CHAPTER

42

Assisting with Medical Emerge and Emergency Preparedness

Learning Objectives

After completing this chapter, you should be able to:

42.1 Define and spell the terms for this chapter.
42.2 Identify types of resources related to emergency care.
42.3 Outline the steps of primary assessment.
42.4 List items commonly found on an emergency crash cart.
42.5 Describe the principles of cardiopulmonary resuscitation.
42.6 Explain how to provide first aid to a person with an obstructed airway.
42.7 Describe the symptoms of different types of respiratory distress.
42.8 Explain how to provide first aid to a person in shock.
42.9 Explain how to provide first aid to a person with a diabetic emergency.
42.10 Explain how to provide first aid to a person who is bleeding.
42.11 Explain how to provide first aid to a person with a wound.
42.12 Explain how to provide first aid to a person with a burn.
42.13 Explain how to provide first aid to a person with temperature-related eme
42.14 Explain how to provide first aid to a person having a seizure.
42.15 Explain how to provide first aid to a person who has syncope.
42.16 Explain how to provide first aid to a person with a musculoskeletal injury
42.17 List the elements of an emergency plan in response to an emergency.
42.18 Describe the importance of participating in a mock exposure event.

Case Study

It's a very busy day at Pearson Physicians Group. The examination rooms are full, and three patients are still in the reception area waiting to be seen. Many of the patients have been discussing the odd weather patterns of alternating rain and hail. Lewis Jordan, RMA, is working on medical billing in the front office when he notices that the weather has finally settled down. Within minutes, Lewis hears a fire siren and an emergency broadcast on the radio station announcing a tornado warning. Everyone within the listening area is advised to take immediate cover.

Terms to Learn

algorithm	first responders	intubate
anaphylactic shock	heat exhaustion	patent
bandage	hyperglycemia	primary assessment
crash cart	hyperthermia	Rule of Nines
dressing	hypoglycemia	stat
emergency kit	hypothermia	triage

This chapter presents a number of medical emergencies. The physician must be notified immediately of any emergency that occurs in the medical office. In some cases, you will need to call 911 to access the Emergency Medical Services (EMS) system. To ensure every patient's safety until additional medical help arrives, medical assistants are cautioned not to perform procedures outside their scope of practice while providing the emergency care they are trained to provide.

EMERGENCY RESOURCES

People with a medical emergency have several options about where to seek care, depending on the nature and severity of their emergency.

- **Medical office: conditions that pose no immediate danger to life or limb.** During normal office hours, minor emergencies, such as a twisted ankle or a moderate nosebleed, may be handled in a medical office. Some physician group practices may have an emergency clinic where emergency service is provided both during and after office hours.
- **Freestanding clinics or urgent care centers: conditions that need to be treated quickly but that are not life threatening.** Freestanding clinics or urgent care centers provide emergency care during regular hours until late in the evening and often on weekends. However, many of these facilities do not offer critical-care intervention for life-threatening conditions.
- **Hospital emergency departments: most emergencies, including those that are life threatening.** Hospitals usually have 24-hour emergency departments (EDs) that are open seven days a week. These "24-7 EDs" can handle most emergencies and arrange transport of patients to critical-care trauma centers.
- **Critical-care centers: life-threatening conditions that require specialized critical care.** Critical-care centers, such as trauma, cardiac, burn, and surgical centers, have specialty-trained physicians, surgeons, anesthesiologists, and other critical-care staff on duty at all times.

As a medical assistant, you should be aware of the emergency care options available in your community. It is prudent to have a list of these centers prepared before an emergency happens and placed in the reception area so patients can be appropriately redirected to a venue that can best serve them if they call or come in for advice. Further, the practice's voice messaging system should instruct patients who call with an emergency to hang up and dial 911 to prevent patients from leaving messages or waiting to speak to someone in the doctor's office rather than acting quickly and appropriately in an emergency.

Emergency Medical Services

Emergency Medical Services (EMS) was established to provide prehospital emergency care and safe and prompt transportation from any location, including a medical office, to a hospital or other appropriate facility. It is often said that EMS brings the emergency department to the patient.

There are four nationally recognized levels of EMS practitioner:

- An *Emergency Medical Responder (EMR)* can provide immediate basic life-saving care while awaiting response from a higher-level EMS practitioner.
- An *Emergency Medical Technician (EMT)* can provide basic emergency medical care, administration of a few specific medications, and transport to a hospital or other appropriate facility for definitive care.
- An *Advanced Emergency Medical Technician (AEMT)* can provide basic emergency medical care, some advanced care, administration of a somewhat broader range of medications, and transport.
- A *Paramedic* can provide all the care that an EMT or AEMT can provide plus a broad range of advanced emergency care, a much broader variety of medications, and transport.

The term **first responder** is sometimes used to mean what is now called the Emergency Medical Responder (EMR) (often a policeman or firefighter trained as an EMR) and is sometimes used to mean any EMS practitioner at any level of training who is first to respond to an emergency.

Paramedics and AEMTs are trained to use advanced airway devices to **intubate**, which may involve inserting a breathing tube into the trachea, and they may start an intravenous (IV) line in seconds. They carry ample oxygen supplies and an assortment of emergency medications, and they are able to perform other invasive procedures.

The following summarizes the roles played by EMS:

- Provide on-the-scene intervention and treatment.
- Prepare the patient with injuries, trauma, or illness for transport.
- Transport the patient to the emergency facility. Emergency transportation is accomplished by ambulance, helicopter, or fixed-wing aircraft.
- Transfer the patient to medical personnel at the receiving facility (Figure 42-1).

EMS personnel are accustomed to working with other health care professionals. An EMT or Paramedic may ask the office staff for all the pertinent patient information, including information about patient complaints, immediate and overall history, medications taken and allergies, and care that has been administered up to the point of the EMS responders' arrival. EMS personnel will make sure this information accompanies the patient to the hospital and may transmit the information by radio from the ambulance to the hospital so hospital personnel can prepare for the patient's arrival. Thus, this communication between you and EMS personnel is vital for the patient's continuity of care.

FIGURE 42-1 EMS personnel respond to emergencies and transport patients to the hospital.

Specialized Resources

Apart from emergency response teams, the medical assistant will occasionally need to consult with specialists in such areas as poison control, pediatrics, trauma, and burns. Some consultations will be under emergency conditions, so make sure the specialists' telephone numbers are displayed prominently near the phones in the office to be readily accessible.

Good Samaritan Laws

A health care professional who volunteers in an emergency situation in which duty is not owed a victim is generally protected by various state laws that hold the medical professional not legally liable when rendering first aid. These laws are often referred to as Good Samaritan laws.

Once a health care professional has decided to provide care, that health care professional is committed to rendering such care according to the scope of his license, certification, or training given the resources available at the scene. In an emergency situation in which the health care professional has begun to provide care to the patient, he must remain with the patient, as long as the scene is safe, until relieved by another health care professional with an equal or higher level of training. It is important that health care professionals be aware of the laws in their own state and

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GUIDELINES FOR PROVIDING EMERGENCY CARE

Medical assistants and other staff members must stay up to date on the emergency plans of the office, facility, and community. These plans should be reviewed with personnel of the practice on a regularly scheduled basis.

For major or catastrophic events, local law enforcement and emergency management agencies direct rescue, treatment, and transportation efforts. In such an emergency or disaster, health care professionals are expected to provide care with whatever limited resources are available, so those patients who have little hope of survival may not be treated. Patients with very severe injuries may be diverted to trauma centers. Treatment of patients with mild or non–life-threatening injuries will be deferred until after life-threatening but survivable injuries have been treated.

Medical assistants need to be able to handle emergencies in three types of situations. The most common is on the telephone, when a patient or patient's relative calls to ask for advice for an emergency that is occurring outside the office. Another type is when an emergency occurs near the doctor's office, and someone brings the patient to the office. The third is when an emergency occurs in the office setting.

In an emergency, the medical assistant must be able to look at someone or listen to her on the phone and quickly decide whether that person is ill or injured and does or does not require emergency care. The medical assistant may ask the physician for advice anytime the physician is in the office or may decide to activate EMS by calling 911. Sometimes a decision tree, or map of what action to take in certain circumstances, is created by the physician for the medical assistant to use for **triage**, which refers to assessing and prioritizing the emergency care needed by patients.

In some states, triage is not within the scope of practice of the medical assistant. In these states, the medical assistant should not work alone in the medical office but should assist the physician during emergencies.

Primary Screening and Assessment

Every patient contact by a medical professional begins with a few questions and a basic patient examination, the **primary assessment**. When the patient presents with an emergency, the primary assessment is critically important for the medical assistant, whose role is to organize the process of caring for patients and to maintain control of an emergency situation. The steps of primary assessment include the following:

Professionalism The Law

As a medical assistant, you have three primary legal responsibilities in an emergency. The first is a duty to act within your scope of practice. Even though we all feel a little intimidated by the thought of an emergency, you are a medical professional and must act. You are accountable to yourself, your employer, and the public for actions that fall within the scope of your medical training and certification.

Your second legal responsibility is to ensure and document the constant emergency readiness of the office in which you work. You not only need to check your equipment when you come to work every day or as deemed by your employer (an ethical responsibility), but you need to be able to prove that you did so (a legal responsibility). That means documentation, by means of timed, dated, and signed logs as required by your office. When a piece of equipment that you were supposed to check, but did not, fails, you may be held wholly or partly legally responsible.

Your third legal responsibility, which you share with others in your workplace, is to do all you can to prevent emergencies—for example, by creating emergency preparedness plans. Educating patients and their families about their own safety is also part of emergency prevention.

1. Determine the patient's name, approximate age, and gender.

   When you ask patients their name, they must quickly go through an extensive neurological process to give a simple appropriate answer. They must be able to do the following:
   - Hear you.
   - Localize the sound of your voice, using both ears and both eyes.
   - Look at you with a symmetrical gaze, and focus on you with both eyes.
   - Reason that you are a caregiver, and then process the meaning of your words, hopefully in your own language (but maybe not).
   - Remember their name, and formulate a meaningful response.
   - Answer in coherent speech and with a symmetrical face.

   During that brief period of time, you may learn a lot about a patient's mental function by observing other details, such as facial expressions and body language.

2. Determine the patient's need for intervention.

   A patient who cannot be aroused or who cannot stay awake deserves serious concern. Does the patient

TABLE 42-1 | **Emergency Intervention**

Life-Threatening: Immediate Intervention	Not Life-Threatening: Immediate Intervention	Not Life-Threatening: Intervention as Soon as Possible
• Extreme shortness of breath (airway or breathing problems) • Cardiac arrest • Severe, uncontrolled bleeding • Head injuries • Poisoning • Open chest or abdominal wounds • Shock • Severe burns, including face, hands, feet, and genitals • Potential neck injuries	• Decreased levels of consciousness • Chest pain • Seizures • Major or multiple fractures • Neck injuries • Severe eye injuries • Burns not on face, hands, feet, or genitals	• Severe vomiting and diarrhea, especially in the very young and in older adults • Minor injuries • Sprains • Strains • Simple fractures

seem too weak to stand up? Does the skin color seem very pale or red or perhaps blue? Is the patient very sweaty for no apparent reason (such as hot weather or recent exercise)? Is the patient bleeding uncontrollably or struggling to breathe? Table 42-1 lists various conditions, signs, and symptoms categorized by severity and need for immediate intervention or intervention as soon as possible.

3. Obtain the history of the event.

   The immediate history can reveal a lot about the nature of a problem. For instance, a patient who feels "dizzy" on awakening in the morning with a cold is a lot different from a patient who feels the same way after several episodes of dark-colored, foul-smelling diarrhea. Although these patients have the same complaint (dizziness), their histories differ. By itself, the first patient's history suggests an ear infection, whereas the second patient's history points to gastrointestinal bleeding. Another example is a caller who describes where his terrible headache is located and then loses consciousness. The data reported in the patient's history would prompt the initial decisions and actions of an entire team of people who would then care for that patient.

   Past medical history is also important in emergency situations. The best way to gather the past medical history is to use a checklist, whether mental or written. The questions you ask may depend on your employer's standard procedures, but should probably be the same for every patient, regardless of the complaint. Specifically, you might ask if the patient has:

   - Heart problems (Has the patient ever had a heart attack or a diagnosed heart disease?)
   - Lung problems (Does the patient have both lungs?)
   - Asthma or allergies
   - Kidney problems (Does the patient have both kidneys?)
   - Diabetes (Does the patient take insulin? Has the patient had insulin today and, if so, when?)
   - High or low blood pressure (Which?)
   - Seizures
   - Fainting spells
   - Pregnancy, if possible (OB/GYN history? Last menstrual period?)
   - Previous similar events (When, treatment, outcome?)

4. Gather medication information.

   A medication list can provide information regarding medical history. Also, many medical conditions are caused by interactions among medications or by a patient's reaction to one or more of them. It is important to ask the patient both the name of each drug and the dosage taken.

5. Identify the patient's allergies.

   Many caregivers underestimate the importance of allergies. People can go into **anaphylactic shock**, a severe allergic reaction that causes respiratory distress from swelling of the upper airways. This condition must be treated immediately. (Anaphylactic shock is discussed in more detail later in this chapter.) Thousands of patients experience anaphylactic reactions to medications that are dispensed every day. Many wear some kind of identifying jewelry as a reminder, in the form of bracelets, wristbands, or necklaces. Usually they are keenly aware of their allergies, but it happens sometimes during a medical crisis that people either forget about their allergies or become unable to

Professionalism The Life Span

It is necessary to consider the age and body structure of a patient whom you are treating in a medical emergency. Just as there are specific guidelines for administering CPR to a child, there are factors to take into consideration when performing an emergency intervention on an older adult. As discussed in the chapter titled "Assisting with Life Span Specialties: Geriatrics," the aging body undergoes various systemic changes. For example, as patients enter their seventies and eighties, their skeletal structure is likely to be frailer than that of patients who are in their twenties and thirties. Keep this in mind when performing emergency interventions such as abdominal thrusts, chest compressions, and CPR. The amount of force necessary to achieve the desired effect may not be as great in older adults. (However, do not withhold such interventions, as needed, because you fear injuring the patient. The life-saving imperative outweighs the possibility of skeletal injury.)

communicate about them. Check for warning tags and jewelry during the patient examination, even if a patient denies having any allergies.

6. Take the vital signs.

With the patient's permission, take vital signs. Take the patient's temperature; then count respirations for about 30 seconds and multiply by 2. Then spend 30 seconds checking the pulse and multiply by 2, followed by taking the blood pressure. Record these readings on the chart. If the patient has a potentially serious complaint, or if anything in the vitals or the patient's appearance concerns you, terminate the physical examination and notify the physician immediately. If the physician is unavailable, call 911. Have the patient lie down on the examination table, and make the patient comfortable. Oxygen may need to be administered, as ordered by the physician.

OFFICE EMERGENCY CRASH KIT

Every doctor's office has an **emergency kit** or box (sometimes called a **crash cart**) that contains all supplies that may be needed during an emergency and that is instantly accessible to anyone in the office (Figure 42-2). A crash cart resembles a large roll-around toolbox with drawers that can store emergency medications, intubation equipment, needles and syringes, assorted small instruments, a resuscitator, a heart monitor-defibrillator, an oxygen supply, and airway and suction devices. The emergency medical or drug box is kept on or close to the crash cart. Table 42-2 lists some of the drugs that may be stocked in an emergency medical box.

FIGURE 42-2 Emergency crash cart.

The physicians in each office determine which drugs are appropriate for the practice, as established by emergency **algorithms**, sequences of actions to perform tasks. It is best if these algorithms are created before the emergency and frequently rehearsed with staff to ensure that all are trained on how to perform as a team in sequence during an emergency. These algorithms provide decision trees so that depending on whether the answer to a question is yes or no, you proceed to the next question in the algorithm until you have found the action needed for the specific situation. For example, if the patient is not breathing, then opening an airway is paramount. If the patient is breathing, then looking for other injuries will be the next action.

TABLE 42-2 | Drugs Commonly Stocked in an Emergency Medical Box

- Activated charcoal
- Atropine
- Diphenhydramine
- Epinephrine
- Furosemide
- Instant glucose
- Insulin
- Lidocaine
- Local anesthetics
- Nitroglycerin
- Normal saline
- Phenobarbital and diazepam
- Sodium bicarbonate
- Solu-Cortef
- Verapamil

A crash cart may contain items that are not within the scope of practice for a medical assistant. However, a physician or nurse may use them. In a small office, a crash cart can be brought to the side of any patient within moments of an emergency, or a "code."

Emergency supplies must be checked routinely. The cart must be restocked after every use and maintained at least once a month on a regular basis, with expiration dates checked, for two reasons. First, emergency medications tend not to get used often, and they expire. The same is true of the batteries that power monitor-defibrillators, laryngoscopes, and suction devices. When these items do get used, someone who is not currently dealing with the aftermath of the emergency must double-check them. Second, being able to use emergency equipment under pressure in an emergency situation requires comfortable, hands-on familiarity with the equipment. When emergencies are infrequent, as in most physicians' offices, familiarity can only come from handling the equipment during frequent maintenance checks. Mock practice sessions can also help medical assistants become more familiar with the equipment and how to use it.

