

Answers to Assessment in Action and Points to Ponder

Section 5: Trauma

Chapter 21: Kinematics of Trauma

Assessment in Action

1. D. All of the above

Knowing that the patient landed in this position means that his lower extremities struck the ground first, likely suffering the greatest amount of damage. However, the energy of the fall will continue up to his pelvis and spine, so you should be on the lookout for these injuries as well. Your patient will likely be very vocal when it comes to identifying the location and severity of his injuries.

2. B. index of suspicion.

This term is taken directly from the chapter text. Given just the dispatch information, you have immediate concerns regarding potential injuries based on the height of the fall and the patient's complaints.

3. D. mechanism of injury.

Mechanism of injury describes the outside forces that act on the body to result in injury. MOI is a very common term used by prehospital providers. Knowing the MOI provides a wealth of information regarding likely injuries.

4. D. All of the above

All of these are all important to consider when evaluating a patient who has fallen from a significant height. The more you can understand about the circumstances and forces placed on the body during the event, the greater your understanding will be regarding the location and severity of the injuries.

5. D. All of the above.

Pain will cause changes in a patient's vital signs. It is common to see pulse and respiration rates increase. Blood pressure can also increase in response to pain, but in this case, his blood pressure is low and is combined with tachycardia. This means that the patient is in shock, which is most likely caused by internal bleeding from bilateral femur fractures.

6. C. Both A and B

Both A and B are correct. Falls within these categories suggest that significant forces were placed on the body.

7. The ground is described as hard and frost-covered. It is obvious that surface conditions can significantly increase or decrease the severity of the injury. Picture the following surfaces and how they would change the impact of a fall: a hardwood floor versus a carpeted floor; muddy ground versus frozen ground.

8. Your main concerns should revolve around the injuries suffered from his fall. However, it is important to obtain information regarding his medical history. He told you that he lost his footing. Sometimes traumatic events are preceded by a medical condition. If you cannot find an obvious reason why the incident occurred, suspect an underlying medical condition.

9. Yes. You want to obtain as much information as possible regarding the event. Eyewitnesses can provide valuable information regarding what happened before the fall, what possibly caused the fall, how the patient landed, if the patient lost consciousness, etc. If you knew the patient landed on his feet, you would expect to see lower extremity, pelvic, and lumbar spine fractures. No matter what your suspicions, you must perform a thorough assessment in order to prevent missing any other injuries.

10. Underlying medical conditions can significantly exacerbate or mask resultant injuries. For example, a fall for a person with osteoporosis can cause fractures not normally expected in young, healthy adults. Patients with diabetes can have difficulties in sensing minor injuries as a result of neuropathy. Patients with significant medical conditions must be thoroughly evaluated.

Points to Ponder

Not only are you dealing with potentially serious head and spinal trauma, but also a tearful teenager's emotional state. He isn't worried about his injuries. He's worried about getting in trouble with his parents. Since his parents are not readily available, you will provide care using the premise of implied consent. Although you are working off the assumption that his parents would want their child to receive medical care, you must make every attempt to contact his temporary guardian(s) and parents. In order to obtain his cooperation, you will likely need to address his concerns. Be supportive and express your concern for his well-being. Explain the reasons why he needs to receive emergency care and transport to the hospital.

Chapter 22: Bleeding

Assessment in Action

1. B. Scene safety

Although it is essential to take all appropriate BSI precautions, your first concern must be scene safety. You cannot enter the scene before law enforcement has secured it. Therefore, patient assessment cannot begin until the scene is secure.

2. D. Gloves and eye protection

Although A is partially correct, D is the most appropriate choice given the possibility you may encounter large amounts of blood or blood spatter during this call.

3. D. All of the above

All of the answers are correct. Her pale skin color and her complaints of feeling cold and faint give you clues to her perfusion status. The towel she is holding is described as blood-soaked. These signs and symptoms lead you to believe she has experienced significant blood loss.

4. D. None of the above

Your assessment of this patient indicates that she needs immediate transport. This call is a “load and go” not a “stay and play” scenario.

5. C. 2, 3, 4, 1

The correct sequence is: direct pressure, elevation, pressure dressings, and pressure points. A tourniquet can be used only as a last resort. Direct pressure will most often control external bleeding. However, if bleeding continues despite direct pressure, there are other techniques that can be utilized to control external hemorrhage.

