Chapter 3

Initial Assessment

Objectives

On completion of this chapter/lecture, the learner should be able to:

1. Describe the components of the primary assessment.

2. Correlate life-threatening conditions with the specific component of the primary assessment.

3. Identify interventions to manage life-threatening conditions identified during the initial assessment.

4. Identify the components of the secondary assessment.

5. Describe how to conduct a complete head-to-toe assessment.

Introduction

A systematic process for initial assessment of the trauma patient is essential for recognizing life-threatening conditions, identifying injuries, and determining priorities of care based on assessment findings.\(^1,2,3\) The initial assessment is divided into two phases, primary and secondary assessments. Both phases can be completed within several minutes unless resuscitative measures are required. Within an organized team approach to trauma care, this first step of the nursing process (assessment) is often simultaneously conducted with the identification of nursing diagnoses that require immediate intervention. Utilizing an organized, systematic approach when one assesses each trauma patient helps to ensure that injuries will not be missed and that priorities can be set for each intervention based on the life-threatening potential of each injury.

Standard Precautions

Nurses involved in trauma resuscitation must follow Occupational Safety and Health Administration (OSHA), Centers for Disease Control and Prevention (CDC), and institutional guidelines to protect themselves and the patient from any unnecessary risk of exposure to infectious diseases. Adherence to "Standard Precautions" (precautions for care of all patients in hospitals) and "Transmission-based Precautions" (precautions for care of patients who are known or suspected of being infected or colonized by certain pathogens transmitted by air or contact
with skin or droplet) are indicated for use by the trauma team. All trauma team members should be provided with personal protective equipment (PPE). This equipment should include gloves, gowns/aprons, masks and respirators (if indicated), and goggles and face shields. Factors that influence the type of PPE to be used during trauma resuscitation include the type of exposure anticipated, the durability and appropriateness for the task, and the fit of the equipment. Trauma team members should be taught how to use PPE appropriately. Personal protective equipment should be put on before contact with the patient, used carefully so that contamination is not spread, and then removed and carefully discarded. After removal of PPE, hand hygiene should be immediately performed.

**A Guide to Initial Assessment**

Initial assessment provides the nurse with subjective and objective data that are analyzed, interpreted, and documented. The following mnemonic may assist nurses during the initial assessment of a trauma patient:

- **Primary Assessment**
  - A—Airway with simultaneous cervical spine protection
  - B—Breathing
  - C—Circulation
  - D—Disability (neurologic status)
  - E—Expose/environmental controls (remove clothing and keep the patient warm)

- **Secondary Assessment**
  - F—Full set of vital signs/focused adjuncts (includes cardiac monitor, urinary catheter, and gastric tube/family presence)
  - G—Give comfort measures (verbal reassurance, touch, and pharmacologic and nonpharmacologic management of pain)
  - H—History and Head-to-toe assessment
  - I—Inspect posterior surfaces

**Primary Assessment and Resuscitation**

The primary assessment begins immediately on the patient’s arrival at the hospital, with collection of primarily subjective information. The extent and timing of obtaining information related to both the injury event and the patient’s past medical history depend on the severity of the patient’s condition. Subjective information from prehospital personnel, family, or the patient at this point of the assessment process is limited to a brief statement composed of the patient’s major injuries or chief complaints and the mechanism of injury. A more detailed history is obtained during the secondary assessment.

Airway with simultaneous cervical spine protection, breathing, circulation, disability (neurologic status), and expose/environmental control are the A-B-C-D-E of the primary assessment. Remove only those clothes necessary to expose the patient to conduct the primary assessment. If any life-threatening injuries or circumstances are determined, implement interventions to correct them immediately. Additional assessment steps are not taken until the primary assessment is completed.

**Airway with Cervical Spine Protection**

**Assessment**

Open and inspect the patient’s airway while initiating or maintaining cervical spine protection. Because partial or total airway obstruction may threaten the patency of the upper airway, observe for the following:

- **Vocalization**
  - Is the patient able to talk? Is the patient crying or moaning?

- **Tongue obstructing the airway**

- **Loose teeth or foreign objects**

- **Blood, vomitus, or other secretions**

- **Edema**

If the patient has been intubated or an alternative airway has been inserted before arrival at the hospital, confirm that the airway device is in the correct place by:

- **Observing for equal rise and fall of the chest with ventilation.**

- **Listening over the epigastrium (nothing should be heard) and then over the lung fields (breath sounds should be heard equally bilaterally).**

- **Using a specific device to confirm tube placement**
  - Exhaled CO₂ detector
  - Esophageal detection device (EDD)

- **Obtaining a chest radiograph.**

**Interventions**

**Airway Patent**

- Maintain cervical spine protection for any patient whose mechanism of injury, symptoms, or physical findings suggest a spinal injury.

- If the patient is awake and breathing, he or she may have assumed a position that maximizes the ability to breathe. Before proceeding with cervical spine protection, ensure that interventions do not compromise the patient’s breathing status.
Airway Totally Obstructed or Partially Obstructed

- Place the patient in a supine position.
  If the patient is not already supine, logroll the patient onto his or her back while maintaining cervical spine protection. Remove any headgear such as a football helmet, if necessary, to allow access to the airway and cervical spine. Removal of such gear should be done carefully and gently to prevent any manipulation of the spine. Penetrating wounds may cause disruption of the integrity of the airway, and blunt trauma may lead to injury of the larynx or other upper structures, causing partial or complete obstruction.
- Protect the cervical spine.
  - If the patient is already in a rigid cervical collar and strapped to a backboard, do not remove any devices until directed by an appropriate care provider. Check that the devices are placed appropriately.
  - If the patient has not been immobilized, perform in-line manual stabilization of the patient's head. Complete spinal immobilization includes application of a rigid cervical collar, placing the patient on a backboard, and having the patient appropriately strapped to the backboard. Complete spinal immobilization should be done at the completion of the secondary assessment, depending on the degree of resuscitation required and the availability of team members.
- Cervical spine protection is a concept that includes in-line manual stabilization and complete spinal immobilization. During the primary and secondary assessments, the patient may only have in-line manual stabilization as a means to protect the cervical spine until the resuscitation and assessment are completed.
- Open and clear the airway.

(Read Chapter 4, Airway and Ventilation, for an expanded discussion on airway management.)