Finally, crash cart supplies must include a checklist that names every drug container and every piece of equipment the cart contains. (The physician decides what equipment and supplies should be stocked in the emergency cart.) The checklist should provide space for a daily date and signature, and someone in the office should be specifically accountable for maintaining the cart. However, all persons who are likely to use the cart must check it personally as well, for the sake of their own performance.

MEDICAL EMERGENCIES

The following sections of this chapter describe medical emergencies that may be seen in the medical office and treatments that should be initiated by the medical assistant.

Cardiopulmonary Resuscitation and Automated External Defibrillation

Respiratory arrest and cardiac arrest may be caused by an occluded airway, electrocution, shock, drowning, heart attack, trauma, anaphylaxis, drugs, poisoning, or traumatic head or chest injury. Intervention must be immediate if resuscitation is to be successful. Basic life support guidelines should be followed for respiratory arrest, cardiac arrest, or an obstructed airway.

For individuals experiencing loss of consciousness with no breathing or no normal breathing (gasps of air known as agonal breathing), follow the cardiopulmonary resuscitation (CPR) protocol. These guidelines vary somewhat accordi to age group. The adult guidelines include adolescents, w are defined as those who have gone through puberty. Signs puberty include chest or underarm hair in males and bre development in females. A child is defined as 1 year of age puberty. Infant guidelines should be applied to patients l than 1 year of age. Table 42-3 lists the standards for C recently established by the American Heart Associati (AHA) and American Red Cross (ARC).

Because we assume that there is probably more than o person in the medical office with professional-level CPR cer fication, we will primarily focus on two-rescuer, professiona level CPR standards. However, if you are alone when y find an unresponsive adult patient who is not breathing who has agonal breathing, you should shout out for he immediately after checking to confirm the patient's un sponsiveness and lack of normal breathing. If someo responds, instruct that person to activate the emergen response system, which is 911 if outside a hospital settin get an automated external defibrillator (AED), if availab and immediately return to assist you. (If that person not trained in two-person CPR, he should bring someo who is.)

If someone has responded to your shout for help, wh that person calls 911 or activates the emergency respon system and retrieves the AED, you should work alone check for a pulse. If there is no pulse, immediately begin t CPR protocol with chest compressions.

If, however, no one has responded to your shout for he and if the patient is an adult, before performing CPR y should first leave the patient to call 911 or activate the em gency response system and get an AED. When you return the patient, then check for a pulse and, if it is absent, imm diately begin the CPR protocol with chest compressions.

If an infant or child is unresponsive and not breathing not breathing normally (agonal breathing), and you a working alone, you should provide five cycles (approx mately two minutes) of CPR first, before you leave t patient to activate the emergency response system and get AED. The reason for first providing five cycles of CPR in t infant or child is that the cardiac arrest is likely caused by airway obstruction or a ventilation or hypoxia issue and n from a cardiac cause as is likely in the adult patient.

The sequence of actions is critical. Early access to EMS important. Access is initiated by calling 911 or activati the emergency response system as soon as you have det mined that the adult patient is unresponsive and not breat ing or not breathing normally (or after five cycles of CPR f the infant or child).

TABLE 42-3 | Adult, Child, and Infant CPR Standards

Conscious Choking	Abdominal thrusts for adult or child over 1 year of age. Five back slaps, then five chest thrusts (same as chest compressions) for an infant (less than 1 year of age). Continue the sequence for the adult, child, or infant until the obstruction is relieved or the patient becomes unconscious.
Unconscious Choking	Activate emergency response system, lower the patient to the ground or onto a hard surface, initiate CPR beginning with chest compressions (do not check for a pulse). Before ventilation, open the airway and inspect for an obstruction. If the obstruction is seen and can be removed, remove it with your fingers. If no object is seen, attempt to deliver two breaths and continue with CPR until the obstruction is relieved or EMS arrives on the scene. Use this sequence for adults, children, and infants.
Rescue Breaths	Deliver the breath over one second with enough volume to cause the chest to rise. Do not overventilate with too much volume, too fast, or with too much pressure.
Chest Compression to Ventilation Ratio for a Single Rescuer	30 compressions: two ventilations for the adult, child, and infant.
Chest Compression to Ventilation Ratio for Two Rescuers	30 compressions: two ventilations for the adult, 15 compressions: two ventilations for the child and infant.
Chest Compression Rate	At least 100–120/minute for the adult, child, and infant.
Chest Compression Hand Position	Center of the chest on the lower half of the sternum for the adult and child. Two fingers in the center of the chest just below the nipple line for one-rescuer infant chest compressions. Both hands encircling the chest with both thumbs on the center of the chest just below the nipple line, with hands supporting the back, for two-rescuer infant chest compressions.
AED	Use adult defibrillation pads on any patient 8 years of age or older. Use child defibrillation pads on any child less than 8 years of age. If no child pads are available, adult defibrillation pads should be used on children and infants. Deliver one shock if advised and then continue CPR until advised—approximately two minutes (or five cycles).
Anaphylaxis	Assist person with use of prescribed auto injector.
Asthma	Assist person with use of prescribed inhaler.

Professionalism

As a medical assistant, you are responsible for upholding the highest professional standards. You should obtain and always maintain professional-level CPR certification from either the American Heart Association (AHA) or the American Red Cross (ARC). Your employer may require it.

The Chain of Survival, established by the AHA, illustrates the key factors affecting survival of a cardiac arrest. The Chain of Survival has five steps: (1) immediate recognition of the emergency and activation of EMS; (2) early CPR; (3) rapid defibrillation; (4) effective advanced life support; and (5) integrated post-cardiac-arrest care.

If a cardiac arrest occurs in the medical office, medical assistants with CPR training will perform the first three of the five steps of the Chain of Survival.

Immediate initiation of chest compressions (or as promptly as possible given the scenarios just discussed) is imperative to a patient's survival. Thus, the initial sequence followed for CPR is to provide circulation support by chest compressions, followed by opening the airway and providing ventilations. This sequence is referred to as CAB: Circulation, Airway, Breathing.

One-Person and Two-Person CPR Sequence for an Adult Patient

The sequence for CPR for an adult patient (anyone beyond puberty) is as follows:

1. Tap the patient's shoulder and ask, "Are you okay?" If there is no response, check for breathing. If the patient is unresponsive and there is no breathing or no normal breathing (agonal breathing), shout for someone to activate the emergency response system by dialing 911.

2. Check for a carotid pulse for at least 5 seconds but no more than 10 seconds. If a pulse is not found within 10 seconds, initiate CPR by immediately beginning chest compressions (CAB sequence).
3. Begin chest compressions by positioning yourself at the patient's side. The patient should be in a supine (face up) position and on a hard or firm surface. If the patient is in a prone (face down) or lateral (on the side) position, logroll him into a supine position. If a spinal injury is suspected, try to keep the patient's head and neck in line with the navel when doing the logroll. Place the heel of one hand on the center of the patient's chest on the lower half of the sternum (breast bone). Place the heel of your other hand on top of your first hand with your fingers interlaced. Straighten your arms and get up on your knees until your shoulders are directly over your hands (Figure 42-3).
4. According to the AHA, you should "push hard and fast." Push hard so that each compression is delivered at a depth of at least 2 inches but not to exceed 2.4 inches (5–6.1 cm). Make sure that at the end of each compression, you allow the chest to recoil completely without taking your hands completely off the patient's chest. This is vitally important to facilitating blood flow. By not allowing the chest to recoil completely, you will impede the flow of blood to the heart and brain. Push fast by delivering the compressions in a smooth motion at a rate of at least 100–120 compressions per minute (30 compressions should be delivered in 18 seconds or less). Do not interrupt compressions or minimize the time and number of interruptions. The more interruptions, the more poorly the blood flows to the brain and heart. Provide 30 compressions.
5. After the first rescuer provides the first 30 compressions, the second rescuer will open the airway with a head-tilt, chin-lift by placing the palm of one hand on the forehead and two or three fingers of the other hand under the bony part of the lower jawbone near the chin. The second rescuer will then gently tilt the head backward and lift the jaw forward (Figure 42-4). If a spinal injury is suspected, a jaw-thrust maneuver must be used to open the airway (Figure 42-5). If the jaw thrust fails to open the airway, switch to a head-tilt, chin-lift. When you do the head-tilt, chin-lift, or jaw-thrust maneuver, the tongue is lifted forward and the airway opened.
6. To deliver ventilations, pinch the patient's nose shut, seal your lips tightly around the patient's mouth, and slowly deliver two breaths, each lasting one second. It is recommended that mouth-to-mask or bag-valve mask devices be used initially, if available, or to replace mouth-to-mouth as quickly as possible. You will know the artificial ventilation is effective if the patient's chest rises with each delivered breath. For a patient with a tracheotomy, it may be necessary to close the mouth and nose and administer breaths to the tracheotomy.

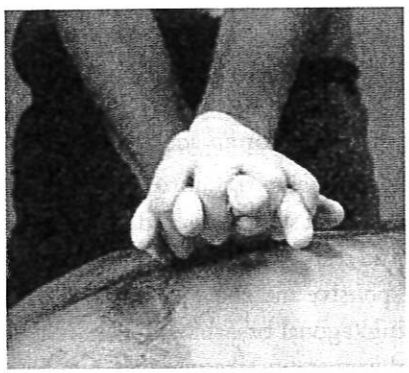


FIGURE 42-3 Position of hands for chest compression on an adult.

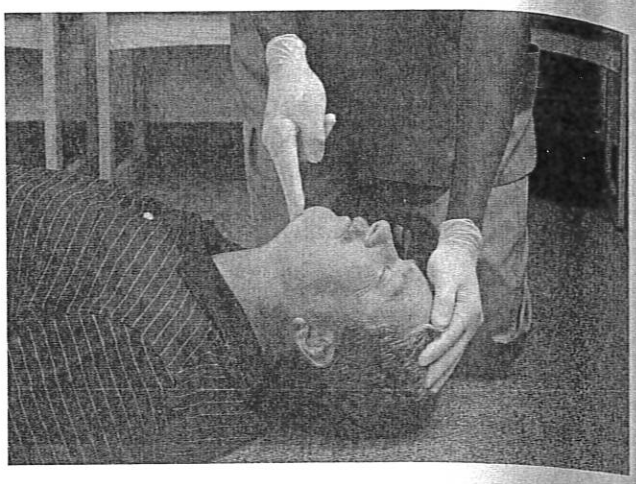


FIGURE 42-4 Head-tilt, chin-lift maneuver.

FIGURE 42-5 Jaw-thrust maneuver.

7. Continue to deliver cycles of 30 compressions and two breaths. Switch duties between the rescuers every five cycles or approximately every two minutes. Chest compressions should not be interrupted for more than five seconds to switch compressors. As soon as an automated external defibrillator (AED) becomes available, power-on the device and apply the proper defibrillation pads (adult or pediatric) and follow the prompts.

Procedure 42-1 details the procedures for one- and two-person adult rescue breathing and CPR.

One-Person and Two-Person CPR Sequence for a Child from 1 Year of Age to Puberty

1. Assess for responsiveness by tapping the child's shoulder. If the child is unresponsive and there is no breathing or agonal (gasping) breathing, have someone activate the emergency response system and get an AED.
2. Check the femoral or carotid pulse for at least 5 seconds but no more than 10 seconds. If you do not definitely feel a pulse or the heart rate is less than 60/minute with signs of poor perfusion, begin CPR by initiating chest compressions (CAB sequence).

PROCEDURE 42-1

Performing Adult Rescue Breathing and One- and Two-Rescuer CPR

Objective *Administer rescue breathing for an adult and one- and two-rescuer CPR for an adult correctly, within the time frames designated.*

EQUIPMENT AND SUPPLIES

Approved mannequin; gloves; ventilation mask; mouth guard

METHOD

Note: All medical assistants should obtain and maintain professional-level CPR certification (which includes performance of two-person CPR). Medical offices often have more than one employee with professional-level CPR certification. If, as a medical assistant, you are alone with a patient who needs CPR, shout for help. If someone comes right away—and while you begin one-person CPR—that second person can call 911 to activate EMS response and can also retrieve the office defibrillator. If that or another person in the office has professional-level CPR certification, the two of you can then continue with two-person CPR and defibrillation until EMS arrives.

The first set of instructions below, for one-rescuer CPR, assumes you will be working alone. The second set of instructions, for two-rescuer CPR, assumes that a second person with professional-level CPR certification will be available to work with you.

ONE-RESCUER ADULT CPR

1. Assess the patient and determine if help is needed. Shout "Are you okay?" while gently tapping the patient's shoulders.
2. If you determine that the adult patient is unresponsive and not breathing or not breathing normally (agonal breathing), *activate EMS immediately* by calling 911; then get an AED if available (or shout for another office employee to call 911 and get the AED).
3. Check a carotid pulse (Figure A) for no less than 5 seconds but no longer than 10 seconds. If there is definitely no pulse, begin chest compressions. Kneel at the patient's side. Place your hand in the center of the chest on the lower half of the sternum.
4. Place your other hand on top of the first hand on the chest, interlock your fingers, and be sure to lift your fingers off the chest using only the heels of your hands to administer compressions.
5. Kneel next to the patient and keep your shoulders directly over your hands. Compress the chest at least 2 inches but not to exceed 2.4 inches, and allow the chest to completely recoil after each compression (Figure B). Do not lift your hands completely off the chest.
6. Continue to compress the chest a total of 30 times at a rate of at least 100–120 compressions/minute.

FIGURE A Assess circulation by feeling for carotid pulse.

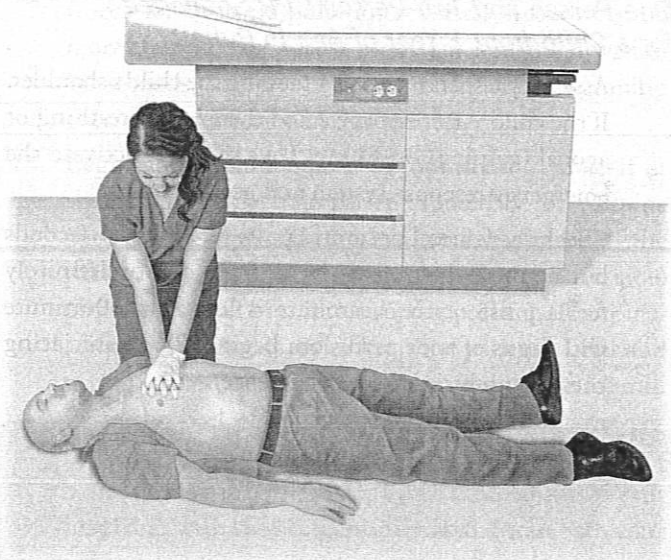


FIGURE B Rescuer working alone delivers chest compressions.

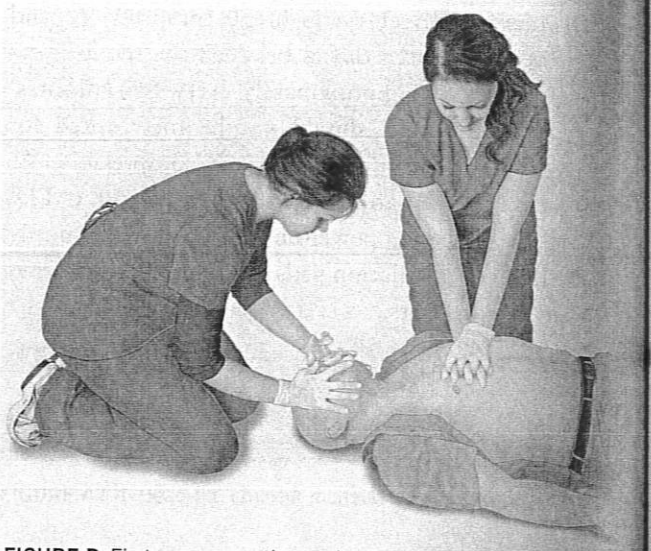


FIGURE D First rescuer continues chest compressions as second rescuer takes a position above the patient's head.

7. After 30 compressions are delivered, perform a head-tilt, chin-lift, or, if spine injury is suspected, a jaw-thrust maneuver to open the airway. Administer two breaths with each delivered over one second, preferably using a mouth-to-mask protective device (Figure C).

   Continue chest compressions and ventilations.
8. Apply the AED as soon as it becomes available. (See Procedure 42-3 regarding defibrillator use.)
9. Repeat this sequence until a pulse has been restored or until EMS arrives.
10. If breathing is absent, but a pulse has been restored, administer two rescue breaths, preferably using a mouth to-mask device. If your breaths do not cause the chest to rise, reestablish the head-tilt, chin-lift, or jaw-thrust maneuver. If you suspect choking, look in the patient's mouth and remove an object if you see one. If you see no obstruction, continue with rescue breathing. Check the pulse every two minutes. If an obstruction is present, perform the steps for an obstructed airway.
11. Wash your hands and document the incident in the patient's chart.

