. Supplemental vitamin therapy and a high-protein diet are provided as prescribed to counteract nutritional deficits. The patient should be referred to an alcoholic treatment center for follow-up care and rehabilitation.

VIOLENCE, ABUSE, AND NEGLECT

Family Violence, Abuse, and Neglect

EDs are often the first place where victims of family violence, abuse, or neglect go to seek help. Each year in the United States, there are 4.8 million women and 2.9 million men who experience physical assaults involving their intimate partners. Intimate partner violence (IPV) caused 1544 deaths in 2004; of these victims, 75% were females and 25% were male. Costs related to IPV are estimated to exceed $8.3 billion annually (Centers for Disease Control and Prevention [CDC], 2006a).

It is estimated that up to one third of all patients in the ED have experienced IPV at some point in their lives. Research studies suggest that as many as 44% of all women murdered by a partner had visited an ED within the 2 years prior to death. Researchers believe that most persons who have experienced IPV are willing to disclose their causes of injury, but as few as 4% to 10% of cases are accurately identified in EDs (Daugherty & Houry, 2008). ED nurses must be vigilant in their assessments of both women and men who present with injuries that may be consistent with IPV. In addition, ED nurses must be aware that men and women with disabilities are at higher risk of domestic violence and abuse than nondisabled people and should include questions to that effect in their evaluations.

It is estimated that between 700,000 and 1.2 million elders are abused or neglected annually (American Geriatrics Society, 2005). Elder abuse takes many forms, including physical, emotional, and verbal abuse; neglect; violation of personal rights; and financial abuse (see Chapters 5 and 46).

Clinical Manifestations

When people who have been abused seek treatment, they may present with physical injuries or with health problems such as anxiety, insomnia, or gastrointestinal symptoms that are related to stress. The possibility of abuse should be investigated whenever a person presents with multiple injuries that are in various stages of healing, when injuries are unexplained, and when the explanation does not fit the physical picture (Chart 71-13). The possibility of neglect should be investigated whenever a dependent person shows evidence of inattention to hygiene, to nutrition, or to known medical needs (eg, unfilled medication prescriptions, missed appointments with health care providers). In the ED, the most common physical injuries seen are unexplained bruises, lacerations, abrasions, head injuries, or fractures. The most common clinical manifestations of neglect are malnutrition and dehydration.

CHART 71-13 *Assessing for Abuse, Maltreatment, and Neglect*

The following questions may be helpful when assessing a patient for abuse, maltreatment, and neglect:

- I noticed that you have a number of bruises. Can you tell me how they happened? Has anyone hurt you?
- You seem frightened. Has anyone ever hurt you?
- Sometimes patients tell me that they have been hurt by someone at home or at work. Could this be happening to you?
- Are you afraid of anyone at home or work, or of anyone with whom you come in contact?
- Has anyone failed to help you to take care of yourself when you needed help?
- Has anyone prevented you from seeing friends or other people whom you wish to see?
- Have you signed any papers that you did not understand or did not wish to sign?
- Has anyone forced you to sign papers against your will?
- Has anyone forced you to engage in sexual activities within the past year?
- Has anyone prevented you from using an assistive device (eg, wheelchair, walker) within the past year?
- Has anyone you depend on refused to help you take your medicine, bathe, groom, or eat within the past year?

Assessment and Diagnostic Findings

Nurses in EDs are in an ideal position to provide early detection and interventions for victims of IPV. This requires an acute awareness of the signs of possible abuse, maltreatment, and neglect. Nurses must be skilled in interviewing techniques that are likely to elicit accurate information. A careful history is crucial in the screening process. Asking questions in private—away from others—may be helpful in eliciting information about abuse, maltreatment, and neglect.

Whenever evidence leads one to suspect abuse or neglect, an evaluation with careful documentation of descriptions of events and drawings or photographs of injuries is important, because the medical record may be used as part of a legal proceeding. Assessment of the patient's general appearance and interactions with significant others, an examination of the entire surface area of the body, and a mental status examination are crucial.

Management

Whenever abuse, maltreatment, or neglect is suspected, the health care provider's primary concern should be the safety and welfare of the patient. Treatment focuses on the consequences of the abuse, violence, or neglect and on prevention of further injury. Protocols of most EDs require that a multidisciplinary approach be used. Nurses, physicians, social workers, and community agencies work collaboratively to develop and implement a plan for meeting the patient's needs.

