

L2



Trauma

Slides change from 439

Objectives:

- No Objectives in slides



Dr. Wahdan Playlist

Color index:

Main Text	Textbook
Males slides	Important
Females slides	Golden notes
Doctor notes	Extra

Editing file

Trauma



Types of Trauma: 439 Slides

Major trauma:

in physical medicine, is a **severe** physical injury caused by an external source.

Psychological trauma:

a type of **damage** to the **psyche** that occurs as a result of a severely distressing event.

Traumatic injury:

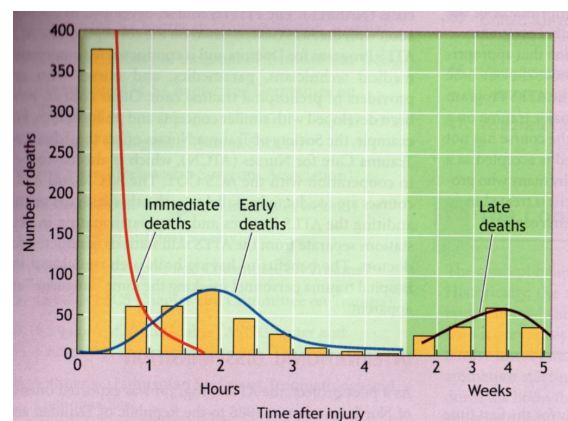
sudden physical injury caused by an external force, which **does not rise to the level of major trauma**.

Stats:

- Leading cause of death for individuals up to the age of 44.
- **Disabilities exceed deaths by ratio of 3:1**
- More than 400 billion trauma-related costs each year.
- Road traffic crashes kill 1.2 mill a day
- There is lack of public awareness for injury prevention.
- **Leading causes of death & disability in Saudi Arabia:**

Trimodal Death in Trauma

Relatively few patients die after the first 24 hours following injury. Rather, the majority of deaths occur either at the scene or within the first four hours after the patient reaches a trauma center. **late death usually occur in weeks and mostly due to multiple organ failure (MODS) and infection (Sepsis)**



Trimodal Death Distribution¹

1. It is often quoted that trauma deaths have a trimodal distribution. **The first peak** 'immediate deaths', represent deaths (unsurvivable injuries: ruptured aorta, airway compromise, severe head injury) occurring immediately after or within a few seconds of injury, contributes up to 50% of the total. This peak is impacted by increased trauma preventive measures which is done at level of the government. **The second peak** 'early deaths', up to 4 hours after injury and accounts for 30% of deaths (This peak is the golden hour of care, and is impacted by early hospital care, ex: hemorrhagic shock), and the final 20% occur in the **third peak** 'late deaths' and it takes place (usually in an intensive care unit) days or weeks after the event (usually caused by sepsis and multiorgan dysfunction syndrome). This peak is mainly impacted by optimal early care and trauma center management.

Trauma



What is different in approaching trauma patients?

- Treat greatest threat to life first
- Definitive diagnosis less important
- Physiological approach
- Time is of the essence
- Do no further harm!
- Teamwork



This Table will be with you till the residency!

Table 1 estimated fluid and blood losses based on patient's initial presentation				
	Class I	Class II	Class III	Class IV
Blood loss (ml)	UP to 750	750-1500	1500-2000	>2000
Blood loss (% Blood volume)	Up to 15%	15%-30%	30%-40%	>40%
Heart Rate	<100	>100	>120	>140
Blood Pressure	Normal	Normal	Decreased	Decreased
Pulse Pressure (mmHg)	Normal	Decreased	Decreased	Decreased
Respiratory Rate	14-20	20-30	30-40	>35
Urine Output (mL/hr)	>30	20-30	5-15	Negligible
CNS Mental Status	Slightly Anxious	Mildly Anxious	Anxious , Confused	Confused , Lethargic
Fluid replacement (3:1 rule)	Crystalloid	Crystalloid	Crystalloid & Blood	Crystalloid & Blood





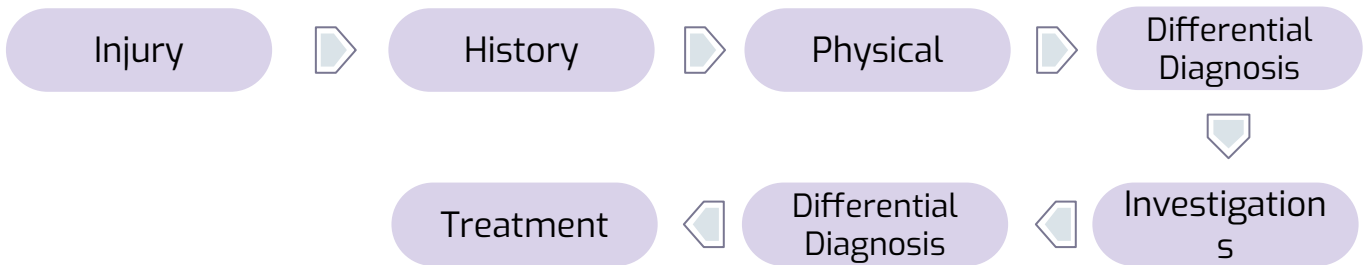
Standard concept (Advanced Trauma Life Support 'ATLS'):

- **ABCDE** approach to evaluation and treatment.
- Treat greatest threat to life first.
- Definitive diagnosis not immediately important.
- Time is of the essence.
- Do no further harm.

