CHAPTER 8

# PATIENT ASSESSMENT

## OUTLINE



# STREET STORY

*I'm a captain stationed in a semi-rural area of California. Our unit's primary responsibility is the urban interface of this area. One of the public attractions in this semi-rural area is a motorcycle sports park. The park has three tracks for motorcycle dirt bikes and entertains at least a couple hundred participants per week in the six days they are open.*

*Our typical call to this sports park is in response to riders who have fallen after a jump and injured themselves in any manner of ways. Minor fractures, sprains, and strains are handled by the track personnel. When we're called, the injury is typically greater than they can handle.*

*Our engine is a PAU (Paramedic Assessment Unit) with three firefighters. It's an engine with a captain, engineer, and a firefighter/paramedic. Our job on medical aids is to handle what is within our scope, and to assess the need for our second due engine, which is a Paramedic Engine.*

*One evening we responded to the sports park on a typical motorcyclist down call. Upon arrival we found that the patient had crashed his motorcycle and had been unconscious for approximately 3 to 5 minutes. He was now conscious and on a backboard with spinal precautions already taken. He had no pain and felt recovered from his accident. We took a second set of vitals (the track EMT had taken an earlier set) and discussed the accident and the patient's condition, trying to determine how we would handle the patient's rising refusal of our help.*

*I was the on-scene supervisor doing the paperwork, asking medical questions, and documenting the paramedic's work. As I jotted down information something caught my eye, so I asked for a third set of vitals. They immediately confirmed my suspicions. His blood pressure was narrowing. Each time the pressure was taken, the results were changing with the diastolic and systolic pressures getting closer and closer.*

*With this additional information we adamantly suggested the patient be taken to the nearest hospital at once. We advocated this position for two reasons: his period of unconsciousness and the changing blood pressures indicating a possible severe injury. The patient finally agreed to further treatment and transportation to the hospital.*

*In following up on the incident the next morning, we found that the patient had been operated on for a lacerated liver, which saved his life. While vital signs may seem like a small piece of the puzzle, in this situation they may have helped the emergency responders save a life.*

—Captain Dennis Childress, Orange County Fire Department, Orange County, California

## OBJECTIVES

Upon completion of this chapter, the reader will be able to:

- Discuss the components of the scene size-up, identify common hazards, and determine if the scene is safe to enter.
- Discuss and identify the mechanism of injury or nature of illness.
- Discuss and perform a complete patient assessment.
- Explain the importance of the general impression.
- Discuss the importance of the initial assessment.
- Differentiate between the assessment of adult, child, and infant patients.

## INTRODUCTION

Patient care is based on the ability of the first responder to quickly and accurately assess the scene and the patient for potential life threats to both the responding team and to the patient. The safety of the first responder and the team is the number one consideration for two reasons. First, the first responder has an obligation to prevent further injury or illness to anyone who might be in danger. Second, a first responder who becomes a patient will not be of any use to the team or the patient, and will further reduce the number of emergency responders available to treat the original patient or patients.

## BODY SUBSTANCE ISOLATION

As a first responder you are going to come in contact with other people. Physical contact cannot be avoided. This means that you may come in contact with bodily fluids. To protect yourself and the patients, you must always use the appropriate levels of body substance isolation (BSI) as discussed in Chapter 3. The use of BSI techniques can protect you and the patient from the spread of disease and infection. Part of the scene size-up is to determine the level of BSI that will be needed for a particular incident. BSI equipment such as gloves, eye protection, a mask, and a gown may be needed and must be available and readily accessible, **Figure 8-1**. Safety is the first step in all incidents.

**Figure 8-1** Body substance isolation equipment such as gloves, eye protection, a mask, and a gown must be available and readily accessible.

## SCENE SAFETY

Scene safety, as discussed in Chapter 3, involves an assessment of the scene and surroundings that will provide valuable information about the incident, hazards, and patient and will help ensure the well-being of the first responder. The scene assessment should begin as the first responder responds to the incident. First responders may be given information that will provide clues as to what type of incident is occurring, what types of hazards the responding team may need to be aware of, and what type of equipment first responders are going to need.

As first responders approach the scene, they should assess any hazards that could possibly place the responding team, bystanders, and the patient(s) in jeopardy of being injured further or exposed further. Where is the location? Is this going to be an industrial setting or a nursing home? What do you need to consider before you even step onto the scene? First responders need to consider different hazards at different scenes. An approach to the scene of any incident must start with an overall scene assessment that would include any of the following:

- What type of incident is this? Is this a medical or trauma incident?
- How many vehicles are involved? Are any vehicles overturned or are any of the vehicles cargo carriers that may present special safety concerns?

- Could the incident involve hazardous materials or toxic substances for which more resources will be needed including special teams with specialized training?
- Is the incident a crime scene? Is there a potential for violence? Are weapons involved?
- Are there any unstable surfaces or structural compromises that need to be addressed? Are there slippery surfaces that need to be corrected or unstable vehicles that need to be stabilized?
- Is the incident in a residential or industrial setting? (**Figure 8-2**)
- If a crowd is present, how do they appear to be acting? Are they hostile or agitated? Large crowd settings can be dangerous and can create a difficult situation very quickly.

**Streetsmart Tip** One important consideration for scene safety is that if more than one individual on a scene has the same complaint(s), first responders should consider the possibility of a hazardous materials incident until proven otherwise.

**Figure 8-2** Scene safety considerations can be different depending on the setting.

**Safety** Make sure the scene is safe before entering. Rushing into a scene before it is determined to be safe can mean the difference between a first responder treating a patient or becoming a patient!

It is also important to note any information sources who may be present on the scene. This can include family members, coworkers, and other bystanders who are already on the scene trying to help. These bystanders can provide very valuable information about what happened and the patient's condition immediately following the incident. Clear the family members or bystanders to a safe area and ask them to remain there so that you can find them if you have any questions.

# BEGINNING THE PATIENT ASSESSMENT

Once the scene is determined to be safe and the first responder has appropriate BSI, attention can be directed to the patient. Protect the patient from further harm through hazard assessment and mitigation. Assessing and mitigating hazards may provide you with valuable information about how the patient was injured (mechanism of injury) and what injuries and or illnesses (nature of illness) they may have.

## Identify the Mechanism of Injury or Nature of Illness

The **mechanism of injury (MOI)**, or **nature of illness (NOI)**, involves an evaluation of the forces that caused the injury or the illness that has resulted in the patient's presenting medical condition. This evaluation is very important in locating injuries that may not be readily evident. The MOI can lead first responders to injuries that might not otherwise be suspected.

**Streetsmart Tip** Asking bystanders or family members to describe what happened is helpful in determining the MOI or NOI. Often, family members who have been dealing with a particular illness in a family member are quite knowledgeable and can be a great source of information.

Witnesses can provide information about what happened if the patient is unable to answer any ques-

tions. The next sections discuss items to look for at both trauma and medical scenes that will assist first responders in determining the mechanism of injury or nature of illness.

## Mechanism of Injury

First responders should consider the following elements when responding to scenes involving injuries and trauma:

- *Automobile accidents:* Assess the damage to vehicles, the area of the vehicle that was damaged, the amount of damage, the existence and type of damage to the interior of the vehicle, loose items in the vehicle that could have been projectiles and caused injury to the patient, and any hazards on the scene that could further complicate the well-being of the patient or first responder, **Figure 8-3**.
- *Falls:* Consider the height of the fall, the surface the victim landed on, how the patient landed, and what caused the patient to fall.
- *Assaults:* Consider the existence, type, and size of weapons involved, and from what direction the assault occurred.
- *Industrial accidents:* Assess whether or not chemicals were involved, or the involvement of heavy machinery.

## Nature of Illness

First responders should consider the following elements when responding to scenes involving illnesses and medical emergencies:

- Why were EMS resources called to this location?
- What is the patient's chief complaint?
- What home medical equipment is present, **Figure 8-4**?
- Is there any pertinent past medical history?
- What medications is the patient currently taking? (This can include both prescription and over-the-counter medications, **Figure 8-5**.)

All of this information will help you in your assessment and treatment of the patient. The more information you gather, the better understanding you will have of the situation and the better you will be able to handle that situation until the transport unit arrives.

