

► Assessment in Action

While working at a construction site, you witness a fellow worker fall to the ground after being struck by a piece of wood thrown by a table saw. He was not wearing his safety glasses and you see a cut to his eyeball and eyelid.

Directions: Circle Yes if you agree with the statement; circle No if you disagree.

- Yes No 1. Apply pressure immediately to the injured eyeball.
- Yes No 2. Tell the victim to keep both eyes closed. Both eyes can be covered with a cravat or roller bandage.
- Yes No 3. Position the victim with his head elevated.
- Yes No 4. Medical care is not necessary in this case.

► Check Your Knowledge

Directions: Circle Yes if you agree with the statement; circle No if you disagree.

- Yes No 1. Remove objects embedded in an eyeball.
- Yes No 2. Scalp wounds have very little bleeding.

- Yes No 3. Scrub and rinse the roots of a knocked-out tooth.
- Yes No 4. After a blow to the area around an eye, apply a cold pack.
- Yes No 5. Tears are sufficient to flush a chemical from the eye.
- Yes No 6. Use clean, damp gauze to remove an object from the eyelid's surface.
- Yes No 7. Preserve a knocked-out tooth in mouthwash.
- Yes No 8. Do not move a victim with a suspected spinal injury.
- Yes No 9. Inability to move the hands or feet, or both, may indicate a spinal injury.
- Yes No 10. To care for a nosebleed, have the injured person sit down and tilt his or her head back.

prep
kit

Chest, Abdominal, and Pelvic Injuries

11

chapter *at a glance*

- ▶ **Chest Injuries**
- ▶ **Closed Chest Injuries**
- ▶ **Open Chest Injuries**
- ▶ **Abdominal Injuries**
- ▶ **Closed Abdominal Injuries**
- ▶ **Open Abdominal Injuries**
- ▶ **Pelvic Injuries**

Chest Injuries

Chest injuries fall into two categories: open or closed. In open chest injuries, the chest wall is penetrated by some object (eg, knife, bullet). A closed chest injury is one in which the skin is not broken. The injury is caused by blunt trauma (eg, falling object, struck during a fight or assault).

All victims with chest injuries should have their breathing checked and rechecked. A responsive victim with a chest injury should usually sit up or, if the injury is on a side, be placed with the injured side down. This position prevents blood inside the chest cavity from seeping into the uninjured side and allows the uninjured side to expand.

▶ **Closed Chest Injuries**

In a **closed chest injury**, the skin is not broken. Closed chest injuries include rib fractures and flail chest.

Rib Fractures

The upper four ribs are rarely fractured because they are protected by the collarbone and the shoulder blades. The upper four ribs are so enmeshed with the muscles that they rarely need to be splinted or realigned like other broken bones. The lower two ribs are difficult to

fracture because they are attached on only one end and have the freedom to move, which is why they are called *floating ribs*. Broken ribs usually occur along the side of the chest. The main symptom of a rib fracture is pain at the injured rib site when the victim breathes, coughs, or moves, or when the area is touched.

Recognizing Rib Fractures

The signs of rib fracture include:

- Sharp pain, especially when the victim takes a deep breath, coughs, or moves
- Victim holds the injured area, trying to reduce the pain
- Victim reports being hit where the pain is
- Area tender when pressed
- Shallow breathing

To assess for a rib fracture, gently press inward on both sides of the chest at the same time.

Care for Rib Fractures

1. Help the victim find a comfortable position. Stabilize the ribs by having the victim hold a pillow or other similar soft object against the injured area or use bandages to hold the pillow in place. You can also tie an arm over the injured area. Do not apply tight bandages around the chest because they will restrict breathing. **Figure 1**
2. Give pain medication.
3. Seek medical care.

Flail Chest

A **flail chest** is a serious injury that involves several ribs in the same area broken in more than one place. The area over the injury may move in a direction opposite to that of the rest of the chest wall during breathing (known as *paradoxical movement*). This injury is very painful and makes breathing difficult.