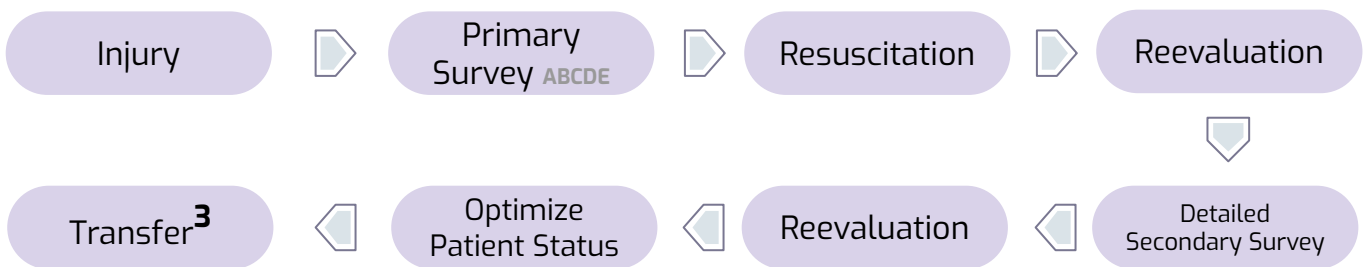
First secure the patient ABCDE before the diagnosis

The most important part of the ATLS is primary survey

Regular Medical Assessment ¹:



Initial Assessment and Management for Trauma Patients ²:



1. The routine approach used for regular patients is called a **secondary survey** in trauma settings. A trauma patient would die before receiving treatment if we approach him this way.
2. In trauma patients we start with the **primary survey** first to save the patient's life (will be further explained in the following slides). Then once we've secured the primary survey, we do secondary survey and detailed assessment.
3. When you are in a faculty that has Limited resource thinking about transferring the patient should occur early while you are doing your primary survey
3. There is a history we need to know in a trauma patient. It's **AMPLE**: **A**llergy, **M**edications **P**ast surgical/medical, **L**ast meal, **E**vent





Case:

24-year-old male involved in a motorcycle crash in to a truck, Not wearing a helmet, Arrives at hospital with the red crescent:

- BP 80/40 (**hypotensive**), P140 (**high, to compensate and improve the cardiac output**), RR 33 (**high, normal RR= 12-20**), and central cyanosis (**a clear indication that there's an issue with ventilation and oxygenation**).
- C-collar, Oxygen at 8L/min, Dressing to forehead & thigh soaked in blood (**indicates active bleeding**).
- Has a wrist splint & is on a spinal board.



How do we deal with this case? ¹

First thing we should do is applying PPE



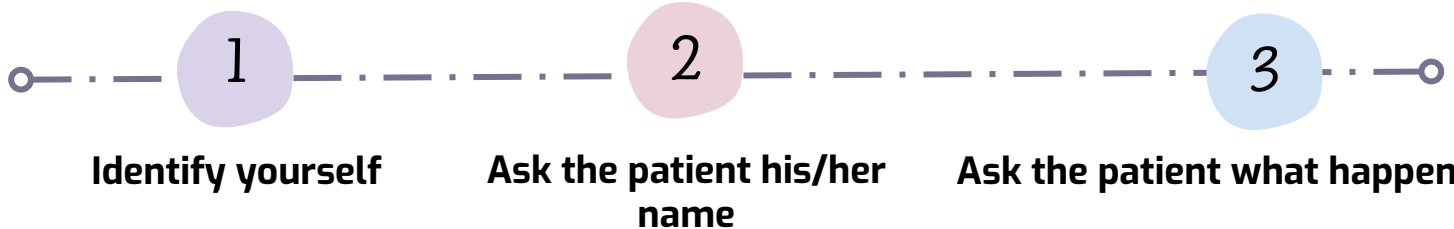
Standard Precautions (PPE) ²:

- Cap, Gown, Gloves, Mask **N95 especially during the COVID-19 pandemic**, Shoe covers, Goggles/face shield. (**All personnel must be appropriately immunized for hepatitis B.** to protect against communicable diseases)



The Quick Assessment ³:

- It's a quick, simple way to assess the patient in 10 seconds



• Appropriate response⁴ confirms:

- ✓ **A → Patent airway.**
- ✓ **B → Sufficient air reserve to permit speech.**
- ✓ **C → Sufficient perfusion to permit cerebration.**
- ✓ **D → Clear sensorium** we need adequate cardiac output to ensure clear sensorium.