TWO-RESCUER ADULT CPR

1. Follow the steps just described for one-rescuer adult CPR until a second rescuer certified in professional-level CPR can join you.
2. Continue performing chest compressions while the second rescuer positions herself by kneeling above the patient's head (Figure D). After you have completed a cycle of 30 compressions, the second rescuer will administer two breaths, as described in the steps for one-rescuer CPR (Figure E).

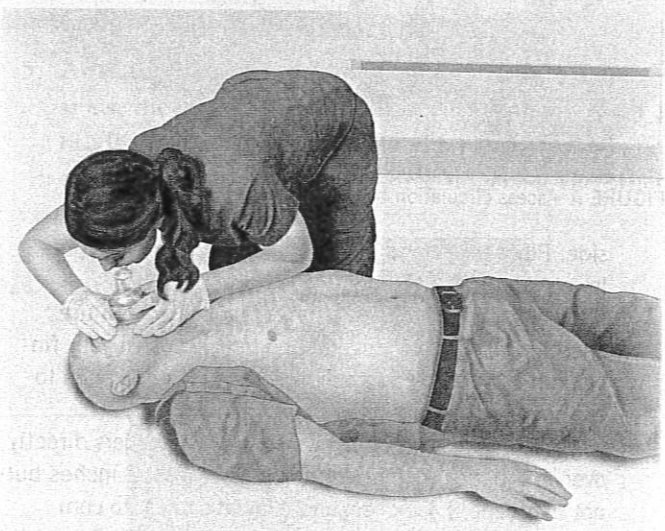


FIGURE C Rescuer working alone delivers ventilations through a mouth-to-mask protective device.

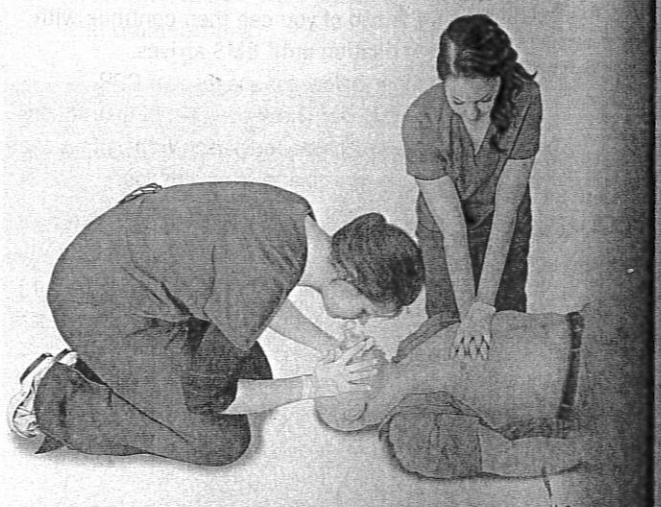


FIGURE E First rescuer rests but does not remove hands from the patient's chest while the second rescuer administers two ventilations.

3. Switch positions with the second rescuer every five cycles (approximately every two minutes), the ventilator taking over chest compressions while the compressor takes over ventilations.
4. Repeat this sequence until a pulse has been restored or until EMS arrives.
5. If breathing is absent, but a pulse has been restored, administer two rescue breaths as described in step 10 for one-rescuer CPR.
6. Wash your hands and document the incident in the patient's chart.

CHARTING EXAMPLE

08/05/YY 7:30 P.M. Patient found collapsed in bathroom and unresponsive. 911 call placed and CPR started. EMS arrived in approximately six minutes and took over care. Patient was transferred to Deaconess Medical Center.....
.....V. Nagle, RMA

3. Depending on the size of the child and your strength, you can provide chest compressions using both hands or the heel of one hand for smaller children (Figure 42-6). Until the second rescuer arrives back at the patient's side, use a ratio of 30 compressions to two ventilations. Once the second rescuer arrives, switch to a ratio of 15 compressions to two ventilations. Compress at a rate of at least 100–120/minute and at least ⅓ the depth of the chest, or approximately 2 inches. As in the adult, allow the child's chest to completely recoil after each compression. Provide 15 compressions.
4. The second rescuer will open the airway using a head tilt, chin-lift, or jaw-thrust maneuver. Deliver two slow ventilations over one second and watch for chest rise with each ventilation.
5. When the AED becomes available, power-on the AED, apply pediatric defibrillation pads, if available, and follow the prompts. (Use adult pads if pediatric pads are not available.)
6. Push hard and push fast while delivering 15 compressions followed by two breaths.

One-Person and Two-Person CPR Sequence for an Infant Less Than 1 Year of Age

1. Assess the infant for responsiveness. You can flick the sole of the foot to assess for any response if the infant does not seem to be responsive. If the infant is unresponsive and has no breathing or agonal (gasping) breathing, have someone activate the emergency response and get an AED.
2. Check the infant's brachial pulse for at least 5 seconds but no longer than 10 seconds. If there is definitely no pulse or if the heart rate is less than 60/minute with signs of poor perfusion, begin CPR by initiating chest compressions. If a second rescuer is immediately available, use a 15 compression to two ventilation ratio. However, if the second rescuer has not yet returned, immediately initiate CPR using a 30 compression to two ventilation ratio until the second rescuer arrives back at the patient's side. If one rescuer is providing CPR, use the two-finger compressions technique; however, if two rescuers are providing CPR, the two thumb-encircling hands techniques should be used to deliver the chest compressions (Figure 42-7). Push hard enough to compress the chest at least ⅓ the anterior-posterior diameter, which is approximately 1½ inches in the infant. The compressions should be delivered at a rate of at least 100–120 compressions/minute. Deliver 15 compressions.
3. The second rescuer should open the airway by placing the infant's head and neck in a neutral position. Use a chin lift and ventilate by using a mouth-to-mask device or an infant bag-valve-mask device. If mouth-to-mouth is required, place your mouth over the nose and mouth of the infant. If chest rise is not present, slightly extend the head and neck until the airway is open. Do not hyperextend the head and neck because this may collapse the trachea and obstruct the airway. Ensure that the chest rises with each delivered ventilation. Administer two ventilations after each 15 compressions when performing two-rescuer CPR.
4. Apply the AED using pediatric defibrillation pads, if available, as soon as it becomes available. Turn on the device and follow the prompts.

FIGURE 42-6 Compressions for a child.

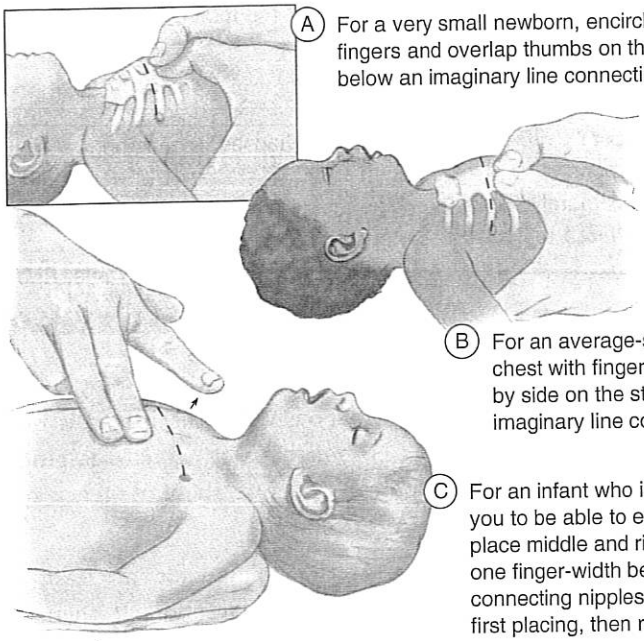


FIGURE 42-7 Compressions for an infant.

Rescue Breathing

If a patient of any age has a pulse but is not spontaneously breathing, provide rescue breaths until EMS arrives. An adult should be ventilated once every five to six seconds (10 to 12 breaths/minute), whereas a child or infant should be ventilated every three to five seconds (12 to 20 breaths/minute). Each ventilation should be delivered over one second. Check the pulse every two minutes. During ventilation, if an infant's heart rate decreases to less than 60 bpm with signs of poor perfusion, begin CPR by initiating chest compressions. Ensure that the airway is open and ventilations are being delivered adequately because bradycardia in infants most often results from an occluded airway, inadequate ventilation, or hypoxia (lack of adequate oxygen in the body tissues).

With an adult, child, or infant, place the palm of one hand on the forehead and two or three fingers under the lower jawbone to gently tilt the head backward (review Figure 42-4). If cervical or other spinal injuries are suspected, a jaw-thrust maneuver must be used to open the airway (review Figure 42-5). When the airway is opened, the patient may begin spontaneous breathing because the tongue is lifted and is no longer occluding the oropharynx. If a pulse is present but spontaneous breathing is not present, continue rescue breathing until EMS arrives.

Procedure 42-2 details the procedures for one- and two-person infant rescue breathing.

Defibrillation

Automated external defibrillation (AED) is highly effective when provided immediately after or within minutes of cardiac arrest. Most cardiac arrests in adults are related to fatal electrical arrhythmias of the heart that are sometimes converted (corrected) with defibrillation. The automated external defibrillator (AED) gives verbal prompts to the rescuer or rescue team that are easy and safe to follow. AEDs are applied to adults, children, and infants. It is recommended that child-size defibrillator pads and pediatric attenuator cables be used in children less than 8 years of age. Adult defibrillation pads and cables are used for any patient older than 8 years of age. If no child defibrillator pads or pediatric cables are available, an adult AED should be applied to the patient regardless of age, including children less than 8 years and infants.

Procedure 42-3 explains the use of an AED.

Obstructed Airway

An obstructed airway prevents the movement of air into or out of the respiratory tract. Certain conditions, such as anaphylaxis or croup, can cause a blockage from swelling of the upper airway tissue, but foreign objects are the cause of most obstructions. With small children, the obstruction is usually from food or small toys. With adults, an obstructed airway may be the result of the following:

- Not chewing large pieces of food properly
- Talking too excitedly or laughing too much while eating
- Drinking alcohol before and during eating
- Choking on body or extraneous fluids, such as vomit or blood

As a medical assistant, you should know how to respond to the following choking scenarios:

- **Partial airway obstruction with good air exchange**—The patient is conscious, is capable of moving air through the upper airway, and is able to produce a strong and forceful cough. This is also known as a mild airway obstruction.
- **Partial airway obstruction with poor air exchange**—The patient is conscious but is not moving adequate air and does not have the ability to produce a strong cough. This is also known as a moderate airway obstruction.
- **Total airway obstruction**—The patient is unable to speak or cough and is not moving any air. This is also known as a severe airway obstruction.

PROCEDURE 42-2

Performing Infant Rescue Breathing

Objective *Administer rescue breathing for an infant correctly and within the designated time frame.*

EQUIPMENT AND SUPPLIES

Approved mannequin; gloves; ventilation mask; mouth guard

METHOD

1. Assess for responsiveness and breathing. Never shake an infant.
2. If you determine that the infant is not breathing or not breathing normally but has a pulse, perform rescue breathing. *Immediately* activate EMS by calling 911.
3. Carefully place the patient in a supine position. If a spine injury is suspected, keep the head and neck in line with the navel.
4. With the palm of one hand, tilt the patient's head back. With two to three fingers of the other hand, lift the lower jaw forward to open the airway (Figure A).
5. If possible, place a face mask for mouth-to-mask ventilation over the patient's mouth and nose (Figure B). If two rescuers are present, one may cradle the infant in a supine position while the other administers ventilations (Figure C). Administer two rescue breaths. If your breaths do not cause the chest to rise, reestablish the head-tilt, chin-lift, or jaw-thrust maneuver. If you suspect choking, look in the patient's mouth and remove an object if you see one. If you see no obstruction, continue with rescue breathing. If an obstruction is present, perform the steps for an obstructed airway.
6. Once the obstruction is clear, begin rescue breathing by administering one breath every three to five seconds or 12 to 20 breaths every minute.

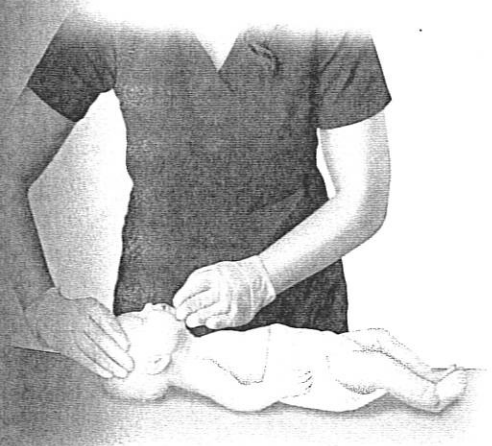


FIGURE A For infant rescue breathing, gently open the airway.

FIGURE B Cover the infant's mouth and nose with the mouth-to-mask device before delivering ventilations.

FIGURE C If two rescuers are present, one may cradle the infant in a supine position while the other delivers ventilations.

7. Continue breaths until the infant recovers or EMS arrives.
8. Wash hands and document the incident in the patient's chart.

CHARTING EXAMPLE

10/09/YY 9:45 A.M. 10-month-old patient choked in exam room and was not responsive when physician and medical assistant arrived. Called 911 and EMS activated as directed by the physician. Infant rescue breathing was initiated by the physician until EMS arrived. Patient transported to Walters Creek General Hospital.....M. Cowan, CMA (AAMA)

PROCEDURE 42-3

Demonstrating the Use of an Automated External Defibrillator

Objective ◆ *Use an automated external defibrillator (AED) correctly within the time frame designated by the instructor.*

EQUIPMENT AND SUPPLIES

AED machine; patient chart

METHOD

1. Place the AED (Figure A) next to the patient's left ear. This position allows the rescuers clear access to the chest and airway for continued CPR while the AED is being set up. (One provider may continue one-person CPR while the other sets up the AED) (Figure B).
2. Turn the AED on (Figure C) and follow the voice prompts.
3. You will be prompted to attach the electrode pads to the patient's chest, following the diagram provided for correct placement (Figure D). Use adult-size electrode pads on patients 8 years of age and older. Child-size electrode pads are used for patients less than 8 years of age. (Use adult-size pads on a patient less than 8 years of age if child-size pads are not available.)
4. Next, you will be directed to clear the patient to allow the machine to analyze the heart rhythm to determine if a shockable rhythm is present (Figure E). CPR should cease while the machine is analyzing, and no one should be in contact with the patient for any reason.
5. If a shockable rhythm is present, the AED will automatically begin a charging sequence and warn rescuers to stand back and not to touch the patient. The voice prompt will then tell you to press the SHOCK button to administer the electrical current to the patient (Figure F).

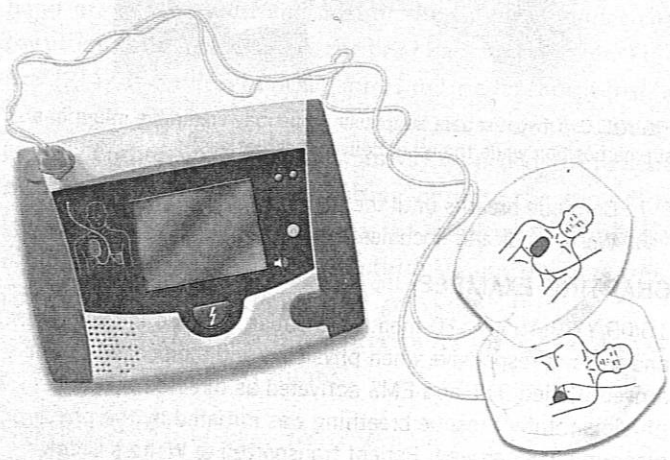


FIGURE A Place the AED next to the patient's ear in order not to interfere with continuing chest compressions and ventilations.

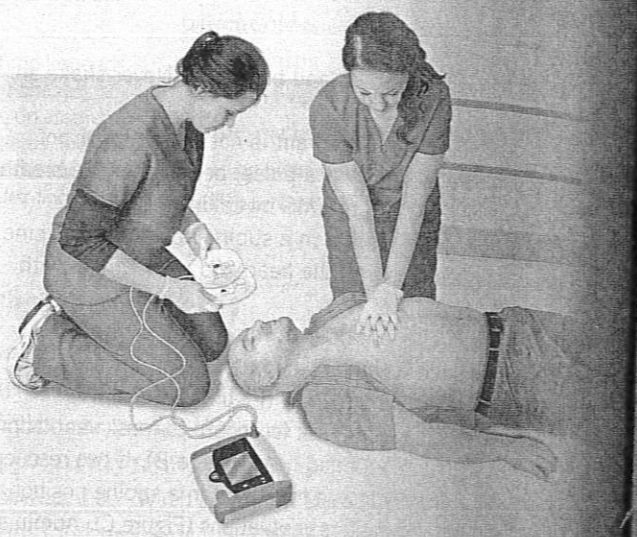


FIGURE B One rescuer continues chest compressions while a second rescuer sets up the AED.