Recognizing Flail Chest

The signs and symptoms of a flail chest include:

- Paradoxical chest motion takes place. The area over the injury may move in a direction opposite to that of the rest of the chest wall during breathing.
- Breathing is very painful and difficult.
- Bruising of the skin over the injury may occur.

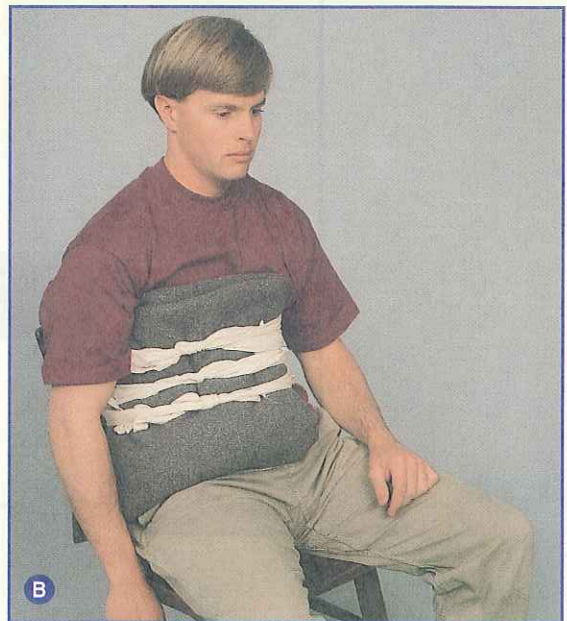
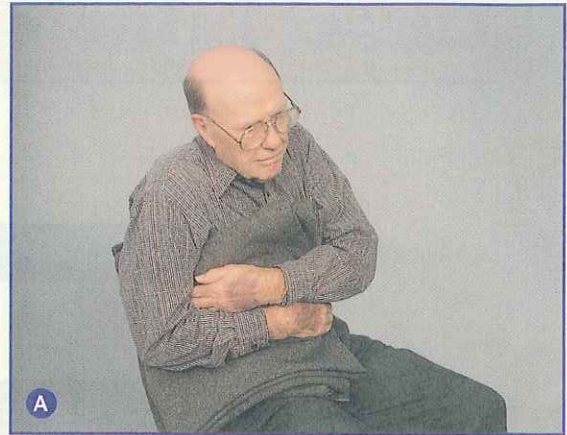