1. We start by applying the standard precautions (PPE), then we do the quick assessment test and primary survey.
 2. To protect the patient and the trauma team members from transmitting communicable diseases.
 3. A patient that fails this test needs immediate attention
 4. A patient that is able to response we know that he has a patent airway there is no obstruction, he has a good respiratory reserve because speaking requires air to go out and when he answer appropriately and tells you what happened that means he has enough circulation to his brain to hear, analyze and respond.






The ATLS concept



Overview Advanced Trauma Life Support	Airway with C-spine protection .
	Breathing: Life-threatening chest injury / ventilation / oxygenation.
	Circulation: stop the bleeding .
	Disability: Intracranial mass lesion / neurological status. by using Glasgow scale
	Exposure /Environment/ Body temperature. We have to expose the patient completely. F= foley catheter , G= gastric tube.

★ The Primary Survey (the priorities are the same for all the patients):

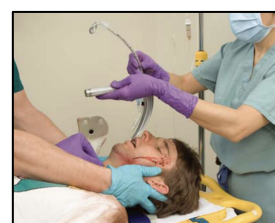
 Airway	<ul style="list-style-type: none"> Evaluate patency : Snoring, Gurgling, hoarseness, stridor Hoarseness indicates If there is laryngeal injury. How to quickly evaluate the airway ? <ul style="list-style-type: none"> Chin lift/ Modified jaw thrust Remove Foreign bodies Definitive airway as necessary Q) what is the meaning of Definitive airway? endotracheal intubation tube placed in the trachea ,A tube that passes between the vocal cords Reassess frequently <p>Establish patent airway and protect c-spine with a collar (Assume every pt has a C spine injury) (Establishing and securing the airway is always the first step in managing any patient with acute trauma or change in mental status. Altered mental status is the most common indication for intubation in trauma patients since unconscious patients can't maintain their airways).</p> <p>Q) what is a quick easy way to evaluate a patient airway ? Talking with the patient by asking what's your name ? And what's happened?If the patient can answer these questions maybe he's ok but when a patient can't respond we worry about the airway distraction > do chin lift > the airway will open</p>
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Basic Airway Techniques	Advanced Airway Techniques ³
<ul style="list-style-type: none"> Chin-lift Maneuver (No head tilt! ²) Jaw-thrust Maneuver <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <p>Chin-lift</p> <p>Jaw-thrust (better than chin-lift)</p> </div>	<ul style="list-style-type: none"> Orotracheal intubation ⁴: The definitive airway control. In case of failure → surgical airway (Cricothyroidotomy ⁵). Nasotracheal intubation: Nasotracheal intubation is indicated in any patient with spontaneous respirations or when orotracheal intubation is not feasible (e.g. in patients with limited mouth opening). However, it's rarely used.



Pitfalls

- Occult airway injury. **If you are suspecting progressive airway loss secure it as soon as possible.**
- Progressive loss of airway (E.g. bleeding in the neck that's slowly pressing on the trachea **and with time you'll notice that the patient is having breathing difficulties.**)
- Equipment failure.(E.g. you want to light up your laryngoscope but the battery is out)
- Inability to intubate. **When they have a very bad facial fracture**



The ATLS concept ¹

1. ATLS provides a structured approach to trauma patients with standard Algorithms of care. It provides a guide for assessment and resuscitation to save the patient's life. However, judgment is required to determine which procedure is needed to save the patient from death. The goal is to provide initial care during the golden hour (window of opportunity which has the greatest impact on morbidity and mortality).

2. To avoid further damage in case the patient had a cervical injury. Bc if the patient had a C-Spine injury and you did a head tilt the patient will be quadriplegic and the innervation to the diaphragm will be lost.

- The patency of the airway is first assessed by direct inspection, identifying and removing obstructions. Noisy breathing, snoring or stridor implies airway obstruction. The most common cause of airway obstruction is a reduced conscious level, with the tongue falling back and blocking the oropharynx. Airway clearance, together with the 'chin-lift' or 'jaw-thrust' manoeuvres, will correct this.

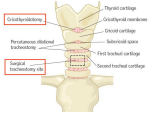
3. Advanced airway techniques are required when: protective airway reflexes are absent (usually caused by altered consciousness), basic techniques are unable to cope with current or predicted airway compromise (e.g. major facial or burns/inhalation injury), there is a need for controlled ventilation (e.g. head and/or chest injury).

4. **Orotracheal intubation** is the advanced airway technique of choice, It protects the airway from aspiration of vomit or blood, and allows ventilation with controlled levels of oxygen and airway suctioning to remove debris. It does, however, require expertise in using anaesthetic and neuromuscular paralyzing agents. (prior to intubation, the patient is pre-oxygenated and must be carefully monitored throughout the process.)

5. Surgical **cricothyroidotomy** is performed by making an incision that extends through the cricothyroid membrane and inserting a tracheostomy tube.

Used for patients in whom attempts of intubation have **failed** or who are precluded from intubation due to **extensive facial injuries**.

★ **Emergent Tracheostomy:** Is indicated in patients with **extensive laryngeal injury**.