- Techniques to open or clear an obstructed airway during the primary assessment include
  - Jaw thrust
  - Chin lift
  - Removal of loose teeth or foreign objects
  - Suctioning
  - Maintain the cervical spine in a neutral position. Do not hyperextend, flex, or rotate the neck during these maneuvers.
  - Suctioning and other manipulation of the oropharynx must be done gently to prevent stimulation of the gag reflex and subsequent vomiting, aspiration, or both.
- Insert an oropharyngeal or nasopharyngeal airway.
- Prepare for endotracheal intubation.
  - Ventilate the patient with a bag-mask device before endotracheal intubation.
  - Administer medications to facilitate endotracheal intubation.
  - Use an alternative airway if the patient's airway cannot be managed with endotracheal intubation.
Some injuries or problems with patient anatomy may restrict passage of an endotracheal tube. Continue to ventilate the patient with a bag-mask device with supplemental oxygen until an alternative airway can be established. Numerous alternative airway devices are available, including the esophageal-tracheal Combitube®, laryngeal mask airway, and surgical airways.

If there are any life-threatening compromises in airway status, stop and intervene to correct the problem before proceeding to breathing assessment. Examples of life-threatening airway conditions are partial or complete obstruction of the airway by the tongue; loose teeth or foreign objects; blood, vomitus, or other secretions; edema; or all of these.

Breathing

Assessment

Life-threatening compromises in breathing may occur with a history of any of the following:
- Blunt or penetrating injuries of the thorax
- Acceleration, deceleration, or a combination of both types of forces (e.g., motor vehicle crashes, falls, crush injuries)

Once the patency of the airway is ensured, assess for the following:
- Spontaneous breathing
- Rise and fall of the chest
- Rate and pattern of breathing
- Use of accessory muscles, diaphragmatic breathing, or both
- Skin color
- Integrity of the soft tissues and bony structures of the chest wall
- Bilateral breath sounds
- Auscultate the lungs bilaterally at the second intercostal space midclavicular line and at the fifth intercostal space at the anterior axillary line.
Interventions

(Read Chapter 4, Airway and Ventilation, for an expanded discussion on interventions that improve breathing effectiveness.)

Breathing Present: Effective

All trauma patients should receive oxygen, regardless of their preexisting history. Although various oxygen delivery methods are available, it is best to use a tight-fitting nonrebreather mask for alert patients. Supplemental oxygen should be administered at a flow rate sufficient to keep the reservoir bag inflated during inspiration. Proper administration via a nonrebreather mask usually requires a flow rate of at least 12 liters/minute and may require 15 liters/minute or more.

Breathing Present: Ineffective

When spontaneous breathing is present but ineffective, the following signs may indicate a life-threatening condition:

- Altered mental status (e.g., restless, agitated)
- Cyanosis, especially around the mouth
- Asymmetric expansion of the chest wall
  - Paradoxical movement of the chest wall during inspiration and expiration
- Use of accessory or abdominal muscles or both or diaphragmatic breathing
- Sucking chest wounds
- Absent or diminished breath sounds
- Administer oxygen via a nonrebreather mask or assist ventilations with a bag-mask device, as indicated.
- Anticipate definitive airway management to support ventilation.

Breathing Absent

- Ventilate the patient via a bag-mask device with an attached oxygen reservoir system.
- Assist with definitive airway management to support ventilation.

If there are any life-threatening injuries that compromise breathing, stop and intervene before proceeding to circulation assessment. Examples of life-threatening injuries that may compromise breathing are tension pneumothorax, open pneumothorax, flail chest with pulmonary contusion, and hemothorax. These conditions may require simultaneous assessment and immediate intervention (e.g., needle thoracentesis or covering an open chest wound).

Circulation

Assessment

- Palpate a central pulse (carotid, femoral, or brachial in infants under one year of age) for strength (normal, weak, or strong) and rate (normal, slow, or fast).
- Inspect and palpate the skin for color, temperature, and moisture.
- Capillary refill is used to assess perfusion in the pediatric patient. Blanch the nail bed for a few seconds and then release the pressure. The time it takes for the nail to return to its original color is the capillary refill time. Normal capillary refill takes two seconds or less in a warm ambient environment. Factors that may affect capillary refill, not related to an alteration in general tissue perfusion, include a cool ambient temperature and injury with vascular compromise.
- Inspect for any obvious signs of uncontrolled external bleeding.
- Auscultate blood pressure.

If other members of the trauma team are available, auscultate the blood pressure. If not, proceed with the primary assessment and auscultate the blood pressure at the beginning of the secondary assessment.

Interventions

Circulation: Effective

If the circulation is effective, proceed with assessment. Obtain vascular access with a large-caliber intravenous catheter and administer warmed isotonic crystalloid solution at a rate appropriate for the patient’s condition.

Circulation Present: Ineffective

Although the pulse is present, other signs may indicate inadequacy of circulation, such as

- Tachycardia
- Altered level of consciousness or mental status (e.g., agitated, confused, decreased arousability)
- Uncontrolled external bleeding
  - Pale, cool, moist skin
  - Distended or abnormally flattened external jugular veins
  - Distant heart sounds
Circulation: Effective or Ineffective

- Control any uncontrolled external bleeding by
  - Applying direct pressure over the bleeding site
  - Elevating the bleeding extremity
  - Applying pressure over arterial pressure points
  - Using a tourniquet

  The use of a tourniquet is rarely indicated; however, if the preceding interventions do not control the bleeding and operative bleeding control is not readily available, a tourniquet may be the last resort.

- Cannulate two veins with large-caliber intravenous catheters, and initiate infusions of an isotonic crystalloid solution.
  - Use warmed solutions.
  - Use pressure bags to increase the speed of the infusion of the fluids.
  - Use blood administration tubing for possible administration of blood.
  - Use a rapid infusion device based on institutional protocols.
  - Use normal saline (0.9%) in the same intravenous tubing through which blood is administered.

  Venous cannulation may require a surgical cutdown, an insertion of a central line, or both.

  When starting intravenous lines, obtain a blood sample to determine ABO and Rh group and to facilitate any additional laboratory studies.

- Intraosseous needles may be used for access in the sternum, legs, arms, or pelvis if the patient’s injuries would not interfere with the procedure.

- Administer blood or blood products, as prescribed.

  - Consider the use of a pneumatic antishock garment (PASG) for intra-abdominal or pelvic bleeding with hypotension. Despite the controversies that surround the use of PASG, the American College of Surgeons recommends their use to control bleeding from pelvic and lower extremity fractures; however, their use should not interfere with fluid resuscitation.