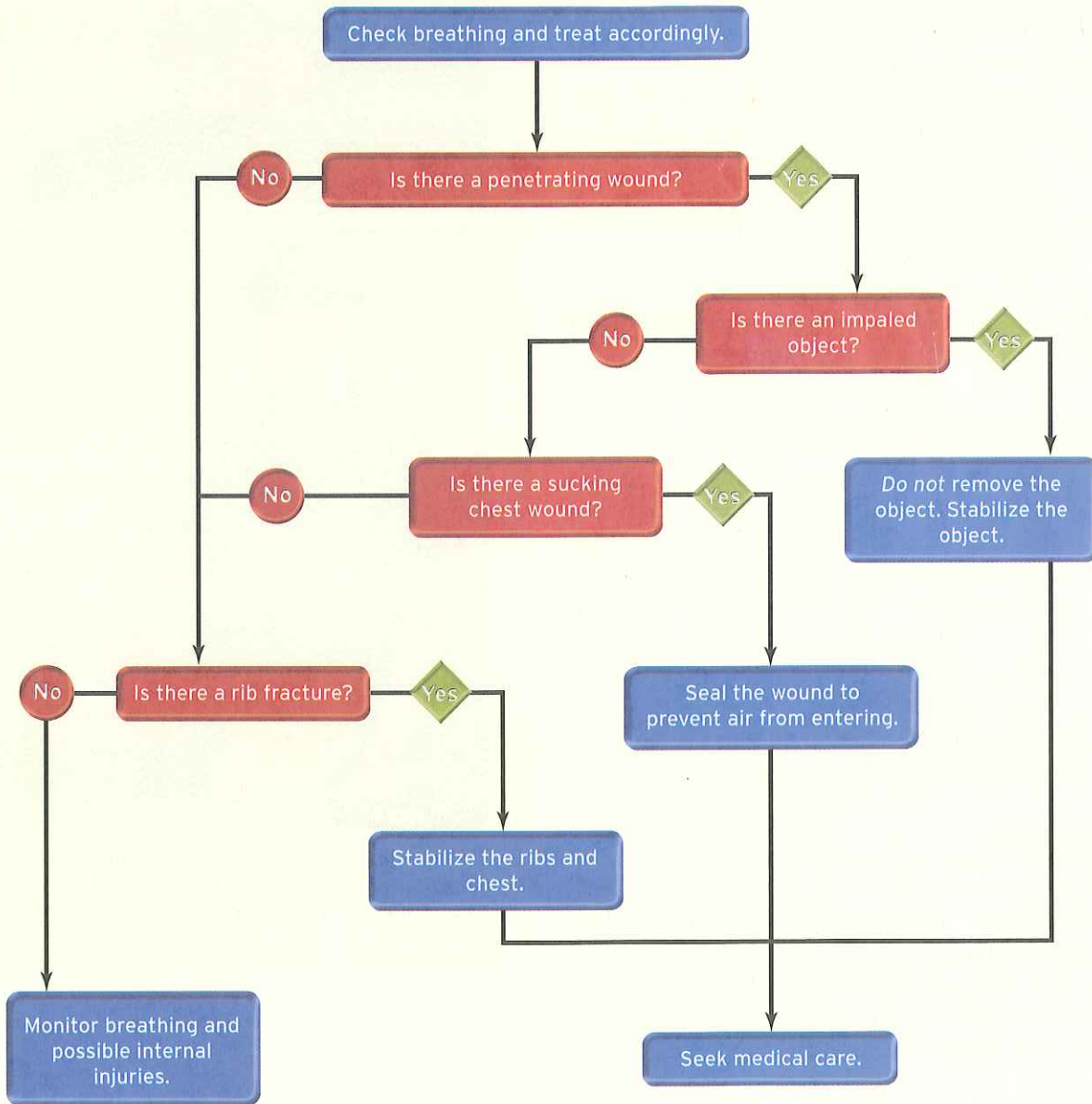
Figure 1

Stabilize the ribs with a soft object such as a pillow, coat, or blanket (hold or tie). Tell the victim to occasionally take a deep breath and to cough.

Care for Flail Chest

1. Support the chest by one of several methods:
 - Apply hand pressure. This is useful for a short time.
 - Place the victim on the injured side with a blanket or clothing underneath.
2. Monitor breathing.
3. Seek medical care.

Chest Injuries



► Open Chest Injuries

In an **open chest injury**, the skin has been broken and the chest wall is penetrated by an object such as a knife or bullet.

Impaled Object in the Chest

If an object penetrates the chest wall, air and blood escape into the space between the lungs and the chest wall. The air and blood cause the lung to collapse. Lung collapse can lead to shock and death.

Recognizing an Impaled Object in the Chest

An impaled object is usually easily recognized. However, in some cases the object may be below the skin surface and is difficult to see. Carefully look at wounds that could be hiding the object that caused the damage.

Care for an Impaled Object in the Chest

1. Stabilize the object in place with bulky dressings or clothes **Figure 2**. Do not try to remove an impaled object. Doing so can result in bleeding and air in the chest cavity.
2. Call 9-1-1.

Sucking Chest Wound

A **sucking chest wound** results when a chest wound allows air to pass into and out of the chest with each breath **Figure 3**. Bubbles may be seen at the wound



Figure 2

Stabilize a penetrating object with bulky padding. Secure the padding and object.



Figure 3

A sucking chest wound.

during exhalations and a sucking sound heard during inhalations.