The Primary Survey (the priorities are the same for all the patients):

B

Assess and ensure **adequate oxygenation and ventilation**¹:

- Chest rise and symmetry / Chest Movement.

Q) How to identify chest injuries? 1) **inspection**: For example if there is one side moving and the other side is not moving (asymmetry) It could be injury **Q)** What do you think the **name** of this injury ? It could be **Pneumothorax** in the pleura And it could be **ribs fracture** Before the pleura 2) **Palpation**: What are you going to feel? First it gonna be **tender** when you touch them they gonna say ouch. (air trap under skin → surgical emphysema) Feeling like Rice Krispies. 3) **Auscultation** : Q) What are you going to hear? Is there air entry ? Or not

***No air entry with tender chest wall with subcutaneous emphysema → what is the diagnosis? pneumothorax.**

There is pleura around the lung so this tells me pneumothorax is where there is injury to the lung and air is escaping out of that and it's occupying the pleural space. you will hear either no air entry Or decrease air entry. You are not hearing the lung.

*Tension pneumothorax: when tracheal deviation "very late sign" So tension is more physiological approach .Tension is a physiological diagnosis (pneumothorax then your heart is not able to pump against this air, against the pressure comes from pneumothorax so your cardiac output goes down / JVP goes up .

85% of chest injury fixed with tube (very simple procedure)

15% of chest injury fixed with surgery

Q) How to treat pneumothorax? Chest tube

Q) How to treat tension pneumothorax? Needle followed by Chest tube. "Your exam answer in case of tension Pneumothorax >> is Needle decompression" **Ideal answer is : Needle decompression followed by chest tube.** The needle doesn't fix the problem right away so we put chest tube the chest tube drains the air out.

Q) What we do for patient with breathing problems in general? Oxygen, always when trauma patient comes in right away we put on O2 you should know The O2 Saturation (normal oxygen saturation level ranges between 95% and 100 %.) **Definitive airway:** for tracheal problem. / **Chest tube:** for lung problem.

- Air entry
- Rate/ Effort (Respiratory rate.)
- Color
- Oxygen/decompression of pneumothorax / Oxygen saturation (you look for central cyanosis, cold periphery and the periphery of the nails). Always check for oxygen saturation. If saturation <90%, obtain an arterial blood gas (ABG) and determine likely causes of hypoxia based on the history.

Breathing

★ The **Immediate** life threatening injuries are: **(439 SLIDES)**

- Laryngotracheal injury / Airway obstruction
- **Tension pneumothorax** (air in the chest that's massive and may cause mediastinal shift to the other side. **Needle thoracocentesis is indicated**)
- Open pneumothorax (laceration to the chest causing the O₂ to move in and out).
- Flail chest and pulmonary contusion (fracture in two or more consecutive ribs, causing paradoxical movement of that region of the chest).
- Massive hemothorax (the insertion of an intercostal drain is indicated)
- Cardiac tamponade (bleeding into the pericardium space due to an injury to the myocardium, resulting in constriction of heart, decreased inflow and decreased cardiac output. **Immediate needle pericardiocentesis is indicated**)

The ATLS concept

The Primary Survey (the priorities are the same for all the patients):

C

- vitals
- shock (Hemorrhagic /Other)
- evaluate perfusion

Assess perfusion: pulse and blood pressure .Trauma patients will have tachycardia + hypotension.

Dr.This Q it will come in the exam

Q) What is the most common type of shock in trauma patients?

hemorrhagic shock (hypovolemic category) "HR up and BP fall"

You always have to worry about are they bleeding ,Is there bleeding or not ?

The highest probability is hemorrhagic shock

Second highest is tension shock (tension pneumothorax / pericardial tamponade)

- **floor, and four more.** a life-threatening amount of blood can be lost as

active hemorrhage outside the body "External", in the ;

1-thigh compartments of bilateral **femur** fractures "**long bone**"

2-**retroperitoneal cavity** (retroperitoneal organs like kidneys , pancreas , part of the colon)

3-**peritoneal cavity**,

4- **pleural cavity** (Chest).

Sign of Shock:

1. Tachycardia. Early sign
 2. Vasoconstriction. Cold hand
 3. ↓ Cardiac output
 4. Narrow pulse pressure
 5. ↓ MAP. Late sign
 6. ↓ Blood flow. Late sign
- Level of consciousness
 - Skin color and temperature
 - Pulse rate and character

very important. This Q will be in your exam. I'm going to ask you

Q)what is **balanced resuscitation**? You should answer me

Balanced resuscitation:

- Prevent hypothermia
- Prevent acidosis
- Transfuse blood products 1:1:1
- Prevent hypocalcemia

Q) What is the most common trauma patient? Young , healthy, fit , and having no medical problems

Circulatory Management (439 SLIDES)

- Control hemorrhage ²
- Restore volume By giving Crystalloids (warm to prevent hypothermia)
If the patient does not stabilize (or stabilizes then deteriorates) give PRBCs.
- Reassess patient is the patient responding? Still hypotensive?