FIGURE C Press the "on" button of the AED to hear instructions.

FIGURE D Rescuer two applies the AED pads while rescuer one continues chest compressions.

FIGURE E Rescuer one commands "CLEAR" before AED analyzes the heart rhythm. No one must touch the patient during analysis or shock delivery.

FIGURE F If advised by the AED, press the "SHOCK" button.

6. If the machine indicates "No shock is advised," continue CPR beginning with chest compressions. After two minutes, the AED will prompt you to stand clear and will reanalyze the rhythm. Repeat step 5 if a shockable rhythm is present or continue CPR beginning with chest compressions. Repeat this sequence until advanced medical personnel arrive or the patient regains a pulse.

CHARTING EXAMPLE

11/25/YY 3:30 P.M. Patient found in stairwell, unresponsive, with absence of pulse and respirations. 911 protocol initiated with two-rescuer CPR. Third rescuer initiated AED response, and patient was analyzed for shockable rhythm. CPR and AED shocks administered a total of eight cycles before advanced medical support arrived. Patient released to EMS care and transferred to Sacred Heart Medical Center.....
.....M. Cowan, CMA (AAMA)

The conscious choking adult may use the universal choking sign—crossing the hands at the throat—to signal for help (Figure 42-8).

A partial airway obstruction will allow some air to flow past the obstruction in the upper airway, which may produce a high-pitched noise on inhalation and exhalation. The patient may still be able to cough and expel the foreign object. Any time the patient can speak or cry, air is moving in and out of the airway. For example, if a phone call comes into the medical office and the caller says, "My child is not breathing," and you hear the child crying in the background, the airway is not obstructed.

As a rescuer, ask the choking patient, "Are you choking?" If the patient cannot speak, and responds by nodding yes,

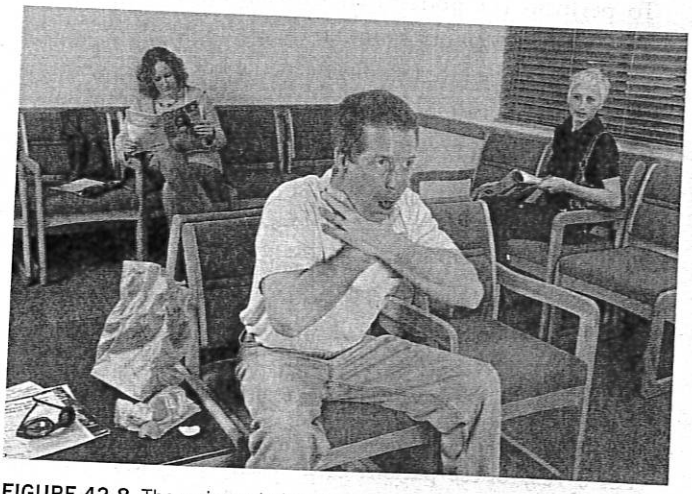


FIGURE 42-8 The universal choking sign.

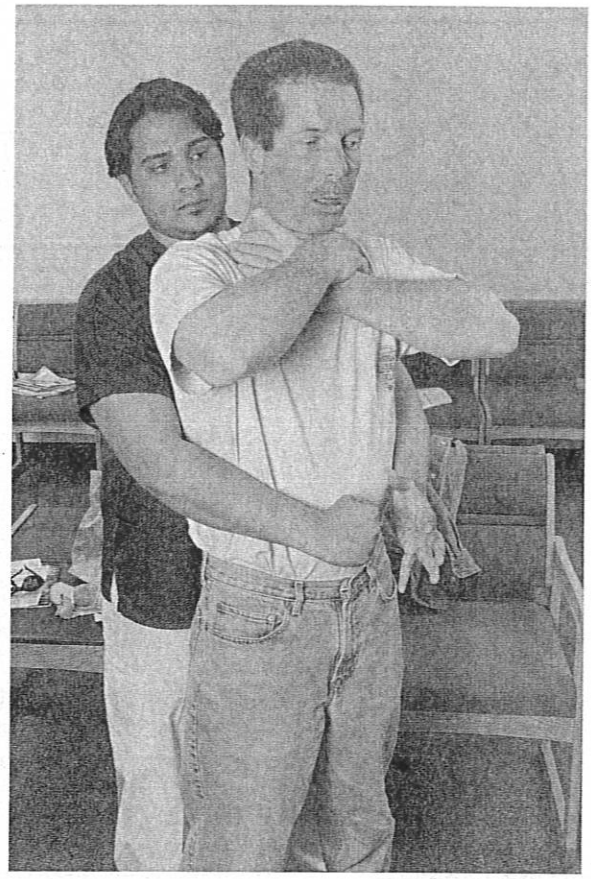


FIGURE 42-9 Abdominal thrusts are delivered with a firm thrust into the patient's abdomen with an upward movement.

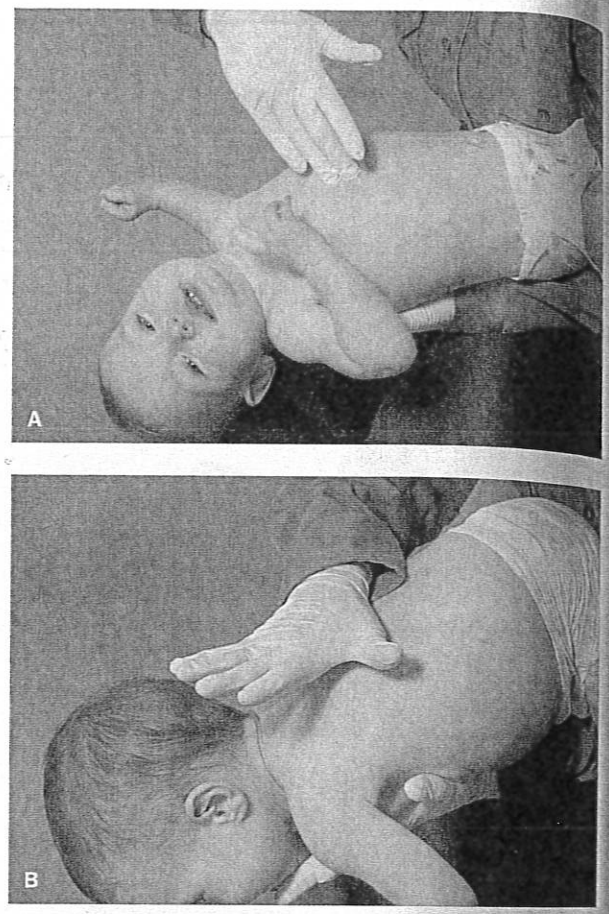


FIGURE 42-10 To clear an obstructed airway in an infant (A) use chest thrusts followed by (B) back blows.

the airway is obstructed and immediate intervention is required.

For the Still-Conscious Patient. Request permission to assist the patient, and perform the abdominal thrusts for the still-conscious adult or child (Figure 42-9) and chest thrusts and back slaps for the infant (Figure 42-10).

To perform the abdominal thrusts, stand behind the patient and put your arms around the abdomen between the xiphoid process (pointed extension at the bottom of the sternum) and the umbilicus (navel). Make a fist with one hand, with the thumb turned into the fist. Wrap your other hand around the fisted hand and pull the fisted hand in and up toward the diaphragm. This force against the diaphragm may be sufficient to loosen the foreign object and propel it out of the airway. If the patient becomes unconscious, ease him to the floor to prevent any additional injuries and proceed with the technique described in the next section for unconscious obstructed airway. Procedure 42-4 explains how to respond to an adult with an obstructed airway.

For a very obese patient or a visibly pregnant woman, provide chest thrusts to the center of the chest over the lower half of the sternum in place of abdominal thrusts. If an obese or visibly pregnant patient is unconscious, perform CPR with the additional step of inspecting the airway, as described next.

For the Unconscious Patient. If the patient becomes unconscious, activate the emergency response system, lower the patient to the ground or onto a hard surface, and initiate CPR beginning with chest compressions (Figure 42-11—do not check for a pulse). Before performing ventilation, open the airway and inspect for an obstruction. If you can see the obstruction and it can be removed, remove it with your fingers. If you don't see an object, attempt to deliver two breaths and continue with CPR until the obstruction is relieved or EMS arrives on the scene. Use this sequence for adults, children, and infants.

Respiratory Distress

Respiratory distress may be a reaction to a long-term debilitating disease, such as chronic obstructive pulmonary disease (COPD), or to an emergency situation, such as anaphylactic response to medication. It also can be the result of other

- Cyanosis
- Failure of the chest to rise and fall
- Nasal flaring
- Pursing of the lips
- Noisy breathing (snoring, gurgling, wheezing, rattling, or stridor)
- Tachypnea (abnormally rapid breathing, more than 24 breaths per minute)

If respiratory distress is severe or results from a change in a known diagnosis, the patient may need follow-up with an emergency facility or a medical specialist.

Asthma Attack

Patients presenting with coughing, wheezing, shortness of breath, and chest tightness may have asthma. Short-acting Beta2 agonists in inhalers work well for acute asthma attacks, and corticosteroids work well for long-acting treatment. The physician may ask the medical assistant to administer oxygen to the patient.

Shortness of Breath

Any individual experiencing shortness of breath (SOB) needs immediate intervention. A **patent**, or unobstructed, airway is necessary to support life. If the person can speak, air is moving in and out. Ask the patient about the onset for difficult breathing and what activity caused it. This information helps to identify the problem. The patient experiencing SOB may be gasping for air, looking pale or cyanotic, and exhibiting nasal flaring and extreme anxiety (Figure 42-12). Usually the patient sits in an upright position and may be quite weak. If the airway is partially obstructed, the patient may cough in an attempt to clear the passages. If the patient is not in a sitting position, help her to a sitting position with support to the back. Call out for assistance.

Hyperventilation

Hyperventilation is quick, shallow breathing or rapid, deep breathing that results in decreasing carbon dioxide in the blood, dilation of blood vessels, and lowered blood pressure. The patient feels faint or light-headed and may experience any of the following:

- Chest tightness
- Cardiac palpitations
- Rapid pulse
- Deep sighing breaths
- Anxiety

Inform the physician and encourage the patient to breathe slowly and as deeply as possible. This condition can generally be resolved quickly and without further intervention.

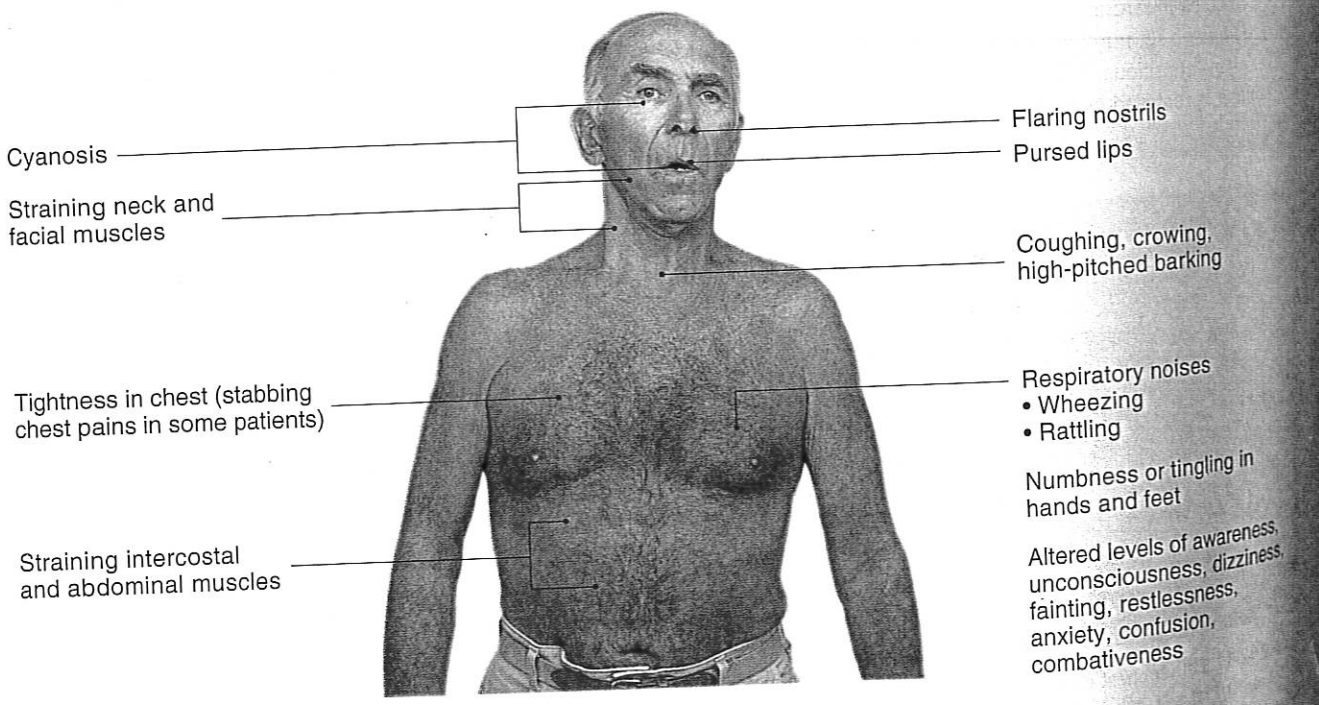


FIGURE 42-12 Signs and symptoms of breathing difficulty.

Chronic Obstructive Pulmonary Disease

Asthma, chronic bronchitis, and emphysema are types of chronic obstructive pulmonary disease (COPD). Air is trapped in the lungs, and the patient is unable to expel all the carbon dioxide from the alveoli. Although each condition has specific signs and symptoms, they share many of the same problems. A person with COPD has SOB and a rapid heart rate and experiences weakness. Asthma may also be characterized by audible wheezes, diaphoresis, and tightness in the chest. Inform the physician in all cases and, if ordered, administer oxygen. Depending on the situation, the physician may order administration of medications, delivery of oxygen, or transport to an emergency facility by EMS.

Pulmonary Edema

Fluid accumulation in the lung tissue and alveoli results in a condition known as pulmonary edema. The patient presents with difficulty breathing, wheezing sounds, cyanosis, rapid heartbeat, distended neck veins, extreme anxiety, and orthopnea. Inform the physician. Place the patient in a sitting position with knees bent or dangling, which helps to trap venous blood and reduce the volume for the heart to pump. Administer supplemental oxygen if ordered and available. Call EMS for transport to an emergency facility.

Chest Pain

Heart attacks are the leading cause of death for both men and women. The patient experiencing chest pain may display various signs and symptoms. The primary complaint will be pain in the middle or left side of the chest, described as sharp, stabbing, crushing, squeezing, or aching. The pain may radiate to the left arm, to the back, or up the neck. Sometimes the pain is brought on by exertion, but other times onset is sudden and unexplained. Other symptoms are nausea, weakness, SOB, apprehension, and the feeling of impending doom. The skin may be clammy, moist, pale, or cyanotic. Denial is common, as the individual tries to explain the pain as heartburn or indigestion.

The first intervention is to have the individual stop what he is doing and sit down, with the feet elevated if possible. Immediately request help from a coworker. Ask the coworker to stay with the patient while you inform the physician of the situation. If instructed by the physician, or if a physician is unavailable, call EMS. If oxygen is available, administer it according to office protocol by nasal cannula at 6 to 8 liters per minute (L/min) until the physician or emergency personnel arrive. Assess heart rate and blood pressure. If the patient has previously been diagnosed with angina and has nitroglycerin tablets, insert one tablet under the tongue (Figure 42-13). If the pain is not relieved within five minutes, inform the physician or EMS on the scene. Have the patient chew 162 to 325 mg of uncoated aspirin.

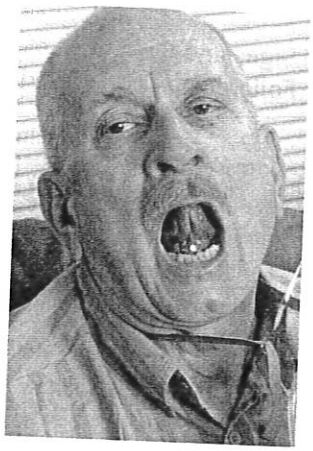


FIGURE 42-13 Nitroglycerin is administered sublingually.

Do the following if a patient calls on the telephone complaining of chest pain:

- Keep the caller on the line while asking for help from another office staff member.
- Write down the caller's name and location. (If someone is calling for the patient, ask the caller for the patient's name and location.)
- Follow office protocol regarding assisting patients with chest pain. Offices often want all patients calling with chest pain sent to the emergency department. If this is the case, call EMS for the patient and remain on the phone with the caller until EMS has arrived. Your protocol may include instructing the patient to chew an uncoated aspirin tablet immediately.

Shock

Shock, the collapse of the cardiovascular system, is caused by insufficient cardiac output. Blood supply and nourishment (oxygen and nutrients, including glucose) to the tissue and perfusion to the organs are inadequate. Untreated shock can progress very rapidly to death.