## Number of Patients

First responders should determine the number of patients at the emergency scene and request any additional resources needed. There may be more than one patient and more than one ambulance may be needed. There may be a need for advanced life support (ALS)

**Figure 8-3** Automobile accidents present first responders with many scene safety and mechanism of injury considerations.

**Figure 8-4** Take note of any medical equipment present on the scene, such as home oxygen therapy.

units, **Figure 8-6**, law enforcement, or special response teams. Try to call for additional resources as soon as the need is identified. If there is more than one patient, begin triage to identify the most critical patients and prepare them for transport. (Triage will be discussed in Chapter 16.)

## The Initial Assessment

When the scene size-up is complete, the first responder must then perform an **initial assessment** of the patient. The purpose of the initial assessment is to identify and treat **immediate life threats**. Immediate life threats are conditions that need to be corrected as soon as they are identified. Immediate life-threatening conditions are listed here:

- An obstructed airway
- No spontaneous respirations
- Uncontrolled bleeding and shock (**hypoperfusion**)
- Cardiac arrest.

## General Impression

As first responders enter the scene, they can begin to form a **general impression** of the patient. This can be done as the patient enters their view as they approach. All of a first responder's senses can help in providing this valuable general impression. A general impression is not to be considered a substitution

**Figure 8-5** It is important to note what medications the patient is taking.

**Figure 8-6** First responders should consider the need for ALS units to provide additional patient care.

for a proper patient assessment, but it can set the team into motion and raise the level of concern for the patient, **Figure 8-7**.

Consider the environment, the patient's chief complaint, and the preliminary general impression when evaluating a scene. First responders can then gain a better idea of whether the incident is a medical or trauma situation, if that has not already been established.

## Level of Consciousness

While approaching a patient, first responders can try to establish the responsiveness of the patient. This is done by talking to the patient, identifying yourself, and telling the patient that you are a first responder and that you are there to help. This allows first responders to do two things. First it can help in determining whether the patient is responsive and begins the airway assessment. It also allows the first responder to establish a relationship with the patient and family.

**Streetsmart Tip** Remember that an emergency incident might be a very difficult time for the patient and family. Always treat the patient and the patient's family with respect. The general impression that you give to the patient and their family is just as important as the general impression that you receive from the patient as you enter the room.

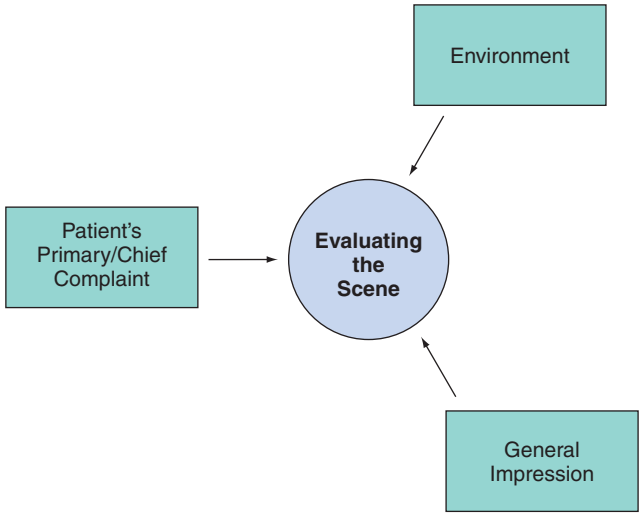



**Figure 8-7** Consider the environment, the patient's chief complaint, and the first responder's general impression when evaluating the emergency scene.

Determining the level of consciousness (LOC) is the first step in actually assessing the patient. The level of consciousness is determined by how the patient responds to you and is measured as Alert, responsive to Verbal or Voice, responsive to Painful stimuli, or Unresponsive, or **AVPU** for short. A patient who is conscious, alert, and oriented (eyes are open; is responding appropriately to your questions) is considered to be Alert. To determine if a patient is oriented, ask questions that are

commonly known, like the date or day, time, place, and event. First responders should note any incorrect answers in their documentation. Patients who are conscious but give some inappropriate answers or are slow to answer may have one or more of several problems ranging from head injury and stroke to medical illness.

Patients who are not alert but respond to your verbal commands and may answer questions are considered to be responsive to Verbal stimuli. These patients may appear to be unconscious but will respond to your commands and may open their eyes when spoken to. This is commonly seen in patients with neurological problems such as strokes and head injuries but may also be seen in drug and medication overdoses and some medical illnesses.

Some patients may only respond to agitation and painful stimuli, such as a **sternal rub**, **Figure 8-8**; in such cases the patients are considered to be responsive to Pain. Acceptable pain stimulation would be a sternal rub, performed by vigorously rubbing ones knuckle up and down the patient's sternum, or a pinch to the ear lobe or the skin on an upper extremity, **Figure 8-9**.

Patients who do not respond to any stimulation are termed unresponsive. Any unresponsive patient should be treated as a trauma patient unless otherwise proven to be a medical problem and there is no possibility of trauma. This means that head and neck stabilization should be performed immediately, since the first responder may not know if a traumatic injury occurred.

**Streetsmart Tip** Patients may be alert but disoriented. For evaluation purposes these patients are considered alert but be aware of a rapid change in the level of consciousness. Many diseases can cause a patient to be alert but disoriented. Try to ascertain from bystanders or family members the patient's normal level of consciousness and take this into consideration when assessing the patient. For example, an elderly patient with Alzheimer's disease may be awake and alert, but unable to appropriately answer questions. This inappropriate response may be normal for the patient considering prior medical history.

## Pediatric Considerations

Infants and young children respond differently to situations than adults. Generally young children do not like strangers and will be more challenging to assess. They will tend to cling to a parent or caregiver when facing new people. Children and infants are usually very interested in what is happening around them. The child or infant who is looking around at all the new people and "toys" (your equipment) may be acting appropriately. Use the parents or caretakers of the children to determine if the patient is acting normally. To determine an LOC on an infant, *do not* use a sternal rub. Tap the infant on the bottom of the foot to stimulate a response, **Figure 8-10**.

**Figure 8-8** A sternal rub.

**Figure 8-9** First responders can pinch the ear lobe or the skin on an upper extremity to test for patient responsiveness.

**Figure 8-10** To determine an LOC on an infant, do not use a sternal rub. Tap the infant on the bottom of the foot to stimulate a response.

## AIRWAY

One of the primary functions of the first responder is to establish and secure an open airway. Without an airway, the patient will not live. If the patient is alert, the status of the airway is usually easy to assess. If the patient is unconscious or the patient appears to be having any difficulty breathing, an assessment of the airway may be more difficult. The airway can be opened using two methods, the head-tilt/chin-lift method or the jaw thrust method shown in **Figure 8-11**. Refer to and review Chapter 7 for more on assessing and opening the airway.

**Figure 8-11** Opening the patient's airway.

**Note** A patient's airway must be maintained throughout the entire duration of the emergency incident. Do not forget to frequently check on the status of the airway. Just because a first responder assesses the airway at the beginning of a patient assessment does not mean it can be ignored after that! Airway assessment is a critical—and ongoing—part of a patient assessment and the treatment a patient will receive.

## BREATHING

Assess the patient's breathing by looking for chest rise, listening for air movement, and feeling for air movement as discussed in Chapter 7. Normal respirations in the adult range from 12 to 20 per minute. Children and infants range from 15 to 40 and newborns from 30 to 50. Rate is determined by counting the respirations for a full minute. Experienced first responders may be able to count the number of respirations in 15 seconds and multiply that number by four to get the respiratory rate for a full minute. Counting for a full minute is optimal. Normal respiratory rates are listed in **Figure 8-12**. Any patient who presents with a rate other than normal is a priority patient and should receive supplemental oxygen via oxygen mask depending on local protocol. Patients that present with slow, shallow, very rapid or **agonal respirations** may need assisted ventilation.