6. C. Head down and feet up

The Trendelenburg position requires the patient to lie supine on a backboard with the lower extremities elevated 6” to 12”. It is effective in increasing blood flow to the brain and other vital organs. If there is no suspected spine injury and the patient is not on a backboard, the patient may be placed in the shock position, which is the same as the Trendelenburg position except that the patient is not on a backboard.

7. As you take steps to control external bleeding, you might notice the presence of scars from previous self-inflicted injuries. Do not make any assumptions, however.

No matter what type of patient you are caring for, the presence of scars can provide volumes of information regarding pertinent past medical history, especially for patients who cannot provide this information for you. An example would be the presence of a ‘zipper’ scar on a chest pain patient. It is your job to be observant. Noting the condition and items at the scene can also prove very helpful in seeing the overall picture of the patient’s condition.

8. It would be wise to request an officer accompany you in the ambulance during transport. You might also consider the use of restraints if you believe they are needed or are required in these situations by your local protocols. A patient who is cooperative initially may not remain so throughout transport. You must always have safety in mind throughout the entire call, especially when dealing with potentially violent patients.

9. No. Removing the dressings will disturb the clots and initiate or exacerbate bleeding. If possible, question the person who applied the dressings for a description of the wound.

10. Yes. Ideally, you should look at what caused her wound and provide a weapon description in your documentation. If she had truly been stabbed, as the original dispatch suggested, then only seeing entrance wounds would not provide much information on the potential damage underneath. If possible, give specifics to the emergency department personnel, such as, “The knife had a serrated edge and was 6” in length with blood up to the handle.” Even the gender of the assailant can provide pertinent information regarding injuries (generally speaking, women hold knives and stab in different patterns than men do). This holds true for any weapon. For gunshot wounds, knowing information regarding caliber, distance fired, and angle are important pieces of information. Because these situations are crime scenes, take care not to disturb any evidence and gather as much information as you can without delaying patient care and transport.

Points to Ponder

His vital signs indicate that he is in (decompensatory) shock. His increase in heart rate is no longer able to compensate for his blood loss, and he now has a decrease in blood pressure. Although you have not yet arrived at the scene, you have a clear picture of the patient’s condition and status. The patient’s comment about feeling fine could imply a possible refusal of care. Confirm the patient’s willingness to be transported via the on-scene responders. The more time spent on-scene trying to convince the patient he needs to be transported, the more critical this patient’s condition will become. Utilize the first responders on-scene to encourage the patient to be transported by relaying the significance of his vital signs and what they likely indicate about his condition. You should also activate the trauma system (according to your local protocols).

Notify the receiving facility of the MOI, vital signs, significant physical exam findings, treatment, and the patient's response to the interventions. Your job is to recognize the seriousness of the patient's condition, provide care without delaying transport, and notify personnel at the receiving facility so that they can prepare for the patient's arrival.

Chapter 23: Shock

Assessment in Action

1. D. contusion of the right ankle.

Contusion of right ankle may cause extreme pain and swelling but will not likely cause the development of shock. Closed head injury and a closed fracture of the femur can cause blood and fluid loss that can potentially cause shock. As a provider, you must remember that blood loss is not always obvious. In a femur fracture, the patient can lose 1 to 2 L of blood. The radial artery is a high-pressure vessel that without quick intervention will result in serious blood loss that will cause shock and ultimately death.

2. A. control any life-threatening bleeding.

After initially assessing the ABCs and maintenance of the cervical spine has been established, the next course of action would be to take care of any life-threatening bleeding. Severe bleeding will result in shock if not managed early and aggressively.

3. B. arterial.

Bleeding from an artery can be life threatening if not treated early and aggressively. Arteries are larger vessels that are under high pressure, and the bleeding is bright red. Both capillary and venous bleeding are dark red because of the unoxygenated properties of the blood and the low pressure. Whenever you observe a large volume of blood in a short time, you should always consider it to be arterial.

4. D. lower the extremity.

Lowering the extremity will only increase blood flow to the area, causing an increase in the bleeding. Elevating the extremity will slow the bleeding and allow for platelets to begin the clotting cascade to stop the bleeding. Using the correct pressure point should stop all bleeding distal to the pressure point.

5. D. all of the above.

All of the above are correct. Early recognition and treatment of shock in the patient could mean the difference between and life and death outcome. Advanced life support should be called as

quickly as possible to provide intravenous fluid replacement therapy. High-flow oxygen will prevent early hypoxia. Placing the patient in the Trendelenburg position will increase the amount of circulating volume to the vital organs.