Circulation: Absent

If a patient does not have a pulse, life-support measures should be initiated.

- In a traumatic arrest, recognition and correction of the underlying causes, such as a tension pneumothorax or exsanguination, should be addressed.

- Administer intravenous fluids and blood or blood products, as prescribed.

- Prepare for and assist with an emergency thoracotomy, as indicated, in the emergency department or resuscitation area. Open thoracotomy should be performed only in facilities with the resources to manage postthoracotomy patients. Table 3-1 summarizes the indications for a resuscitative thoracotomy based on recommendations of the American Heart Association.

- Prepare the patient for definitive operative care after thoracotomy, if indicated.

If any life-threatening conditions compromise circulation, stop and intervene before proceeding to the neurologic assessment. Examples of life-threatening conditions that may compromise circulation are uncontrolled external bleeding, shock because of hemorrhage or massive burns, pericardial tamponade, or direct cardiac injury.

Disability—Brief Neurologic Assessment

Assessment

After the primary assessment of airway, breathing, and circulation, conduct a brief neurologic assessment to determine the degree of disability (D) as measured by the patient’s level of consciousness.

- Determine the patient’s level of consciousness by assessing the patient’s response to verbal or painful stimuli using the AVPU mnemonic, as follows:
  - A—Speak to the patient. The patient who is alert and responsive is considered A for Alert.
  - V—The patient who responds to verbal stimuli is considered V for Verbal.
  - P—Apply a painful stimulus. The patient who does not respond to verbal stimuli but does respond to a painful stimulus is considered P for Pain.
  - U—The patient who does not respond to a painful stimulus is considered U for Unresponsive.

- The Glasgow Coma Scale (GCS) score is a quick way to measure the patient’s level of consciousness. Although it is not a measure of total neurologic function, initial and serial scores provide the trauma team with a good indication as to patient outcomes. Scores range from 3 to 15. Because assessment of brain injury hinges on the GCS score, it is essential that the GCS be performed during the initial assessment. (See Chapter 6, Brain and Cranial Trauma, for an in-depth discussion of the GCS, and Table 13-3 for a Pediatric GCS). The Revised Trauma Score (RTS) is an assessment tool that incorporates the GCS with physiologic parameters and can be associated with
patient survival (see Appendix 3-A). The recommendation of the American College of Surgeons Committee on Trauma is that patients with a GCS score of less than 14, a systolic blood pressure less than 90 mm Hg, a respiratory rate greater than 29 or less than 10, or a total Revised Trauma Score of 11 or less should be triaged to a trauma center. For further discussion on hyperventilation, refer to Chapter 6, Brain and Cranial Trauma.

**Expose/Environmental Controls**

**Assessment**

The patient’s clothing should be carefully removed so that all injuries can be quickly identified. Injuries such as gunshot wounds, abdominal and pelvic trauma that can cause severe shock from blood loss, and open fractures can be missed without adequate exposure.

**Interventions**

- Remove the patient’s clothing carefully because weapons, needles, or objects such as glass from the incident may injure trauma team members.
- Ensure appropriate decontamination procedures if the patient has been exposed to a hazardous substance.
- Keep the patient warm by using warm blankets or heating lamps or turning up the room heat to prevent hypothermia. Hypothermia in trauma patients has been associated with increased mortality rates as a result of dysrhythmias, coma, coagulopathy, and decreased cardiac output.
- Consider whether the clothing may be evidence and preserve it according to policy (see Initial Assessment and Management of the Victim of Violence, discussed later in this chapter).

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**Table 3-1: Suggested Indications for Resuscitative Thoracotomy in Patients with Traumatic Cardiac Arrest**

<table>
<thead>
<tr>
<th>Type of Injury</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>Blunt trauma</td>
<td>Patient arrives at emergency department or trauma center with blood pressure and spontaneous respirations and then experiences cardiac arrest</td>
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<tr>
<td>Penetrating cardiac trauma</td>
<td>Patient experiences a witnessed cardiac arrest in the emergency department or trauma center after &lt; 5 minutes of out-of-hospital cardiopulmonary resuscitation with positive secondary signs of life (e.g., pupillary reflexes, organized electrocardiogram activity)</td>
</tr>
<tr>
<td>Penetrating thoracic (noncardiac) trauma</td>
<td>Patient experiences a witnessed cardiac arrest in the emergency department or trauma center OR Patient arrives in the emergency department or trauma center after &lt; 15 minutes of out-of-hospital cardiopulmonary resuscitation and with positive secondary signs of life (e.g., pupillary reflexes, organized electrocardiogram activity)</td>
</tr>
<tr>
<td>Exsanguinating abdominal vascular trauma</td>
<td>Patient experiences a witnessed cardiac arrest in the emergency department or trauma center OR Patient arrives in the emergency department or trauma center with positive secondary signs of life (e.g., pupillary reflexes, organized electrocardiogram activity) OR Resources available for definitive repair of abdominal-vascular injuries</td>
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Consider the Need for Transfer

Not all hospitals are able to provide the emergent care that an injured patient requires. During the primary assessment, enough information may be collected that would indicate the patient has been severely injured and requires transfer to another facility. The earlier the patient transfer is initiated, the quicker the patient can be transported to a center that can provide the most appropriate care. Indications for transfer recommended by the American College of Surgeons Committee on Trauma are summarized in Table 3-2. Arrangements for transfer and transport should follow Emergency Medical Treatment and Active Labor Act (EMTALA) guidelines, as discussed in Chapter 16, Transition of Care for the Trauma Patient. To safely and legally transfer a patient, there should be, at a minimum:

- An accepting physician
- An available bed AND resources to care for the patient
- An appropriate mode of transport used to transfer the patient based on the patient’s injury and needs

Secondary Assessment

After each component of the primary assessment has been addressed and lifesaving interventions have been initiated, begin the secondary assessment. This assessment is a brief, systematic process to identify all injuries as well as collect any additional information about the patient and become aware of any comorbid factors that can affect the patient’s care and resuscitation.

Full Set of Vital Signs, Focused Adjuncts, and Family Presence

The F of the assessment mnemonic stands for a full set of vital signs, focused adjuncts, and family presence.

Before initiating the head-to-toe assessment to identify other injuries, obtain a full set of vital signs, including blood pressure, pulse rate, respiratory rate, oxygen saturation, and temperature.

