



ATLS SECONDARY SURVEY

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Finalize your patient's suffering

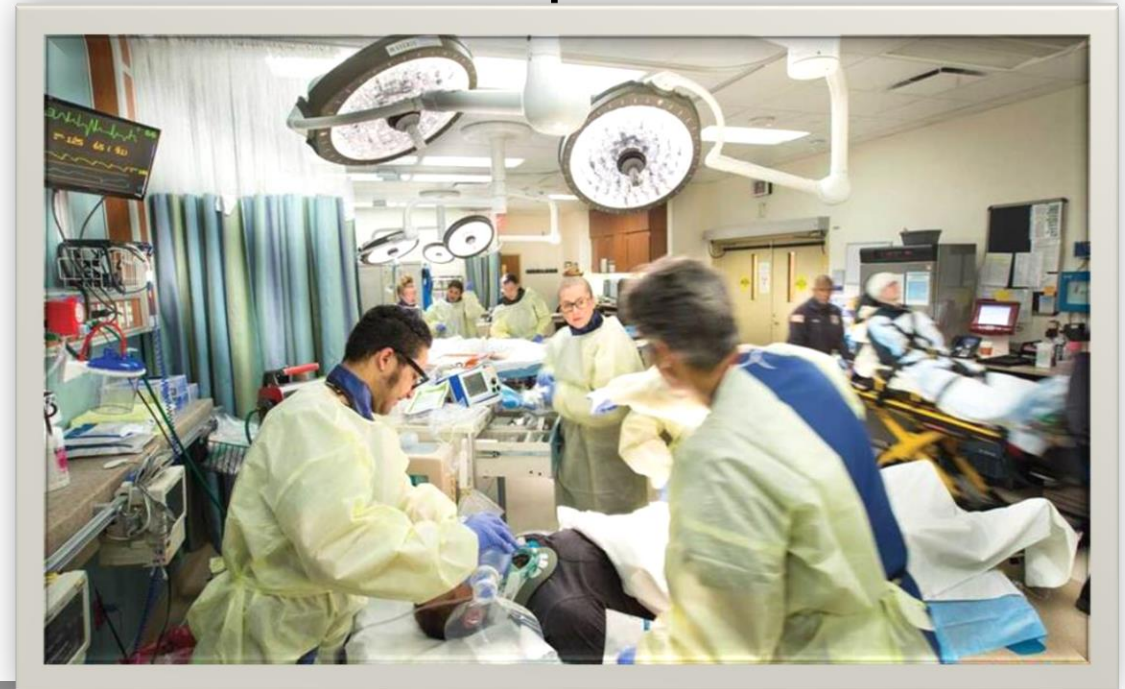
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Objectives:

1. The corner stone steps of secondary survey
2. When to ask for investigations?
3. If you find deterioration what should you do?
4. At the end of this survey what is the next step?





Case scenario

Q- You receive a 47-year old male victim with multiple trauma site at the face, neck, torso and extremities. After you finish your primary survey and your patient seems to be stable regarding life threatening injuries, what should be your next step?



Secondary Survey:

1. The secondary survey does not begin until the primary survey (ABCDE) is completed, resuscitative efforts are under way, and improvement of the patient's vital functions has been demonstrated.
2. The secondary survey is a head to toe evaluation of the trauma patient that is, a complete history and physical examination, including reassessment of all vital signs. Each region of the body is completely examined. The potential for missing an injury or falling to appreciate the significance of an injury is great, especially in an unresponsive or unstable patient.



History

“AMPLE”

is a useful mnemonic for this purpose:

- ❖ Allergies
- ❖ Medications currently used
- ❖ Past illnesses/Pregnancy
- ❖ Last meal
- ❖ Events/Environment related to the injury





Types of injuries:

1. Blunt Trauma:

Results from automobile collisions, falls, and other injuries related to transportation, recreation, and occupations.

Important information to obtain about automobile collisions includes seat belt use, steering wheel deformation, presence and activation of air bag devices, direction of impact, and patient position in the vehicle.

Ejection from the vehicle greatly increases the possibility of major injury.