Assess the quality and rate of breathing. Quality can be described as normal, shallow, labored, or agonal. Normal respirations are what you would expect from a person in a normal setting, resting and without exertion. Shallow respirations are seen in many disease processes and may be present in very ill patients. With shallow respirations, it will be difficult to see the chest rise and to hear or feel air movement. Labored respirations are very noticeable. Patients will be gasping for air and you may

### Normal Respiratory Rates, by Age

| AGE | NORMAL RESPIRATORY RATE (BREATHS/MINUTE) |
|---|---|
| Adult | 12–20 |
| Adolescent (11–14 yr) | 12–20 |
| School-aged child (6–10 yr) | 15–30 |
| Preschool-aged child (1–5 yr) | 20–30 |
| Infant (1 mo–1 yr) | 20–40 |
| Newborn (0–1 mo) | 30–50 |

**Figure 8-12** Average respiratory rates by age.

see the patient using **accessory muscles** to help breathing. Accessory muscles in the neck are seen contracting during inspiration. The muscles in the neck will tense and become very obvious. You may also see muscle retractions in the chest. Generally air movement should not be heard from across the room. If you hear the patient breathing as you approach, then there is probably a respiratory problem. Take note of any wheezing or gurgling noises heard when the patient breathes.

> **Note** If a patient has labored respirations and tells you that he cannot breathe or is tired of breathing, prepare to assist ventilations and breathe for the patient as needed using a bag-valve-mask or other barrier device preferably with supplemental oxygen (if approved for use through the first responder's agency or department).

Agonal respirations are seen just prior to respiratory arrest. Agonal respirations are very distinctive and easily identified. They are usually much slower than normal respirations. The patient's jaw will drop with inspiration and the patient will appear to be gulping. You may hear this referred to as "guppy" breathing as it looks very much like how a fish breathes when out of water. Agonal respirations produce little to no air movement and require immediate attention by assisting ventilations with a barrier device.

During the breathing assessment, first responders should perform a visual check of the neck and chest for any penetrating injuries or deformities that might cause respiratory compromise. Gunshot wounds, stab wounds, and severe blunt trauma pose serious threats to the airway and breathing. Any open wounds to the chest need to be covered immediately with an **occlusive dressing**, or gloved hand, to help prevent development of increased breathing difficulty from lung collapse. **Flail segments** must also be stabilized as soon as they are found. A flail segment on the chest occurs when *two or more ribs* are fractured in *two or more places* causing a portion of the chest wall to move independently of the rest of the torso, **Figure 8-13**. Placing a gloved hand against the segment to stabilize it will suffice until a bulky dressing can be properly applied.

First responders should also be aware of the potential for breathing problems in patients who have been

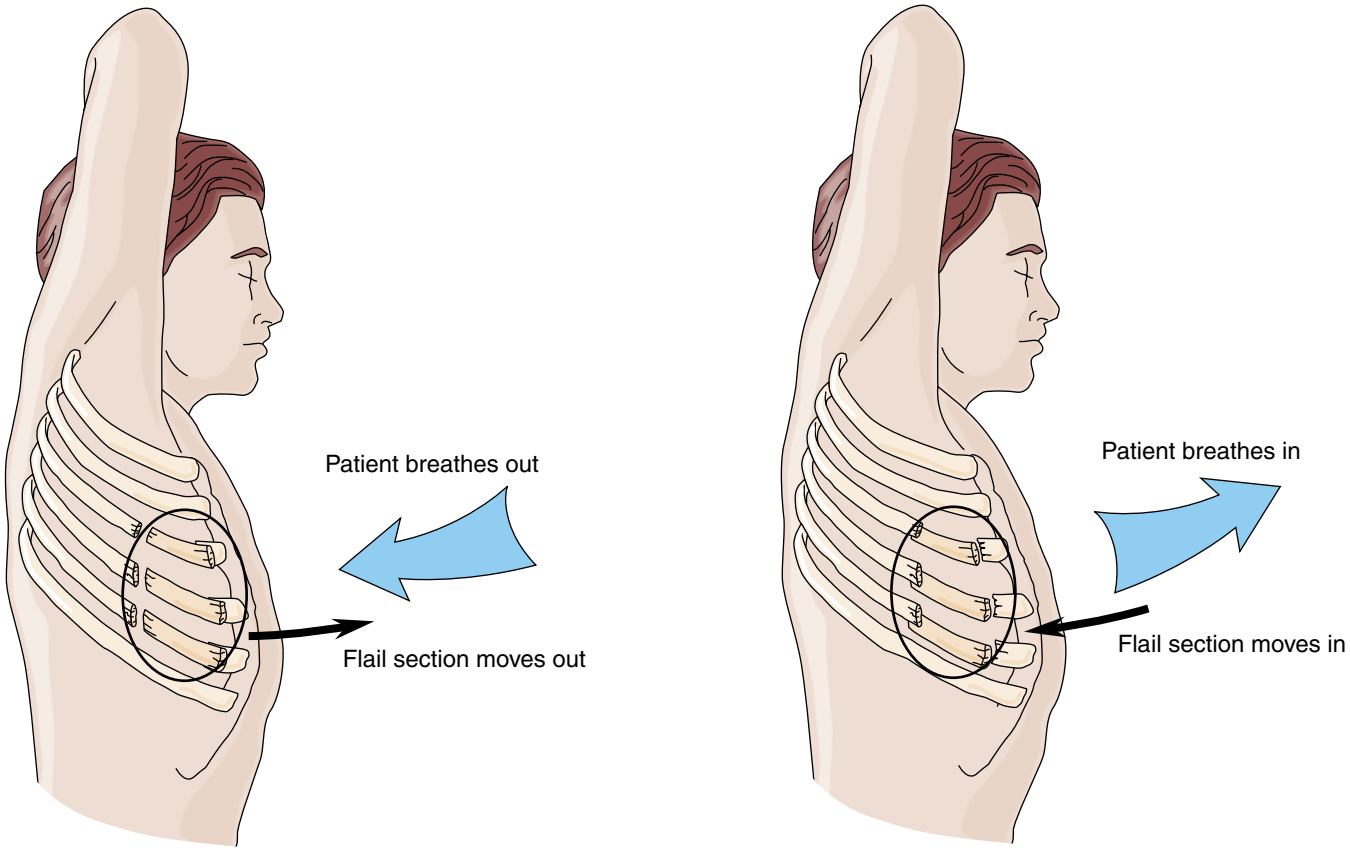



**Figure 8-13** A flail segment on the chest occurs when several ribs are fractured in a traumatic injury.

**Figure 8-14** Superheated gases from fire can cause serious problems in the respiratory system.

exposed to fire or smoke from fires, **Figure 8-14**. Superheated gases can cause serious problems in the respiratory system. When performing the assessment, first responders should look for soot or burns on or near the patient's nose and mouth and try to determine how long the patient was exposed to smoke or fire.

## CIRCULATION

As with airway and breathing, the initial assessment of the patient's circulation has two components: assessment and treatment. The first step is to assess the patient's circulation and assess for major blood loss. Assessing the patient's pulse is the first step in assessing the circulation. Pulses are assessed in one of two places. To assess the pulse of a patient who is alert, use the radial pulse. For patients who are anything but alert, or if you cannot feel a radial pulse, assess the carotid pulse. If you assess the carotid pulse first, check the radial pulse next and compare the two. The radial pulse is checked using the pads of the index and middle fingers at the wrist as shown in **Figure 8-15A**. The carotid pulse is checked on the side of the neck closest to the first responder, as shown in **Figure 8-15B**. Assess the pulse for 5 to 10 seconds. If the patient does have a pulse, determine if the pulse is rapid, slow, or weak. (This can be done during the 5- to 10-second pulse check.) If the patient does not have a pulse, cardiopulmonary resuscitation (CPR) will be required.

**Streetsmart Tip** First responders should never use the thumb to check a patient's pulse because the thumb has its own pulse, which could be confused with that of the patient.

### Assessment of the Pediatric Patient's Pulse

The pulse on a young child or infant should be checked using the brachial artery, **Figure 8-16**. Young children are anatomically different than adults and require different assessment techniques. Assessing a radial pulse in a child may be difficult. The child may not have developed enough to make an accurate assessment using the radial artery. Children may also not like you touching them. If this is the case, use the brachial artery in the upper arm. The brachial pulse is much easier to find and it can be much easier to hold onto the patient's upper arm than the wrist. If the child is unresponsive, use the carotid artery in the neck or the femoral artery in the upper leg to assess the pulse.