Lethal triad (**Acidosis, Hypothermia & Coagulopathy**):

caused by tremendous loss of blood that's not being replaced ³, this triad will assure if the patient isn't resuscitated will, try to prevent the lethal triad

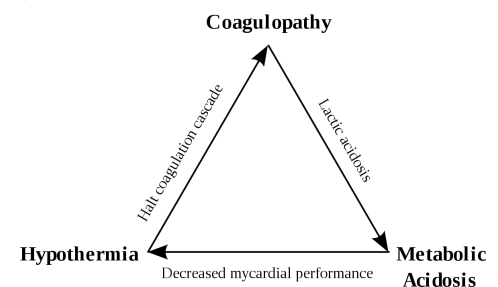
Apply direct local pressure when site is visible (e.g., extremity)

	Class I	Class II	Class III	Class IV
Blood loss (mL)	Up to 750	750–1500	1500–2000	>2000
Blood loss (% blood volume)	Up to 15%	15%–30%	30%–40%	>40%
Heart rate	<100	>100	>120	>140
Blood pressure	Normal	Normal	Decreased	Decreased
Pulse pressure (mm Hg)	Normal	Decreased	Decreased	Decreased
Respiratory rate	14–20	20–30	30–40	>35
Urine output (mL/hr)	>30	20–30	5–15	Negligible
CNS mental status	Slightly anxious	Mildly anxious	Anxious, confused	Confused, lethargic
Fluid replacement (3:1 rule)	Crystalloid	Crystalloid	Crystalloid and blood	Crystalloid and blood

This table is Very Important for exams it will show up in all exams but actually in the reality I never ever use it Here the questions that may come that they will give you a **scenario** and they will ask about

Q) what class of shock is this ? Easy point

Circulation



1. Keep in mind that even when placing high flow O₂ on the patient, if the patient isn't breathing well it won't guarantee adequate ventilation.

- The risk of pneumothorax in patients with coexisting chest injuries is markedly increased by positive pressure ventilation (method of providing noninvasive ventilatory support). If pneumothorax is already present, tension may be induced. For these reasons, tube **thoracostomy** is **mandatory** (tube thoracostomy involves making a small incision in the chest to place a hollow tube between the ribs and into the chest to drain fluid or air from around the lungs).

2. Blood loss into the **peritoneal cavity**, **thorax** or **pelvis** is usually concealed, can be life-threatening, and cannot be simply controlled. Patients with **major pelvic fractures** pose a difficult management problem, as conventional splintage is impossible and massive and uncontrollable blood loss may result. The optimal approach is the application of external fixator devices in the resuscitation phase, followed, if required, by angiographic embolization.

3. Coagulopathy: when the patient's blood isn't restored, as a mechanism of defense the body will try to stop the bleeding by activating the intrinsic and the extrinsic pathways of the coagulation cascade, and the patient will reach a stage where the PT and the PTT are sky-high.

Acidosis: the patient's O₂ carrying capacity is gone and the acidosis will take over.

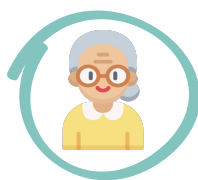
The ATLS concept



The Primary Survey (the priorities are the same for all the patients):