If the patient is in immediate danger, he or she should be separated from the abusing or neglecting person whenever possible. Referral to a shelter may be the most appropriate action, but many shelters are inaccessible to people with mobility limitations.

When abuse or neglect is the result of stress experienced by a caregiver who is no longer able to cope with the burden of caring for an elderly person or a person with chronic disease or a disability, respite services may be necessary. Support groups may be helpful to these caregivers. When mental illness of the abuser or neglecter is responsible for the situation, alternative living arrangements may be required.

Nurses must be mindful that competent adults are free to accept or refuse the help that is offered to them. Some patients insist on remaining in the home environment where the abuse or neglect is occurring. The wishes of patients who are competent and not cognitively impaired should be respected. However, all possible alternatives, available resources, and safety plans should be explored with the patient.

Mandatory reporting laws in most states require health care workers to report *suspected* child or elder abuse to an official agency, usually Adult (or Child) Protective Services. All that is required for reporting is the suspicion of abuse; the health care worker is not required to prove abuse or neglect. Likewise, health care workers who report suspected abuse are immune from civil or criminal liability if the report is made in good faith. Subsequent home visits resulting from the report of suspected abuse are a part of gathering information about the patient in the home environment. In addition, many states have resource hotlines for use by health care workers and by patients who seek answers to questions about abuse and neglect.

Sexual Assault

The definition of *rape* is forced sexual acts, especially if these acts involve vaginal or anal penetration. Perpetrators and victims may be either male or female. Society is focused on the rights and care of people who have been sexually assaulted, and law enforcement agencies are increasingly sensitive and aggressive in managing these crimes. Rape crisis centers offer support and education and help people who have been sexually assaulted through the subsequent police investigation and courtroom experience.

The manner in which the patient is received and treated in the ED is important to his or her future psychological well-being. Crisis intervention should begin when the patient enters the health care facility. The patient should be seen immediately. Most hospitals have a written protocol that addresses the patient's physical and emotional needs as well as collection of forensic evidence.

In many states, the emergency nurse has the opportunity to become trained as a sexual assault nurse examiner (SANE). Preparing for this role requires specific training in forensic evidence collection, history taking, documentation, and ways to approach the patient and family. Specialized training also includes learning proper photographic methods and the use of colposcopy. Colposcopy facilitates assessment by magnifying tissues and looking for evidence of microtrauma. Evidence is collected through photography, videography, and analysis of specimens. Another tool useful to the SANE is the light-staining microscope, which enables the examiner to identify motile and nonmotile sperm

and infectious organisms. This tool saves time and also enhances assessment. The SANE complements the ED staff and they can spend more time with both the patient and police officers investigating the incident (Lynch, 2006).

Assessment and Diagnostic Findings

The patient's reaction to rape has been termed *rape trauma syndrome* and is seen as an acute stress reaction to a life-threatening situation. The nurse performing the assessment is aware that the patient may go through several phases of psychological reactions (Lynch, 2006), which have been described as follows:

- An acute disorganization phase, which may manifest as an expressed state in which shock, disbelief, fear, guilt, humiliation, anger, and other such emotions are encountered or as a controlled state in which feelings are masked or hidden and the victim appears composed
- A phase of denial and unwillingness to talk about the incident, followed by a phase of heightened anxiety, fear, flashbacks, sleep disturbances, hyperalertness, and psychosomatic reactions that is consistent with posttraumatic stress disorder (PTSD) (see Chapter 7 for further discussion of PTSD)
- A phase of reorganization, in which the incident is put into perspective; some victims never fully recover and go on to develop chronic stress disorders and phobias

Management

The goals of management are to provide support, to reduce the patient's emotional trauma, and to gather available evidence for possible legal proceedings. All of the interventions are aimed at encouraging the patient to gain a sense of control over his or her life.

Throughout the patient's stay in the ED, the patient's privacy and sensitivity must be respected. The patient may exhibit a wide range of emotional reactions, such as hysteria, stoicism, or feelings of being overwhelmed. Support and caring are crucial. The patient should be reassured that anxiety is natural and asked whether a support person may be called. Appropriate support is available from professional and community resources. The Rape Victim Companion Program, if available in the community, can be contacted, and the services of a volunteer can be requested. The patient should never be left alone.