### Life-Threatening Blood Loss

Once the presence of a pulse in a patient has been determined, first responders need to look for major bleeding. This is bleeding that is so severe that the patient could die if not controlled. Use both hands and run them down the patient's body to check for major bleeding. Be sure to check under the patient as well.

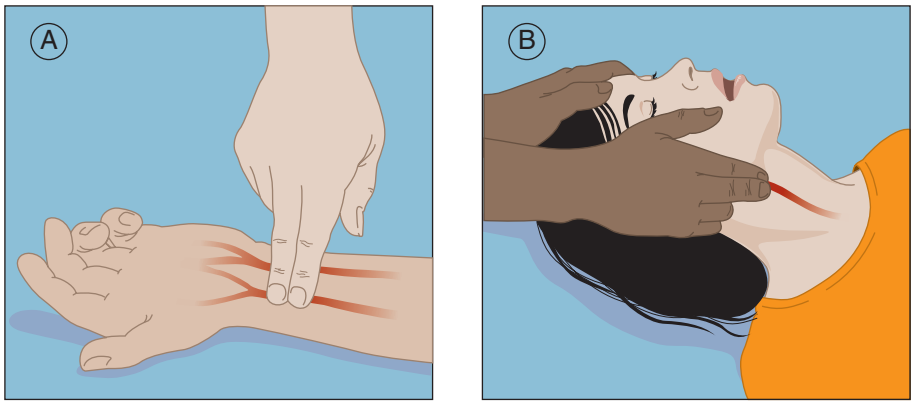



**Figure 8-15** Locating pulses in the **A.** radial artery in the wrist and **B.** carotid artery in the neck.

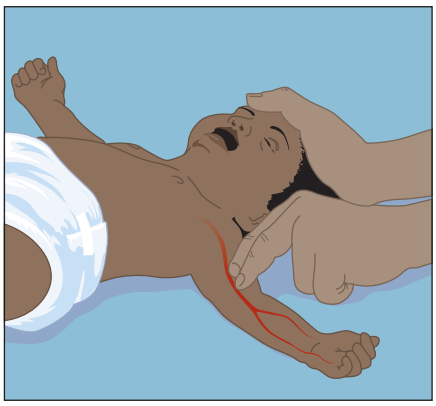


**Figure 8-16** Locating the brachial pulse in an infant's arm.

**Figure 8-17** First responder checking for major bleeding.

This can be done without moving the patient by simply sliding your hands under the sides of the patient as demonstrated in **Figure 8-17**. Look at your gloves often to see if there is any blood on them. If you find a source of major bleeding, stop the initial assessment and bandage the wound.

**Streetsmart Tip** Simply placing a gloved hand over major bleeding immediately on discovery will help to control the bleeding until a bandage can be applied, **Figure 8-18**.

If the bleeding is minor, continue with the initial assessment and treat the minor injury once the life threats have been treated. While performing this hands-on assessment look for any medical alert tags that might provide you with any information about past medical history, medications, or any allergies and make note of the information, **Figure 8-19**.

Children and infants have a considerably smaller volume of blood than adults. What may seem to be a minor amount of blood loss for an adult may be a significant amount for an infant or young child. Treat all uncontrolled bleeding in children and infants immediately and prepare to treat for shock (hypoperfusion.)

Any patient whose pulse is rapid or weak or in whom you have found major bleeding is a priority patient and should be placed on high-flow supplemental oxygen (based on local department or organization policy).

The patient's skin condition can tell first responders a great deal about the patient's perfusion. Normal skin condition is warm and dry. Any other condition in the skin should be noted and the patient should be considered a priority patient.

**Figure 8-18** Simply placing a gloved hand over major bleeding immediately on discovery will help to control the bleeding until a bandage can be applied.

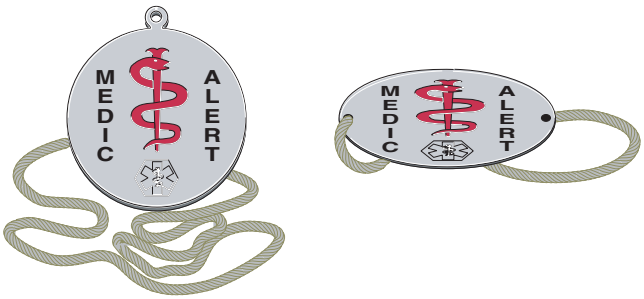



**Figure 8-19** Examples of medical alert tags.

**Priority Findings in the Initial Assessment**

- Poor general impression
- Altered mental status
- Any airway that is not open or was at one time compromised
- Breathing other than normal
- Open chest injuries or flail chest segments
- Signs and symptoms of shock
- Complicated childbirth
- Chest pain
- Severe pain anywhere

**Figure 8-20** Priority findings in the initial assessment.

## Patient Priority

The initial assessment is designed to assist the first responder in locating, identifying, and correcting any life-threatening conditions that may be detrimental to the outcome of the patient. Any patient who presents with a life-threatening condition, altered mental status, airway problems, breathing or circulatory problems is a priority patient. All other assessments are delayed until the life threats are corrected. **Figure 8-20** reviews conditions that make a priority patient.

## Update Other Responding Units

First responders should give a patient update to the other incoming units so that they may prepare for the patient, **Figure 8-21**. Provide a very brief report on the patient's age, sex, primary or chief complaint, level of consciousness, and current condition of the patient's airway, breathing, and circulation.

Having updated the responding units as appropriate, the first responder should then perform a further examination of the patient to better determine the

"Engine 3 to Medic 19. On scene with a 79-year-old male with a chief complaint of chest pain. Patient is conscious, alert, and oriented. He has a history of chest pain and has taken one of his nitroglycerin tablets about 5 minutes ago without any relief. He is having trouble breathing and we have placed the patient on high-flow oxygen via a non-rebreather mask. His pulse is rapid and weak and his skin is cool and clammy. Do you have any questions or instructions?"

**Figure 8-21** An example of a first responder's update report to an EMS transport unit.

problem and what treatment might be rendered prior to the arrival of the transporting unit.

# PHYSICAL EXAMINATION

Physical exams can vary depending on the patient's chief complaint and what is found in the initial assessment. First responders may perform one of two exams on a patient, either a **detailed exam** or a **focused exam**. The detailed exam is a hands-on, head-to-toe exam of the unconscious or unresponsive patient. A detailed exam should be performed on all patients who present with an altered level of consciousness or a serious mechanism of injury. Remember that continuous monitoring of an unconscious patient's airway, breathing, and circulation is required. The focused exam is performed on patients who are conscious and can answer questions appropriately and have isolated complaints such as arm pain from a fall.

The physical exam is a more detailed look at the patient designed to identify signs and symptoms that patients may present with once the life threats have been treated. The physical exam is a head-to-toe exam that will provide the first responder with more information about the patient's condition and what steps to take in the treatment of the patient. A physical exam is performed on patients unable to answer questions so the first responder can determine the problem. This would include all unconscious patients and any patient who has more than one isolated complaint. Any patient with a significant mechanism of injury or nature of illness that presents in a priority condition following the initial assessment should have a physical exam completed and documented.

## Detailed Exam

The detailed exam requires that you inspect (look) and palpate (feel) the patient to determine what signs of injury or illness the patient may be presenting. During the detailed exam, inspect and palpate for the following, Deformities, Open injuries, Tenderness, and Swelling. The mnemonic **DOTS** may be used to help remember these, **Figure 8-22**. Briefly exam the patient in a logical manner beginning with the head.

## Head

Inspect and palpate the head for DOTS (deformities, open injuries, tenderness, and swelling), **Figure 8-23**. Note any soft spots in the skull but *do not* push on them. Inspect the ears and nose for blood and fluids that might indicate a head injury, **Figure 8-24**. Inspect the airway for blood, excessive saliva, broken teeth, or dentures that could cause an obstruction and remove them, **Figure 8-25**. Check the pupils for reaction to light and size. (See the section on vital signs in this chapter for more on pupil assessment.) Reassess the patient's level of consciousness, airway, and breathing. If you suspect trauma, do not move the patient's head. Stabilize the head and neck and do not release it until the patient is secured to a long spine board.