<div data-bbox="38 344 159 479">D</div> <div data-bbox="35 741 207 781">Disability¹</div>	<div data-bbox="341 344 1570 530"> <ul style="list-style-type: none"> Baseline Neurological Evaluation <small>First thing we need to know if the patient is moving or not</small> ★ Glasgow Coma Scale (GCS) score by calculating: eye opening response + verbal response + motor response <small>(Dr.this is a common exam question)</small> Pupillary response² <p>If there is pupils asymmetric it's called lateralizing sign: space occupying lesion somewhere in his brain causing the abnormal pupil response</p> </div> <div data-bbox="302 766 839 869"> <div>★</div> <p>IMP : Memorize everything in schedule > scores with the problem u will calculate GCS score the <u>lowest possible score is 3</u> not zero!!! and the <u>highest is 15</u></p> </div> <div data-bbox="870 636 1536 978"> <div> <div> Table 4. Pediatric Glasgow Coma Scale For Nonverbal Children. <table> <tr><th colspan="2">Eye Opening</th></tr> <tr><td>Spontaneous</td><td>4</td></tr> <tr><td>To speech</td><td>3</td></tr> <tr><td>To pain</td><td>2</td></tr> <tr><td>No response</td><td>1</td></tr> <tr><th colspan="2">Verbal Response</th></tr> <tr><td>Coos, babbles</td><td>5</td></tr> <tr><td>Irritable cry</td><td>4</td></tr> <tr><td>Cries to pain</td><td>3</td></tr> <tr><td>Moans to pain</td><td>2</td></tr> <tr><td>No response</td><td>1</td></tr> <tr><th colspan="2">Motor Response</th></tr> <tr><td>Follows commands</td><td>6</td></tr> <tr><td>Localizes pain</td><td>5</td></tr> <tr><td>Withdraws to pain</td><td>4</td></tr> <tr><td>Decorticate flexion</td><td>3</td></tr> <tr><td>Decerebrate extension</td><td>2</td></tr> <tr><td>No response</td><td>1</td></tr> </table> </div> <div> Glasgow Coma Scale <table> <tr><th>BEHAVIOR</th><th>RESPONSE</th><th>SCORE</th></tr> <tr><td rowspan="4">Eye opening response</td><td>Spontaneously</td><td>4</td></tr> <tr><td>To speech</td><td>3</td></tr> <tr><td>To pain</td><td>2</td></tr> <tr><td>No response</td><td>1</td></tr> <tr><td rowspan="4">Best verbal response</td><td>Oriented to time, place, and person</td><td>5</td></tr> <tr><td>Confused</td><td>4</td></tr> <tr><td>Inappropriate words</td><td>3</td></tr> <tr><td>Incomprehensible sounds</td><td>2</td></tr> <tr><td rowspan="6">Best motor response</td><td>No response</td><td>1</td></tr> <tr><td>Obeys commands</td><td>6</td></tr> <tr><td>Moves to localized pain</td><td>5</td></tr> <tr><td>Flexion withdrawal from pain</td><td>4</td></tr> <tr><td>Abnormal flexion (decorticate)</td><td>3</td></tr> <tr><td>Abnormal extension (decerebrate)</td><td>2</td></tr> <tr><td>No response</td><td>1</td></tr> <tr><td rowspan="3">Total score:</td><td>Best response</td><td>15</td></tr> <tr><td>Comatose client</td><td>8 or less</td></tr> <tr><td>Totally unresponsive</td><td>3</td></tr> </table> </div> </div> </div>	Eye Opening		Spontaneous	4	To speech	3	To pain	2	No response	1	Verbal Response		Coos, babbles	5	Irritable cry	4	Cries to pain	3	Moans to pain	2	No response	1	Motor Response		Follows commands	6	Localizes pain	5	Withdraws to pain	4	Decorticate flexion	3	Decerebrate extension	2	No response	1	BEHAVIOR	RESPONSE	SCORE	Eye opening response	Spontaneously	4	To speech	3	To pain	2	No response	1	Best verbal response	Oriented to time, place, and person	5	Confused	4	Inappropriate words	3	Incomprehensible sounds	2	Best motor response	No response	1	Obeys commands	6	Moves to localized pain	5	Flexion withdrawal from pain	4	Abnormal flexion (decorticate)	3	Abnormal extension (decerebrate)	2	No response	1	Total score:	Best response	15	Comatose client	8 or less	Totally unresponsive	3
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<div data-bbox="35 1140 248 1223">Exposure / Environment</div>	<div data-bbox="341 1028 946 1303"> <ul style="list-style-type: none"> Completely undress the patient³ Prevent hypothermia ⚠️ Pitfalls: Missed injuries Remove helmet if present Look for visible / palpable injuries Log roll, protect the spine </div>																																																																															

Special Considerations



Trauma in the elderly ⁴



Pediatric trauma ⁵



Trauma in pregnancy ⁶

- It's essential to identify neurological injuries in order to: A- avoid secondary brain injury B- identify surgically correctable lesions C- provide a baseline GCS to identify trends and changes throughout treatment process.
- Check the pupils for asymmetry. If the pupils are symmetrical and reactive it's most likely that the patient doesn't have a skull injury. But if there's bleeding and pressure in one side it will press on the nerves and the muscle of the pupils making them unequal/asymmetrical and you need to start worrying about intracranial bleeding.
- To make sure you're not missing any lesions.
- because they're usually weak and on medications; which alters injury response. E.g. The patient may not be able to respond to hypovolemia by increasing the heart rate because of age, pre-existing cardiac disease or medications such as β -blockers or calcium channel blockers.
- The effective resuscitation of the injured child requires an appreciation of the physiological differences that exist between children and adults. The normal cardiovascular and respiratory parameters vary with age. For example, the normal heart rate of a newborn infant is 160 beats/minute; the normal respiratory rate of a 1-year-old is about 30 breaths per minute.
- If you lay a pregnant lady on her back, the uterus (in the 2nd & 3rd trimester) will compress and weigh down on vasculature (IVC) leading to hypotension. **To avoid this; rest her on her left side.**

Primary & secondary Survey



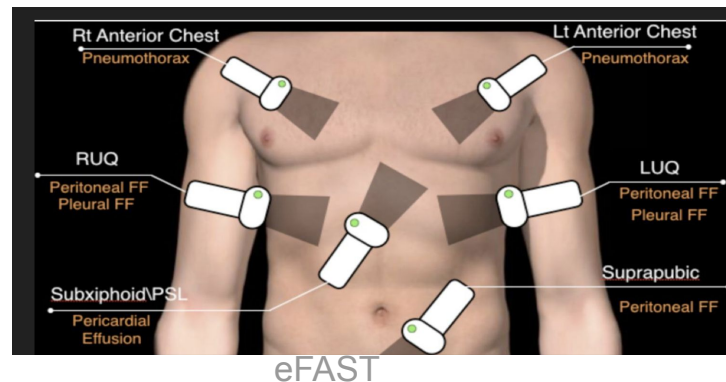
Primary survey overview (Resuscitation) ¹:

- If in doubt, establish definitive airway
- - Oxygen for all trauma patients
- - Chest tube may be definitive for chest injury
- - Stop the bleeding!
- - 2 large-caliber IVs
- - Prevent hypothermia



Adjuncts to Primary Survey ²:

- NGT (Nasogastric Tube)/Foley³ (When to not insert them ?) (Catheter used to drain urine in situations where you can't urinate on your own)
- CXR (chest X ray)/Pelvic X ray⁴
- eFAST⁵ (Extended Focused Assessment with Sonography in Trauma)
- Labs



Secondary survey:

- - **AMPLE⁶**
- - Head to toe exam
- - Racoon eyes/battle's sign
- - Seatbelt sign
- - More detailed neurological exam

1. Identifying and providing treatment to life-threatening conditions while resuscitating and reassessing are processes that occur during the primary survey and are performed **simultaneously**.

2. These are tools that are done selectively (depending on the spectrum of injuries and the physical response) to help you pick up unidentified injuries and to help you in resuscitation and reassessment.

3-common type of indwelling catheter

4-Chest and pelvic X-Ray are mandatory for trauma patients. Previously, Lateral cervical spine imaging was included in the primary survey..but it's no longer needed (unless indicted), the reason behind this is that patients wear C-collars and other systems are needed to be assessed first.

5-to detect free fluid, eg:bleeding

6-(mnemonic)A llergies, M edications, P ast medical history, L ast meal or other intake, and E vents leading to presentation



Extra 439 slides :

Adjuncts to Primary Survey :

01

1. ECG: when suspecting cardiac intuition.
2. Vital signs
3. ABGs (arterial blood gasses)
4. Urinary Output: to estimate the cardiac output
5. Urinary / gastric catheters: to rule out bleeding or elaboration to GI tract unless contraindicated
6. Pulse oximeter and CO2: to make sure chest is fine, no pneumothorax.

02

Imaging studies

1. Chest X-Ray
2. Pelvic X-Ray

Diagnostic tools:

1. Focused Abdominal Sonography Test (FAST).
2. Diagnostic Peritoneal Lavage ¹(DPL).

The DPL is a lifesaver if you don't have the resources like the US

03

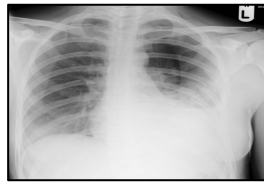
Consider Early Transfer ³:

1. Use time before transfer for resuscitation
2. Do not delay transfer for diagnostic tests or for secondary survey

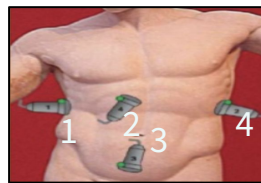
If you are in a rural area with limited resources and you received a trauma patient you need to transfer the patient.



"Open-book" fracture



Probably Hemothorax ²



FAST



DPL

Secondary Survey?

When Do We Start the Secondary Survey?

The complete history and physical examination, Start after:

- Primary survey is completed
- ABCDEs are assessed, reassessed and addressed
- Vital functions are returning to normal

Components:

- History
- Physical exam: Head to toe
- Complete neurologic exam
- Special diagnostic tests
- Reevaluation

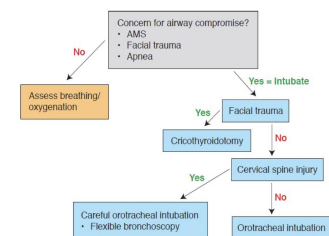


Figure 4.1: TraumaABC Assessment Algorithm

1. A cut is made in the abdomen where a catheter is inserted and the bag is leveled on the ground to allow gravitational force to pull fluid out. In the picture illustrated, the blood is coming out meaning this test is positive.

- Abdominal injury is commonly missed in patients with altered consciousness of whatever cause. Clinical signs are modified or absent in paralyzed and sedated patients, and so additional investigations, such as ultrasound, CT or diagnostic peritoneal lavage, are important.

2. opacity on the lower left side of the chest with blood leveling, it's probably hemothorax.

3. The time to initiate the transfer process is when the need is recognised. Therefore the need to transfer must be determined early, and the sooner the need is recognised and communicated the more efficiently it occurs. In addition, the time spent waiting for transportation should be spent stabilizing the patient.

- Reasons to transfer: no available surgeons (trauma, orthopaedic surgeons...), no available operating room, no available equipments.

Scenarios

(Not important)



- **Blunt trauma**
 - Hypotensive
 - Normotensive



- **Penetrating**
 - Chest
 - Anterior abdominal wall
 - Flank
 - Thoracoabdominal
 - Transmediastinal
 - Cardiac box
 - Dead
 - Not dead

Recall

Summary (439)

Q1: What are the 3 main elements of ATLS protocol? ?