6. B. shunting.

The body will move blood away from extremities in an attempt to maintain the core temperature; this is called shunting. Discussed in Chapter 18, shunting increases the risk of local cold injury to the extremities, ears, nose, and face. In this case, shunting is occurring due to shock as the body shifts fluids to help maintain pressure in the system.

7. A. decreased thirst.

Decreased thirst is not a sign of shock; rather, marked thirst is a sign of shock. Dilated pupils are a sign of decompensated shock, showing up later. Restlessness is a sign of compensated shock, occurring earlier. Cyanosis indicates that there is not enough oxygenated blood reaching that area of the body, which can be a result of shock.

8. Beta-blockers are medications that work on the beta-adrenergic receptors of the body. They are used primarily to treat hypertension and tachycardia. In the normal response to shock, the body will compensate by increasing sympathetic response, that is, the heart rate. A patient taking a beta-blocker may not respond with the usual compensatory responses, such as increased heart rate in shock. Thus, the patient may have normal vital signs even though he or she is in shock.

Points to Ponder

This patient is most likely going into shock. On the basis of only the mechanism of injury and the extent of injuries, you should always consider shock to be the primary problem, even though the vital signs may be considered normal. The patient's blood pressure may be normal, but you should note that the pulse and respiratory rate are higher than normal, possibly compensating for the internal and external blood loss that may have resulted from the accident. Remember that children do not have the blood volume that adults do, so a small blood loss could potentially be detrimental to the patient. Also remain suspicious for child abuse in situations involving trauma to children.

Chapter 24: Soft Tissue Injuries

Assessment in Action

1. D. Rule of Nines.

The Rule of Nines is used to systematically estimate the amount or percentage of the body that has been burned.

2. A. apply direct pressure with a sterile bandage.

The first step in controlling hemorrhaging is for the EMT-B to apply direct pressure using sterile bandages.

3. A. apply a second dressing.

If the bleeding continues through the bandages the EMT-B should apply additional bandages and then try elevation.

4. C. the extent or area of the burn.

The severity of the burn and the amount of area (extent) burned are the two items to help the EMT-B determine the treatment of the patient.

5. B. his age.

Burns in geriatric and pediatric patients intensify the severity of injury.

6. C. being dry and leathery.

Third-degree or full-thickness burns are described as dry, white, and leathery looking. The burn also looks charred around the burn. This burn involves all the layers of the skin, fat, muscle, and sometimes even bone.

7. D. partial-thickness (second-degree) burn.

A burn that involves both the dermis and epidermis, is red, and has blisters is classified as second-degree or a partial-thickness burn. Burns that involve the dermis and epidermis are both red in color, but when the epidermis is burned as well, blisters are common.

8. C. hypothermia.

One of the functions of the skin is to keep in body heat and control body temperature. When the skin is burned, the body cannot regulate temperature and is susceptible to hypothermia.

9. Nine for each leg for 18%, and 18% for the front of the torso, for a total of 36%.

10. Pulling out impaled objects can cause further damage to nerves, vessels, and tissue. Items should only be removed if they may interfere with breathing.

11. Keep the patient supine, administer oxygen, and seal the wound with an occlusive dressing on three sides only.

Points to Ponder

Although you only find a minor laceration, due to the mechanism of injury in this case, the patient could have sustained other unseen injuries as well. Also, since the patient is not legally an adult, you cannot release him. The best approach in this situation is to explain to the patient why further evaluation at the emergency department is required and to contact his parents or guardian.

Chapter 25: Eye Injuries

Assessment in Action

1. C. Lacerated globe

The eye has lost its shape and you notice clear fluid on the towel and the patient's face. These signs point to leakage of the vitreous humor or ruptured globe.

2. D. both A and C.

The eyeball, or globe, keeps its global shape as a result of the pressure of the fluid contained within its two chambers. The sclera also helps the eye maintain its shape.

3. B. the jellylike substance in the eye.

The clear, jellylike fluid near the back of the eye is called the vitreous humor. If the globe is ruptured and this gel leaks out, it cannot be replaced.

4. D. both B and C.

Humans blink unconsciously many times per minute. This action sweeps fluid from the lacrimal glands over the surface of the eye, cleaning it.

5. D. sclera.

The white of the eye, called the sclera, extends over the surface of the globe. This is extremely tough, fibrous tissue that helps maintain the eye's globular shape and protect the more delicate inner structures.