Causes, Signs, and Symptoms of Shock

Shock may be the result of many insults to the body, including anaphylaxis, cardiac failure, hemorrhage, extreme emotional upset, respiratory distress, neurological collapse, severe metabolic insult, and sepsis. Some of the signs and symptoms that may occur after the initial crisis are listed in Table 42-4.

Anaphylactic Shock

Anaphylactic shock, as mentioned previously in this chapter, is a severe allergic reaction to a foreign substance. Examples

TABLE 42-4 | Signs and Symptoms of Shock Following a Crisis Situation

• Weakness	• Cool skin
• Rapid heartbeat	• Clammy skin
• Thirst	• Cyanosis
• Nausea	• Confusion
• Dizziness	• Disorientation
• Restlessness	• Unresponsiveness
• Pallor	• Shallow breathing

of foreign substances that may trigger allergic reactions include medications, bug bites, and latex gloves. Inform the physician immediately and call EMS. The physician may order epinephrine with or without an antihistamine. An IV may also be started. Prevention is the most important factor in anaphylactic shock. Always ask the patient about allergies to any medication before administering it, and record this information on the front of the chart in red. After administering medication, ask the patient to wait 20 minutes before leaving the office and observe for any potential reactions. In offices where antibiotics and allergy injections are given on a regular basis, you must be alert to possible reactions and prepared with an emergency drug box for rapid intervention.

Assisting Patients in Shock

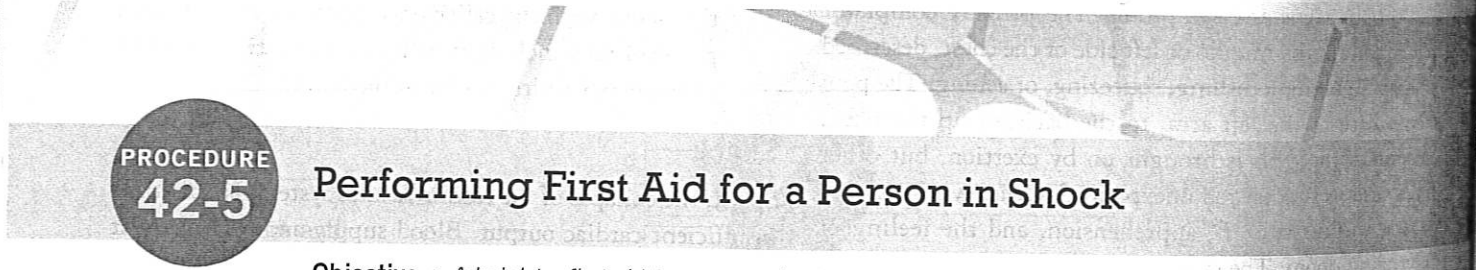
Patients go into shock for varied reasons, including blood loss, infection, and pain. The most common signs of shock include pale, gray, or bluish skin; moist, cool skin; dilated pupils; a weak, rapid pulse; shallow, rapid respirations; and extreme thirst. Regardless of the cause, immediate, aggressive intervention is required to stop the progression of the condition and the possible death of the patient.

When a patient exhibits signs of shock, ensure that the patient has an open airway and proper circulation. Encourage the patient to lie down. Next, cover the patient with blankets for warmth and keep him calm until emergency personnel arrive. The medical assistant should inform the physician, call EMS for further assessment and transport, monitor the patient's vital signs, and provide emotional support. Procedure 42-5 describes how to perform first aid for a person in shock.

Most emergency treatments for shock patients need to be administered by a physician or emergency personnel. Oxygen may be administered, if ordered and available, by trained personnel. Table 42-5 lists types of shock and recommended treatments.

Diabetic Emergencies

A patient with diabetes may exhibit signs of either **hypoglycemia** (low blood sugar level) or **hyperglycemia** (high blood



PROCEDURE 42-5

Performing First Aid for a Person in Shock

Objective ◈ *Administer first aid for a person in shock correctly, within the time frame designated by the instructor.*

EQUIPMENT AND SUPPLIES

Blanket; examining table

METHOD

1. Assist the patient to a supine position.
2. If the patient complains of cold or the room is cold, apply a blanket.
3. Loosen tight clothing.
4. Encourage the patient to keep still and remain calm.
5. If the patient vomits or bleeds from the mouth, turn on her side to prevent choking, unless you suspect spinal damage.
6. Perform CPR if needed.
7. Wash hands and document in the patient's chart.

CHARTING EXAMPLE

6/25/YY 11:30 A.M. Jason Blevins exhibited signs of shock after car accident in parking lot. Clover Bolgiano, RMA, alerted the physician and placed a call to 911. Patient was assisted to examination table, with feet elevated. Blanket applied. Patient remained calm under supervision of physician and Clover Bolgiano until EMS arrived and took Jason to the hospital.....

.....J. Walker, CMA (AAMA)

TABLE 42-5 | Treatment for Shock in the Medical Office

Cause	Treatment
Anaphylactic Shock	Epinephrine
Cardiogenic Shock	IV dopamine, immediate transport to the emergency department
Hemorrhagic Shock	Stop bleeding, replace volume, immediate transport to the emergency department
Hypovolemic Shock	Replace volume
Insulin Shock	Sugar given to patient by any means tolerated
Neurogenic Shock	IV dopamine, immediate transport to the emergency department
Poisoning	Consult the poison control center for treatment specific to the poison
Respiratory Shock	Intubation and immediate transport to the emergency department
Sepsis	Fluids, IV norepinephrine and immediate transport to the emergency department

sugar level). Both conditions may cause the rapid onset of altered levels of consciousness. The greater risk for a patient is hypoglycemia. Hypoglycemia, in which blood sugar falls below 70 mg per deciliter (mg/dL), may be the result of a skipped meal, vomiting after taking diabetic medications, excessive exercise, or an unknown reason. A patient may appear to be intoxicated (slurred speech, balance disturbances, and uncharacteristic behavior), have cold clammy skin, and be anxious or combative.

Intervention must be immediate and consists of some form of glucose administration. If the patient is conscious, ask about the last intake of food and diabetic medication. If the patient is able to swallow, glucose paste may be placed inside the mouth behind the lip and along the cheek, or the patient may drink orange juice with added sugar. If the patient is unconscious, IV glucose is administered.

The person experiencing hypoglycemia is in grave danger when the blood glucose drops below 40 mg/dL. The brain requires glucose to survive, and brain cells begin dying unless glucose is administered promptly. If possible, blood glucose levels should be checked with a blood glucose monitor. Contact EMS if a physician is not available to administer IV glucose. If there is doubt about whether the patient is hypoglycemic or hyperglycemic, glucose may be administered. It will raise the glucose 25 to 50 points, but this rise can be reversed with an insulin injection as soon as an elevated glucose level is diagnosed. The hyperglycemic patient may progress to an unconscious state, reversible with insulin. The physician orders the amount and administration route of the insulin.

Whether the patient is hypoglycemic or hyperglycemic, keep her as warm and comfortable as possible on an examination table until the physician arrives. Procedure 42-6 demonstrates how to perform first aid for diabetic shock or coma.

Bleeding

Bleeding can be external or internal. External bleeding occurs when the skin is broken. Internal bleeding occurs with tissue damage and intact skin. Bleeding can originate from any of the three types of blood vessels: arteries, veins, and capillaries. Internal bleeding is unlikely to be diagnosed in the medical office and requires advanced interventions to correct. External bleeding can be controlled if it occurs in the medical office.

Arterial bleeding is usually copious, rapid, and bright red. The blood often spurts, echoing the heartbeat. Arterial bleeding must be brought under control as soon as possible. Apply pressure directly over the wound and elevate the injured part higher than the heart to help control bleeding.

Venous blood flows more slowly, is darker in color, and can usually be controlled by direct pressure. Blood from capillaries oozes rather than flows and can also be halted with direct pressure. Bleeding from the scalp or face is often copious because of the many blood vessels in those areas.

Direct pressure is applied by placing a sterile dressing over the wound and holding it in place with a gloved hand (Figure 42-14). A pressure bandage may be wrapped around the injured part to maintain pressure on the site. If blood seeps through, reinforce the bandage by applying more dressings and bandages over it. Do not remove the original dressing.

Exercise caution if a fracture is suspected, especially a facial or skull fracture that could be exacerbated by pressure. EMS should be activated if bleeding cannot be controlled or if head injuries or extremity fractures are suspected.

Epistaxis

Nontraumatic epistaxis (nosebleed not caused by an injury) may be messy and embarrassing, but it is usually a benign (not life threatening) occurrence. Nosebleeds tend to occur most commonly in dry weather or in dusty conditions and are usually easy to treat.

A nosebleed that occurs after a head injury and does not stop should be considered a serious emergency until proven otherwise. Even if there is no history of trauma, at least three other circumstances should worry a caregiver about

PROCEDURE 42-6

Performing First Aid for Diabetic Shock/Diabetic Coma

Objective ◆ *Administer first aid for a patient in diabetic shock, within the time frame designated by the instructor.*

EQUIPMENT AND SUPPLIES

Two glucose tablets; ½ cup fruit juice, ½ cup sugary soda, cup of milk, 1 tablespoon sugar, 1 tablespoon honey, 5–6 hard candies, or ¼ cup raisins

METHOD

1. Identify signs and symptoms of diabetic shock in the patient.
2. Assist the patient to a sitting position.
3. Offer the patient a glucose tablet to put under the tongue or one of these to drink: fruit juice, sugary soda, or milk or sugar cube, honey, candy, or raisins to eat if the case is mild and the patient is alert.
4. Check vital signs.
5. Assess blood sugar.
6. Monitor the patient for the time frame designated by the instructor (representing time that may elapse before arrival of the physician or of EMS if a physician is not available).
7. Wash hands and document in the patient's chart.

CHARTING EXAMPLE

3/14/YY 9:30 A.M. Carmen Spears presented with confusion, headache, shaking hands, and rapid heart rate (101). Assessed blood sugar through glucometer as 40. Administered ½ cup of orange juice. Vital signs 130/90 BP right arm, 86 pulse, 20 respirations, 98.8 temperature. Second blood sugar after 30 minutes was 89.....J. Walker, CMA (AAMA)

persistent nosebleeds. One is high blood pressure, especially in a patient who has recently changed or stopped taking medicines for the condition. Another is a clotting disorder of some kind. The third is a patient history of nosebleeds that have caused shock in the past.

FIGURE 42-14 Apply direct pressure to the patient's wound.

Nosebleeds severe enough to cause changes in a patient's vital signs are rare, but they do occur. If the patient's vital signs are normal in the absence of trauma, the patient should be seated upright. If the vital signs are compromised, the patient should lie on the affected side and may need oxygen.

Bleeding from both nostrils is likely to be more serious than bleeding from just one nostril. If the blood emerges from both nostrils, its origin is not in the nose but somewhere above it, and it requires the immediate attention of a physician or **stat** (immediate) transport to an emergency department.

A nosebleed that emanates from one nostril is easily treated by a physician. To stop it, the physician will grasp a facial tissue by one corner and twist that corner firmly into a cone shape about 4 inches long. The physician then inserts the pack deeply into the patient's affected nostril, while continuing to twist it and until the nostril is firmly packed. Then a washcloth is placed over the patient's upper face, and the patient is instructed to hold a chemical cold pack against the washcloth so it fits the bridge of the nose like a saddle.

Bleeding should stop after only a few minutes, at which time the packing can be removed. If bleeding does not stop, electrocautery may be necessary. The physician may be able to perform this treatment in the office, or the patient may require transport to an emergency department.

If trauma is a possible factor in the medical office, the physician may not attempt to pack the nose or stop bleeding. In this case, the physician will order immediate contact of 911 and anticipate transport to the emergency department. The physician may insert an oral airway if the patient is unresponsive. (Do not use a nasal airway in a patient with this type of condition.) Place the patient on oxygen by nonrebreather mask, and monitor the patient carefully for changes in status.

Open Wounds

Open wounds are seldom life threatening, unless they penetrate the head, chest, throat, or abdomen. These cases are serious emergencies that warrant EMS transport to an emergency department. Most soft tissue injuries are uncomplicated. They typically require irrigation, debridement (or surgical trimming of damaged tissue), sutures, and antibiotics. Wounds that involve important structures such as nerve or muscle tissue, the genitalia, the eyes, and possibly the hands require specialized care and will probably be referred.

You may see some industrial soft tissue injuries that appear quite dramatic but that will probably heal well after office treatment. The one thing that you, as a medical assistant, can almost always control is bleeding.

Abrasions

An abrasion occurs when the outer layer of skin is scraped away, exposing the underlying tissue. Common types of abrasions include friction burns, rug burns, road rashes, and scrapes. Bleeding is usually in the form of oozing, and the injury is quite painful because nerve endings are exposed or damaged. As with all open wounds, the area is cleansed and any debris removed. Depending on the physician's choice, antibacterial ointment may be applied to the area and covered with a sterile dressing. Large areas of abraded tissue may require burn treatment.

Lacerations and Incisions

A laceration is an open wound in which the skin and underlying tissue are torn. It usually has jagged edges that may interfere with the healing process. When vessels are torn, bleeding results and must be controlled by direct pressure, pressure on pressure points, or eventual suturing or application of Steri-Strips. Cleanse the laceration with soap and water or an antiseptic solution, removing all debris and foreign matter. If bleeding is severe, a physician should direct the cleansing process. For minor lacerations, after cleansing, the edges of the wound are approximated and then held together with a small dressing, such as a Band-Aid, Steri-Strip, or sterile butterfly. Lacerations over a joint may require joint immobilization for a few days while healing progresses.

An incision, which is a type of laceration, is a cut with smooth edges made with a knife or other sharp object. It is treated in the same manner as any other laceration. If the wound is deep or extensive, the physician usually performs a surgical intervention consisting of debridement, bleeding control, and trimming away of the jagged wound edges. If there is damage to underlying tissue, such as a tendon or ligament, further surgical intervention is required.

Avulsions and Amputations

An avulsion is the tearing away of skin or tissue. Avulsions usually occur on limbs and appendages, including fingers, toes, hands, arms, feet, legs, nose, and penis. The body part may become entangled in machinery or be injured in a motor vehicle accident or a confrontation with an animal. Cleanse minor avulsion wounds with soap and water and return any skin flap to its normal position. Apply direct pressure to control bleeding; then apply a dressing when bleeding is controlled.

If the body part has been amputated (completely separated from the body) and recovered, cleanse the dismembered part with sterile saline. Wrap it with moist, sterile gauze, seal it in a plastic bag, and place the plastic bag in a cooler with an ice pack or ice in the bottom. Do not place the bag containing the amputated part directly on the ice or ice pack to avoid freezing the tissue. Prompt medical attention and preservation of the body part enhance the chances for successful reattachment. Cover the wound or stump with a sterile dressing until advanced treatment can be provided.

Puncture Wounds

A puncture wound results from a pointed foreign body penetrating the skin and tissue. Often the wound edges close, trapping pathogens and debris in the tissue. Depending on the nature of the pointed object, cleansing may consist of simply soaking the area or may require invasive irrigation. After cleansing, a dressing is applied. Bleeding from a puncture wound is usually minimal.

Impaled Objects

A patient who has been impaled by an object such as a large piece of glass or sharp metal requires special treatment. The general rule is to leave the object in place until it can be safely removed by trained personnel. Stabilizing the object is critical to preventing further damage. Control bleeding and stabilize the impaled object with a bulky dressing held in place with tape or other bandages. Splint the area to prevent movement. For a small penetrating object, a small paper cup may be used. Make a hole in the bottom of the cup, place it

Professionalism The Workplace

An important part of professionalism in the workplace includes time efficiency and preparedness. Many ideas can be implemented when working in a medical office to increase time efficiency, especially in the event of medical emergencies. For instance, you might suggest to the office manager or clinical supervisor the idea of creating wound care kits. These kits would include all necessary materials in the event that a patient with an open wound presents to the medical office. The kit may include alcohol, Betadine, gauze pads or rolls, sterile dressings, suture packs, and anything else determined appropriate by the physician. By having a prepared pack on hand, the medical staff will save time gathering supplies in emergency situations when time is of the essence.

over the object with the lip of the cup against the skin, and secure it with bandages.

Soft Tissue Injuries

Soft tissue trauma involves both the skin and underlying tissue. Abrasions, incisions, lacerations, and puncture wounds are easily identified as open-wound skin injuries. Avulsions, amputations, and burns are considered soft tissue injuries because underlying tissues as well as skin are involved. Contusions (bruises) are closed soft tissue wounds in which the skin is not broken. Damage to the underlying tissue may involve subcutaneous tissues, blood vessels, nerves, muscles, ligaments, and tendons. The tearing of small blood vessels results in bleeding into the tissue and discoloration of the area. Swelling may exert pressure on nerve endings, creating pain. Crush injuries result when force is applied to the tissue. Depending on the area involved, the crush may be similar to pinching of tissue or so severe as to involve organs and bones.

