



Introduction to Trauma , Multiple Trauma & Treatment Priorities

Tues. Nov 20, 2007 . Dr. Gamal Khairy

Hi !! These are some guiding signs :

(!) : Important note .

☒ : The Dr didn't mention this at all but it was found in the slides .

☆ : Is a risk question --> The Dr said that this point was important or asked a question about it .

- Have Q's ? found errors ? send them at : surgeryqueens@gmail.com

- Have fun studying ,, or .. at least اخلصوا النية لله .

☼ Introduction

- ♣ Trauma remains the leading cause of death in the 1st 4 decades of life.
- ♣ 3rd after cancer and atherosclerosis in all age groups.
- ♣ Death rate 150,000 Deaths Annually in status.
- ♣ Two people killed → 350 disabling injury :(.
- ♣ Trauma related costs: 400 billion \$/year.

❖ Prevention :

- λ methods and modalities .
- λ Public awareness not translated to utilization and acceptance .
 - ◆ (E. g. Use of seat belt and helmets).
- λ The need for improved methods of caring :
 - ◆ As great as it has ever been.

- λ Treatment needs very rapid assessment (Systematic approach which is easily practiced).

There must be one who has an experience with accidents and knows the abcdes and what to do first). (!)

- λ This is called (initial assessment) and includes:

- ◆ Preparation .
- ◆ Triage(It's a place in the ER , there's at least a doctor and a nurse to filtrate patients (!)).
- ◆ Primary Survey (ABCDES) .
- ◆ Resuscitation .
- ◆ Adjuncts to primary survey and resuscitation.
- ◆ Secondary survey (head to toe evaluation) .
- ◆ Adjuncts to the secondary survey.
- ◆ continued post resuscitation and re-evaluation.
- ◆ Definitive care.



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- ☆☆ The difference between Primary & Secondary Surveys.
- ☆☆ The difference between **adjuncts** to primary & secondary surveys.

🔥 Primary Survey Assessment of ABCDE's ☆ ☆

(To diagnose and treat immediate life threatening injuries) .

- λ Airway and cervical spine protection.
- λ Breathing .
It's the action you can observe (movement of the chest)or you can feel the air comes out .
- λ Circulation .
- λ Disability . (Neurological status of the patient).
- λ Exposure / Environment (Completely undress patient **but** prevent Hypothermia [especially in the cold weather]) .

☆ The difference between checking the airway and the breathing .

☠ How to check the airway? (!)

- ▲ By asking the patient to talk . If it's obstructed , the patient won't talk.

☠ What can obstruct the air way ?

- ▲ Foreign bodies .
- ▲ If the patient is comatized and lying in the supine position (it's the **most** imp.) the tongue will obstruct the air way , so you've to position the patient to the lateral or semiprone position .
- ▲ Broken bones or broken teeth .

- ❖ In case of (tension)**neumothorax** , the airway of the traumatic patient is patent but the patient can't breath (because the plural cavity's full of air and there's no space for the lung to expand .

(!)

☠ How to solve this problem ?

- ▲ insertion of a large bore cannula or a needle into the 2nd intercostal space on the mid-clavicular line , thereby releasing the pressure in the pleural cavity .

🔥 Resuscitation

- λ Oxygenation and ventilation.
- λ Shock management, **intravenous lines** warmed ringers lactate solution .
- λ Management of life-threatening problems identified in the primary survey is continued.

❖ In multiple traumatic patient , we should use cannula [Wide bore cannulas , "14 and less in size"] . We use 2 lines of cannulas or if you need put a central line .

⊕ **Don't** Put Small cannula (the sizes go up , the smaller cannula diameter and vice versa) .



🌀 Adjuncts to Primary Survey

λ Monitoring:

- ◆ ABG's (Arterial Blood Gases).
- ◆ ECG .
- ◆ Pulse oximetry .
- ◆ Blood Pressure .

λ Urinary and Gastric catheters.

SEE THE NOTES →

λ X-rays and Diagnostic studies:

- ◆ Chest .
- ◆ Pelvis .
- ◆ Spine .
- ◆ DPL or abdominal ultrasound .