6. C. retina.

The lens focuses images on the light-sensitive area at the back of the eye or globe called the retina.

7. It is important to cover both eyes in order to prevent any further damage to the injured eye. The eyes move together, so failure to cover both eyes will promote the uninjured eye to look and focus on the images within view. By covering both eyes, movement will be minimal.

8. Depending upon the severity of the eye injury, surgical intervention must be accomplished in 30 minutes or less or permanent blindness may result. For seriously injured patients, you should not delay transport to complete a focused history and physical exam. If the injury is isolated to one or both eyes, consider eye care specialty centers (if available in your area).

9. This patient shows signs of a lacerated globe. Putting pressure on the eye may squeeze the vitreous humor, iris, lens, or even the retina out of the eye and cause permanent damage and blindness. Never exert pressure. If part of the eye is exposed, use a moist, sterile dressing to prevent drying of the eye. Cover the injured eye with a protective cup or shield. Apply soft dressings to both eyes and transport immediately.

10. Hyphema, or bleeding into the anterior chamber of the eye that obscures part or the entire iris, is possibly the result of globe injuries. One quarter of all hyphemas indicate the presence of a globe injury and are commonly seen in blunt trauma to the eye. Keep in mind that this may seriously impair vision. Cover the eye to safeguard from further injury and provide prompt transport.

Points to Ponder

It is not hard to imagine how you would feel if you suddenly could not see. You would feel frightened and helpless. You would wonder whether permanent damage was done and whether you would be able to see again. You can compensate for this anxiety by explaining everything you see and everything you will do. Explain who you are and what you will do to help. Answer the patient's questions honestly. If you are not sure when or if the patient will regain sight, tell the patient you are unsure but you will do everything possible to help.

Chapter 26: Face and Throat Injuries

Assessment in Action

1. B. Establishing a patent airway

This patient obviously has a seriously compromised airway. His airway should be opened utilizing the jaw-thrust maneuver to avoid movement of his cervical spine. This patient will need

suctioning of his airway, given the trauma to his face and the presence of blood. Be on the lookout for blood clots, vomitus, and loose teeth as well.

2. D. foramen magnum.

The large opening in the base of the skull is called the foramen magnum. The brain can actually herniate through this opening if enough intracranial pressure occurs.

3. A. 6

The face is composed of six bones—the nasal bone, two maxillae, two zygomas, and the mandible.

4. D. mastoid process.

About 1” posterior to the external opening of the ear is a prominent bony mass at the base of the skull called the mastoid process.

5. C. face and cranium.

The head is divided into two parts: the cranium and the face. The cranium, or skull, contains the brain, which connects to the spinal cord through the foramen magnum. The face is composed of the eyes, ears, nose, mouth, cheeks, and jowls. There are six major bones in the face.

6. D. all of the above.

Several useful landmarks can be palpated and seen in the neck. The most obvious is the firm prominence in the center of the anterior surface, commonly referred to as the Adam’s apple. This prominence is the upper part of the larynx, formed by the thyroid cartilage.

7. Injuries to the face can produce airway obstructions from bleeding, swelling, or objects such as broken teeth or large blood clots. If the patient’s level of consciousness becomes decreased, the tongue will also become flaccid and cause obstruction of the airway.

8. Using a nasopharyngeal airway in the patient with a basal skull fracture can result in cannulation of the brain. Instead of lifting the tongue off the throat, the airway enters the cranial cavity. If you believe there is a chance of skull fracture, use an oral airway. If an oral airway is not tolerated by the patient, utilize the jaw-thrust technique throughout transport.

9. There are cases where pieces skin can be torn completely from the body. It is important to find and transport these segments because they can be reattached. Do not delay transport of a critically

injured patient. If you find portions of skin, you should wrap them in a sterile dressing, place them in a plastic bag, and keep them cool. Never place tissue directly on ice as this will likely cause the tissue to freeze, making it unusable.

10. Many people place pressure on the bridge or bony part of the nose. This does not aid in reducing or stopping blood flow. Rather, pressure should be placed over the cartilage. Patients will often tilt their heads back in an effort to minimize bleeding onto clothing or other objects. Instruct them not to swallow the blood; doing so will likely make them nauseated. Also, many people will blow their noses as clots form. This will cause continued bleeding.