For soft tissue injuries, elevating the body part above the heart and applying cold are often the only interventions needed. With a more severe injury, the body part should be immobilized. Monitoring vital signs and observing skin color, temperature, and moisture are essential to deciding whether more extensive intervention is needed.

Wound Care Pointers

Following is a list of concepts that relate to dressing wounds:

- A **dressing** is a sterile covering placed directly over a wound to absorb blood and other body fluids, prevent contamination, and protect the wound from further trauma. Dressings come in many commercially available forms: sterile and nonsterile gauze (2 × 2s, 4 × 4s), compress (bulky sterile dressing to help control bleeding), occlusive (creates an airtight seal), petroleum (sterile gauze covered with petroleum that prevents the wound from sticking), and premedicated and packed dressings (medicated gauze for application over a wound, or strips to pack into the wound).
- A **bandage** is a strip of binding material used to hold a dressing in place. Commonly used dressings are roller gauze (e.g., Kerlix and Kling) and elastic bandages (e.g., Ace and Coban). A dressing or compress prefastened to a bandage is called a bandage compress (e.g., a Band-Aid). A pressure dressing is a compress held in place by an elastic bandage. All of these devices come in various widths. Choose the type and size that fit the wound. Bandage types depend on where the injury is located.

Circular bandage turns are used to hold and secure a dressing in place. A figure-eight bandage is used for holding a dressing in place, bandaging joints, and providing immobilization of the area. A spiral turn is used to cover cylindrical (round) body parts such as the forehead. A reverse spiral turn is used for covering cone-shaped body parts such as the lower leg and forearm.

Simple direct pressure (as discussed) with a dressing (bulky if needed) will usually stop bleeding from a soft tissue injury. Once the direct pressure is determined to be sufficient, keep the dressing in place with a bandage as ordered by the physician. The priority is to prevent infection by dressing the wound properly. That always begins with cleansing. Cleanse the wound from the center outward, beginning with vigorous irrigation using a disinfecting solution prescribed by the physician. Wipe the edges of the wound in all directions away from the wound with sterile gauze, then cover with a sterile dressing and fasten the dressing in place. The use or nonuse of antibacterial ointments or creams should be specified by the physician. Procedure 42-7 describes the application of a pressure bandage.

Figure 42-15 provides a classification of open wounds for injuries. Open soft tissue wounds can be superficial (penetrating only the skin) or deep (penetrating the fascia, or connective layer beneath the skin, and other structures that lie deeper still). Once bleeding is controlled and the wound dressed, obtain a complete set of vital signs and allow patients to remain in the supine position or the position that brings greatest comfort while you take the time to document in the chart. Watch for signs of shock and treat as needed. Next, get patients into a sitting position and make

PROCEDURE 42-7

Applying a Pressure Bandage to Control Bleeding

Objective ◆ *Apply a pressure dressing.*

EQUIPMENT AND SUPPLIES

Dressing supplies or makeshift materials; gloves and other available PPE

METHOD

1. Escort the patient immediately to an examination room.
2. Perform hand hygiene.
3. Put on disposable gloves.
4. Under the physician's supervision, apply direct pressure with a dressing placed on the open wound. If possible, elevate the affected part.
5. After assessment, the physician will decide if EMS should be contacted.
6. Apply additional dressings as needed. Do not remove the original dressing.
7. Apply pressure to pressure points as necessary and with the physician's supervision.
8. If bleeding is controlled, anchor the dressing to maintain pressure.
9. If the physician orders, prepare the patient for transport to an emergency care facility.
10. Dispose of waste in a biohazard waste container.
11. Remove and discard gloves.
12. Perform hand hygiene and document the procedure in the patient's chart.

CHARTING EXAMPLE

08/31/YY 8:00 A.M. Pt came to office with 6″ laceration to right forearm. Injury occurred from fight with 7-year-old brother when patient fell into glass patio door. Bleeding profusely. Physician called to examination room. B/P 96/60 P 100, regular but weak. R 26. Pt appears very nervous. Pt transported to ED to further control bleeding and take to surgery. Pt is alert and talking to parents.....S. Porter, CMA (AAMA)

sure they are not dizzy and that they understand their home care instructions. When a patient is ready, provide assistance to a standing position, again ensuring stability before allowing the patient to leave. If there are signs of shock, notify the physician immediately and do not leave patients alone. If instructed by your physician, contact EMS.

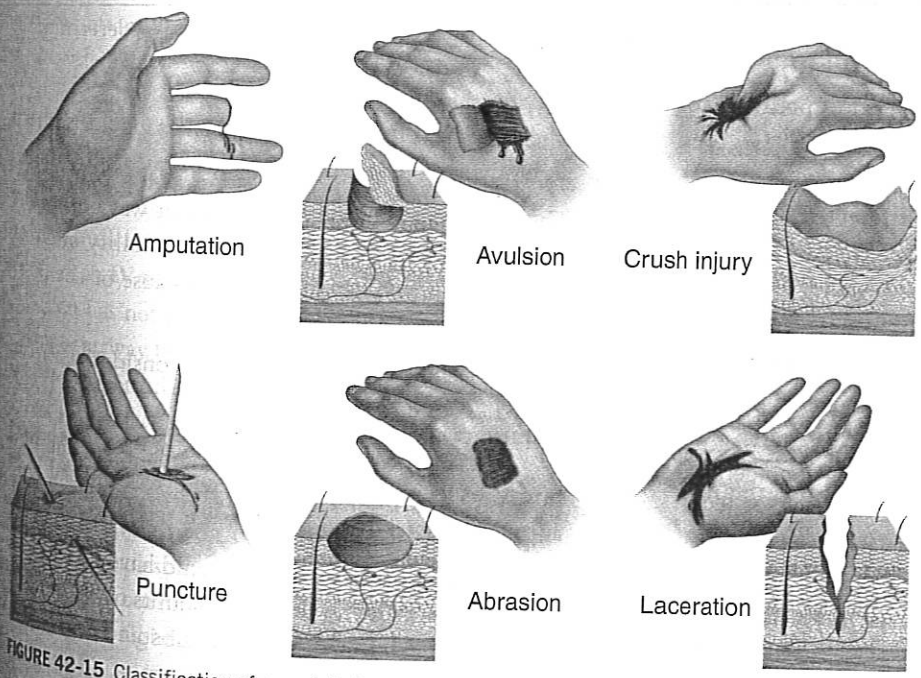
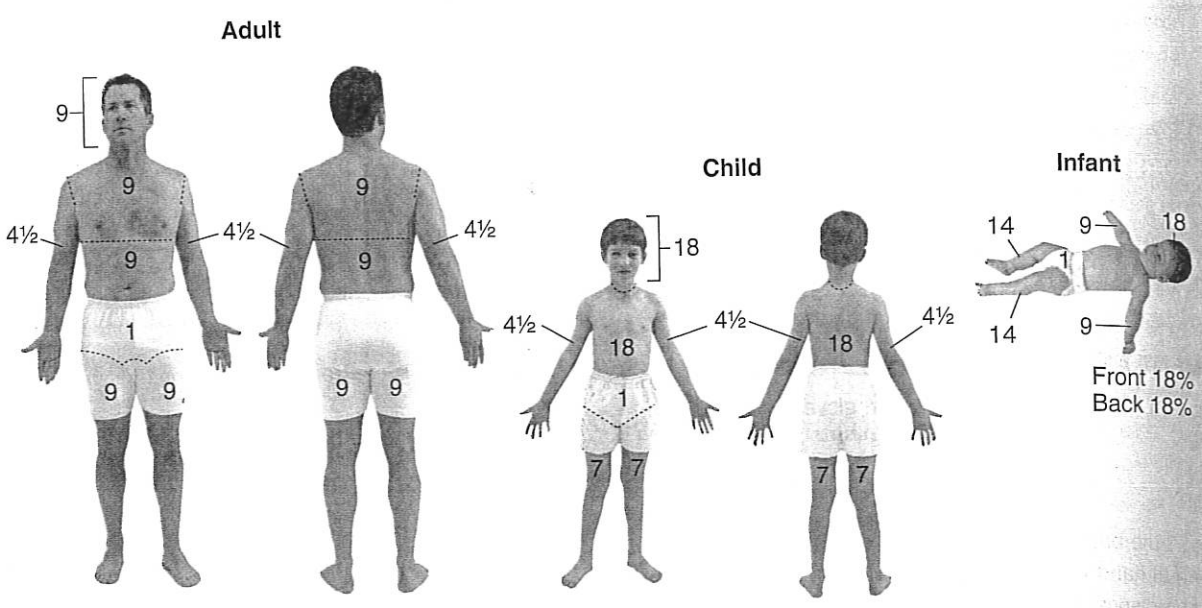


FIGURE 42-15 Classification of open injuries.

Burns

A burn injury occurs when an area of tissue is destroyed by the action of physical heat, chemical activity, high electrical current, or heavy exposure to radiation. The severity of a burn depends on the amount and depth of tissue injury. Survival depends on those factors and the amount of surface area that is destroyed. Destruction of skin surface is an important consideration because of all the skin functions that are lost: insulation, regulation of fluids, sensation, and protection from infection. All of these are crucial to life.

If directed by a physician, the medical assistant may help stop



Note: Each arm totals 9% (front of arm 4½%, back of arm 4½%)

FIGURE 42-16 Rule of Nine for burns.

the burning and remove any metal jewelry from the burn patient.

Classification of Burns

Burns are classified in two basic ways: by surface area and by depth. The **Rule of Nines** is a useful tool for estimating body surface area (Figure 42-16). For an adult, each of the following areas represents 9 percent of the body surface: head and neck, each upper extremity, chest, abdomen, upper back, lower back and buttocks, the front of each lower extremity, and the back of each lower extremity. These make up 99 percent of the body's surface. The remaining 1 percent is assigned to the genital region.

In the Rule of Nines, the percentages are modified for infants and young children, whose heads are much larger in relationship to the rest of the body.

Table 42-6 gives you a basic idea of burn severity by depth.

TABLE 42-6 | Classification of Burns

Classification	Characteristics
Superficial Burn (First Degree)	Reddening, swelling of epidermis (like a mild sunburn)
Partial Thickness Burn (Second Degree)	Reddening, swelling of epidermis and outer dermis; blisters noted
Full Thickness Burn (Third Degree)	Charring of all layers of skin and at least some deeper structures
Full Thickness Burn (Fourth Degree)	Underlying muscle, tendons, ligaments and bone are damaged; very often fatal

Superficial and partial thickness burns are extremely painful, even those involving very small areas. Full thickness burns tend not to be painful immediately because, along with the entire dermis, this kind of burn destroys sensory nerve endings. The edges of the burn are likely to be very painful partial thickness burns, however.

Full thickness burns disrupt all the normal functions of skin, including its self-regenerative properties and its ability to resist infection. Full thickness burns are profound injuries, even if they involve only a small amount of surface area.

Certain special considerations can also help determine the seriousness of a burn:

- The mortality of serious burns is higher for older patients and for very young patients.
- The mortality is higher if the patient was burned in a closed area (partly because of the possibility of carbon monoxide poisoning and partly because of the possibility of airway burns).
- Burns of the genitalia are always considered serious, regardless of depth.
- Always consider the possibility of other injuries besides burns, especially in a patient who was burned in an auto or industrial accident.
- Patients with chemical burns should have the area irrigated immediately with large amounts of water. If the burns resulted from an alkali substance, irrigation should be continued for a minimum of 20 minutes.

Contact EMS as soon as you encounter such a patient to be sure that you have access to the proper resources as early as possible if you are dealing with a hazardous substance that cannot be rendered harmless.

Electrical burns serious enough to leave marks on the body are considered serious burns because of the probability of internal injuries. (Electrocution by lightning is always considered serious until proven otherwise.)

Extremely severe full thickness burns are sometimes called fourth degree burns. These burns are frequently fatal because they damage underlying muscles, tendons, ligaments, and even bone. Burns that may be called fifth and sixth degree burns are not compatible with life and are usually diagnosed on autopsy. Burns of this severity are regarded as stand-alone admission criteria by trauma centers and burn centers in most places.

Treatment of Burns

Treatment for superficial burns involving less than 10 percent of the body surface includes pain relief by applying cool water. Cool water instantly relieves pain, but it is not appropriate for larger surface areas. Damaged skin may not be able to regulate body temperature, so the use of cooling measures over large surface areas can cause hypothermia. Analgesic (pain-relieving) creams and ointments are appropriate for use on superficial burns only if ordered by the physician.

Cool water can also be used to soothe partial thickness burns involving small surface areas as long as there are no broken blisters. Partial thickness burns should never be treated with creams or ointments because of the risk of breaking blisters and the resulting potential for infection.

Burns of any kind that involve broken skin may need to be debrided (have dead or damaged tissue removed) by a physician. Full thickness burns of any size warrant treatment at a trauma center or burn center.

Burns should be dressed with dry sterile dressings, and pain should be managed with injectable analgesics as ordered by the physician. If Paramedics transport the patient, they will start an IV and administer analgesics by that route if the physician has not already done so.

Upper airway burns are a dire emergency and always warrant prompt intubation by the physician or EMS with the largest tube that can be inserted. The burned epiglottis can swell quickly and make intubation very difficult or impossible at a later time. If the patient sounds even slightly hoarse or complains of difficulty breathing; if you notice singed nasal hairs, eyebrows, or eyelashes; or if you detect stridor in any burn patient, suspect airway burns and notify the physician right away. Administer oxygen as ordered by the physician.

Large surface-area burns should be dressed with dry sterile sheets that are wrapped entirely around the patient's body. These patients should be promptly transported to a trauma center or burn center. All burn patients should be monitored for signs of shock, especially in the case of large surface-area involvement.

Heat- and Cold-Related Emergencies

Heat Exhaustion

Heat exhaustion, which is an extreme fatigue caused by heat, occurs as the result of sodium and water depletion from the body. Strenuous activity often precedes heat exhaustion because the individual becomes overheated and perspires profusely. The skin is moist, pale, and cool, and body temperature is normal. The individual may complain of headache, muscle cramps, weakness, dizziness, and nausea. The patient should be moved to a cooler environment and encouraged to lie down. Apply cool compresses and give sips of water if the individual is conscious. Heat exhaustion can usually be prevented by taking salt pills and drinking lots of water before, during, and after strenuous activities in a warm environment.

Hyperthermia

Prolonged exposure to extremely hot temperatures often results in an elevated body temperature, or **hyperthermia**. The loss of water and salt through perspiration leads to a state of mild shock. If the body's cooling mechanisms fail, heat exhaustion can progress into heat stroke. An individual experiencing heat stroke usually fails to perspire and has a body temperature of 105°F or higher. The skin is dry, red, and hot to the touch. Headache, shortness of breath, nausea or vomiting, dizziness, weakness, and dry mouth are common symptoms. At the onset, the pulse is rapid, but it gradually slows and becomes weak. The blood pressure begins to drop. Mental confusion may appear, possibly accompanied by irritability and hysterical behavior. In some cases the patient collapses. If the individual remains exposed to heat, brain cells begin to die. Permanent brain damage or even death may eventually result. The patient must be removed from the environment immediately. Loosen the clothing and cool the body down as quickly as possible by pouring cool water over the patient or sponging with a cool, wet cloth. If heat stroke is suspected, after the initial emergency treatment, EMS should be contacted to transport the patient to an emergency facility where vital signs and cardiac status can be monitored. The patient should not be left alone and should be assessed by a physician as promptly as possible.

Hypothermia

The patient with **hypothermia** is also at great risk. Hypothermia results from prolonged exposure to cold or cold

water and can cause the core temperature to drop below 95°F. The patient shivers and experiences numbness and tingling throughout the body. The skin becomes very cool to the touch and is pale with a blue or ashy tinge. Respirations are slow and shallow, and the patient becomes disoriented and eventually unconscious as body functions and organs slow down to the point of complete shutdown.

Treatment involves removing any cold, wet clothing and wrapping the patient in warm blankets. Heat packs may be used but not directly on the skin. Once the patient is conscious, offer sips of warm liquid. When possible, the patient should be transported to a treatment facility for assessment by a physician.

Seizures

Seizures, or convulsions, are produced by disorganized electrical activity in the brain and are characterized by involuntary muscle contractions that alternate between the contraction and relaxation of muscles. In some cases the convulsions are generalized, involving the entire body, or localized and limited to a specific area of the body. Convulsions can result from a number of problems or combinations of problems.

By themselves, convulsions are not life threatening, but the muscle spasms that come with full-body seizures can restrict breathing. Seizure patients may also bite their tongues, causing bleeding and swelling, which can obstruct the airway. Finally, seizure patients are sometimes injured when their convulsions cause them to fall.

Once a seizure stops, especially a full-body seizure, it is normal for a patient to remain unconscious for as long as 15 minutes. During that time, most patients cannot control their secretions—for example, urine—the way they would in normal sleep.