Physical Examination

A written, witnessed informed consent must be obtained from the patient (or parent or guardian if the patient is a minor) for examination, for taking of photographs, and for release of findings to police. A history is obtained only if the patient has not already talked to a police officer, social worker, or crisis intervention worker. The patient should not be asked to repeat the history. Any history of the event that is obtained should be recorded in the patient's own words. The patient is asked whether he or she has bathed, douched, brushed his or her teeth, changed clothes, urinated, or defecated since the attack, because these actions may alter interpretation of subsequent findings. The time of admission, time of examination, date and time of the alleged rape, and the patient's emotional state and general appearance (including any evidence of trauma, such as discoloration, bruises, lacerations, secretions, or torn and bloody clothing) are documented.

For the physical examination, the patient is helped to undress and is draped properly. Each item of clothing is placed in a separate paper bag. Plastic bags are not used because they retain moisture; moisture may promote mold and mildew formation, which can destroy evidence. The bags are labeled and given to appropriate law enforcement authorities.

The patient is examined (from head to toe) for injuries, especially injuries to the head, neck, breasts, thighs, back, and buttocks. Body diagrams and photographs aid in documenting the evidence of trauma. The physical examination focuses on the following:

- External evidence of trauma (bruises, contusions, lacerations, stab wounds)
- Dried semen stains (appearing as crusted, flaking areas) on the patient's body or clothes
- Broken fingernails and body tissue and foreign materials under nails (if found, samples are taken)
- Oral examination, including a specimen of saliva and cultures of gum and tooth areas

Pelvic and rectal examinations are also performed. The perineum and other areas are examined with a Wood lamp or other filtered ultraviolet light. Areas that appear fluorescent may indicate semen stains. The color and consistency of any discharge present is noted. A water-moistened rather than a lubricated vaginal speculum is used for the examination. Lubricant contains chemicals that may interfere with later forensic testing of specimens and acid phosphatase determinations. The rectum is examined for signs of trauma, blood, and semen. During the examination, the patient should be advised of the nature and necessity of each procedure and given the rationale for each question asked.

Specimen Collection

During the physical examination, numerous laboratory specimens may be collected, including the following:

- Vaginal aspirate, examined for presence or absence of motile and nonmotile sperm
- Secretions (obtained with a sterile swab) from the vaginal pool for acid phosphatase, blood group antigen of semen, and precipitin test against human sperm and blood
- Separate smears from the oral, vaginal, and anal areas
- Culture of body orifices for gonorrhea
- Blood serum for syphilis and HIV testing and DNA analysis; a sample of serum for syphilis may be frozen and saved for future testing
- Pregnancy test if there is a possibility that the patient may be pregnant
- Any foreign material (leaves, grass, dirt), which is placed in a clean envelope
- Pubic hair samples obtained by combing or trimming. Several pubic hairs with follicles are placed in separate containers and identified as the patient's hair

To preserve the chain of evidence, each specimen is labeled with the name of the patient, the date and time of collection, the body area from which the specimen was

obtained, and the names of personnel collecting specimens. Then the specimens are given to a designated person (eg, crime laboratory technician), and an itemized receipt is obtained.

Treating Potential Consequences of Rape

After the initial physical examination is completed and specimens have been obtained, any associated injuries are treated as indicated. The patient is given the option of prophylaxis against sexually transmitted disease (STD) (also referred to as sexually transmitted infection [STI]). Ceftriaxone (Rocephin), administered intramuscularly with 1% lidocaine (Xylocaine), may be prescribed as prophylaxis for gonorrhea. In addition, a single oral dose of metronidazole (Flagyl) and either a single oral dose of azithromycin (Zithromax) or a 7-day oral regimen of doxycycline (Vibramycin) may be prescribed as prophylaxis for syphilis and chlamydia (CDC, 2006b).