Points to Ponder

Possessing a solid understanding of human anatomy is not only essential to providing appropriate patient care, but also can affect your communication with hospital personnel. Remember that emergency department staff rely on your information of the patient and scene to make determinations for hospital resources and guidance in your care should you need it. If you provide inaccurate information regarding location of injuries by misusing terminology, breakdown in communication can result. When in doubt, use plain English to avoid confusion. This can have significant consequences for the patient and for your professional reputation.

Chapter 27: Chest Injuries

Assessment in Action

1. B. paradoxical motion.

Paradoxical motion of the chest occurs when a segment of fractured ribs moves in the opposite direction of the other ribs. It is also defined as unequal chest wall movement.

2. A. closed chest injury.

Blunt chest injuries result in closed injuries. Open chest injuries are likely caused by stab wounds and gun shots.

3. A. hemoptysis.

Hemoptysis means the spitting up of blood.

4. C. rapid respirations.

Tachypnea is rapid respirations. Blue skin, or cyanosis, can indicate a chest injury but does not indicate tachypnea. Equal chest rise indicates that the patient's lungs are filling equally with

oxygen, which again does not relate to tachypnea. Slow exhalations are the opposite of tachypnea.

5. C. pneumothorax.

As air moves into the pleural space, a pneumothorax will develop.

6. A. Tension pneumothorax

The deteriorating condition of this patient and severe chest injury meets the criteria of a tension pneumothorax.

7. B. flail chest segment.

Multiple ribs broken in multiple places defines a flail chest, such as two or more ribs broken in two or more places. This causes paradoxical respirations.

8. You should place an occlusive dressing over the open wound and seal it only on three sides. This creates a flutter valve-type dressing.

9. Traumatic asphyxia is caused by a severe compression of the chest, which produces a rapid increase of pressure in the chest. The signs and symptoms include distended neck veins, cyanosis in the face and neck, hemorrhaging in the sclera of the eyes, and bulging of the eyes.

Points to Ponder

This is a difficult situation. Regardless of whether the patient is a law enforcement officer, bystander, or potential criminal, once scene safety is secured, you would move on to triage the patients and then render care accordingly. It is generally not appropriate to make treatment/triage decisions based on a bias for or against a particular patient; triage is supposed to be based on the patient's injuries and chance of survival. In this situation your best approach may be to explain that you must triage the patients rapidly and then begin management. You may also contact medical control to obtain additional orders for backup.

Chapter 28: Abdomen and Genitalia Injuries

Assessment in Action

1. C. Kidney trauma

Hematuria or blood in the urine signifies injury to the kidneys. Damage to the kidneys may not be obvious, but you will see signs of shock if the injury is associated with significant blood loss.

Because one of the functions of the kidney is the production of urine, a sign of kidney damage includes hematuria.

2. A. retroperitoneal cavity.

The kidneys lie in the retroperitoneal space. They are well protected and generally do not occur as isolated injuries.

3. C. both A and B.

Abdominal injuries are categorized as either open (penetrating trauma) or closed (blunt force trauma).

4. D. all of the above.

Injury to the solid internal organs often causes significant unseen (occult) bleeding that can be life threatening.

5. C. peritonitis.

Injury to the hollow organs of the abdomen may cause irritation and inflammation to the peritoneum as caustic digestive juices leak into the peritoneum. This is called peritonitis and may result in a serious infection over the next several hours.

6. D. all of the above.

The first signs of peritonitis include severe abdominal pain, tenderness, and muscular spasm. Later, bowel sounds diminish or disappear as the bowel stops functioning. Nausea and vomiting are common, the abdomen may become distended and firm, and an infection may occur.

7. It is highly unlikely that the inmate fell down a flight of stairs. Although this sort of mechanism would produce potentially significant injuries, his injury patterns are not consistent with this mechanism. He would likely have bruises on the front of his body, not the back. This would suggest that his story is falsified and likely caused by other inmates. His injuries were likely caused by fists, feet, and/or improvised weapons.

8. Abdominal distention indicates that bleeding is significant and blood has had time to accumulate in the abdominal cavity. With the amount of bleeding associated with abdominal distention (more than 2 to 3 L), your patient will be exhibiting signs and symptoms of shock, including increased pulse and respirations and decreased blood pressure.

9. Although these devices save lives, they may also cause injuries during a crash. Seat belts have occasionally caused blunt injuries to abdominal organs. If the lap belt is worn too high, it can squeeze abdominal organs or great vessels against the spine when the vehicle suddenly decelerates. Children and short adults riding in the front seat can experience life-threatening injuries from airbag deployments.