## Neck

Inspect and palpate the neck. Be sure to note any deformities. Any open injuries of the neck should be covered with an occlusive dressing. Note if the trachea is midline or deviated to one side. A deviated trachea can indicate a severe chest injury.


**Figure 8-22** The mnemonic DOTS can help first responders remember what to look for in the detailed exam.

**Figure 8-23** Inspecting the head.

**Figure 8-24** Inspect the ears and nose for blood and fluids that might indicate a head injury.

**Figure 8-25** Inspect the airway for blood, excessive saliva, broken teeth, or dentures that could cause an obstruction and remove them.

**Figure 8-26** Palpate the posterior neck for DOTS, particularly with trauma patients, by sliding your hands behind the neck and gently palpating with your fingertips.

Palpate the posterior neck for DOTS, particularly with trauma patients, by sliding your hands behind the neck and gently palpating with your fingertips, **Figure 8-26**. *Do not* press in on the neck! Palpation should also be completed before applying a cervical collar. Once a cervical collar is in place it should not be removed.

## Chest

Inspect and palpate the chest for DOTS. Expose the entire chest and look for equal chest wall movement during inspiration and expiration. Feel the chest for equal expansion during inspiration, **Figure 8-27**. If the chest does not rise equally, the first responder should suspect a chest injury. Check for flail segments. During inspiration the flail segment will appear to be sucked into the chest, while during expiration it will appear to bulge from the chest. This is known as paradoxical motion. A flail segment must be treated as soon as it is discovered. Using a gloved hand, stabilize the segment until a proper bulky dressing can be applied, **Figure 8-28**.

Inspect the chest for any open injuries. Any lacerations or punctures of the chest should be covered with an occlusive dressing as soon as they are discovered. Note any bubbling coming from an open chest injury. This would indicate that the lung might have also been damaged. These can be covered with a gloved hand until a proper dressing can be applied.

Note any tenderness in the chest when palpating. Internal injuries may not be evident right away. By noting where the tenderness is located, you can return to the tender area during your ongoing assessment to see if there are any changes. Bruising and swelling usually do not show right away. When palpating the midline of the chest near the sternal notch, note any popping sensations you may feel. **Subcutaneous emphysema** feels like lots of little bubbles popping just under the skin in the area of the lower trachea and is a good sign of an internal chest injury. Note any swelling or bruising in the chest. If any of these signs are noted, the patient has sustained a significant injury and needs to be transported to the hospital immediately.

**Figure 8-27** Feel the chest for equal expansion during inspiration.

**Figure 8-28** A flail segment must be treated as soon as it is discovered. Using a gloved hand, stabilize the segment until a proper bulky dressing can be applied.

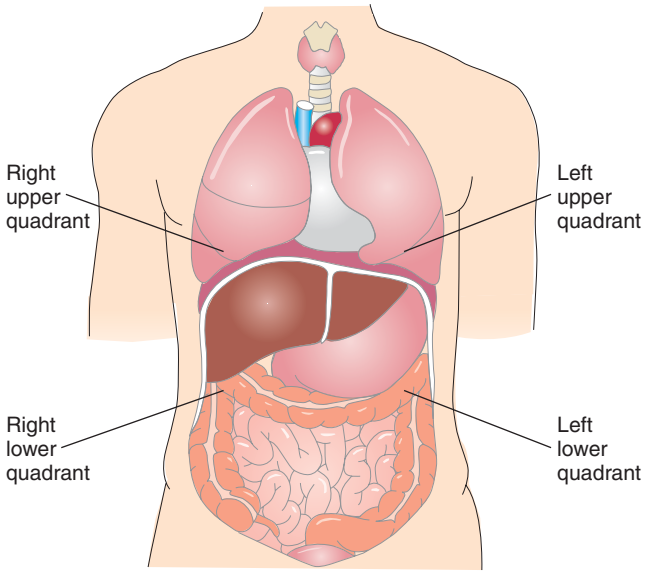



**Figure 8-29** Divide the abdomen into four quadrants for the assessment.

## Abdomen

Inspect and palpate the abdomen for DOTS. Look for any swelling (**distension**) or tenderness that would indicate an internal abdominal injury. Divide the abdominal section into four quadrants, as seen in **Figure 8-29**. Palpate each quadrant of the abdomen separately and note any indications of pain and rigidity, **Figure 8-30**. Open injuries of the abdomen should be dressed with an occlusive dressing, **Figure 8-31**. If organs are protruding from the abdominal injury (**evisceration**), *do not* place them back inside. Cover them with sterile dressings, **Figure 8-32**. (Refer to Chapter 12 for complete treatment of abdominal injuries.)

**Streetsmart Tip** If the patient has an abdominal complaint, start the assessment of the abdomen at the quadrant farthest from the area of the complaint, palpating the quadrant of complaint last. If you note a pulsating mass in your assessment, *do not* palpate the abdomen again. The palpating mass may be an **abdominal aortic aneurysm** and should not be agitated. This is a serious condition in which the main artery of the body has ruptured, or is beginning to rupture, which causes major internal bleeding. This patient should be transported to the hospital immediately and very carefully!

**Figure 8-30** Assessing the abdomen.

Palpate the lower back by sliding your hands into the small of the back and feeling the spine and sides of the back, **Figure 8-33**. After log-rolling the patient on a long spine board, palpate and inspect the entire posterior body including the back, buttocks, and posterior of the lower extremities and note any findings, **Figure 8-34**.

## Pelvis

Examine the pelvis for DOTS. When palpating the pelvis *do not* rock the pelvis from side to side. Gently push straight down equally on both sides and then push in on both sides, noting any indica-

**Figure 8-31** Open injuries of the abdomen should be dressed with an occlusive dressing.

**Figure 8-33** Palpate the lower back by sliding your hands into the small of the back and feeling the spine and sides of the back.

**Figure 8-32** If organs are protruding from an evisceration, do not place them back inside. Cover them with sterile dressings.

**Figure 8-34** When placing a patient on a long spine board, palpate and inspect the entire posterior body including the back, buttocks, and posterior of the lower extremities.

tions of deformities or pain, **Figure 8-35**. Rocking the pelvis will twist the spine, an action that should be avoided with any patient, but especially for trauma patients. Quickly examine the clothing around the pelvis for any signs of urinary or fecal incontinence.

## Lower Extremities

Inspect and palpate the lower extremities one at a time. Again look for DOTS. Control any major bleeding that is found, **Figure 8-36**. Check the patient's pulse, motor, and sensation in each extremity. Compare the pulse in one lower extremity with the pulse in the other lower extremity, **Figure 8-37**. This can be done by finding the pulse located on the top of the foot. First responders can place two gloved fingers across the top of the foot where it meets with the ankle/lower leg. The pulses in both lower extremities should be present and equal.

Next, check movement and sensation. Place both hands under the balls of the patient's feet and ask the patient to push down as if they were pointing their toes down. Compare the strength of the two extremities. Touch the patient on the toes or sides of each foot and ask the patient if they can feel this sensation. Compare the two extremities to each other and note any differences.

**Figure 8-35** Assessing the pelvis.

**Figure 8-37** Check the patient's pulse, motor, and sensation in each extremity. Compare the pulse in one lower extremity with the pulse in the other extremity.

**Figure 8-36** Inspect and palpate the lower extremities one at a time. Control any major bleeding that is found.

**Figure 8-38** Respiratory patients may present with swelling in the feet and ankles.

First responders should note any swelling in the ankles especially in respiratory patients. Push in on the skin of the swollen ankle and observe for deep indentations that are slow to come back to normal, **Figure 8-38**. This is generally seen in patients with congestive heart failure. (*Do not* perform this exam on a traumatic ankle injury!) Swelling of the upper leg could be a sign of an internal hemorrhage. The thigh is capable of holding up to 3 liters of blood.

## Upper Extremities

Inspect and palpate the upper extremities, one at a time, looking for DOTS. Assess the patient's pulse, motor, and sensation. Assess the pulse for rate and rhythm in the wrist (radial artery) and compare it to the pulse in the other extremity. Compare the motor function of both upper extremities by asking the patient to move the extremity or to squeeze two fingers and compare the grip strength, **Figure 8-39**. Lightly touch the distal end of the extremities and ask the patient if your touch can be felt.