Recognizing a Sucking Chest Wound

The signs of a sucking chest wound include:

- Blood bubbling out of a chest wound during exhalation
- Sucking sound heard during inhalations

Care for a Sucking Chest Wound

1. Seal the wound with anything available to stop air from entering the chest cavity. Plastic wrap or a plastic bag works well. Tape it in place, but leave one side untaped to create a flutter valve to prevent air from being trapped in the chest cavity. The open side of the dressing should be allowed to drain to gravity. If plastic wrap is not available, you can use your gloved hand.
2. Lean or lay the victim on the injured side.
3. If the victim has trouble breathing or seems to be getting worse, remove the plastic cover (or your hand) to let air escape, and then reapply.
4. Call 9-1-1.

Abdominal Injuries

Injuries to the abdomen are either open or closed and can involve hollow and/or solid organs. An internal abdominal injury is one of the most frequently

unrecognized injuries; when missed, it becomes one of the main causes of death. A hollow organ rupture (for example, of the stomach or intestines) spills the contents of the organ into the abdominal cavity, causing inflammation. Solid organ rupture (such as of the liver or spleen) results in severe internal bleeding.

► Closed Abdominal Injuries

Closed abdominal injuries occur when the internal abdominal tissues are damaged but the skin is unbroken. These are also known as blunt injuries. Such an injury might come from striking the handlebar of a bicycle or the steering wheel of a car, or when the victim is struck by a board or baseball bat.

A Blow to the Abdomen

Bruising and damage to internal organs can result from a severe blow to the abdomen.

Recognizing a Closed Abdominal Injury

Examine the abdomen by gently pressing all four quadrants of the abdomen with your fingertips **Figure 4**. A normal abdomen is soft and not tender when pressed. Signs of a closed abdominal injury include:

- Bruises or other marks
- Pain, tenderness, muscle tightness, or rigidity
- Distention (swelling)

Care for a Closed Abdominal Injury

1. If unresponsive, place the victim on the left side in a comfortable position with the legs bent and in a “fetal position.”
2. If responsive, place the victim on one side in a comfortable position with the legs slightly bent. Roll onto side in case of vomiting.
3. Call 9-1-1.

► Open Abdominal Injuries

Open abdominal injuries are those in which the skin has been broken. These injuries are also known as *penetrating injuries*. Examples include stab wounds and

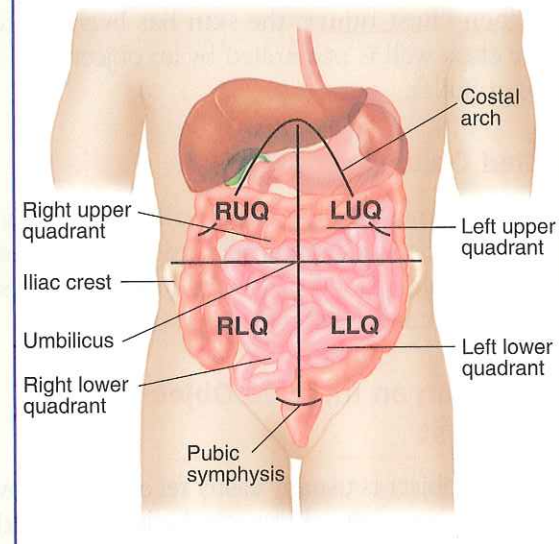


Figure 4

The four quadrants of the abdomen: left upper, right upper, right lower, and left lower.

gunshot wounds. It is difficult to know whether a penetrating injury involves more than just the abdominal wall. Always assume the worst—that internal organs have been damaged.

A Penetrating Wound/Impaled Object

Open abdominal wounds usually result from stabbing by a knife or other sharp object and are always serious injuries. Penetrating injuries to the abdomen usually cause internal organ damage.

Care for a Penetrating Wound/Impaled Object

1. If the penetrating object is still in place, stabilize the object and control the bleeding by placing bulky dressings around it. Do not try to remove the object.
2. Call 9-1-1.

Protruding Organs

A **protruding organ injury** (evisceration) refers to a severe injury to the abdomen in which internal organs escape or protrude from the wound.