❖ *Importance of the urinary catheter is to :* ⚡

- 1. Measure the urine output .It's the best way for assessing your resuscitation . After giving a traumatic patient fluid , quick urine output reflects that there are a good perfusion to the kidneys , good pressure and the patient is well resuscitated transfused .*
- 2. If there's blood in the urine or injury in the UT .*

❖ *Nasogastric (NG) tube :* ⚡

- *To prevent aspiration to the lung .*
- *After trauma ,there's an acute gastric dilatation and the bowel become irritable and the gases fill the abdomen . By putting the NG tube , the gas will leak out .*
- *If there's gastric injury .*

- ❖ *[DPL] Diagnostic Peritoneal Lavage (washing) : A procedure with a small incision(put a catheter and a local anesthesia to find if there's an injury in the abdomen . Saline is infused into the abdomen, and then removed (by gravity). If blood is present in the saline after removal, it is highly probable that there is a serious intra-abdominal injury .*



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🔍 Secondary Survey, total patient evaluation physical examination and history

1. Head or skull.
2. Maxillofacial.
3. Neck.
4. Chest.
5. Abdomen.
6. Perineum rectum vagina
7. Musculoskeletal.
8. Complete neurologic examination.
9. Tubes and fingers in ever orifice.

Secondary : complete , total , detailed , head to toe .

🔍 Adjuncts to the Secondary Survey

Specialized diagnostic procedures to confirm suspected injury :

- * only performed when life threatening injuries have been identified and managed and patient's hemodynamic and ventilatory status back to normal.
 - 💧 CT.
 - 💧 Contrast x-ray.
 - 💧 Extremity x-ray.
 - 💧 Endoscopy and ultrasound.

US is used in both primary and secondary adjunctions.

🔍 Definitive Care

After:

- λ identifying patients injuries.
- λ managing life threatening problems.
- λ obtaining special studies
 - ▲ Definitive Care begins.

- ❖ Definite care is the **final** care or treatment of traumatic patient after identifying , imaging and obtaining .Usually by operations (example) rupture spleen the DC is splenectomy. The care plan depends on :
 1. Mechanism of injury .
 2. The patient physiological status .
 3. Anatomic injury .
 4. Concomitant disease conditions that may affect the patient's survival .



TABLE 1
MECHANISMS OF INJURY AND RELATE SUSPECTED INJURY PATTERS

Mechanisms of Injury	Suspected Injury Patients
1. Frontal Impact <ul style="list-style-type: none"> ▪ Bent steering wheel . ▪ Knee imprint, dashboard . ▪ Bull's eye fracture, windshield . 	<ul style="list-style-type: none"> ▪ Cervical spine fracture . ▪ Anterior flail chest . ▪ Myocardial contusion . ▪ Pneumothorax . ▪ Traumatic aortic disruption . ▪ Fractured spleen or liver . ▪ Posterior fracture/dislocation of hip, knee .
2. Side impact, (automobile and traffic accidents) .	<ul style="list-style-type: none"> ▪ _Contralateral neck sprain . ▪ Cervical spine fracture . ▪ Lateral flail chest . ▪ Pneumothorax . ▪ Traumatic aortic disruption . ▪ Diaphragmatic rupture . ▪ Fractured spleen/liver, kidney depending on side of impact . ▪ Fractured pelvis or acetabulum .
3. Rear Impact, automobile .	<ul style="list-style-type: none"> ▪ Cervical spine injury . ▪ Soft-tissue injury to the neck .
4. Ejection, vehicle .	<ul style="list-style-type: none"> ▪ Ejection from the vehicle precludes . meaningful prediction of injury patterns, but places patient at greater risk from virtually all injury mechanisms . ▪ Mortality significantly increased .
5. Motor Vehicle-pedestrian .	<ul style="list-style-type: none"> ▪ Head injury . ▪ Traumatic aortic disruption . ▪ Abdominal visceral injuries . ▪ Fractured lower extremities / pelvis .

Transfer to Definitive Care

- λ To closest appropriate hospital .
- λ Determining the need for transfer (asses capabilities and limitations) .
 - ▲ Outcome → related to time from injury to properly delivered definitive care .



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☉* Inter-hospital Transfer Criteria

(When the Patient's Needs Exceed Available Resources)

λ Central Nervous System

* Head Injury

- ♣ Penetrating injury or depressed skull fracture .
- ♣ Open injury with or without CSF leak .
- ♣ GCS score < 14 or GCS deterioration .
- ♣ Lettering signs .

* Spinal Cord Injury or Major Vertebral Injury

λ Chest

- ♣ Widened mediastinum or signs suggesting great vessel injury .
- ♣ Major chest wall injury or pulmonary contusion .
- ♣ Cardiac injury .
- ♣ Patients who may require prolonged ventilation .

☉* Transfer Responsibilities

- λ Referring doctor and receiving doctor .
- λ Modes of transportation and transfer personnel .
- λ Transfer protocols .