Penetrating Trauma:

- ❖ factors that determine extent of injury and subsequent management include the body region that was injured, organs in the path of the penetrating object, and velocity of the missile.
- ❖ Therefore, in gunshot victims, the velocity, caliber, presumed path of the bullet, and distance from the weapon to the wound can provide important clues regarding the extent of injury





Thermal Injuries

- ❖ can occur alone or in conjunction with blunt and/or penetrating trauma resulting from, for example, a burning automobile, explosion, falling debris, or a patient's attempt to escape a fire
- ❖ Inhalation injury and carbon monoxide poisoning often complicate burn injuries.





Physical examinations:

1. physical examination follows the sequence of head, maxillofacial structures, cervical spine and neck, chest, abdomen and pelvis, perineum/rectum/vagina, musculoskeletal system, and neurological system.



Head

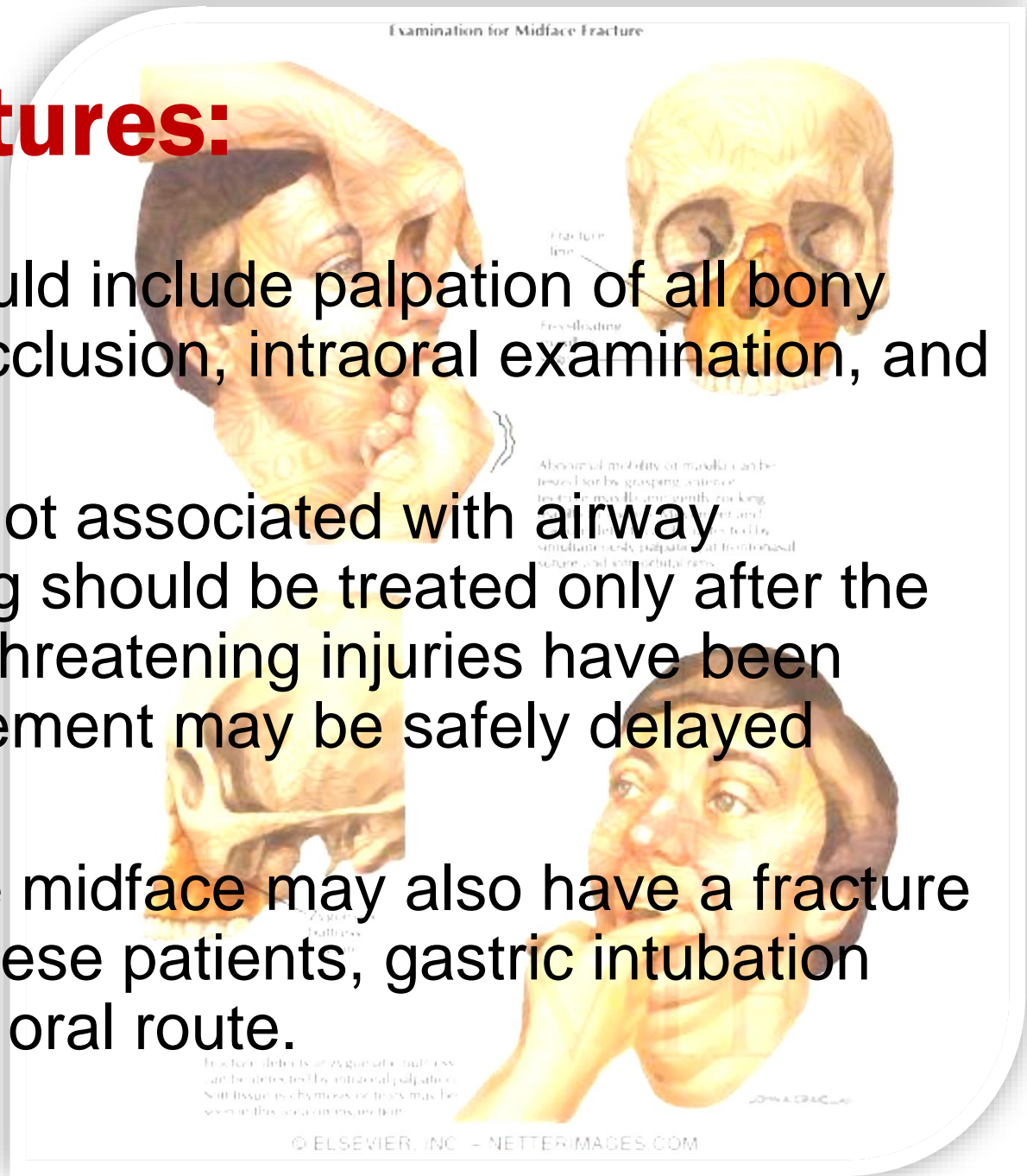
- ❖ The entire scalp and head should be examined and palpated for lacerations, contusions, and evidence of fractures.
- ❖ perform a quick visual acuity examination of both eyes by asking the patient to read printed material, such as a handheld Snellen chart.
- ❖ Ocular mobility should be evaluated to exclude orbital fractures.