Antipregnancy measures may be considered if the patient is of childbearing age (CDC, 2006b). A postcoital contraceptive medication, such as an oral contraceptive medication that contains levonorgestrel and ethinyl estradiol (Alesse, Seasonique), may be prescribed after a pregnancy test. To promote effectiveness, the contraceptive medication should be administered within 12 to 24 hours and no later than 72 hours after intercourse. The 21-day package rather than the 28-day package is prescribed so that the patient does not take the inert tablets by mistake. An antiemetic may be administered as prescribed to decrease discomfort from side effects. A cleansing douche, mouthwash, and fresh clothing are usually offered (Lynch, 2006).

Follow-Up Care

The patient is informed of counseling services to prevent long-term psychological effects. Counseling services should be made available to both the patient and the family. A referral is made to the Rape Victim Companion Program, if available. Appointments for follow-up surveillance for pregnancy and for STD and HIV testing also are made (CDC, 2006b).

The patient is encouraged to return to his or her previous level of functioning as soon as possible. When leaving the health care facility, the patient should be accompanied by a family member or friend.

PSYCHIATRIC EMERGENCIES

A psychiatric emergency is an urgent, serious disturbance of behavior, affect, or thought that makes the patient unable to cope with life situations and interpersonal relationships. A patient presenting with a psychiatric emergency may display overactive or violent, underactive or depressed, or suicidal behaviors.

The most important concern of the ED personnel is determining whether the patient is at risk for injuring self or others. The aim is to try to maintain the patient's self-esteem (and life, if necessary) while providing care. Determining whether the patient is currently under psychiatric care is important so that contact can be made with the therapist or physician who works with the patient.

Overactive Patients

Patients who display disturbed, uncooperative, and paranoid behavior and those who feel anxious and panicky may be prone to assaultive and destructive impulses and abnormal social behavior. Intense nervousness, depression, and crying are evident in some patients. Disturbed and noisy behavior may be exacerbated or compounded by alcohol or drug intoxication.

A reliable source for obtaining an accurate history is needed to identify events leading to the crisis. Past mental illness, hospitalizations, injuries, serious illnesses, use of alcohol or drugs, crises in interpersonal relationships, or intrapsychic conflicts are explored. Because abnormal thoughts and behavior may be manifestations of an underlying physical disorder, such as hypoglycemia, drug or alcohol toxicity, a stroke, a seizure disorder, or head injury, a physical assessment is also performed.

The immediate goal is to gain control of the situation. If the patient is potentially violent, security or local police should be nearby. Restraints are used as a *last* resort and only as prescribed. Approaching the patient with a calm, confident, and firm manner is therapeutic and has a calming effect. Helpful interventions include the following:

- Introduce yourself by name.
- Tell the patient, "I am here to help you."
- Repeat the patient's name from time to time.
- Speak in one-thought sentences and be consistent.
- Give the patient space and time to slow down.
- Show interest in, listen to, and encourage the patient to talk about personal thoughts and feelings.
- Offer appropriate and honest explanations.

A psychotropic agent (eg, one that exerts an effect on the mind) may be prescribed for emergency management of functional psychosis. However, a patient with a personality disorder should not be treated with psychotropic medications, and psychotropic medications should not be used if the patient's behavior results from the use of hallucinogens (eg, lysergic acid diethylamide [LSD]).

Agents such as chlorpromazine and haloperidol act specifically against psychotic symptoms of thought fragmentation and perceptual and behavioral aberrations. The initial dose depends on the patient's body weight and the severity of the symptoms. After administration of the initial dose, the patient is observed closely to determine the degree of change in psychotic behavior. Subsequent doses depend on the patient's response. Typically, after stabilization, the patient is transferred to an inpatient psychiatric unit or psychiatric outpatient treatment is arranged.

Violent Behavior

Violent and aggressive behavior, usually episodic, is a means of expressing feelings of anger, fear, or hopelessness about a situation. Usually, the patient has a history of outbursts of rage, temper tantrums, or impulsive behavior. People with a tendency for violence frequently lose control when intoxicated with alcohol or drugs. Family members are the most

frequent victims of their aggression. Patients with a propensity for violence include those intoxicated by drugs or alcohol; those going through drug or alcohol withdrawal; and those diagnosed with acute paranoid schizophrenic state, acute organic brain syndrome, acute psychosis, paranoid character, borderline personality, or antisocial personality disorders.