A. Primary survey/resuscitation (Life threatening problems discovered during the primary survey are always addressed before proceeding to the next step) B. Secondary survey C. Definitive care

Q2: In addition to the airway, what MUST be considered during the airway step?

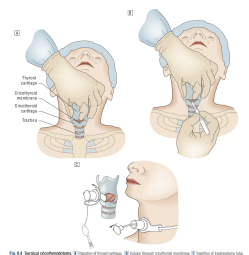
Spinal immobilization, by using a full backboard and rigid cervical collar.

Q3: What is the first maneuver used to establish an airway? If these methods are unsuccessful, what is the next maneuver used to establish an airway?

Chin lift, jaw thrust. If these methods failed → Endotracheal intubation.

Q4: If all other methods are unsuccessful, what is the definitive airway?

Cricothyroidotomy, a.k.a. "**surgical airway**": Incise the cricothyroid membrane between the cricoid cartilage inferiorly and the thyroid cartilage superiorly and place an endotracheal or tracheostomy tube into the trachea.



Q5: What are the goals in assessing breathing?

A) Securing oxygenation and ventilation B) Treating life-threatening thoracic injuries

Q6: What are the goals in assessing circulation?

Securing adequate tissue perfusion; treatment of external bleeding.

Q7: What comprises adequate assessment of disability?

A) Mental status: Glasgow Coma Scale (GCS) B) Pupils: a blown pupil suggests ipsilateral brain mass (blood) as herniation of the brain compresses CN III C) Motor/sensory: screening exam for lateralizing extremity movement, sensory deficits.

Q8: What are the goals in obtaining adequate exposure?

Complete disrobing to allow a thorough visual inspection.

Q9: What is the "environment" of the E in ABCDEs?

Keep a warm environment (i.e., keep the patient warm; a hypothermic patient can become coagulopathic).





Quiz!

Q1: Q8: A 27-year-old man is brought to the emergency department after being injured in a motor vehicle collision. He is noted to speak using inappropriate words. He withdraws and opens his eyes to pain only. This patient's Glasgow Coma Scale score is:

- A) 10
- B) 9
- C) 8
- D) 7

Q2: GCS indication for intubation?

- A) 10
- B) 9
- C) ≤ 8

Regarding GCS, the Q may presented as is it (mild, moderate severe)
Mild -> GCS=13-15
Sever -> GCS< 8 -> need intubation
And moderate in between

Q3: Which of the following statements regarding the immediate management of a trauma patient is true?

- A) The patient should be asked a simple question such as 'What is your name?'
- B) Oxygen should be administered with great care in trauma patients who might suffer from chronic bronchitis.
- C) The physical signs of a tension pneumothorax are difficult to pick up in the resuscitation room and so it is best diagnosed by an immediate chest X-ray.

Q4: Which of the following are **not** immediately life-threatening injuries?

- A) Tension pneumothorax
- B) Cardiac tamponade
- C) Flail chest
- D) Open pneumothorax
- E) Massive haemothorax
- F) Liver injury
- G) Airway obstruction

01) B | 02) C | 03) A | 04) F





Quiz!

Q5: If a patient presented to the ER with his eyes responding to pain, he keeps answering the physician with inappropriate words and he withdraws his right leg from pain and moves his left leg in response to pain, then what is his glasgows score ? Mentioned by doctor

- A) 7
- B) 8
- C) 10
- D) 13

Q6) What is the most common shock in traumatic patient ? Mentioned by doctor

- A) Hypovolemic shock
- B) Anaphylactic shock
- C) Cardiogenic shock
- D) neurogenic shock

Q7: A patient is admitted following an assault. On assessment, he has a stab wound to his chest. Clinically, he has a massive haemothorax and his Glasgow Coma Scale score is 4/15. Without further management this patient will succumb to which cause of death first?

- A) Respiratory failure
- B) Airway compromise
- C) Intracranial haemorrhage

Explanation: This patient has a GCS of 4, rendering him unable to maintain his own airway, which will therefore be the first factor to lead to his death. Consequently, his airway must be managed before addressing his other injuries.

Q8) Which of the following techniques does not provide a definitive airway?

- A) Cricothyroidotomy
- B) Tracheostomy
- C) Nasotracheal tube
- D) Laryngeal mask airway

Explanation: The definition of a definitive airway is a tube in the **trachea** with an **inflatable cuff**. Definitive airways are of three types: nasotracheal, orotracheal and surgical.

Q5) C | Q6) A | Q7) B | Q8) D



القادة

محمد الغامدي

في الدوسري

رزان المهنا

وعد أبو نخاع

نوف الضلعان

الأعضاء

نورة آل رشود

مشاعل السليمان

مها القرشي

حسبي الله لا إله إلا هو عليه توكلت وهو رب العرش العظيم.
اللهم إني أستودعك ما قرأت وما حفظت وما تعلمت فردّه لي عند حاجتي إليه إنك على كل شيء قدير.



SURGERY442@GMAIL.COM

Theme designed by Razan Almohanna