A medical assistant can do two important things for a seizing patient. First, prevent injuries. Keep the patient from falling, and prevent the head from striking anything until the seizure stops. Second, pay close attention to what the patient is experiencing so you can describe it later. Observations will eventually be very important to the patient's neurologist. If breathing seems adequate, note the patient's response, apply oxygen as ordered, and place the patient on the left side to allow any secretions to drain. Listen for noise in the airway, and be prepared to assist the patient by moving any furniture or objects away from him. Never place anything in the mouth of a seizing patient.

You must immediately notify your physician. If the physician is not available, contact EMS and anticipate transport. Continue to assess the patient until EMS personnel arrive, and communicate your findings to them. Procedure 42-8 describes how to perform first aid for a patient having a seizure.

Fainting

Many serious disorders cause unresponsiveness. Fainting, or syncope, is the sudden loss of consciousness. Sometimes it is preceded by vertigo, the sensation of feeling dizzy or that

PROCEDURE 42-8

Performing First Aid for a Patient Having a Seizure

Objective ◆ *Administer first aid for a patient having a seizure, in the time frame designated by the instructor.*

EQUIPMENT AND SUPPLIES

None

METHOD

1. Identify that the patient is having a seizure.
2. Assist the patient to the floor, protecting the head and assuring no hard or sharp objects nearby can injure her.
3. Loosen clothing around the neck.
4. After seizure, lay the patient on her side, and monitor and reassure the patient.
5. If the seizure lasts more than five minutes, call 911.
6. Wash hands and document in the patient's chart.

CHARTING EXAMPLE

2/28/XX 3:30 P.M. Heidi Haldeman began seizing while sitting in examining room. Assisted patient to the floor, protecting the head from trauma. Loosened collar and monitored patient. Post-seizure, patient began to vomit, so turned her on her side and offered emesis basin. Reassured and reoriented patient. Seizure lasted two minutes. Afterwards, patient complained of soreness and fatigue but was oriented x 3.....M. Jimenez, RMA

the room is spinning. It seems to be caused by a brief interruption in the body's ability to control the brain's circulation. Fainting often occurs just after a patient has received an emotional shock of some kind. The patient usually collapses and becomes unresponsive but, within a minute, should awaken and return to normal function. Patients seldom become incontinent or have seizures as a result of simple fainting but may be injured in the course of a fall.

There is always a reason for unresponsiveness, and determining the reason is, of course, important. However, early in your contact with any unconscious patient, your first concern should be to take care of the ABCs (airway, breathing, and circulation). A patient who suddenly becomes unresponsive may be experiencing arrhythmia such as ventricular fibrillation or ventricular tachycardia. If a patient has fainted and there is no response, provide oxygen if the physician orders this. Check the ABCs and call for help. If the patient is breathing well but will not wake up, place him on his left side and contact your physician. If your physician is not available, contact EMS. While you await their arrival, try to get a good set of vital signs and if possible obtain a blood sugar reading. Procedure 42-9 illustrates how to assist a patient with syncope.

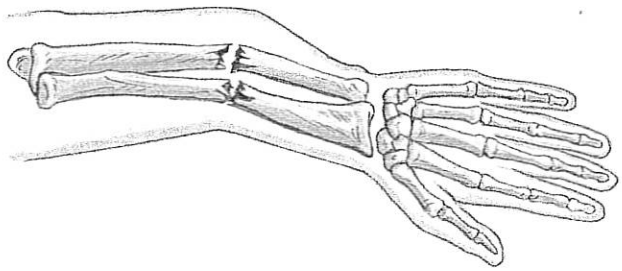


FIGURE 42-17 A closed fracture.

Musculoskeletal Injuries

Musculoskeletal injuries involve bones, muscles, tendons, and ligaments and include fractures, dislocations, sprains, and strains. Definitive diagnosis is made by X-ray, but these injuries must be considered fractured bones until determined to be otherwise. Therefore, the affected part must be immobilized.

Fractures

In a closed or simple fracture, the bone is broken but does not penetrate the skin (Figure 42-17). In an open or compound fracture, the bone pierces the skin, or the skin is torn

PROCEDURE 42-9

Responding to a Patient with Syncope

Objective ◆ *Correctly care for a patient with syncope, within the time limit set by the instructor.*

EQUIPMENT AND SUPPLIES

Blanket; small stool or box; ½ cup of orange juice; glucometer

METHOD

1. Identify signs of syncope.
2. Assist the patient to a supine position.
3. Elevate legs.
4. Loosen tight clothing and apply a blanket if the physician directs.
5. Assess the patient for respirations, heart rate, chest pain, and consciousness.
6. If any of the following is present and the physician directs, call 911: blue lips or face, irregular or slow heart rate, chest pain, difficulty breathing, is difficult to awaken, or acts confused.
7. If none of the above are present, assess blood sugar and treat for hypoglycemia if appropriate.
8. Wash hands and document in the patient's chart.

CHARTING EXAMPLE

1/16/XX 9:30 A.M. Chester Tyler was found on the floor of the examining room. Assisted patient to supine position and loosened collar. Applied blanket and elevated feet. Patient's pulse was irregular and 55, and he was difficult to awaken. 911 immediately called. Physician and Jenny Erkfitz CMA (AAMA) remained with patient until EMS arrived five minutes later and took patient to hospital.....C. Glidewell, RMA

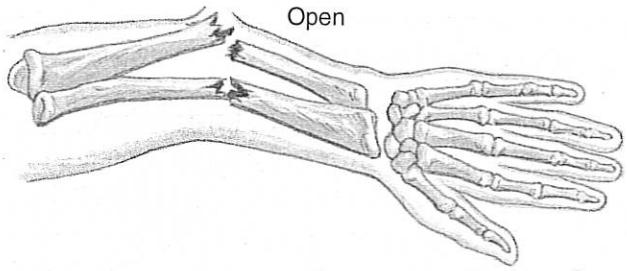


FIGURE 42-18 An open fracture.

open by the bone or by an external force (Figure 42-18). Fractures may also involve single or multiple breaks in the bone. Bone breaks can be complete, twisted, or splintered.

The affected part is immobilized and examined for impaired circulation to the distal aspect. The location of the fracture and the possible presence of heavy bleeding or bruising are also determined. Knowing the cause of the injury is very helpful in this assessment. A fracture may occur in any bone. Procedure 42-10 shows the steps to perform first aid for a patient with a fracture.

Special precautions must be taken for suspected fractures of the spinal column or skull. For any injury caused by sudden acceleration and deceleration, the cervical spine must be immobilized. Other injuries to the spinal column require extreme caution when moving the patient. The best response is to call 911. Allow EMS professionals to stabilize the cervical spine with a cervical collar; then logroll the patient onto a spine board for transport to a facility where X-rays can be taken to determine the extent of the injury.

Suspected fractures of the thigh (femur) and pelvis are always severe and dangerous injuries that require immobilization and transport and are best handled by the EMS.

In open or compound fractures, the soft tissue injury must be tended. Cover the open wound with a sterile, saline-moistened dressing; then place a sterile occlusive dressing over that. Generally, the tissue must be surgically cleaned and debrided.

Splint Application

Fractures of long bones require immobilization by splinting to prevent joint movement above and below the fracture. In addition to preventing additional damage to the bone and surrounding soft tissue, the splint helps to relieve pain and allows safe movement of the injured part. Another comfort measure is the application of cold, usually after splinting, to prevent swelling.

PROCEDURE 42-10

Performing First Aid for a Patient with a Fracture

Objective ◆ *Perform first aid for a patient with a fractured arm, within the time period established by the instructor.*

EQUIPMENT AND SUPPLIES

Sling; arm splint; gauze; tape; ice pack

METHOD

1. Identify the patient and introduce yourself.
2. Obtain vital signs.
3. Examine the injury, without straightening the arm, for bleeding, bruising, or protruding bones.
4. If the bone has broken through the skin, wrap in gauze and apply pressure to stop bleeding and get emergency help.
5. If the bone has not broken through the skin, apply a padded arm splint under the ulna and radius, and secure the splint by wrapping dressings or material around the arm and splint. Place ties above and below the suspected fracture and then along the arm to secure.
6. Assess circulation distal to the wound.
7. Elevate the arm and place in a sling.
8. Apply ice for 20 minutes.
9. If the physician requests, send to the patient to the hospital for X-ray and possible casting.
10. Wash hands and document in the patient's chart.

CHARTING EXAMPLE

9/30/XX 2:30 P.M. Charlton Parker presented with a possible fracture after a soccer injury at school. Mother administered Tylenol 480 mg for pain en route to office. Bone has not broken through skin, but patient complains of pain. Secured arm in arm board and sling. Applied ice and instructed mother to remove ice after 20 minutes. Referred to Radiology at Blue Ridge Hospital for radiograph by physician.....C. Glidewell RMA

Sprains, Strains, and Dislocations

A *sprain* occurs when muscles, tendons, or ligaments are torn. It may be the result of trauma or cumulative overuse of a joint. A *strain*, often called a pulled muscle, occurs when a muscle or tendon is overextended by stretching. The patient complains of pain and may be unable to use the joint. In the lower extremities, weight bearing is painful and sometimes impossible. In a *dislocation*, the bone is actually pulled away from the joint, stretching or tearing the ligaments and tendons. A deformity is generally noted. Dislocations must be reduced and the bone reinserted into the joint. The injured body parts should be immobilized to prevent additional damage and reduce pain. Applications of cold also help with the pain and slow edema. The physician assesses the injury and usually orders radiographs to eliminate the possibility of fracture and diagnose sprain, strain, or dislocation. Table 42-7 describes first aid for some emergencies sometimes seen in medical offices.

Planning for Medical Emergencies in the Office

It is important for the physician and staff in a medical office to develop a plan for medical emergencies that can occur in the office, in order for all staff to be prepared. Procedure 42-11 shows how to develop a medical emergency plan policy for a medical office.

EMERGENCY PREPAREDNESS

The medical assistant should be knowledgeable in the area of emergency preparedness. This includes knowing how to respond in the event of a human-caused disaster, such as a terrorist event, and to a natural disaster, such as a hurricane. Remaining calm in the event of an emergency is paramount to the success of handling it. Through proper education, preparedness, and simulation, a medical assistant can play a key role in emergency response.

Earthquakes

Because earthquakes can happen at any time, and without any warning, the medical assistant must know how to respond to this type of emergency. One of the first steps to preventing injury during an earthquake is to prepare before an earthquake happens. Advance preparation may save lives as well as prevent injuries. According to the Federal Emergency Management Agency (FEMA), six steps are involved

TABLE 42-7 | Response to Emergencies

Emergency	Response
Poisoning	If you suspect poisoning because the patient states that she ingested a poison or has lost consciousness with a poison nearby, or is vomiting profusely, gather information about potential poisons by asking about the scene and circumstances. Encourage family to call, or call the National Poison Control Center at (800) 222-1222 and follow their instructions. Instructions may be to go to emergency room, ingest milk, hydrate with water, etc. It depends on the suspected poison and amount.
Stroke	If you suspect stroke, ask the patient to smile (F)—does one side of the face droop? Ask the patient to raise both arms (A)—does one arm drift downwards? Ask the patient to repeat a simple phrase (S)—does the speech seem slurred or strange? And (T) if you observe any of these signs, call 911 immediately. Immediate transportation to the hospital gives the patient access to thrombolytic (clot-dissolving) drugs that can greatly reduce damage.
Animal Bite	If the bite is minor and barely breaks the skin, wash with soap and water and apply an antibiotic and bandage. For a deeper wound, rabies is possible. Apply pressure with a clean dry cloth, and have the patient seen by a physician for possible treatment for rabies or tetanus. Also refer to a physician if you see signs of infection.
Insect Bite	For a mild bite, get to an area safe from further bites. If needed, remove the stinger with a credit card or similar device. Wash with soap and water. Apply a cool compress. Apply hydrocortisone, pramoxine, or lidocaine to help control pain. Use creams such as calamine lotion or those containing colloidal oatmeal or baking soda to help soothe itchy skin. Treat for pain with a mild pain reliever like Tylenol. For more serious bites such as a scorpion sting, a bite on a child, or a bite that leads to anaphylaxis, contact 911. You may need to administer an epinephrine autoinjector for an allergic reaction. Hold the autoinjector against the thigh, and inject as indicated on instructions. Loosen tight clothing, cover with a blanket as needed, and monitor the patient. Do not give the patient anything to eat or drink. If vomiting or bleeding occurs, turn on the side. Perform CPR if needed.
Concussion	If concussion is suspected, have the person stop the activity and rest. Apply ice as needed. For pain, use Tylenol, aspirin, or ibuprofen. Monitor for at least 24 hours. Notify physician if: a headache gets worse, vomiting continues, drowsiness or dizziness increases, patient experiences increased confusion, or if a child will not nurse or eat or stop crying.

PROCEDURE 42-11

Creating a Medical Emergency Plan

Objective ◆ *Create a medical emergency plan.*

EQUIPMENT AND SUPPLIES

Pen; paper; emergency kit composed of water, canned food, can opener, snacks, personal hygiene products, first aid kit, trash bag, gloves, battery-powered radio, flashlight, extra batteries, whistle, tools, protective masks, diapers, powdered milk, formula, baby wipes, and crash cart

METHOD

1. Develop an emergency kit using the above-listed supplies and any others you desire, explaining what each supply might be used for in an emergency.
2. Document a policy that would cover the actions needed in each of the following situations that might occur in the medical office:
   a. Choking
   b. Lack of pulse
   c. Shortness of breath
   d. Shock
   e. Bleeding
   f. Epistaxis
   g. Superficial burn
   h. Hyperthermia
   i. Seizures
   j. Fainting
3. Determine the best location to store your medical emergency policy and kit.
4. Develop a memorandum to the physician stating that you have developed the medical emergency plan.

DOCUMENTATION

12/6/YY 1:30 P.M. Medical emergency plan developed and posted at the reception desk on bright yellow paper. Medical emergency kit inventoried and stored in lowest drawer of receptionist's desk.....M. Schuknecht CMA (AAMA).

in planning ahead for an earthquake as well as other emergency situations:

1. Check for hazards around the facility.
   - Make sure shelves are fastened securely to walls.
   - Keep large or heavy objects on lower shelves.
   - Store any breakable items in low, closed cabinets equipped with locks.
   - Do not hang heavy items on walls above where patients will sit or lie.
   - Secure overhead light fixtures.
   - Repair any defective electrical wiring or leaky gas connections.
   - Strap water heaters to wall studs and bolt them to the floor.
   - Repair any deep cracks in ceilings or foundations.
   - Store all flammable products on the bottom shelves of closed cabinets with locks.
2. Identify safe places indoors and outdoors.
   - Under sturdy furniture
   - Against an inside wall
   - Away from glass that could shatter
   - Away from bookcases or furniture that could fall over
   - In the open, away from buildings, trees, telephone or electrical lines, overpasses, or elevated expressways
3. Educate yourself and your coworkers.
   - Contact the local EMS office or ARC chapter for information.
   - Teach all staff members how and when to turn off gas, electricity, and water.
4. Have disaster supplies on hand (Figure 42-19).
   - Flashlight and extra batteries
   - Portable battery-operated radio and extra batteries
   - First-aid kit and manual
   - Emergency food and water
   - Extra blankets
5. Develop an emergency communication plan.
   - In case staff members are separated from one another during an earthquake, have a plan in place for reuniting after the disaster.

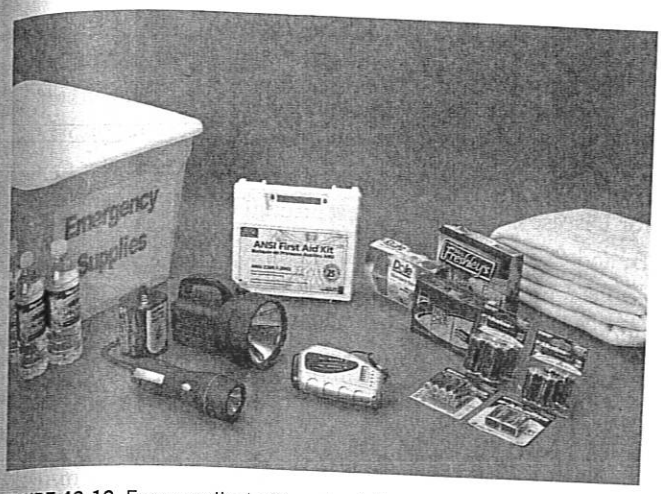


FIGURE 42-19 Every medical office should keep emergency supplies in a waterproof container.

- Define the expectations of each staff member: Who will escort patients from the building? Who will check the treatment rooms?

6. Help your community get ready.
   - Provide literature for patients on how to prepare for an earthquake.

Tornadoes

According to FEMA, tornadoes are the most violent storms occurring in nature. Tornadoes are very erratic can strike with very little or no warning. The warning signs of a tornado include thunderstorms with heavy rain and large hail; dark, almost greenish-colored skies; and dark, low-lying clouds. Many people have related the sound of a tornado to that of a freight train.