10. There are numerous causes of abdominal pain. For this reason, you will not see paramedics administering pain relievers for patients with abdominal pain. Sometimes it can be extremely difficult to pinpoint the exact cause of a patient's abdominal pain. Understanding what organs underlay which quadrants and knowing what common complaints are associated with which conditions can help you to narrow down the potential causes.

Points to Ponder

Without a translator, this call could become significantly more complicated. You may not be able to quickly identify the source of her distress, but just know that she is pregnant and upset. Your agency should provide translators for this purpose. Better yet, take a proactive stance and learn language(s) commonly used in your area. Some cities have many ethnic groups, so you will have to decide what languages you will most likely use. If a translator is not available, your patient assessment and care can be significantly hindered. Given the mechanism of injury, you will be concerned about the fetus, the uterus, and the mother's abdominal organs such as the urinary bladder. In essence, you will be caring for and concerned about two patients. Because this mother is in her 30th week of pregnancy, you should transport her on her left side to avoid supine hypotensive syndrome.

Chapter 29: Musculoskeletal Injuries

Assessment in Action

1. B. Tibia fracture

This patient could have a fracture of both tibia and/or fibula. You will not be able to make a clear determination in the field. This will require X-rays. You will splint the lower leg the same regardless of the type of fracture.

2. C. cutting both pant legs.

You should refrain from moving the affected extremity to avoid any further injury and increasing the patient's pain. You should expose both legs to compare the uninjured side to the injured side. This is especially helpful to compare both extremities when the injury is not obvious and when measuring for application of traction devices.

3. D. Both A and B

It is extremely important to check for distal circulation both before and after you perform splinting. If you fail to check prior to splinting, you will not know whether the patient's perfusion status has changed after stabilization of the extremity. You will have no way to defend your splinting techniques or prove that there was no pulse prior to your care. You should also continue assessment of distal pulses throughout transport.

4. D. All of the above

You should determine the status of distal pulse, motor, sensation and capillary refill. Depending on the patient, you may not be able to locate a pulse on either extremity. Obviously, it would be significant to find a pulse on the uninjured side and not on the injured side. If pulses cannot be found on either, it is especially important to compare skin color, temperature, and capillary refill times.

5. D. Either B or C

There are many options to use regarding types of splints. You may use vacuum splints, air splints, or cardboard splints. You cannot use any type of traction device, including Sager splints or Hare traction splints. These are used in the stabilization of isolated femur fractures only.

6. A. False motion

False motion is the motion at a point in the limb where there is no joint. It is also called free movement and is a positive indication of a fracture.

7. A sprain occurs when a joint is twisted beyond its normal range of motion, causing the supporting capsule and ligaments to be stretched or even torn. A fracture can look like a sprain and vice versa, especially in ankle injuries. This will require X-rays and a physician's diagnosis. The basic principles of patient care for sprains, dislocations, and fractures are essentially the same.

8. Guarding is an inability to use an affected body part (extremity) and is the body's way of stabilizing the injury, minimizing pain. The muscles around the fracture will contract to prevent any movement of the broken bone. Guarding doesn't occur with all fractures, but can indicate the presence of a fracture in combination with other signs and symptoms.

9. Failing to properly splint can cause various injuries and complications including compression of nerves, tissues, and blood vessels; delay in transport of a patient with a life-threatening injury; reduction of distal circulation; aggravation of the injury; and injury to tissue, nerves, blood vessels, or muscles as a result of excessive movement of the bone or joint. Not only can you cause damage such as this, but improper splinting techniques can reduce your credibility with family members and patients, which can open you and your agency up to possible lawsuits.

10. Because the femur is the longest and strongest bone in the body, it requires significant forces to break this bone. In car crashes, if the patient's legs contact the dash, causing a femur fracture, you should become suspicious of the possibility for pelvic fractures as well. The force that broke the femur(s) will likely continue up the shaft of the bone to the pelvis. Pelvic fractures can be accompanied by significant blood loss. The extent of the blood loss is not always readily visible. Many liters of blood may drain into the pelvic and retroperitoneal spaces.