After the nurse completes the A-B-C-D-E of the assessment, intervenes for life-threatening conditions, and obtains a complete set of vital signs, critical decision making will determine whether to continue with the secondary assessment or perform additional interventions. The availability of other trauma team members to perform these focused interventions will influence the decision. If the patient sustained significant trauma and required lifesaving interventions during the primary assessment, assign another trauma

Table 3-2: Interhospital Transfer Criteria When the Patient’s Needs Exceed Available Resources

<table>
<thead>
<tr>
<th>Clinical Considerations</th>
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<tbody>
<tr>
<td><strong>Central Nervous System</strong></td>
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<tr>
<td>- Head injury</td>
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<td>- Penetrating injury or depressed skull fracture</td>
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<td>- Open injury with or without a cerebrospinal fluid leak</td>
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<td>- GCS score &lt; 15 or neurologically abnormal</td>
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<td>- Lateralizing signs</td>
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<td>- Spinal cord injury or major vertebral injury</td>
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<tr>
<td><strong>Chest</strong></td>
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<td>- Widened mediastinum or signs suggesting great vessel injury</td>
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<td>- Major chest wall injury or pulmonary contusion</td>
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<td>- Cardiac injury</td>
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<td>- Patient who may require prolonged ventilation</td>
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<tr>
<td><strong>Pelvis/Abdomen</strong></td>
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<tr>
<td>- Unstable pelvic-ring disruption</td>
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<td>- Pelvic-ring disruption with shock and evidence of continuing hemorrhage</td>
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<tr>
<td>- Open pelvic injury</td>
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<tr>
<td>- Solid organ injury</td>
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<tr>
<td><strong>Extremity</strong></td>
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<tr>
<td>- Severe open fractures</td>
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<tr>
<td>- Traumatic amputation with potential for replantation</td>
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<tr>
<td>- Complex articular fractures</td>
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<tr>
<td>- Major crush injury</td>
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<tr>
<td>- Ischemia</td>
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<tr>
<td><strong>Multisystem Injury</strong></td>
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<tr>
<td>- Head injury with face, chest, abdominal, or pelvic injury</td>
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<td>- Injury to more than two body regions</td>
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<tr>
<td>- Major burns or burns with associated injuries</td>
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<tr>
<td>- Multiple, proximal long-bone fractures</td>
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<tr>
<td><strong>Comorbid factors</strong></td>
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<tr>
<td>- Age &gt; 55 years</td>
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<tr>
<td>- Children ≤ 5 years of age</td>
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<tr>
<td>- Cardiac or respiratory disease</td>
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<td>- Insulin-dependent diabetes, morbid obesity</td>
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<td>- Pregnancy</td>
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<tr>
<td>- Immunosuppression</td>
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<tr>
<td><strong>Secondary Deterioration (Late Sequelae)</strong></td>
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<tr>
<td>- Mechanical ventilation required</td>
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<tr>
<td>- Sepsis</td>
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<tr>
<td>- Single or multiple organ system failure (deterioration in central nervous, cardiac, pulmonary, hepatic, renal, or coagulation systems)</td>
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<tr>
<td>- Major tissue necrosis</td>
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</table>

Adapted with permission. American College of Surgeons Committee on Trauma: Resources for Optimal Care of the Injured Patient, in publication.
team member to perform the following interventions before proceeding with the secondary assessment:

- Attach ECG leads and monitor the patient’s cardiac rate and rhythm.
- Attach a pulse oximeter, if available, to monitor the patient’s oxygen saturation of the hemoglobin (SpO₂).
- If the patient is intubated, connect the endotracheal tube to an exhaled CO₂ detection device to monitor the patient’s exhaled CO₂.
- Insert an indwelling urinary catheter to monitor urinary output. A urinary catheter provides for bladder drainage, allows for frequent monitoring of urinary output, and is necessary for any patient who is being prepared for surgery. Suspected injury to the urethra is a contraindication to catheterization through the urethra. Indications of possible urethral injury are
  - Blood at the urethral meatus
  - Palpation of a displaced prostate gland during a rectal examination
  - Blood in the scrotum
  - Suspicion of an anterior pelvic fracture
- Insert a gastric tube. Gastric distention may lead to vomiting, aspiration, or both. Distention may stimulate the vagus nerve, which can lead to bradycardia. Insertion of a gastric tube provides for evacuation of stomach contents, relieves gastric distention, and prevents vagal stimulation. Contraindications to insertion of a nasogastric tube include suspicion or definitive diagnosis of midfacial fractures. If a head injury is suspected, place an orogastric tube. After insertion of the tube, test the aspirated contents for the presence of blood and for pH. The tube must be placed carefully by
  - Maintaining protection of the cervical spine
  - Minimizing stimulation of the patient’s gag reflex
  - Having suction equipment available
- Facilitate radiographic and diagnostic studies that are adjuncts to the primary assessment and the initial resuscitation of the patient.
  - Chest radiographs are done to identify
    - Life-threatening injuries such as pneumothoraces or hemothoraces
    - Position of tubes and lines
    - Presence of a widened mediastinum
    - Presence of diaphragmatic injuries
  - Pelvic radiographs are done to ascertain the presence of pelvic injury.
  - Cervical spine radiographs are done to ascertain the presence of fractures or misalignment of the cervical spine.
  - Diagnostic peritoneal lavage is done to aid in the diagnosis of hemoperitoneum or ruptured viscus. Once a common procedure, its use has decreased with the emergence of other types of diagnostic tests such as Focused Assessment Sonography for Trauma (FAST) and computed tomography (CT) scans. However, the American College of Surgeons Committee on Trauma still recommends the use of diagnostic peritoneal lavage for the following hemodynamically unstable patients:
    - Patients with changes in sensorium related to alcohol or illicit drug use
    - Patients with changes in sensation from a spinal cord injury
    - Patients with injury to adjacent structures such as the lower ribs, pelvis, and lumbar spine
    - Patients with equivocal physical examination
    - Patients who may require lengthy diagnostic testing or surgery for other injuries
    - Patients with lap-belt sign
- Focused Assessment Sonography for Trauma can be performed rapidly in the emergency department to determine the presence of free fluid in the peritoneum.
- CT scans of the
  - Head
  - Abdomen
  - Chest
- Facilitate laboratory studies.
  - Blood typing is the highest priority. Depending on the severity of the patient’s condition, blood typing studies may also include screening and crossmatching.
- Other frequently ordered studies include hematocrit (Hct), hemoglobin (Hgb), blood urea nitrogen (BUN), creatinine, blood alcohol, toxicology screen, arterial blood gases, pH, base deficit, lactate level, electrolytes, glucose, clotting profile (platelets, prothrombin time [PT], partial thromboplastin time [PTT]), and urine or serum beta human chorionic gonadotropin (HCG) for pregnancy.
- Determine the need for tetanus prophylaxis after trauma based on the condition of the wound and the patient’s past vaccination history.