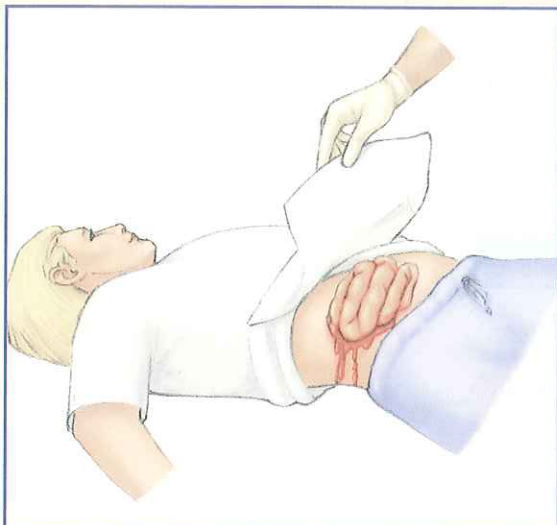


Figure 5

Do not reinsert protruding organs. Cover them with a moist, sterile dressing.

Care for Protruding Organs

1. Call 9-1-1.
2. Allow the victim to stay in a comfortable position with the legs pulled up toward the abdomen.
Cover the protruding organs with a moist, sterile dressing or clean cloth, or a piece of plastic **Figure 5**.
3. Treat for shock.

CAUTION

DO NOT try to reinsert protruding organs into the abdomen. You could introduce infection or damage the intestines.

DO NOT cover the organs tightly.

DO NOT cover the organs with any material that clings or disintegrates when wet.

DO NOT give anything by mouth.

Pelvic Injuries

Pelvic fractures are usually caused by falling or a motor vehicle crash.

Recognizing Pelvic Injuries

The signs of a pelvic injury include:

- Pain in the hip, groin, or back that increases with movement
- Inability to stand or walk
- Signs of shock

Check the pelvis by gently pressing inward and downward on the tops of the hips. See Skill Drill 2, Steps 5a and 5b in the chapter entitled Finding Out What's Wrong.

Care for Pelvic Injuries

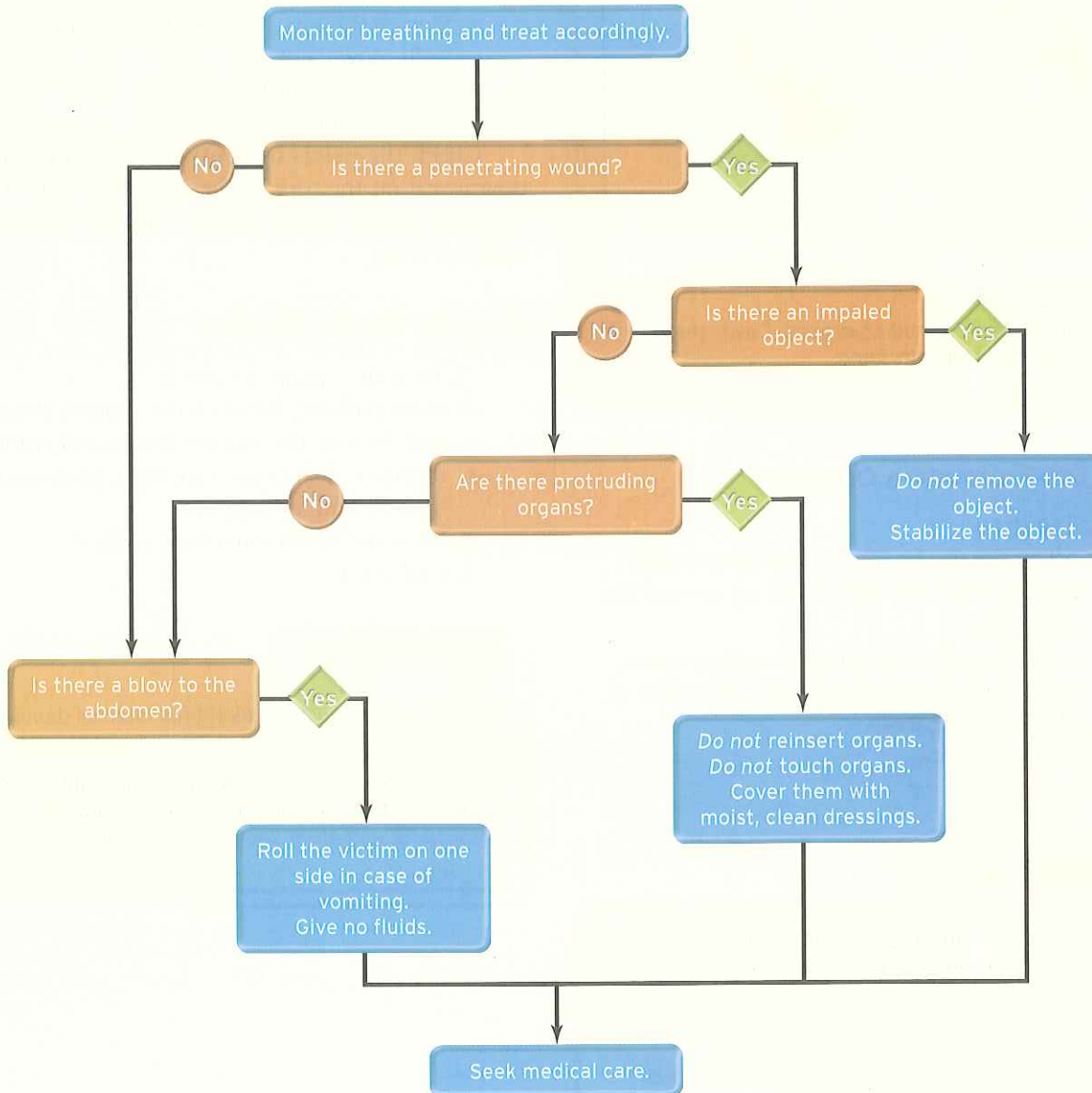
1. Treat the victim for shock.
2. Place padding between the victim's thighs, and then tie the victim's knees and ankles together. If the knees are bent, place padding under them for support.
3. Keep the victim on a firm surface.
4. Call 9-1-1.

