

Patient Assessment Scenario "T"

Comprehensive Guide



SCENARIO SETTING AND PATIENT INFORMATION

Setting

Scenario occurs in a community hospital without surgical services. Portable x-ray and bedside ultrasound are available. CT scan will take 60 minutes to be ready. A total of 4 units of blood are available. Plasma and platelets will take 90 minutes to arrive. A massive transfusion / hemorrhage protocol is not available. The nearest referral center with surgical services is 25 miles (40 km) away. Both ground and air transport are available.

Personnel

- ATLS Learner is the only advanced care clinician available.
- Emergency Area Registered Nurse
- Emergency Area Technicians (2)

Incident History

The site may determine patient gender based on model used.

M	A 24-year-old is brought to the Emergency Area by a friend who heard screams approximately 20 minutes ago and found the patient lying on the floor with multiple stab wounds.
I	The friend reports the patient was stabbed in the right chest and left abdomen. The friend heard a bubbling noise coming from the right chest.
S	The friend reports the patient was moaning, agitated, and breathing rapidly.
T	No treatments.

INJURIES AND INJURY MANIFESTATIONS

PHYSICAL FINDINGS	INJURIES	SKILLS
Dyspnea and tachypnea, 3 cm wound at the right 3rd intercostal space at the midclavicular line that is bubbling with breaths	Open pneumothorax	Breathing assessment, tube thoracostomy, chest x-ray interpretation
Hypotension, agitation	Hemorrhagic shock	Circulation assessment, volume resuscitation
3 cm wound at the junction of the left 10th intercostal space and anterior axillary line, abdominal distension	Intra-abdominal injury	Penetrating trauma assessment, FAST/eFAST image interpretation
4 cm left back wound about 10 cm from the midline at the level of T12, gross hematuria	Potential left kidney injury	Exposure stage of Primary Survey; penetrating trauma assessment

Imaging

- Slide 1: Chest x-ray – appropriately position right thoracostomy tube with residual hemothorax
- Slide 2: FAST image (right upper quadrant) – no intra-abdominal fluid
- Slide 3: FAST image (left upper quadrant) – intra-abdominal fluid around the spleen; kidney image is distorted

INITIAL ASSESSMENT

Pre-arrival Huddle

There is no opportunity for a pre-arrival huddle. The Learner should request activation of a trauma response team if a protocol is available at the hospital. The Learner may request notification of the blood bank, radiology, and other services. The Learner should indicate that appropriate personal protective equipment must be worn

Primary Survey



- The Learner should identify injuries and subsequent physical and imaging findings in proper sequence and institute resuscitative measures.



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x-ABCDE

The Learner should indicate that all clothing is removed and measures taken to prevent hypothermia and maintain patient privacy. The Learner should request vital signs. The Learner should request continuous ECG and pulse oximetry monitoring. BP should be measured and cycled every 5 minutes. The Learner should request insertion of two large bore IV catheters.

X: eXsanguinating eXternal Hemorrhage

- On anterior examination, there is a 3 cm wound at the right 3rd intercostal space at the midclavicular line and a 3 cm wound at the junction of the left 10th intercostal space and anterior axillary line. Neither of these two wounds has major external hemorrhage.

A: Airway

-  The nurse reports a respiratory rate of 35. The respirations are rapid and shallow. The Learner should request the SpO₂ which is 89%. The Learner should apply supplemental oxygen and assess the airway for obstruction. The patient mumbles that there is pain in the chest and abdomen. The voice is weak but clear. There is not a cough. The trachea is midline. Jugular veins are not distended. The Learner should conclude that the airway is patent and progress to Breathing assessment.
- If the Learner requests further vital signs, these are being obtained. The Instructor will relate these during Circulation assessment.
- If the Learner attempts to insert an oral airway or suction catheter, the patient gags. If the Learner performs RSI, hypotension and cardiac arrest occur with medication administration. At the discretion of the Instructor, the patient may not respond to treatment.