The F of the mnemonic also represents family presence. Facilitate the presence of the family in the
Pain Management

Pain is an unpleasant sensory and emotional experience arising from actual or potential tissue damage. Pain that is not managed can cause
- Increased heart rate and force of cardiac contraction
- Peripheral vasoconstriction and pallor
- Tachypnea
- Muscle tension leading to guarding or splinting as a reflex to decrease pain
- Loss of parasympathetic tone with anorexia or nausea and vomiting
- Release of adrenal gland catecholamines resulting in an increase in blood pressure, cardiac afterload, and myocardial oxygen consumption

Assessment

There are both subjective and objective signs of pain. Because the patient’s pain experience is very individualized, pain can be difficult to assess. Consider the following in assessing pain:
- Presence of a source of pain:
  - Injuries such as fractures, lacerations, or burns
- Procedures
  - Intravenous cannulation
  - Chest tube insertion or removal
  - Intubation
  - Wound care
  - Fracture reduction
  - Laceration repair
  - Sexual assault examination
- The treatment environment
  - Light
  - Noise
  - Cardiac monitors
  - Intravenous pumps
  - Pulse oximeter
  - Talking
- Diagnostic procedures
- Physical signs of pain:
  - Tachypnea
  - Shallow respirations
  - Nausea and vomiting
  - Diaphoresis
  - Protective behaviors—guarding, splinting
  - Pinched facial expressions
  - Clenched fist or teeth
  - Crying

Box 3-1: Sample Questions to Identify Religious and Cultural Beliefs

- Why do you think you have this problem? The patient or family may believe the illness is caused by karma or evil offended spirits, or that it has demonic origins.
- Why did it start when it did?
- In your home country, who would you see about this problem, and who would treat you? The patient or family may see a healer or a family elder. What kind of treatment would be done, and who would administer the treatment?
- How long do you think this illness or problem will last?
- What treatment have you (or your healer) tried at home or in the past?
- What results do you hope you will receive from the treatments? What treatment do you think you should receive?
- Do you plan to continue to use those treatments, or are there treatments you will use along with those prescribed in the emergency department?
- Will your healer (or others involved) work with us to make you well?
A variety of pain rating scales are used to assess pain; they are outlined in Table 3-3.

**Interventions**

Various methods may be used to manage pain. These include analgesics, cutaneous stimulation, therapeutic touch, distraction, acupuncture, humor, and provision of comfort measures such as positioning. Desirable properties of medications that are used in the emergency management of pain include minimal side effects, easy and painless administration, amnesic effect, short-term duration of action, few contraindications, and sedative as well as analgesic effects. The most common medications used in trauma care include opioids, benzodiazepines, local anesthetics, and some selected sedation agents for procedures or ventilatory management.

When managing a patient’s pain, it is important that the trauma team remain flexible in dosing and clinical decision making related to the patient’s response to pain medication. A patient’s response to analgesics is not based solely on the severity and etiology of the pain. Pain management decisions should be made based on an understanding of pharmacology, appropriately timed assessments, and adjustments based on the patient’s response.14

- Remove any pain-producing objects (e.g., shattered glass).
- Determine the level of the patient's pain.
- Administer prescribed medications.
- Monitor the patient for any side effects from the medications, such as:
  - Respiratory depression
  - Hypotension
  - Nausea and vomiting
  - Bradycardia
  - Hallucinations from the medications

<table>
<thead>
<tr>
<th>Rating Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oucherm scale</td>
<td>This tool uses six pictures of a child's face representing “no hurt” to “biggest hurt ever.” It also includes a vertical scale with numbers from 0 to 100 to use with older children. The child is asked to choose the face that best describes his or her pain. This scale can be used for children 3 to 13 years of age. The numeric scale can be used if the child can count to 100.</td>
</tr>
<tr>
<td>Poker chip tool</td>
<td>This tool uses four red poker chips placed in front of the child. The chips are placed horizontally, and the child is told that “these are pieces of hurt.” Explain to the child that each chip represents a piece of hurt. Ask the child how many pieces of hurt he or she has right now. Record the number of chips the child selected. This tool can be used for children older than 3 years of age once they can count and understand numbers.</td>
</tr>
<tr>
<td>FACES pain rating scale</td>
<td>This tool consists of six cartoon faces ranging from a smiling face for “no pain” to a tearful face for “worst pain.” Ask the patient to pick the face that best describes his or her pain. This scale can be used for children as young as 3 years of age.</td>
</tr>
<tr>
<td>Numeric scale</td>
<td>This scale uses a straight line with endpoints that are labeled as “no pain” and “worst pain.” Divisions with corresponding numbers from 0 to 10 are marked along the line. The patient is asked to choose the number that best describes his or her pain. This scale can be used on children older than 4 years of age once they can count and understand numbers.</td>
</tr>
<tr>
<td>Visual analogue scale</td>
<td>This scale uses a 10-cm horizontal line with end points marked “no pain” and “worst pain.” The patient is asked to place a mark on the line that best describes the amount of his or her pain. Measure the distance with a ruler from the “no pain” end and record the measurement as the pain score. This scale can be used on children older than 4½ years of age.</td>
</tr>
<tr>
<td>Word-graphic rating scale</td>
<td>This scale uses descriptive words for varying intensities of pain. Examples of the words along the scale include “no pain,” “little pain,” “medium pain,” “large pain,” and “worst possible pain.” This patient is asked to mark along the line the words that best describe his or her pain. Measure the distance with a ruler from the “no pain” end to the mark and record the measurement as the pain score. This scale can be used for children 5 years of age and older; however, they may need explanation of the words.</td>
</tr>
<tr>
<td>Color tool12</td>
<td>This scale uses crayons or markers for the child to construct their own scale that is used with a body outline. After having a child select four crayons that represent “no pain,” “a little pain,” “a little more pain,” and “the worst pain you could imagine,” ask the child to show on a body outline “where the hurt is” using the most appropriate crayon.</td>
</tr>
</tbody>
</table>
Consider using alternative methods to manage pain, such as
- Therapeutic touch
- Acupressure/acupuncture
- Positioning/splinting
- Application of heat or cold
- Distraction
- Relaxation exercises
- Guided imagery
- Humor