Maxillofacial Structures:

1. Examination of the face should include palpation of all bony structures, assessment of occlusion, intraoral examination, and assessment of soft tissues.
2. Maxillofacial trauma that is not associated with airway obstruction or major bleeding should be treated only after the patient is stabilized and life threatening injuries have been managed. Definitive management may be safely delayed without compromising care.
3. Patients with fractures of the midface may also have a fracture of the cribriform plate. For these patients, gastric intubation should be performed via the oral route.





Cervical Spine & Neck:

1. Patients with maxillofacial or head trauma should be presumed to have a cervical spine injury (e.g., fracture and/or ligament injury), and cervical spine motion must be restricted.
2. The absence of neurologic deficit does not exclude injury to the cervical spine.
3. Examination of the neck includes inspection, palpation, and auscultation. Cervical spine tenderness, subcutaneous emphysema, tracheal deviation, and laryngeal fracture can be discovered on a detailed examination.
4. The carotid arteries should be palpated and auscultated for bruits.



Cervical Spine & Neck

1. Most major cervical vascular injuries are the result of penetrating injury; however, blunt force to the neck or traction injury from a shoulder harness restraint can result in intimal disruption, dissection, and thrombosis.
2. Protection of a potentially unstable cervical spine injury is imperative for patients who are wearing any type of protective helmet, and extreme care must be taken when removing the helmet.
3. The finding of active arterial bleeding, an expanding hematoma, arterial bruit, or airway compromise usually requires operative evaluation.



Chest:

1. Visual evaluation of the chest, both anterior and posterior, can identify conditions such as open pneumothorax and large flail segments. A complete evaluation of the chest wall requires palpation of the entire chest cage, including the clavicles, ribs, and sternum.
2. Evaluation includes inspection, palpation, auscultation and percussion, of the chest and a chest x ray. Auscultation is conducted high on the anterior chest wall for pneumothorax and at the posterior bases for hemothorax.
3. Distant heart sounds and decreased pulse pressure can indicate cardiac tamponade.
4. Cardiac tamponade and tension pneumothorax are suggested by the presence of distended neck veins, although associated hypovolemia can minimize or eliminate this finding.



Chest Trauma



1. Rib fractures may be present, but they may not be visible on an x ray.
2. A widened mediastinum and other radiographic signs can suggest an aortic rupture.



Abdomen & Pelvis

1. Abdominal injuries must be identified and treated aggressively. Identifying the specific injury is less important than determining whether operative intervention is required.
2. A normal initial examination of the abdomen does not exclude a significant intraabdominal injury.
3. Close observation and frequent reevaluation of the abdomen, are important in managing blunt abdominal trauma, because over time, the patient's abdominal findings can change.
4. Pelvic fractures can be suspected by the identification of ecchymosis over the iliac wings, pubis, labia, or scrotum.
5. Pain on palpation of the pelvic ring is an important finding in alert patients.
6. Assessment of peripheral pulses can identify vascular injuries.



Abdomen & Pelvis

- ❖ Placement of a pelvic binder can limit blood loss from pelvic fractures.
- ❖ Patients with a history of unexplained hypotension, neurologic injury, impaired sensorium secondary to alcohol and/or other drugs, and equivocal abdominal findings should be considered candidates for DPL, abdominal ultrasonography or, if hemodynamic findings are normal, CT of the abdomen.
- ❖ Maintain a high level of suspicion and recognize injuries with a high risk of development of compartment syndrome (e.g., long bone fractures, crush injuries, prolonged ischemia, and circumferential thermal injuries).



Abdomen & Pelvis



Hip Pointer





Perinium Rectum & Vagina

The perineum should be examined for contusions, hematomas, lacerations, and urethral bleeding.

Rectal examination may be performed to assess for the presence of

blood within the bowel lumen, integrity of the rectal wall, and quality of

sphincter tone.

Assess for the presence of blood in the vaginal vault and vaginal lacerations.

pregnancy tests should be performed on all females of childbearing age.