The goal of treatment is to bring the violence under control. A specially designated room with at least two exits should be used for the interview. The door of the room should be kept open, and the nurse should remain in clear view of the staff, *staying between the patient and the door.* However, the patient's exit to the door must not be blocked, because the patient may feel trapped and threatened. No objects that could be used as weapons should be in sight, in the room, or carried in with health care personnel. If the interviewer feels anxious or uneasy about the patient's response, security staff, a family member, or another health care worker should be asked to remain in the hall nearby in the event that additional help is needed. The patient should never be left alone, because this may be interpreted as rejection or provide an opportunity for self-harm.

To bring the violence under control, it is crucial to use a calm, noncritical approach while remaining in control of the situation. Sudden movements are avoided. If the patient is carrying a weapon, the emergency health care provider should ask that it be surrendered. If the patient is unwilling to surrender the weapon, the security staff is called. If necessary, the security staff may seek further assistance from the local police department.

The patient's violent behavior is a crisis situation for the patient and the ED. Crisis intervention, achieved by talking and listening to the patient, is best accomplished by expressing an interest in the patient's well-being while attempting to tune in to the patient and remain firm. The patient's agitated state is acknowledged by statements such as, "I want to work with you to relieve your distress."

The patient is allowed the opportunity to express anger verbally. If the patient is delusional, challenging the patient is avoided. Trying to hear what the patient is saying, conveying an expectation of appropriate behavior, and making the patient aware that help is available are key. The patient should be informed that violent behavior may be frightening to others and that violence is not acceptable. Help that is available in crisis situations (from a clinic or mental health facility) should be described and offered. Often, the offer of protection by hospitalization is welcomed by the patient, who fears losing control or harming self or others. If the patient does not calm down, security personnel or police intervention may be necessary.

If these measures fail to alleviate the patient's tension, medication may be prescribed (rapid sedation with haloperidol, diazepam, or chlorpromazine) to reduce tension, anxiety, and hyperactivity. Soft restraints must be prescribed by a physician only if other measures to calm the patient have failed (Hoyt & Selfridge-Thomas, 2007). After combativeness, agitation, and fear have decreased, the patient is referred for further mental health treatment.

Posttraumatic Stress Disorder

PTSD is the development of characteristic symptoms after a psychologically stressful event that is considered outside the range of normal human experience (eg, rape, combat, motor vehicle crash, natural catastrophe, terrorist attack). Symptoms of this disorder include intrusive thoughts and dreams, phobic avoidance reaction (avoidance of activities that arouse recollection of the traumatic event), heightened vigilance, exaggerated startle reaction, generalized anxiety, and societal withdrawal. PTSD may be acute, chronic, or delayed. PTSD often presents as multiple readmissions to the ED for minor or recurring complaints without evidence of injury. Refer to Chapter 7 for further discussion of assessment, diagnostic findings, and management of patients with PTSD.

Underactive or Depressed Patients

In the ED, depression may be seen as the primary condition bringing the patient to the health care facility or it may be masked by anxiety and somatic complaints. The depressed person has a mood disturbance.

Any patient who is depressed may be at risk of suicide. Attempts are made to find out whether the patient has thought about or attempted suicide. Questions such as, "Have you ever thought about taking your own life?" may be helpful. Generally, the patient is relieved to have an opportunity to discuss personal feelings. If the patient is seriously depressed, relatives should be notified. The patient should never be left alone, because suicide is usually committed in solitude. See Chapter 7 for further discussion of assessment, diagnostic findings, and management of patients with depression.

Suicidal Patients

Attempted suicide is an act that stems from depression (eg, loss of a loved one, loss of body integrity or status, poor self-image) and can be viewed as a cry for help and intervention. Males are at greater risk than females. Others at risk are elderly people; young adults; people who are enduring unusual loss or stress; those who are unemployed, divorced, widowed, or living alone; those showing signs of significant depression (eg, weight loss, sleep disturbances, somatic complaints, suicidal preoccupation); and those with a history of a previous suicide attempt, suicide in the family, or psychiatric illness.