History
The H of the mnemonic stands for the patient's history that can be obtained from the following:

- Prehospital information
  Obtain information from prehospital personnel as indicated by the circumstances of the injury event. The mnemonic MIVT—which stands for Mechanism of injury, Injuries sustained, Vital signs, and Treatment—can be used as a guide to obtaining prehospital information
  - Mechanism and pattern of injury
    Knowledge of the mechanism of injury and specific injury patterns (e.g., type of motor vehicle impact) will help to predict certain injuries. If prehospital personnel transported the patient, have them describe pertinent on-scene information to the trauma team. Such information includes the location of the patient on their arrival, length of time since the injury event, and extent of extrication or reasons for extended on-scene time.
  - Injuries suspected
    Ask prehospital personnel to describe the patient's general condition, level of consciousness, and apparent injuries.
    - Vital signs
    - Treatment initiated and patient responses
    - Patient-generated information
      If the patient is responsive, ask questions to evaluate the patient’s level of consciousness and have the patient describe discomforts or other complaints. Elicit the patient's description of pain (i.e., location, duration, intensity, and character). If domestic violence is suspected, ask appropriate questions while providing comfort and a sense of security. Talking to the patient provides reassurance and emotional support and gives the patient information regarding upcoming procedures.
      - Past medical history

Gather information from the patient or family regarding
- Age
- Preexisting medical conditions
- Current medications
- Allergies
- Tetanus immunization history
- Previous hospitalizations and surgeries
- Recent use of drugs or alcohol
- Last normal menstrual period
- Comorbid factors
  Comorbid factors are factors that place the patient who has sustained trauma at greater risk of having complications related to the injury. These may include:
  - History of smoking
  - History of substance abuse
  - Age > 55 years
  - Age < 5 years
  - Cardiovascular disease
  - Respiratory disease
  - Diabetes
  - Hemophilia or other blood disorders
  - Morbid obesity
  - Pregnancy
  - Immunosuppression
  - Use of anticoagulants (a significant and sometimes deadly comorbid factor)

Head-to-Toe Assessment
The H also stands for head-to-toe assessment.
Information from this assessment is collected primarily through inspection, auscultation, and palpation. In specific circumstances, percussion may be indicated. The patient may focus on the more obvious distracting injury and have a decreased response to other injuries. While systematically moving from the patient's head to the lower extremities and the posterior surface, complete the assessment as described on the following pages.

General Appearance
Note the patient's body position, posture, and any guarding or self-protection movements. Observe for stiffness, rigidity, or flaccidity of muscles. Characteristic positions of limbs (flexion or extension), trunk, or head may indicate specific injuries. Note and document any unusual odors such as alcohol, gasoline, chemicals, vomitus, urine, or feces. Maintain cervical spine protection during assessment.
Head and Face
- Soft tissue injuries
  - Inspect for lacerations, abrasions, contusions, avulsions, puncture wounds, impaled objects, ecchymosis, and edema.
  - Palpate for cracking associated with subcutaneous emphysema.
  - Palpate for areas of tenderness.
- Bony deformities
  - Inspect for exposed bone.
  - Inspect for loose teeth or other material in the mouth that may compromise the airway.
  - Inspect and palpate for depressions, angulation, or areas of tenderness.
  - Inspect and palpate for facial fractures resulting in loss of maxillary, mandibular, or structural integrity.
- Observe for asymmetry of facial expressions. Also inspect the area for any exposed tissue that may indicate disruption of the central nervous system (e.g., central nervous system tissue from open wounds).
- Eyes
  - Determine gross visual acuity by asking the patient to identify how many of your fingers you see holding up. Determine whether the patient may need glasses or contacts to see.
  - Inspect for periorbital ecchymosis (raccoon eyes), subconjunctival hemorrhage, or edema. Determine whether the patient is wearing contact lenses.
  - Assess pupils for size, shape, equality, and reactivity to light.
  - Assess eye muscles by asking the patient to follow your moving finger in six directions to determine extraocular eye movements.
- Ears
  - Inspect for ecchymosis behind the ear (Battle’s sign), which is a late sign of head injury.
  - Inspect for skin avulsion.
  - Inspect for unusual drainage, such as blood or clear fluid from the external ear canal. Do NOT pack the ear to stop drainage because it may be cerebrospinal fluid.
- Nose
  - Inspect for any unusual drainage, such as blood or clear fluid. Do NOT pack the nose to stop clear fluid drainage because it may be cerebrospinal fluid. If cerebrospinal fluid or drainage is present, notify the physician and do not insert a gastric tube through the nose.
  - Inspect the position of the nasal septum.
- Neck
  - Inspect for signs of penetrating or surface trauma, including presence of impaled objects, ecchymosis, edema, or any open wounds.
  - Observe the position of the trachea and the appearance of external jugular veins.
  - Palpate the trachea to determine position (i.e., midline, deviated).
  - Palpate the neck area for signs of subcutaneous emphysema, areas of tenderness, or both.

Chest
- Inspection
  - Observe breathing for rate, depth, and degree of effort required, use of accessory or abdominal muscles, and any paradoxical chest wall movement.
  - Inspect the anterior and lateral chest walls, including the axillae, for lacerations, abrasions, contusions, avulsions, puncture wounds, impaled objects, ecchymosis, edema, and scars.
  - Inspect the expansion and excursion of the chest during ventilation.
  - Observe for expressions or reactions that may indicate the presence of pain with inspiration and expiration (e.g., facial grimace).
- Auscultation
  - Auscultate lungs for breath sounds and note the presence of any adventitious sounds, such as wheezes, rales, or rhonchi.
  - Auscultate heart sounds for the presence of murmurs, friction rubs, muffled sounds, or all of these.
- Palpation
  - Palpate for signs of subcutaneous emphysema.
  - Palpate the clavicles, the sternum, and the ribs for bony crepitus or deformities (e.g., step-off, areas of tenderness).