Musculoskeletal System:

- ❖ Extremities should be inspected for contusions and deformities. Palpation of bones and examination for tenderness and abnormal movement aids in the identification of occult fractures.
- ❖ Significant extremity injuries can exist without fractures being evident on examination or x rays.
- ❖ Ligament ruptures produce joint instability.
- ❖ Muscle tendon unit injuries interfere with active motion of the affected structures.
- ❖ Impaired sensation and/or loss of voluntary muscle contraction strength can be caused by nerve injury or ischemia, including that due to compartment syndrome.
- ❖ **The musculoskeletal examination is not complete without an examination of the patient's back. Unless the patient's back is examined, significant injuries can be missed.**






The Neurological System:

- ❖ A comprehensive neurologic examination includes motor and sensory evaluation of the extremities, as well as reevaluation of the patient's level of consciousness and pupillary size and response.
- ❖ The GCS score facilitates detection of early changes and trends in the patient's neurological status.
- ❖ In patients with head injuries monitor frequently for deterioration in level of consciousness and changes in the neurologic examination, as these findings can reflect worsening of an intracranial injury.
- ❖ If a patient with a head injury deteriorates neurologically, reassess oxygenation, the adequacy of ventilation and perfusion of the brain (i.e., the ABCDEs)



GCS

Glasgow Coma Scale

EYE OPENING		VERBAL RESPONSE		MOTOR RESPONSE	
					
Spontaneous >	4	Orientated >	5	Obey commands >	6
To sound >	3	Confused >	4	Localising >	5
To pressure >	2	Words >	3	Normal flexion >	4
None >	1	Sounds >	2	Abnormal flexion >	3
		None >	1	Extension >	2
				None >	1

GLASGOW COMA SCALE SCORE

Mild
13-15

Moderate
9-12

Severe
3-8



- ❖ The neurosurgeon will decide whether conditions such as epidural and subdural hematomas require evacuation, and whether depressed skull fractures need operative intervention.
- ❖ Any evidence of loss of sensation, paralysis, or weakness suggests major injury to the spinal column or peripheral nervous system.
- ❖ Neurologic deficits should be documented when identified, even when transfer to another facility or doctor for specialty care is necessary.
- ❖ Protection of the spinal cord is required at all times until a spine injury is excluded. Early consultation with a neurosurgeon or orthopedic surgeon is necessary if a spinal injury is detected.



Adjunct to the Secondary Survey

- ❖ Specialized diagnostic tests may be performed during the secondary survey to identify specific injuries. These include additional x ray examinations of the spine and extremities; CT scans of the head, chest, abdomen, and spine; contrast urography and angiography; transesophageal ultrasound; bronchoscopy; esophagoscopy; and other diagnostic procedures.
- ❖ Many trauma centers skip plain films and use CT instead for detecting spine injury. Restriction of spinal motion should be maintained until spine injury has been excluded.
- ❖ An AP chest film and additional films pertinent to the site(s) of suspected injury should be obtained.
- ❖ These specialized tests should not be performed until the patient has been carefully examined and his or her hemodynamic status has been normalized.



Re-evaluation

- ❖ Trauma patients must be reevaluated constantly to ensure that new findings are not overlooked and to discover any deterioration in previously noted findings.
- ❖ A high index of suspicion facilitates early diagnosis and management.
- ❖ Continuous monitoring of vital signs, oxygen saturation, and urinary output is essential.
- ❖ For adult patients, maintenance of urinary output at 0.5 mL/kg/h is desirable. In pediatric patients who are older than 1 year, an output of 1 mL/kg/h is typically adequate.
- ❖ Periodic ABG analyses and end tidal CO₂ monitoring are useful in some patients.



- ❖ The relief of severe pain is an important part of treatment for trauma patients.
- ❖ Effective analgesia usually requires the administration of opiates or anxiolytics intravenously (intramuscular injections are to be avoided).
- ❖ Careful administration of analgesia while avoiding respiratory status or mental depression, and hemodynamic changes.





Questions?





Take Home Message

- ❖ Dealing with trauma patient is serious and needs a precise steps
- ❖ Don't send patients unnecessary investigations.
- ❖ Always think for either referral or admission at the end of any vital step.
- ❖ Trivial trauma may cause serious sequelae!



References

- ❖ Advanced Trauma Life Support , American College of Surgeons, 10 TH Edition
- ❖ Trauma Secondary Survey, NBCI



Thank you