Being aware of people at risk and assessing for specific factors that predispose a person to suicide are key management strategies. Specific signs and symptoms of potential suicide include the following:

- Communication of *suicidal intent*, such as preoccupation with death or talking of someone else's suicide (eg, "I'm tired of living. I've put my affairs in order. I'm better off dead. I'm a burden to my family.")
- History of a previous suicide attempt (the risk is much greater in these cases)

- Family history of suicide
- Loss of a parent at an early age
- Specific plan for suicide
- A means to carry out the plan

Emergency management focuses on treating the consequences of the suicide attempt (eg, gunshot wound, drug overdose) and preventing further self-injury. A patient who has made a suicidal attempt may do so again. Crisis intervention is used to determine suicidal potential, to discover areas of depression and conflict, to find out about the patient's support system, and to determine whether hospitalization or psychiatric referral is necessary. Depending on the patient's potential for suicide, the patient may be admitted to the intensive care unit, referred for follow-up care, or admitted to the psychiatric unit.

CRITICAL THINKING EXERCISES

1 An elderly man arrives at the ED by ambulance after a car crash. He is immobilized on a backboard with a cervical collar and an oxygen mask is in place. There is a bruise across his abdomen where the seat belt was applied. He is groaning loudly and seems confused; he cannot tell you what has happened, where he is at present, nor what day of the week it is, although he can tell you his full name. You note a shallow, rapid breathing pattern of 26 breaths per minute. How would you prioritize the patient's needs? Develop an assessment strategy, identify diagnostic studies that will benefit the patient, and describe the patient's priority treatment needs.

EBP **2** Two men choose to go ice fishing for the first time of the season. They chose to wear light clothing, expecting the cabin to be warm, but neglected to take into account the 4 inches of snow on the ground and the high humidity. They spent the day fishing on the ice without moving much. One man now presents to the ED for treatment of frostbite of his feet. His friend has been massaging them en route to the ED, and the patient insists that this makes his feet feel better. You tell them to cease massage. Describe the explanation you would give to this patient and the evidence base that guides your response. Tell how you would proceed with managing this patient's care. Describe the treatment dilemmas for this type of injury.

3 The following four patients present to the triage desk of the ED within minutes of each other. How would you prioritize and categorize each of these patients? Which ones need immediate attention? What initial care would you provide at triage? Which patient could wait or be sent to the clinic for management?

a. A college-student with a history of exercise-induced asthma and known noncompliance to prescribed medications presents with rapid, shallow respirations and wheezing after jogging 5 miles. His girlfriend is very anxious. He has been this way for about 15 minutes.
b. An attorney who has had a cold for 3 days says she has no primary care physician and must be seen right now because she cannot breathe. Her respirations are normal, pulse oxygenation saturations are 100%, and she has complaints of sinus drainage and a headache.
c. A middle-age woman experienced sudden dyspnea and chest tightness while making dinner. Instead of calling 911, her husband drove her to the ED. She is complaining of left scapular pain and tingling in her left arm, her skin appears ashen, and she is diaphoretic.
d. An elderly woman with a known history of diabetes presents with complaints of 24 hours of vomiting. Her vital signs are normal, but she is diaphoretic and appears weak.

4 A patient arrives to the triage area of the ED complaining of flulike symptoms. He has developed a rash that seems to be primarily located on the soles of his feet and palms of his hands. He cannot remember touching anything that he knows he is allergic to, and he has not been walking barefoot. He does like to hunt, and only a week ago was in his deer stand for most of the weekend. What potential disease symptoms are being exhibited by this patient? What other questions would you ask? What will you focus on when you examine his skin?

The Smeltzer suite offers these additional resources to enhance learning and facilitate understanding of this chapter:

- thePoint online resource, thepoint.lww.com/Smeltzer12E
- Student CD-ROM included with the book
- *Study Guide to Accompany Brunner & Suddarth's Textbook of Medical-Surgical Nursing*

REFERENCES AND SELECTED READINGS

***Double asterisk indicates classic reference.*

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RESOURCES

American College of Surgeons, Committee on Trauma, www.facs.org
American Heart Association, www.americanheart.org
American Trauma Society, www.amtrauma.org
Centers for Disease Control and Prevention, www.cdc.gov
Divers Alert Network, www.diversalertnetwork.org
Emergency Nurses Association, www.ena.org
National Safety Council, www.nsc.org
Society of Trauma Nurses, http://traumanursesoc.org