**Figure 8-39** Compare the motor function of both upper extremities by asking the patient to move the extremity or to squeeze your two fingers and compare the grip strength.

# VITAL SIGNS

At this point in the exam, the first responder should take the patient's vital signs. Never obtain vital signs on an injured extremity, unless there is no other choice. Treat injuries accordingly.

Vital signs are a very important part of any patient assessment. Vital signs tell the first responder how the body is coping with the situation. Pulses, respirations, skin color and condition, and blood pressure all change with different situations. Vital signs provide important information about what is happening inside the body.

## Respirations

Respirations are a very important vital sign. Respirations are one of the first changes noticed in patients when their condition changes. As a patient's condition deteriorates the respiratory rate increases. As the condition improves the patient's respiratory rate decreases. Refer to Chapter 7 for more on respirations.

**Note** Remember that respirations are also assessed at the beginning of the detailed exam (right after the airway is checked.) This initial check of respirations should always be performed. Do not wait until this stage of the detailed exam to assess respirations.

## Pulse

The pulse is a measure of the heart rate and can tell the first responder a great deal about the patient's perfusion. Pulses change rapidly as the patient's condition changes. The pulse may present as normal, rapid, slow, and/or irregular. The normal resting pulse for a healthy adult patient is 60 to 100 beats per minute. A rapid heart rate, also called **tachycardia**, is a heart rate greater than 100 beats per minute. Slow heart rates, or **bradycardia**, are less than 60 beats per minute. Normal pulse rate ranges can be studied in **Figure 8-40**.

A rapid heart rate (tachycardia) may be a sign of distress. As the body's demand for oxygen increases so does the heart rate. An increase in the heart rate

| AGE | PULSE |
|---|---|
| Newborn | 120–160 |
| 1 year | 80–140 |
| 3 years | 80–120 |
| 5 years | 70–115 |
| 7 years | 70–115 |
| 10 years | 70–115 |
| 15 years | 70–90 |
| Adult | 60–80 |

**Figure 8-40** Average pulse rates by age.

compensates for any decrease in the body's ability to deliver oxygen to the tissues. This may be the result of blood loss or respiratory compromise. Patients with rapid heart rates should be placed on supplemental high-flow oxygen via a non-rebreather mask and monitored closely (based on local protocol or policy).

Bradycardia is a slow heart rate, generally below 60 beats per minute. Bradycardia is usually the result of a slowing of the electrical activity of the heart and may need rapid advanced life support intervention. A slow heart rate can result in low blood pressure and inadequate oxygenation of the body, which can lead to brain damage and death if not corrected immediately. First responder treatment of bradycardia will include placing the patient in a supine position, administering high-flow oxygen, and assisting ventilations as needed.

The pulse may also be regular or irregular. This refers to the rhythm of the heart. The heart should beat in a consistent, even rhythm. A heart rhythm should be regular with equal intervals between beats. If it is not, then the rhythm is considered irregular. This irregular heartbeat may be the result of previous medical condition and may in fact be normal for the patient. Or it may be the result of inadequate oxygenation that may cause the heart to generate extra beats. Check with the patient about any cardiac history if an irregular heart rate is detected.

**First Responder Fact** Many elderly people live with irregular heart rhythms everyday. One such condition is called **atrial fibrillation**. Generally this condition is not life threatening. There are, however, situations in which atrial fibrillation can cause some serious problems for patients. Do not disregard the fact that the patient has a history of atrial fibrillation if the rate is irregular. Treat the patient accordingly.

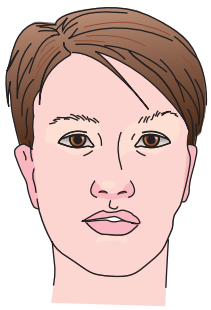
**Streetsmart Tip** Knowing some of the common medications that people take for various illnesses can be of real benefit to the first responder. As family members start handing you medications you can almost develop the patient's history if the patient is unable to answer questions and the family is unsure. See Appendix for some common medications and what they are used to treat.

## Skin Condition

Skin condition is a good indicator of tissue perfusion. Skin condition is often overlooked as a vital sign but, in fact, is a very important part of the assessment. When assessing the skin three characteristics should be noted: color, temperature, and moisture.

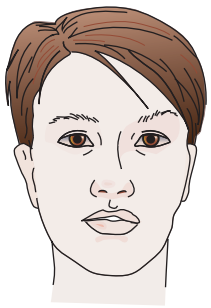
### Skin Color

Normal skin color is pink. In the ill and injured person the skin may present as flushed, pale, or cyanotic. Flushed skin is red and very warm to the touch, usually seen in environmental emergencies and hypertension crises, **Figure 8-41**. Pale skin is white looking and generally easily noticed. Pale skin is an early sign of hypoperfusion and can be accompanied by low blood pressure and a slow or fast heart rate, **Figure 8-42**. **Cyanosis** is a bluish color of the skin, **Figure 8-43**. This is seen in profound hypoperfusion, generally airway obstructions, and severe cardiac and respiratory emergencies. If there are any questions as to the patient's skin color, ask a family member if available or someone who is familiar with the patient if the patient's skin looks normal. See **Figure 8-44** for different skin conditions and possible causes.



Flushed skin

**Figure 8-41** Flushed skin is red and very warm to the touch, usually seen in environmental emergencies and hypertension crises.



Pallor

**Figure 8-42** Pale skin.

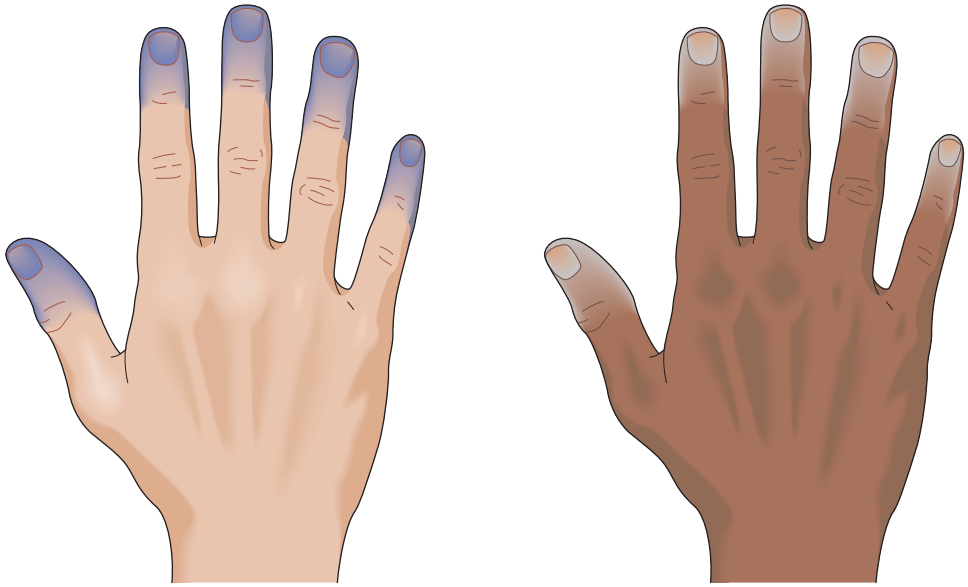


**Figure 8-43** Cyanosis is a bluish color of the skin.

**Skin Color Findings and Possible Causes**

| Skin Color | Possible Causes |
|---|---|
| Flushed | Environmental Emergencies<br>Hypertension Crisis<br>Carbon Monoxide Exposure |
| Pale | Hypoperfusion<br>General Illness (Fever, Gastrointestinal Illness)<br>Respiratory Diseases or Illnesses<br>Environmental Emergencies |
| Cyanosis | Hypoperfusion<br>Respiratory Diseases or Illnesses<br>Airway Obstruction<br>Environmental Emergencies<br>Trouble Breathing<br>Cardiac Arrest |

**Figure 8-44** Skin color and conditions associated with skin color findings.

**Streetsmart Tip** It may be difficult to assess the skin color in patients with naturally dark pigmentation. Turn the lower lip down and look at the inside of the lip and the gums, which should be pink. You may also look at the patient's fingernail beds, but this is not a very accurate method in people who have decreased circulatory functions as a result of previous disease.