B: Breathing

- The Learner should examine the chest. There is a wound 3 cm in length at the right 3rd intercostal space at the midclavicular line with frothy blood coming from the wound. Breath sounds are absent on the right. The Learner should recognize the presence of an open right pneumothorax.
-  The Learner should place an occlusive dressing on the wound and proceed to right tube thoracostomy. If the Learner places a dressing (even if taped only on three sides to permit venting of the thoracic cavity) and does not immediately proceed to tube thoracostomy, the Instructor indicates that oxygen saturation is rapidly decreasing.
- If the Learner elects to perform a chest x-ray before tube thoracostomy, the Instructor indicates that oxygen saturation decreases and the respiratory rate increases.
- The Learner should describe tube thoracostomy including anatomic landmarks and correct technique. The Learner should place the tube through an incision separate from the wound. The Learner should secure the tube and connect it to an underwater seal drainage system with suction. Air bubbles appear in the water seal and 500 mL of blood are drained. The Learner should recognize that an air leak is present.
- The Learner should request a chest x-ray and may proceed to Circulation assessment. The Instructor may show the chest x-ray now (Slide #1) or later in the scenario. The chest x-ray shows a right thoracostomy tube with a residual hemothorax layering over the right lung field (the x-ray was performed in the supine position). If the Learner is unable to interpret the x-ray, the Instructor may say that a remote Radiologist has reviewed the x-ray with the results as noted above.

- After tube thoracostomy, if not done previously, the wound dressing should be completely occlusive (taped on all sides).
- The Learner should reassess Breathing. Breath sounds are present bilaterally. Respiratory rate is 28. The SpO₂ is 95%.
- Arterial blood gas determination may be requested. The values are pH 7.25, PaO₂ 94 mm Hg (12.5 kPa), PaCO₂ 32 mm Hg (4.3 kPa), SaO₂ 96%, and BD 12.1 mmol/L.

C: Circulation

-  The Learner should examine the skin, assess capillary refill, palpate pulses, and review vital signs. The skin is cool and clammy. Capillary refill is more than 4 seconds. Pulses are rapid and weak, but present in all extremities. Blood pressure is 80/60 and heart rate is 130.
- The Learner should recognize the presence of shock. If not performed earlier, the Learner should initiate two large caliber IVs and obtain blood for type and crossmatch and laboratory determinations. If the Learner asks for the lab results, the Instructor should indicate that the results will be available in 20 minutes. The Instructor may relate the ABG results (values as above) if requested.
- The Learner should order transfusion of warmed blood products as blood is available at this hospital. If not done already, an ECG monitor should be connected. The tracing shows sinus tachycardia with a heart rate of 130.
- The Learner should assess for external, thoracic, abdominal, retroperitoneal / pelvic, or soft tissue / muscular compartment sources of continued hemorrhage. Bleeding is controlled at the chest wound and the 3 cm wound at the left 10th intercostal space anterior to the mid-axillary line. The Learner should perform a logroll procedure to examine the back for wounds. A 4 cm left back wound about 10 cm from the midline at the level of T12 is present. There is minimal venous blood oozing from the wound edges that is controlled with a bandage. Rectal exam is not indicated but is normal if performed.
- Chest x-ray demonstrated a residual hemothorax. The Instructor may show the image on Slide #1 if not done previously. If requested, thoracostomy output is 700cc total (increased from 500cc).
- The abdomen is distended and tender. The Learner should perform a FAST examination. Depending on the practice setting, a DPL may be considered. A CT scan is not appropriate. The Learner should describe the technique of FAST or DPL. Intra-abdominal fluid is present around the spleen. There is no pericardial fluid. The Instructor may choose to show the FAST images on Slides #2 and #3 for interpretation. If DPL is performed, 20cc of blood is obtained on aspiration and lavage fluid is red and opaque.
- The mechanism of injury is not consistent with a pelvic fracture. Pelvic x-ray is not indicated. The soft tissue and muscular compartments are soft.
- The Learner should conclude that hemorrhagic shock is likely due to chest, abdominal, and potential left kidney injuries. Blood transfusion should be continued, and vital signs should be reassessed after blood resuscitation. The Learner may mention maintaining a goal blood pressure of 90 due to uncontrolled hemorrhage following penetrating trauma. The Learner should recognize the indication for surgical consultation and initiate the transfer process if not started previously. While blood is infusing, the Learner should progress to Disability assessment.



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D: Disability

- The Learner should assess pupil response and the GCS score.
- The pupils are 3 mm in diameter and normally reactive to light.
- The eyes open to verbal stimuli (E = 3).
- The patient responds verbally but is confused to location and events. (V = 4).
- The patient follows all instructions to move extremities (M = 6).
- GCS score is 13 (E3, V4, M6).
- The Learner should assess spinal cord function. The patient moves all extremities equally and has no sensory deficits to light touch.