CAUTION

DO NOT roll the victim—additional internal damage could result.

DO NOT move the victim. Whenever possible, wait for trained EMS personnel with their ambulance, backboard, and other specialized equipment.

Abdominal Injuries



► Emergency Care Wrap-up

Condition	What to Look For	What to Do
Chest Injuries	<ul style="list-style-type: none"> Rib fracture Sharp pain with deep breaths, coughing, or moving Shallow breathing Holding of injured area to reduce pain Embedded (impaled) object Object remains in wound Sucking chest wound Blood bubbling out of wound Sound of air being sucked in and out of wound 	<p>Place victim in comfortable position. Support ribs with a pillow, blanket, or coat (either holding or tying with bandages). Seek medical care.</p> <p>DO NOT remove object from wound. Use bulky dressings or cloths to stabilize the object. Call 9-1-1.</p> <p>Seal wound to stop air from entering chest; tape three sides of plastic or use gloved hand. Remove cover to let air escape if victim worsens or has trouble breathing. Call 9-1-1.</p>
Abdominal Injuries	<ul style="list-style-type: none"> Blow to abdomen (closed) Bruise or other marks Muscle tightness and rigidity felt while gently pushing on abdomen Protruding organs (open) Internal organs escaping from abdominal wound 	<p>Place victim in comfortable position with legs pulled up toward the abdomen. Treat for shock. Seek medical care.</p> <p>Place victim in a comfortable position with the legs pulled up toward the abdomen. DO NOT reinsert organs into the abdomen. Cover organs with a moist, sterile or clean dressing. Treat for shock. Call 9-1-1.</p>
Pelvic Injuries	<ul style="list-style-type: none"> Pelvic fracture Pain in hip, groin, or back that increases with movement Inability to walk or stand Signs of shock 	<p>Keep victim still. Treat for shock. Call 9-1-1.</p>

prep kit

► Ready for Review

- Chest injuries fall into two categories: open or closed.
- Closed chest injuries include rib fractures and flail chest.
- In an open chest injury, the skin has been broken and the chest wall is penetrated by an object such as a knife or bullet.
- Injuries to the abdomen are either open or closed and can involve hollow and/or solid organs.
- Closed abdominal injuries occur when the internal abdominal tissues are damaged but the skin is unbroken.
- Open abdominal injuries are those in which the skin has been broken and the abdominal wall penetrated.
- Pelvic fractures are usually caused by falling or a motor vehicle crash.