Often, tornado watches and warnings are issued before a tornado touches down. A tornado watch indicates that the weather conditions are right for a tornado and a tornado is possible, whereas a tornado warning indicates that a tornado has been sighted and all persons are to take shelter immediately.

It is important to designate a safe area within the office should a tornado watch occur during working hours. This often will be the basement of a building or the lowest level of a structure. If a basement is not available, it is advisable to seek shelter in a closet or interior hallway. Above all else, stay away from windows, doors, and outside walls. Avoid elevators and use the stairs to reach the lowest level of the facility.

Before the occurrence of a tornado (or an earthquake, hurricane, or other natural disaster), it is important to educate yourself, fellow office staff, and the community about safety precautions. The role that a medical assistant plays in the event of a natural disaster is discussed toward the end of this chapter.

Hurricanes

Hurricanes can strike with little warning, although most allow for some advance warning, giving the medical office staff time to prepare. If the office is in the path of a hurricane, the windows may need to be secured; this can be done using permanent storm shutters or ⅝-inch plywood cut to fit and ready to install. Trees and shrubs around the office should be well trimmed. Secure rain gutters and clean clogged ones. If the medical office is to be evacuated before a hurricane, the medical assistant should listen to the radio or television for information and instructions provided by local emergency management personnel. During the hurricane, the medical assistant should listen to the radio or television for additional information.

Floods

FEMA declares floods to be the most common hazard in the United States. Some floods can develop over days of rainy weather; others may be in the form of flash floods and may come on very quickly. The medical assistant should be aware of the flood dangers that exist in the local area. During a flood, the medical assistant should listen to the radio for information. In the event of a flash flood, the medical assistant should move to higher ground. If there is time before evacuating, the medical assistant should disconnect any electrical equipment and shut off utilities at their main valves. When evacuating, the medical assistant should be careful not to walk through moving water. As little as 6 inches of moving water can make a person fall.

Fires

Because more than 4,000 Americans die and more than 25,000 are injured in fires each year, the medical assistant should be prepared to respond to this type of disaster. Fire spreads quickly, and typically no time is available to gather belongings or make a telephone call. In just two minutes, a fire can become life threatening, and in five minutes a fire can engulf a building. Heat and smoke from fire are often more dangerous than the flames.

The medical office should be equipped with properly working smoke alarms. These should be placed on every level of the building and in every room, either on the ceiling or high on the walls. Every smoke alarm should be tested and cleaned once per month. The batteries in every alarm should be replaced at least once per year, and every individual alarm should be replaced once every 10 years.

The medical assistant should know the escape routes to use in the event of a fire. Staff members should practice those escape routes. If the office is located above the first level, escape ladders may be used.

Any flammable items must be stored in well-ventilated areas, and care must be taken in placing any items near a heat source or heating vent. Any defective wiring must be repaired to avoid a fire hazard. Fire extinguishers should be located throughout the office, and staff should be trained in their use.

During a fire, the medical assistant should be aware that if a person's clothes are on fire, that person should stop, drop, and roll until the fire is extinguished. Running makes the fire burn faster.

When escaping a fire, the medical assistant should check closed doors for heat before opening. This is done by using the back of the hand to feel the top of the door, the doorknob, and the crack between the door and the door frame before opening the door. If the door is hot, it should not be opened, and another route of escape should be sought. If the door is cool, it should be opened slowly. The medical assistant should crawl low under any smoke on the way to the exit and close doors as they are passed through to delay the spread of fire. Once out of the building, the medical assistant should not attempt to reenter until or unless the fire department declares that action to be safe. (Review the chapter titled "The Office Environment," which discusses basic fire safety within the medical office.)

Terrorism

In the event of a terrorist attack, the medical assistant should be aware of the steps to take in each of the following types of emergencies.

Explosions

In the event of a bomb threat, the medical assistant should try to obtain as much information from the caller as possible. The following questions should be asked:

1. When is the bomb going to explode?
2. Where is the bomb right now?
3. What does it look like?
4. What kind of bomb is it?
5. What will cause it to explode?

Any information obtained should be immediately provided to the police, and their instructions should be followed. If an explosion has occurred, the medical assistant should respond by following the steps as if an earthquake or fire has occurred.

Biological Threats

Bioterrorism is defined as the deliberate release of bacteria, viruses, or other agents that can cause illness and death in humans, animals, or plants with the intent to intimidate or coerce a government or civilian population to further political or social objectives. Biological agents can be spread through air, water, or food. Some biological agents are difficult to detect; thus, if a terrorist spreads the agent, its effects may not be felt for several hours or days.

Biological terrorism agents are classified by the Centers for Disease Control and Prevention (CDC) into categories A, B, and C, with A being the agents of highest risk. Terrorists seek agents that are easily transmitted, with high morbidity and mortality, to cause lengthy illness and incite panic—preferably with a long incubation period and nonspecific signs and symptoms. These are the agents that are classified as Category A.

Since the terrorist attacks on the United States on September 11, 2001, the awareness of possible additional terrorist attacks has been on the minds of Americans. The term *agents of mass destruction* is all too familiar as well. The CDC Special Pathogens Branch and the CDC National Center for Preparedness, Detection, and Control of Infectious Diseases (NCPDCID) monitor outbreaks of the category illnesses. Their goals include developing rapid diagnostic tests, gathering information, and offering assistance in control and prevention during outbreaks. Each of the Category A agents is briefly discussed in the following paragraphs. Although not a Category A agent, sarin is also discussed because it has been used recently for bioterrorism. For more information, see the CDC website.

Anthrax. Anthrax is a disease caused by the spore-forming organism *Bacillus anthracis.* This acute infectious disease can be passed from animal to human by contact with animal hair or waste. This disease can attack the lungs, skin, and gastrointestinal tract, causing signs and symptoms from respiratory distress to coma. In 2001, anthrax was spread in the United States through the U.S. Postal Service system, causing 22 cases of anthrax infection. The first signs and symptoms of anthrax contracted through inhalation are the same as for the flu. Respiratory anthrax is the most severe, with half the cases ending in death. Penicillin, tetracycline, and erythromycin are antibiotics of choice for treatment.

Professionalism

Professionalism is not just appearance and good grooming, although they are very important aspects of becoming a professional. Learning by observing and challenging yourself on a daily basis give you the experience you need to become a seasoned medical assistant. Remember to continue updating your skills and education frequently.

Contaminated materials should be incinerated. The CDC and other government agencies are developing plans for an anthrax attack with training and education programs for health care providers, public service personnel, and media. A vaccine to prevent anthrax has been developed but is not yet available for the general public.

Botulism. Botulism is a paralytic condition caused by the neurotoxin produced by the spore-forming bacteria *Clostridium botulinum*. The three types of botulism are food-borne botulism, wound botulism, and infant botulism. Food-borne botulism is caused by eating foods containing the toxin. Improperly prepared canned foods are often a source. Wound botulism is caused by a wound infected with *C. botulinum*. Infant botulism is caused by consumption of spores that grow and release toxins. All forms may be fatal and should be considered a medical emergency.

Botulinum toxin is one of the most poisonous substances known. One gram of toxin evenly dispersed and inhaled would kill more than a million people. It is the first biological toxin to be licensed in the United States for treatment of disease. It is used to treat conditions such as eyelid spasms, dystonia (abnormal, repetitive muscle movements), and strabismus (crossed eyes). A weakened form of the botulinum toxin (Botox) is widely used to reduce facial wrinkles.

The CDC reports that cases of botulism are rare in the United States. Most of these cases are infant botulism. The signs and symptoms of food-borne illness appear as early as six hours and as long as 10 days after eating contaminated food. Double vision, slurred speech, difficulty breathing, and paralysis caused by the toxin occur unless treated. Recovery may take weeks and necessitate use of a ventilator. Food-borne and wound types may respond to horse antitoxin if given early enough. Human antitoxin is available from the state of California Public Health Department for treatment of infant botulism.

Plague. Plague, an infectious disease that affects humans and animals, has several forms. All forms of the plague are caused by the bacterium *Yersinia pestis*, which is found in rodents and their fleas in the United States and many other areas of the world. A person may develop one form or may develop a combination of pneumonic plague, which affects the lungs; bubonic plague, which affects the lymph glands and causes swelling; and septicemic plague, which occurs when the organism enters the bloodstream. Signs and symptoms include fever, chills, and pneumonia, and if not treated, death can occur in a matter of a few days. Wearing a mask and early treatment with antibiotics such as gentamycin or tetracycline within 24 hours are suggested.

Sarin. Although sarin is not a Class A agent, it was used for bioterrorism in Japan in 1994 and 1995 and Syria in 2013. Sarin is a human-made nerve agent, similar to insecticides (insect killers) called organophosphates. Also known as GB, sarin is a clear, colorless, and tasteless liquid that has no odor in its pure form. Sarin can evaporate into a vapor (gas) and spread easily into the environment. Victims can be exposed through inhalation, contact, water, or food. Damage depends on the amount of sarin a patient was exposed to, how the patient was exposed, and the length of the exposure.

Signs and symptoms of sarin exposure present immediately and include fatigue, watery eyes, eye pain, pinpoint pupils, blurry vision, runny nose, drooling, excessive sweating, rapid breathing, cough, chest tightness, nausea, vomiting, abdominal pain, diarrhea, confusion, drowsiness, headache, weakness, increased urination, and changes in heart rate. Exposure to large amounts of sarin can cause loss of consciousness, convulsions, paralysis, and respiratory failure leading to death.

Treatment for sarin exposure includes removing the victim from the area where sarin exists, washing the body thoroughly, and providing access to sarin-free air.

Smallpox. Smallpox is caused by the *Variola* virus. It causes an acute, contagious disease that can be quickly spread from person to person. Signs and symptoms of smallpox include fever, macules, papules, vesicles, pustules, and crusts.

Smallpox outbreaks have been occurring for thousands of years according to historians. The CDC reported that the last case of smallpox in the United States occurred in 1949, and the last case in the world was in Somalia in 1977. Until 1972, smallpox vaccinations were recommended for the general public. Eventually, it seemed that smallpox had been eradicated because no new cases have been reported. Recently, there has been the possibility of heightened danger of the use of the *Variola major* virus as a bioterrorism weapon.

According to the CDC, as of 2004 the United States has enough vaccine stockpiles to inoculate every citizen in the event of a smallpox emergency. Vaccinations are available and have been given to military personnel and to medical personnel who might come into contact with the virus.

Tularemia. Tularemia is a serious illness caused by the bacterium *Francisella tularensis*. This organism is found in rabbits and rodents. The signs and symptoms of tularemia include fever, chills, headache, cough, weakness, and diarrhea.

Tularemia is spread by the bite of a tick or flea infected with the organism; by contact with an infected animal carcass, food, or water contaminated with *F. tularensis*; or by inhaling the organism. It is not spread from person to person

and can be treated with antibiotics. To protect against tularemia, practice good personal hygiene and handwashing, and use insect repellent containing N,N-diethyl-meta-toluamide (DEET).

Viral Hemorrhagic Fevers. Viral hemorrhagic fevers are a group of illnesses caused by several different groups of viruses. These viruses have a number of similar features, such as the following:

- They are RNA viruses.
- They must live in either an animal or insect host (ticks, mosquitoes, certain types of rats, mice).
- They are usually restricted to areas where the hosts live.
- Humans can transmit viruses to one another but are not natural hosts.
- There are no vaccines or cures for the most part, with a few exceptions.

Some examples of VHFs are Ebola-hemorrhagic fever and Lassa fever. The signs and symptoms vary but include fever, fatigue, and loss of muscle strength; bleeding under the skin and from the mouth, eyes, and ears; delirium; and coma. Death is possible. Precautions include controlling rodent populations, proper cleaning of rodent nests and droppings, good personal hygiene, isolation of affected people, and use of PPE.

Preparation for a Biological Attack. Weapons of mass destruction are by nature indiscriminate and prolonged in destruction. To prepare for a biological attack, the medical facility may have a high efficiency particulate air (HEPA) filter installed. In the event of a biological attack, the medical assistant should be prepared to move away from the contaminant quickly, wash with soap and water, contact authorities, listen to the radio for instructions, and remove and bag clothing if contaminated.

Nuclear Blast

In the event of a nuclear attack, the medical assistant should take cover as quickly as possible, below ground if the building has a basement. The medical assistant should remain in a safe location, listening to the radio for instructions. The medical assistant should not look at the flash or fireball but should lie flat on the ground with the head covered and seek shelter as quickly as possible.

Mock Environmental Exposures

Medical assistants can play a vital role in the event of an environmental emergency. It is helpful to be prepared for such events by understanding how to help patients and provide assistance to other health care providers. Organizations within the community, colleges, and hospitals may offer mock environmental exposure events. These events provide real-life scenarios and situations that may arise during times of disaster. Examples of mock environmental events include a tornado site with injured patients, an exposure to a biological chemical, or treating injured patients of flash floods or hurricanes. The role of the medical assistant varies in every situation; however, overall, medical assistants may be able to provide assistance in numerous ways:

- Aiding in evacuation plans
- Triaging patients to determine which patients require immediate attention
- Assisting in first-aid response for wounded individuals
- Administering tetanus and other vaccines under the direction of a physician
- Facilitating order and organization in the midst of chaos
- Implementing and following through on an environmental exposure safety plan

Procedure 42-12 lists the steps to create an environmental exposure plan. Staff should frequently practice a variety of potential disaster scenarios to be prepared for an environmental emergency.

JUDGMENT CALL

The responsibility of the medical assistant is usually to assist as many patients as possible and not to turn any away. However, during a disaster situation, the physician may ask the medical assistant to redirect patients with certain problems instead to trauma centers or reschedule them for another day.

1. What treatments or chief complaints might be deferred to another day during a crisis?
2. What types of injuries or diseases should be sent directly to the emergency department of the hospital instead of treated in an outpatient office?
3. How do legal responsibilities change during a crisis?

Community Resources

It is vital for the medical assistant to be aware of community resources before a disaster. Good sources of information are found through the U.S. Department of Homeland Security (www.ready.gov), the ARC (www.redcross.org), and FEMA (www.fema.gov). Through these resources, the medical assistants can develop personal emergency kits for use at home, office emergency kits for use at work, and community

PROCEDURE 42-12

Developing an Environmental Exposure Safety Plan

Objective ◆ *Develop an environmental exposure plan that can be used in all hazards.*

EQUIPMENT AND SUPPLIES

Pen; paper; computer; copy machine; various emergency supplies; waterproof containers; flashlights; batteries; bottles of water; nonperishable food; duct tape; plastic sheeting; masks; bandages; alcohol wipes; blankets; gloves; tweezers; scissors; self-powered radio; assorted medications; map of a hypothetical medical office; hypothetical staff chart

METHOD

1. Create an emergency kit that can be used by your office in the event of an environmental emergency. Supplies may include flashlights, batteries, bottles of water, nonperishable food, manual can opener, bandages, alcohol wipes, blankets, vinyl or latex gloves, tweezers, scissors, self-powered radio, and medications (ibuprofen, acetaminophen, antihistamines, antibiotic ointment, tetanus vaccines, etc.).
2. Enclose the kit in a waterproof container.
3. Place the kit in a safe area, such as a medicine closet or storage closet.
4. Create evacuation plans for every room in the sample medical office that has been given to you.
5. Create a delineation chart that outlines responsibilities of office staff members in the event of an environmental emergency.
6. Create a list of safety zones that can be used in the event of an emergency (e.g., a safety zone in the event of a tornado, an outdoor safety zone in the event of a fire, a safety zone in the event of a flood).
7. Document development of the policy for the physician.

DOCUMENTATION

2/16/YY 10:00 A.M. Developed Environmental Exposure Plan and placed information in red folder on receptionist's desk.
.....S. Porter CMA (AAMA)

survival kits. The medical assistant may also consider volunteering to serve on the local Medical Reserve Corps (https://mrc.hhs.gov/), ARC Disaster Services (www.redcross.org), and Community Emergency Response Teams (https://www.fema.gov/community-emergency-response-teams). The Department of Homeland Security stated the best way to prepare for a disaster is to get a kit, make a plan, be informed, and get involved!

SUMMARY

Each team member must know what procedures to follow in a medical emergency. As a medical assistant, you will need advanced training in CPR, AED, and treating specialty office emergencies, such as allergic reactions. Patients may experience fainting, seizures, anaphylactic shock, and other conditions when visiting the medical office for other health reasons. Contacting the physician and EMS, if necessary, is part of office protocol. Good Samaritan laws were established to encourage health care professionals to volunteer in emergencies without fear of financial liability. It is important that health care professionals render emergency care according to the scope of license, certification, or training until relieved by another health professional. EMS may be called for on-the-scene care, stabilization of the patient, and transport to the appropriate emergency department for further assessment and treatment. Equipment is kept for medical emergencies in the medical office. Medical assistants must have an understanding of the various facets of emergency preparedness. Students are encouraged to create an environmental exposure control plan as well as participate in mock environmental exposure scenarios.