## Skin Temperature

Skin temperature is easily noted as soon as you place your hands on the patient to open the airway or assess the pulse. If the patient's skin temperature is normal you should not feel any temperature differences through your gloves. Patients that are in shock will generally be cool to the touch. Patients with systemic infections and heat-related emergencies will be very warm to the touch.

First responders may discover a difference between the temperatures of a patient's extremities and torso. This may be caused by decreased circulation due to disease or environmental exposure. If the patient is complaining of pain to a specific area and the area is warmer to the touch than the rest of the body, the patient may have a localized infection. This area may also present as flushed in color.

## Moisture

Skin is generally dry to the touch. Patients who are suffering from hypoperfusion may have moist skin. This can be seen in a number of situations such as environmental emergencies, cardiac and respiratory emergencies, and diabetic emergencies. Severe environmental emergencies, such as prolonged heat exposure, may produce very dry skin when the patient should be sweating.

# Blood Pressure

The blood pressure is a measure of the force exerted against the walls of the arteries when the heart contracts (**systole**) and when the heart is at rest (**diastole**)

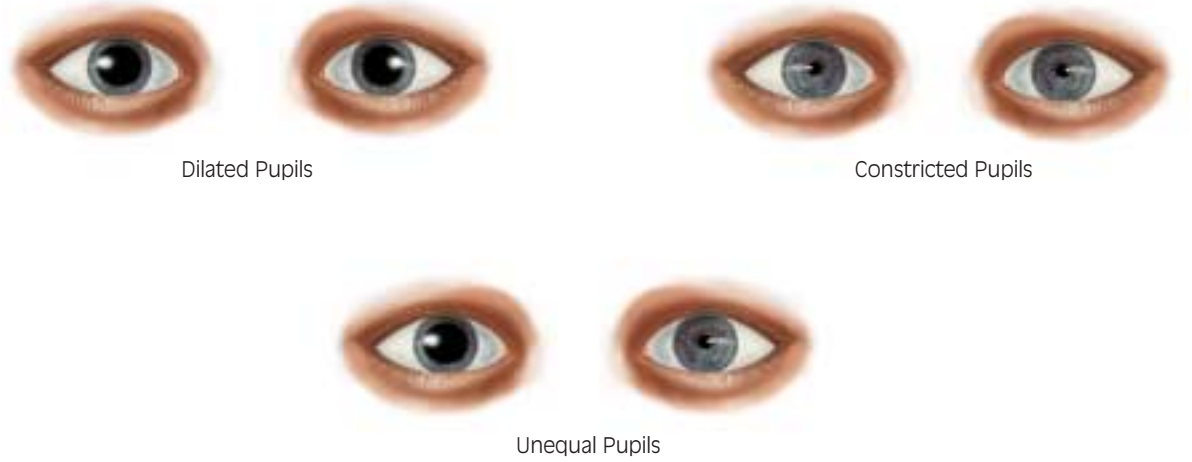



**Figure 8-45** Pupils constrict and dilate with changes in the amount of light in the surrounding area.

and is measured in millimeters of mercury (mmHg). The pressure during the contraction of the heart is called the **systolic pressure** and the pressure when the heart is at rest is called the **diastolic pressure**. Blood pressure is given as the systolic pressure over the diastolic pressure, for example, 120/70. Blood pressures will vary from individual to individual and can be influenced by heredity, diet, smoking, physical condition, and stress. The normal systolic blood pressure for an adult male is 110 plus the patient's age. For example, an average 35-year-old male should have a systolic pressure of around 145 mmHg. The average systolic pressure for an adult female is 100 plus the patient's age. Thus, the average 35-year-old female should have a systolic pressure of 135 mmHg.

The diastolic pressure for an adult generally should not be more than 80 mmHg. Once the diastolic pressure rises above 90 mmHg, the patient is considered to have high blood pressure, or **hypertension**. Hypertension can lead to a cerebral vascular accident (CVA) or stroke and should be taken seriously. Hypertension can be effectively treated with physician-prescribed medications.

**Hypotension**, or low blood pressure, is defined as a systolic blood pressure of less than 90 mmHg. Below 90 mmHg the body is unable to maintain perfusion to the body's most vital organs. A telltale sign of shock (hypoperfusion) is low blood pressure, which is the last vital sign to change to indicate shock. Do not wait for the blood pressure to drop before you start treating the patient for shock. Treat the patient for shock early and avoid the change in blood pressure.

## Pupils

The pupils have been called the "doorway to the brain." Pupils can provide the first responder with information about what is happening inside the patient's head. Pupils get smaller (**constrict**) and expand (**dilate**) with changes in the amount of light in the surrounding area, **Figure 8-45**. Outside on a sunny day, the pupils constrict to limit the amount of light entering the eye. In dark areas or at night the pupils dilate to let in more light. Examination of the pupils can tell the first responder about any neurological changes that would indicate an internal head injury. Pupils should be equal, round, and reactive to light. A common mnemonic used to remember this is PERL (pupils are equal and reactive to light), **Figure 8-46**.

To assess the pupils, use a penlight. Direct the light into the patient's eye and observe for constriction. Remove the light and observe for dilatation. Do this for both eyes and compare the reactions of the pupils. In well-lit rooms or outside in the sun this may be difficult because the patient's pupils may already be constricted. If this is the case ask them to close their eyes for a minute and when they open them observe the reactions.

Any injury that produces a leak of blood or fluid in the cranium can produce pupil changes. As the pressure in the cranium increases, more pressure is placed on the cranial nerves, affecting the ability of the pupil to con-

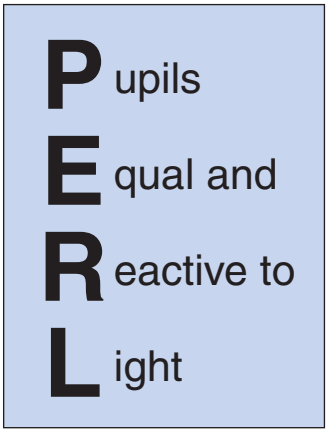



**Figure 8-46** PERL is a common mneumonic used to say pupils equal and reactive to light.

strict. Unequal pupils are generally a sign of an internal head injury whether it was caused by trauma or a CVA (a stroke). Unequal pupils may also be the result of direct eye trauma or may even be normal for some people.

Pupils can also provide signs of drug overdoses. Constricted, pinpoint pupils are the result of opiate-based drug use. Many prescription painkillers are opiate-based medications and can have the same effects as illegal street drugs such as heroin. These drugs can also depress the patient's respiratory drive. Watch for any signs of respiratory depression or compromise in patients with constricted pupils.

**Streetsmart Tip** Some hereditary conditions can cause the pupils to be unequal normally. The presence of a prosthetic eye can also create a situation in which unequal pupils are normal. A recent visit to the eye doctor where the doctor has given medications to the patient may also have an effect on the patient's pupils.

# OBTAINING A MEDICAL HISTORY

One of the best sources of information are the patients themselves. Often patients will be very well informed about their conditions. Listen to what patients have to say. On the other hand, some patients may know nothing about their medical problems. Family members are often a great source of information and can be very helpful when it comes to a patient who is unable to talk.

As first responders communicate with a patient, they should gather certain important information. One way to remember what questions to ask is to use the mnemonic **SAMPLE**. This is an easy way to remember all of the pertinent information that you should collect during your assessment. SAMPLE stands for Signs and Symptoms, Allergies, Medications, Past medical history, Last oral intake, and Events preceding the onset of the complaint, **Figure 8-47**.

## Signs and Symptoms

Signs are those things that the first responder can see and feel. Signs could be pale and diaphoretic skin and a slow heart rate or an angulated or swollen joint or extremity. Symptoms are things that a patient reports to the first responder, but that cannot be seen or felt by the first responder. Symptoms might include nausea, dizziness, chest pain, or pain to a certain part of the body following a fall. Note all the signs and symptoms of the patient no matter how minor they may seem.