► Vital Vocabulary

closed abdominal injuries Injuries to the abdomen that occur as a result of a direct blow from a blunt object. There is no break in the skin.

closed chest injury An injury to the chest in which the skin is not broken; usually due to blunt trauma.

flail chest A condition that occurs when several ribs in the same area are broken in more than one place.

open abdominal injuries Injuries to the abdomen that include penetrating wounds and protruding organs.

open chest injury An injury to the chest in which the chest wall itself is penetrated by an external object such as a bullet or knife.

protruding organ injury A severe injury to the abdomen in which the internal organs escape or protrude from the wound; evisceration.

sucking chest wound A chest wound that allows air to pass into the chest cavity with each breath.

► Assessment in Action

You are on the first aid team at a local scout camp. The scout leaders are conducting a funny skit on a stage at the main lodge. One of the scouts in the skit jumps in the air and lands on his side. As he runs off the stage toward you, he is in obvious pain and is clutching his side. He lies down and a knife falls to the ground. You hear a sucking sound coming from the wound on his side whenever the victim inhales.

Directions: Circle Yes if you agree with the statement; circle No if you disagree.

- Yes No 1. You should check the victim's breathing and treat accordingly.
- Yes No 2. Blood bubbling out of the wound during breathing is a sign of a sucking chest wound.
- Yes No 3. This wound should be sealed on three sides to prevent air from being trapped in the chest cavity.
- Yes No 4. If the victim begins to have trouble breathing, do not remove the seal to reapply.
- Yes No 5. This is a medical emergency and 9-1-1 should be called immediately.

► Check Your Knowledge

Directions: Circle Yes if you agree with the statement; circle No if you disagree.

- Yes No 1. Stabilize a broken rib with a soft object, such as a pillow or blanket, tied to the chest.
- Yes No 2. Cover a sucking chest wound with a piece of plastic taped down on three sides.

prep
kit

- Yes No 3. Remove a penetrating or impaled object from the chest or the abdomen.
- Yes No 4. A flail chest refers to a single broken rib.
- Yes No 5. Keep the victim with a broken pelvis still.
- Yes No 6. Sharp pain while breathing can be a sign of a rib fracture.
- Yes No 7. Rib fractures should be treated by tightly taping the chest.
- Yes No 8. Most victims with abdominal injuries are more comfortable with their knees bent.
- Yes No 9. Leave a chest wound alone if you hear air being sucked in and out.
- Yes No 10. A broken pelvis can threaten life because of the large amount of blood lost.

Bone, Joint, and Muscle Injuries

12

chapter *at a glance*

- ▶ **Bone Injuries**
- ▶ **Fractures**
- ▶ **Joint Injuries**
- ▶ **Dislocations**
- ▶ **Sprains**
- ▶ **Muscle Injuries**
- ▶ **Strains**
- ▶ **Cramps**
- ▶ **Contusions**

Bone Injuries

Bone, joint, and muscle injuries are among the most common reasons for seeking medical care. Although rarely fatal, they often result in short- or long-term disability.

▶ Fractures

The real problems are not the broken bones themselves but rather the potential injury to the vital organs next to them. People usually do not die of broken bones. They die of airway obstruction, blood loss, and brain injury. However, broken bones can be painful and debilitating and can cause lifelong aggravation, disability, and deformity.

The terms *fracture* and *broken bone* have the same meaning: a break or crack in a bone. There are two categories of fractures:

- **Closed fracture.** The skin is intact, and no wound exists anywhere near the fracture site [Figure 1A](#).
- **Open fracture.** The skin over the fracture has been broken. The wound may result from the bone protruding through the skin or from a direct blow that cut the skin at the time of the fracture. The bone may not always be visible in the wound

[Figure 1B](#)