Points to Ponder

The ABCs are your top priority on every call. In this case, as you determine level of consciousness and airway patency, you will perform cervical spine precautions. You must then determine whether the patient is breathing adequately and maintaining perfusion. With this call, splinting the arm becomes a lower priority, because you must attend to life-threatening injuries first. For a young, healthy man, a fall of this sort would not cause more than a couple of bruises. For this man, however, the fall was significant. He likely has serious head and spinal injuries that can be compounded by preexisting medical conditions and currently prescribed medications. If this patient had an isolated lower extremity fracture, it would be appropriate to take on-scene time to manage his injury. In this case, it is not appropriate.

Chapter 30: Head and Spine Injuries

Assessment in Action

1. D. 3, 2, 4, 1

Airway and c-spine stabilization go hand in hand. The likelihood of spinal injury will dictate how you open the airway. In this scenario, the mechanism of injury makes spinal injuries more likely than not. Without immediate and appropriate airway management your patient will die.

2. B. Jaw-thrust maneuver

Anytime you are unsure or suspect a spinal injury, you should use the jaw-thrust maneuver to open the airway. This technique moves the tongue from the back of the throat by displacing the

jaw without moving the spine. This technique can be more difficult to perform correctly than the head tilt-chin lift maneuver. Practice it until it becomes comfortable, then practice some more!

3. D. Both B and C

You should secure the torso of the body first and the head last. If you secure the head before the rest of the body, and the body shifts, you may possibly paralyze and/or kill your patient.

4. A. 12

There are 12 pairs of cranial nerves that pass through holes in the skull and transmit information directly to or from the brain. They perform special functions in the head and face, including sight, smell, taste, hearing, and facial expressions.

5. D. both A and B.

The autonomic nervous system is divided into two sections: the sympathetic system and the parasympathetic system. The sympathetic system causes pupils and smooth muscle in the lungs to dilate, and the heart rate and blood pressure to increase. The parasympathetic system has the opposite effect on the body.

6. C. 33 bones divided into 5 sections.

The spinal column is the body's central supporting system and consists of 33 bones divided into five sections: cervical, thoracic, lumbar, sacrum, and coccyx.

7. When confronted with a patient who has multiple broken bones or other substantial injuries that cause significant bleeding, you can get sidetracked into taking care of these injuries rather than noticing that the patient is not breathing well or at all. Always remember, you must take appropriate c-spine precautions and ensure that a patent airway and adequate breathing and circulation are present. You must address these treatment priorities as you find them or the patient will not survive.

8. These are both indicators of basal skull fracture. They are caused by the presence of blood under the skin, which produces ecchymosis or bruising. Perhaps the most significant factor regarding both of these signs is that they are late signs. Neither of these signs will develop in a few minutes, but rather over a longer period of time depending on the severity of injury and other contributing factors.

9. It is important to perform assessments, taking note of areas of the body that will become obscured by equipment. Common examples include the back, neck, and head. Once you stabilize the patient on a long backboard, you will not be able to visualize the patient's back, and depending on the type of c-collar and head blocks used, you may not be able to see the patient's trachea, neck veins, or ears. The head should not move, so assessment of the back of the head will not be possible once the patient is on the long backboard. Also, if a patient vomits while stabilized, you will need to clear the airway immediately. You must be prepared to turn the patient on his or her side at all times, but especially in cases of suspected or known head injury.

10. Occasionally, you may find a patient who you believe could have a spinal injury, who refuses to allow you to apply a cervical collar and/or apply a backboard. Attempt to continue manual stabilization while you explain why you feel stabilization is important, how it will be done, and what could happen if care is refused, ie, possible paralysis or death. You must be clear on the potential consequences. Avoid medical terminology. Speak in plain terms, and show genuine concern for the patient's well-being. Most patients will agree to spinal stabilization when you explain the cause of your concern. Some patients are claustrophobic. Do what you can to put them at ease. If they continue to refuse and are alert and oriented, this will become a case of informed refusal and will require appropriate documentation.

Points to Ponder

You should only remove a helmet if assessing or managing the airway become difficult and removal of a face guard to improve access is not possible, or if the helmet prevents proper stabilization of the spine or allows excessive head movement. This patient is alert and oriented. You may remove the facemask to apply oxygen, but removing the entire helmet is unnecessary and would require the shoulder pads to be removed as well or padding to be placed under the head to avoid the loss of neutral spine alignment. Practice removing facemasks using a variety of tools, and keep the most effective tools on the ambulance. Helmet removal requires coordination of several responders and must be practiced until individual and team proficiency is achieved.