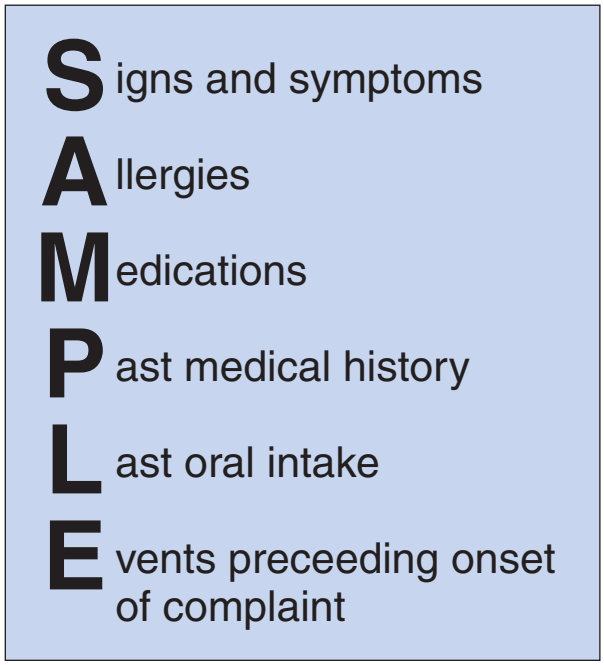



**Figure 8-47** The mnemonic SAMPLE helps first responders gather important patient information.

## Allergies

Knowledge of allergies to foods, medications, and certain products can be very important to your assessment and treatment of the patient. In today's ever-changing chemical world, people are becoming allergic to more and more items everyday. Some patients may even be allergic to some of the equipment the first responder might carry. Latex allergies are becoming more common and need to be considered when assessing and treating patients and when choosing the types and brands of supplies and equipment carried.

## Medications

The medications a patient is taking can provide the first responder with much of the information about a past medical history if the patient is unable to communicate. Many times patients will deny having any medical problems but will be taking medications for conditions that they live with everyday. The patients have become so used to the condition and medications it no longer feels like a "problem." Not only does a first responder need to know what medications the patient is taking but also if the medication has been taken as instructed by the patient's physician. Noncompliance with medications can be a big problem in people with disease processes such as Alzheimer's disease and dementia.

## Pertinent Past Medical History

Obtain information that relates to any significant past medical history. You may need to ask this question more than once, because, as just mentioned, people

who live with medical conditions everyday may not see them as problems. Ask questions of the family to compare information and make sure you are getting all of the important information.

### Last Oral Intake

Ask what the patient had to eat last and how much and make note of this for your documentation. This information plays an important role in many disease processes and certain medications.

### Events Leading Up to the Call

What was the patient doing at the onset of the complaint? Was she involved in physical activity or did she just awake from sleeping? Knowing what provoked the complaint is an important part of assessing the nature of the problem and what treatment should be given.

## FOCUSED EXAM

The focused exam is performed on patients with isolated injuries or problems that do not present in a critical manner. Based on the mechanism of injury or nature of illness a full head-to-toe physical exam may not be necessary. Focused exams would be performed on patients with minor non-life-threatening complaints, such as a possible injured ankle or arm, a laceration or abrasion from a fall, or other minor complaint that would not require a full physical exam of the patient. Many medical conditions may not require a full detailed exam. In patients requiring only a focused exam, examine only the area of complaint and the surrounding areas. For example, a patient complaining of abdominal pain may not require an exam of the head. A patient who twisted an ankle and has no other complaints may not need a full head-to-toe exam.

## ONGOING ASSESSMENT

> **Note** An ongoing assessment is performed on all patients to identify any changes in the patient's condition and to check treatment effectiveness. Reassess the critical patient every 5 minutes. A stable patient can be reassessed every 15 minutes.

Check the treatment interventions to make sure that they have been completed properly and are helping the patient. Note any changes in the patient's condition. Reassess the patient again just before turning the patient over to the transport unit.

## REPORTING AND DOCUMENTATION

When transferring a patient to another emergency medical service provider or hospital provider, a hand-off report is required. This should include, at a minimum, the patient's age, primary complaint, the first responder's assessment findings, vital signs, any treatments provided to the patient, and any changes the patient has experienced since the first responder's arrival. In some cases, first responders may not have all this information, however, as much pertinent information that can be transferred to the new provider is important to the patient's continuity of care.

## DOCUMENTATION

A first responder's job is not complete when a patient is transferred to a transport unit or higher level of EMS care. First responders must document their assessment findings and treatments they provided to the patient. Most states have a standard form that must be completed by the first responder and a copy sent to the hospital with the patient, **Figure 8-48**. This is part of the patient's permanent medical record. Follow your department's procedures for documentation.


**Figure 8-48** Documentation is an important responsibility for first responders.

## Lessons Learned

All patient care is based on complete and accurate assessment of the patient's condition. Safety is always first. Remember to conduct airway, breathing, and circulation assessments for all patients, and head and neck stabilization as needed. First responders' actions can mean the difference between a positive outcome and a negative outcome for the patient.

## KEY TERMS

**Abdominal Aortic Aneurysm** A bulging in the wall of the aorta in the abdomen.

**Accessory Muscles** Muscles used to increase the capacity of air in the chest during exertion.

**Agonal Respirations** Irregular respirations that signal impending death.

**Atrial Fibrillation** Quivering of the atria resulting in an irregular and often rapid heartbeat.

**AVPU** A mnemonic used to remember the level of consciousness of a patient: Alert, Verbal, Painful, Unresponsive.

**Bradycardia** An abnormally slow heart beat.

**Constrict** To make narrow or draw together.

**Cyanosis** Bluish discoloration of the skin caused by a lack of adequate oxygen.

**Detailed Exam** An exam that concentrates on the patient's chief complaint and past medical history.

**Diastole** The dilatation of the cavities of the heart during which they fill with blood.

**Diastolic Pressure** The pressure exerted on the walls of the arteries during diastole.

**Dilate** To enlarge or expand.

**Distension** The state of being enlarged from internal pressure.

**DOTS** A mnemonic used to remember what to look for in detailed exams: Deformities, Open injuries, Tenderness, and Swelling.

**Evisceration** A part of an abdominal organ that protrudes from an open wound of the abdomen.

**Flail Segment** Three or more ribs fractured in two or more places.

**Focused Exam** An exam that focuses on assessment of the patient's chief complaint.

**General Impression** The initial feeling of the patient's condition based on the first observations.

**Hypertension** Higher than normal blood pressure.

**Hypoperfusion** A deficiency of blood passing through an organ or body part.

**Hypotension** A lower than normal blood pressure.

**Immediate Life Threats** Any condition that places the patient's well-being in immediate danger.

**Initial Assessment** The first assessment done on every patient to address life-threatening situations.

**Mechanism of Injury (MOI)** The way in which a person was injured.

**Nature of Illness (NOI)** The underlying cause of a person's medical condition.

**Occlusive Dressing** An airtight dressing placed over a wound to prevent air from entering the abdominal or chest cavities.

**SAMPLE** A mnemonic used to remember assessment questions: Signs and symptoms, Allergies, Medications, Past medical history, Last oral intake, Events leading up to the complaint.

**Sternal Rub** A brisk rubbing of the first responder's knuckles on the patient's sternum to assess the patient's responsiveness to painful stimuli.

**Subcutaneous Emphysema** Air under the skin that feels like trapped bubbles, usually a sign of a chest injury.

**Systole** The contraction of the heart by which blood is forced out to the circulatory system.

**Systolic Pressure** The pressure exerted against the artery walls during systole.

**Tachycardia** Abnormally fast heartbeat.

# REVIEW QUESTIONS

1. What is the purpose of the scene size-up?
2. What does SAMPLE stand for?
3. When should the first responder assess the patient's vital signs?
4. What method is used to assess the airway of the unconscious patient?
5. Explain the reason for prioritizing a patient for care and transport.
6. What is the purpose of the ongoing assessment?
7. Why do first responders perform an initial assessment?
8. Which vital sign change is a late sign of shock?

## Suggested Readings

*Fundamentals of Emergency Care,* Delmar Learning, a part of the Thomson Corporation. Executive Woods, 5 Maxwell Drive, Clifton Park, NY 12065-2919, http://www.firescience.com.