E: Environment/Exposure

- The patient's clothing was removed and a complete exam for additional injuries was performed during Circulation assessment. The Learner should maintain measures to prevent hypothermia and to maintain patient privacy (i.e., providing warm blankets, increasing the room temperature, and providing warmed IV fluids).

- There is no exsanguinating hemorrhage from the wounds.
- The patient can speak clearly and reports no allergies, no medications, no prior illnesses. The injury occurred during a home invasion. The patient last ate 2 hours ago.
- Thoracostomy output is 750 cc and there is a small air leak.
- Bilateral breath sounds are present and remain slightly decreased on the right. RR is 26, and SpO₂ is 97%.
- A repeat chest x-ray may be requested. If so, there are no changes from the image on Slide #1.
- BP is 95/60, and HR is 124. The abdomen remains tender and distended. Urine is bloody. The third unit of blood is being transfused.
- GCS score is 14 (E4, V4, M6). Motor and sensory function are unchanged.

The Learner should report a treatment plan of balanced resuscitation while facilitating emergent transfer to a higher level of care for surgical consultation. The Learner may utilize permissive hypotension as part of resuscitation and transfer.

SECONDARY SURVEY

The extent to which the Secondary Survey is completed is at the discretion of the Instructor, depending on the Learner's progress through the Primary Survey and the time remaining.

Head

The Learner should examine the head and face for injury. No major injury is identified.

The pupils are 3 mm in diameter and normally reactive to light. The GCS score is 14 (E4, V4, M6).

Neck

The trachea is midline and the neck veins are flat. No subcutaneous emphysema is present. No injury is present.

Chest

The Learner should examine the chest. An occlusive dressing, if placed, is intact and no bleeding is observed. Breath sounds are present bilaterally but slightly diminished on the right. The Learner should indicate that drainage from the thoracostomy tube should be monitored. Thoracostomy output remains 750 cc and a small air leak is present.

Abdomen

The Learner should examine the abdomen by inspection and palpation. The abdomen is distended with generalized tenderness. There is no bleeding from the wounds.

Pelvis/Perineum

No abnormal findings are present on examination of the pelvis and perineum.

Musculoskeletal System

The Learner should examine the extremities for injuries. If not performed previously, the back should be examined. As mentioned earlier, a 4 cm left back wound about 10 cm from the midline at the level of T12 is present. There is minimal venous blood oozing from the wound edges that is controlled with a bandage. No additional injuries are present. A rectal examination is not indicated but is normal if performed.

ADJUNCTS TO THE PRIMARY SURVEY

If the learner attempts to move on to the Secondary Survey before discussing Primary Survey adjuncts, the Instructor may relate that the nurse is asking if there are any other monitoring devices indicated.

Monitoring Devices

Monitoring devices, including an ECG rhythm monitor, a noninvasive BP monitor, and a pulse oximeter should be applied, if not done already.

Chest and Pelvic X-rays, FAST and eFAST exams

Chest x-ray and FAST were performed during the Primary Survey. No additional images are indicated currently.

Urinary Bladder Catheter

A urinary bladder catheter should be inserted. Approximately 150 mL of bloody urine returns when the catheter is inserted. The Learner should indicate possibility of a kidney wound. If the Learner does not suggest placement of a urinary catheter, the Instructor may state that the patient spontaneously voided bloody urine.

Gastric Decompression

Gastric decompression is not indicated in this patient.

Arterial Blood Gas

Arterial blood gas analysis is appropriate. If requested earlier, the values after thoracostomy but before volume resuscitation were pH 7.25, PaO₂ 94 mm Hg (12.5 kPa), PaCO₂ 32 mm Hg (4.3 kPa), SaO₂ 96%, and BD 12.1 mmol/L.

The results following transfusion of 2 units of blood are pH 7.35, PaO₂ 96 mm Hg (12.8 kPa), PaCO₂ 36 mm Hg (4.8 kPa), SaO₂ 97%, and BD = 5.5 mmol/L.

Blood Tests

Blood should have been sent previously to the laboratory for type and crossmatch and other laboratory determinations.