Abdomen/Flanks
- Inspection
  - Inspect for lacerations, abrasions, contusions, avulsions, puncture wounds, impaled objects, ecchymosis, edema, and scars that may indicate previous abdominal surgery.
  - Observe for evisceration, distention, and the location of any scars.
- Auscultation
  - Auscultate for the presence or absence of bowel sounds. Auscultate before palpati...
because palpation may change the frequency of bowel sounds.\textsuperscript{15}

- Palpation
  - Gently palpate all four quadrants for rigidity, guarding, masses, and areas of tenderness; begin palpating in an area where the patient has not complained of pain or where there is no obvious injury.

**Elvis/Perineum**
- Inspect for lacerations, abrasions, contusions, avulsions, puncture wounds, impaled objects, ecchymosis, edema, and scars.
- Bony deformities
  - Inspect for exposed bone.
  - Palpate for instability and tenderness over the sac crests and the symphysis pubis.
- Inspect for blood at the urethral meatus (more common in males than females because of the length of the urethra), vagina, and rectum.
- Inspect the penis for priapism (persistent abnormal erection).
- Assess the rectum for the presence of blood.
- Ensure that an appropriate trauma team member has performed a rectal examination to determine whether there is any displacement of the prostate gland in males (this may also be done in the posterior assessment) and to determine anal sphincter tone.
- Note pain and/or the urge, but inability, to void.

**Extremities**
- Inspect previously applied splints and do not move if applied appropriately and neurovascular function is intact.
- Circulation
  - Inspect color.
  - Palpate to assess the skin temperature and for moisture.
  - Palpate pulses (always compare one side with the other and note any differences in the quality of the pulses).
- In the lower extremities, palpate the femoral, popliteal, dorsalis pedis, and posterior tibialis; in the upper extremities, palpate the brachial and radial pulses.
- Soft tissue injuries
  - Inspect for bleeding.
  - Inspect for lacerations, abrasions, contusions, avulsions, puncture wounds, impaled objects, ecchymosis, edema, angulations, deformity, and any open wounds.
- Bony injuries
  - Inspect for angulation, deformity, and open wounds with evidence of protruding bone fragments, edema, and ecchymosis.
  - Note bony crepitus.
  - Palpate for deformity and areas of tenderness.
- Motor function
  - Inspect for spontaneous movement of extremities.
  - Determine motor strength and range of motion in all four extremities; use range of motion (ROM)/muscle strength scale 0 to 5 (Table 3-4).
- Sensation
  - Determine the patient's ability to sense touch in all four extremities.

**Inspect Posterior Surfaces**
The I of the mnemonic stands for inspection of the patient's posterior surfaces.
- Maintain cervical spine protection.
- Support extremities with suspected injuries.
- Logroll the patient with the assistance of members of the trauma team. This maneuver keeps the vertebral column in alignment during the turning process. Do not logroll the patient onto his or her side with an injured extremity. Logroll away from you (if possible) to inspect the back, flanks, buttocks, and posterior thighs for lacerations, abrasions, contusions, avulsions, puncture wounds, impaled objects, ecchymosis, edema, or scars.
- Palpate the vertebral column (including the costovertebral angles) for deformity and areas of tenderness.
- Palpate all posterior surfaces for deformity and areas of tenderness.

**Table 3-4: Range of Motion (ROM)/Muscle Strength Scale**

<table>
<thead>
<tr>
<th>Strength Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Complete ROM or active movement against gravity and full resistance</td>
</tr>
<tr>
<td>4</td>
<td>Complete ROM or active movement against gravity and some resistance</td>
</tr>
<tr>
<td>3</td>
<td>Complete ROM or active movement against gravity</td>
</tr>
<tr>
<td>2</td>
<td>Complete ROM or active body part movement with gravity eliminated</td>
</tr>
<tr>
<td>1</td>
<td>Barely detectable contraction</td>
</tr>
<tr>
<td>0</td>
<td>No detectable contraction</td>
</tr>
</tbody>
</table>
• Palpate the anal sphincter for presence or absence of tone, if not already done during the assessment of the pelvis and perineum.
• Assess the rectum for the presence of blood.

**Focused Assessment**

After the primary and secondary assessments and any simultaneous interventions are completed, a more detailed, focused assessment will be necessary for each area or system injured. This will further direct the priorities of care.

For details on analysis, nursing diagnoses, interventions, and expected outcomes, see Appendix 3-B.

**Focused Adjuncts to the Secondary Assessment**

Once the secondary assessment has been completed, additional interventions may be required to evaluate and manage the injured patients. These may include:

- Additional laboratory studies
- Additional radiographs, (e.g., for extremity injuries)
- Angiography
- Application of PASG, pelvic orthotic device, pelvic sheet wrapping, or “beanbag” wrapping for unstable pelvic fractures
- Bronchoscopy
- Esophagoscopy
- Wound care
- Tetanus prophylaxis
- Application of traction devices
- Administration of medications, including
  - Antibiotics
  - Pain medication, such as morphine or fentanyl
  - Sedation, such as etomidate, propofol, or midazolam
  - Neuromuscular blocking agents, such as vecuronium
- Preparation for the operating room
- Preparation for admission
- Preparation for transfer and transport

**Evaluation and Ongoing Assessment**

The evaluation of a trauma patient is that phase of the nursing process when the nurse evaluates the patient’s responses to the injury event and the effect of all interventions. The achievement of the expected outcomes is evaluated, and the treatment/intervention plan is adjusted to enhance these outcomes. To evaluate the patient’s progress, monitor the following:

- Airway patency
- Effectiveness of breathing
- Arterial pH, PaO₂, and PaCO₂
- Oxygen saturation (SpO₂ or SaO₂)
- Level of consciousness
- Skin temperature, color, moisture
- Pulse rate and quality
- Blood pressure
- Urinary output

Ongoing assessment of the aforementioned parameters is an essential component of the trauma nursing process. In addition, pain and the patient’s response to analgesia and sedation needs to be reassessed frequently. The goal of these interventions should be to achieve the desired level of pain management with minimal side effects (e.g., respiratory depression, hypotension), because side effects may serve to diminish the patient’s response to resuscitation. Written documentation of all information generated during the trauma nursing process is an essential responsibility of the trauma nurse.

Psychosocial support of the patient should be provided. When family or friends are available, they should be allowed to stay with the patient. The patient or family may have questions and needs that should be addressed as quickly as possible by the trauma team.²

**Selected Patient Assessments**

**Initial Assessment and Management of the Victim of Violence**

Traumatic injuries may be the result of an act of violence. Two types of victims of violence frequently seen in the emergency department are patients who have injury as the result of intimate partner violence or who have been sexually assaulted. When injury has been sustained from an act of violence, the collection of evidence is an important part of patient care. For example, a patient who may have sustained a self-inflicted gun shot wound should have paper bags placed on the hands. However, it is important to point out that evidence collection never supersedes any interventions that are needed to save the patient’s life.¹⁶
Assessment

History
Data collection should take place in a quiet, safe, private environment if at all possible, away from family members or individuals who may have accompanied the patient. The nurse should ascertain whether or not the victim knew the assailant. Determination of this fact will serve as a guide to the type of questions that the nurse needs to ask to gather data. The initial questions might include:
- Does the patient know his/her assailant?
- Is the patient in a relationship with someone who has hurt her or him before?
- Is the patient pregnant?
- Was the patient forced to have sexual intercourse?
- Can the patient explain the injuries he or she has sustained?

Refer to Box 3-2 for additional screening questions that the nurse may ask in situations where intimate partner violence is suspected.

Physical Assessment

Inspection and Palpation
Assess for the presence of bruises, contusions, lacerations, and burn marks. Look for:

- Contusions to the head, neck, or chest
- Bruising and contusions to the face and chest
- Bruising around wrists and ankles (signs of physical restraint)
- Burn marks on the face, chest, and genitals
- Injuries that suggest a defensive posture (bruises on the back of a patient’s arms, defensive wounds)
- Injuries that do not equate with reported mechanism of injury
- Substantial delay from the time of injury to seeking treatment
- Evidence of drug or alcohol use
- Bite marks

Assess the perineum and rectum for the following:
- Bleeding
- Lacerations and tears
- Fluids
- Swelling

Assess the patient’s breasts for:
- Lacerations
- Bruising
- Bite marks

Palpate the patient’s abdomen and rectum for tenderness and swelling.

Diagnostic Procedures

Radiographic Studies
- CT scan of the head if there is evidence of head trauma
- Radiographs of any area of injury

Laboratory Studies
Laboratory studies should be obtained based on protocols used for evidence collection related to victims of violence. Laboratory studies that may be collected include:
- Tests for sexually transmitted diseases, including HIV screening
- Blood, hair, and mucosal samples for DNA evidence
- Drug screening if the patient feels that he or she may have been drugged

Other Studies
Based on each department’s protocols, either the emergency staff or a forensic or sexual assault nurse examiner may perform other studies.
Planning and Implementation/Interventions

- Perform primary and secondary assessments to identify and treat any life-threatening injuries.
- Assure the patient that he or she is safe.
- Keep threatening persons away from the patient.
  - Use hospital security.
  - Call local authorities.
- Notify the forensic nurse examiner or sexual assault nurse examiner, if he or she is available, to examine and collect evidence related to the assault.  
- If a forensic nurse examiner or sexual assault nurse examiner is not available, collect evidence per department protocol by
  - Placing evidence in separate paper bags
  - Sealing the bag with a label that contains
    - Patient name
    - Date
    - Time
    - Location of where evidence was collected
    - Name and signature of the person collecting the evidence
- Maintain chain-of-custody of any evidence collected.
- Give the evidence to appropriate authorities and document this on the chart.
- Administer medications based on protocols, for example:
  - Treatment for sexually transmitted diseases
  - Postcoital contraception
- Obtain a patient advocate for the patient.
- Provide the patient with information about how to remain safe.
- If the patient is to be discharged from the emergency department, ensure that the patient has appropriate discharge instructions for follow-up care.

Evaluation and Ongoing Assessment

- Maintain patient safety.
- Answer the patient's questions.

Initial Assessment and Management of the Violent Patient

Patients who act violent at the scene of the injury or who are at risk of becoming violent must be carefully assessed and effectively managed so that care can be safely provided to the patient.  
Ruling out an organic cause of the patient's violent behavior must always be done to ensure that the patient has not sustained an injury (such as head trauma) or has an illness (such as diabetes) that is causing the violent behavior.

Signs and Symptoms (Risk Factors for Violent Behavior)

- A direct threat made to a member of the trauma team, for example:
  - "If you don't stop what you are doing, you will regret it."
  - "I will hurt your family."
  - "I will kill you."
- A patient found with weapons on their person
- Previous violent behaviors
  - Intimate partner violence
  - Incarceration for physical assault
  - Incarceration for sexual assault
- A patient who is out of control because of ingestion of a substance, such as
  - Methamphetamine
  - Cocaine
  - Alcohol
- Psychiatric disorders
  - Bipolar disease
  - Paranoia
- Report of violence at the scene of the injury
  - Attempting to escape from authorities
  - Involvement in a crime such as a fight
  - A patient who is being legally detained

Assessment

History

- How was the patient injured?
- Is there any history of violent or abusive behavior?
- Does the patient have a history of substance abuse?
- How was the patient transported to the emergency department?
- Did the patient require either physical or chemical restraints to be transported?
- Is the patient being legally detained?

Physical Assessment

Inspection

- Assess the patient's level of consciousness.
- Look for any evidence of substance abuse such as needle tracks or skin popping.
- Note the presence of physical restraints.
• Note violent behaviors.
  • Kicking
  • Screaming
  • Spitting
  • Biting
  • Verbal and threatening abuse
• Note evidence of self-injury.
  • Wrist lacerations
  • Scarring from previous injuries
  • Burns

**Summary**

The initial assessment of the trauma patient, the first step of the trauma nursing process, includes primary and secondary assessments. If life-threatening conditions are present, the nurse must stop the assessment and intervene to correct these problems before proceeding with the assessment. Care of the seriously injured trauma patient is best accomplished through a team approach. The A through I mnemonic is

A—Airway with simultaneous cervical spine protection
B—Breathing
C—Circulation
D—Disability (neurologic status)
E—Expose/environmental controls
F—Full set of vital signs/focused adjuncts/family presence
G—Give comfort measures
H—History and head-to-toe assessment
I—Inspect posterior surfaces

Refer to this chapter for information regarding a description of

• General information related to history, which should be collected for every trauma patient
• Assessment of the patient's airway and effectiveness of breathing and circulation
• Frequently ordered radiographic and laboratory studies
• Specific nursing interventions for patients with compromises to airway, breathing, circulation, and disability
• Ongoing evaluation of the patient's airway and effectiveness of breathing and circulation

This general information will not be repeated in the following chapters, which will focus on specific areas of injury.

**References**