Case Status after Primary Survey and Adjuncts

The Learner should perform a tactical pause and review the xABCDEs before proceeding to the Secondary Survey. On xABCDE reevaluation, these findings are present following transfusion of two units of warmed type O blood:



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TRANSFER TO DEFINITIVE CARE

At completion of the Primary and Secondary Surveys of the Initial Assessment, the Learner should request current vital signs and review the xABCDE's as part of a tactical pause. Assessment is unchanged. The patient has received 3 units of blood. Vital signs are BP 98/65, HR 118, RR 20, and SpO₂ 98% with 50% supplemental oxygen. GCS score remains 14. Total thoracostomy tube output is 800cc. If not mentioned earlier, the Learner should indicate that transfer to a facility with surgical services for management of intra-abdominal injury is indicated. The Learner should speak directly with the receiving surgeon.

Pretransfer Management

The Learner should describe these aspects of management before and during transfer:

- Appropriate handover to the receiving surgeon
- Provision of continuous monitoring, oxygen supplementation, and pain / anxiety relief
- Ensure bleeding is controlled from all wounds
- Monitoring of thoracostomy output
- Adequately secure the thoracostomy tube
- Set a blood pressure goal for transfusion of the last unit of blood during transport
- Administration of tetanus prophylaxis and antibiotics
- Adequate fixation of the urinary catheter
- Copies of all test results and images are prepared to accompany the patient

Transfer Specifics

The Learner should review specifics of transfer, including the personnel and equipment / supplies. If time permits, question the Learner about plans for managing changes in patient status that may occur during the transport process, such as a decrease in the blood pressure, dislodgement of the thoracostomy tube, worsening of respiratory status, and decline in mental status.

The Learner should use the S-xABCDE-BAR tool to provide a handover to the surgeon. The Learner should relay these specifics:

- Arrived by private vehicle after multiple stab wounds.
- Wounds present in the right midchest, junction of the left 10th intercostal space and anterior axillary line, and the left back.
- No exsanguinating hemorrhage. No airway obstruction.
- Right sucking chest wound treated with occlusive dressing and tube thoracostomy with total 800cc of blood drained. Respiratory rate 20 and SpO₂ 98% with 50% supplemental oxygen.
- Hemorrhagic shock with arrival BP 80/60 and HR treated with a total of 3 units of blood. FAST demonstrates intra-abdominal fluid. Hematuria present.
- Current BP 98/65, HR 118. Plan to maintain systolic BP 90-95 due to likely uncontrolled intra-abdominal and/or kidney bleeding following penetrating injury.
- GCS score was 14, pupils were reactive, and both motor and sensory exams are intact.
- No other wounds detected.
- Chest x-ray demonstrate right thoracostomy tube and residual hemothorax.

- The patient reported no allergies, no medications, and no prior illnesses. The injury reportedly occurred during a home invasion. The patient last ate 2 hours ago.
- Administered tetanus immunization and antibiotics.
- Recommend urgent operation for likely intra-abdominal and left kidney injuries.

DIRECTIONS FOR MOULAGE

- Apply makeup to simulate shock.
- Using makeup and moulage, create a three stab wounds that do not have active arterial bleeding:
 - A 3 cm long wound at the right third intercostal space, cephalad to the nipple line, at midclavicular line with blood from the wound. If possible, to simulate an open chest injury, a hand pump may be used to create bloody froth and bubbles from the wound.
 - A 3 cm left thoracoabdominal wound at the junction of the left 10th intercostal space and anterior axillary line.
 - A 4cm left flank wound about 10 cm from the midline at the level of T12 that is only visible if the Learner rolls the patient.
- The chest and thoracoabdominal wounds should be visible without rolling the patient. There should be a bloodstain overlying these areas on the shirt.

DIRECTIONS FOR THE PATIENT MODEL

You found a thief in your home. The thief stabbed you three times, in the right chest, left flank, and left back. A friend heard you scream for help and brought you to the hospital. You have difficulty breathing and are breathing rapidly and shallowly. There is bubbling from the right chest wound. You can speak but have a weak voice and are drowsy due to shock. You open your eyes when the Learner speaks to you but not spontaneously, you answer questions slowly and are confused to your location and the day, and you accurately respond to instructions to move your arms and legs. Once a chest tube is inserted, you can breathe slower and easier. Examination of the abdomen creates significant pain, and you respond by grimacing and moving away from the examiner. After you receive several units of blood you are more awake, remain confused to time and location, and look around spontaneously. You have no allergies, take no medications, and have had no prior illnesses. You last ate 2 hours ago.

Notes:

