Lecture no.2

Triage

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Triage

- French verb ‘trier’ triage means (to sort), is the cornerstone of management of mass casualties.
- Triage is a vital entry point to an organized system of care to maximize good outcome in a medical center concerned with casualty management.
- **It aims to:**
- Identify patients who will benefit treatment efficiently by being treated the earliest.
- Ensuring greatest good for greatest number, esp. in battlefields casualties.
- It determines who will be treated first, what mode of evacuation is best and which medical facility is optimal for the management of the patient (deciding who should receive priority when faced with hundreds of seriously injured victims).
- Sorting out the minor injuries, by which triage lessens the immediate burden on medical facilities.


AMBULANCE

Three essential phases of triage:

1- pre-hospital triage; to dispatch ambulances& pre-hospital care resources.
2- at the scene of trauma.
3- on arrival at the receiving hospital.

- The idea behind these systems aimed to identify those immediately at risk of life loss, then moving to the management of urgent cases and thereafter shifting to those clinically stable but seriously ill.
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- **Documentation for triage**
- Accurate documentation of basic patient data, vital signs with timing, brief details of injuries (preferably on a diagram) and treatment given.
- Then, a system of color-coded tags attached to patient's wrist or around the neck. The color denotes the degree of urgency with which a patient requires treatment.
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- **Triage categories:**
- Based on vital signs, rapid clinical assessment, patient's ability to walk, mental status & presence or absence of ventilation or capillary perfusion; **A commonly used four-tier colored system:-**
- **(I) Red Immediate:**
- Critical (emergent) but likely to survive if proper early tt. achieved within minutes eg.Severe facial trauma, tension pneumothorax, profuse external/internal bleeding.
- **(II) Yellow: Urgent Critical:**
- Likely to survive if treatment given within hours eg. ruptured abdominal viscus, pelvic fractures, spinal injuries.
- **(III) Green: Non-urgent Stable:**
- Likely to survive even if treatment is delayed for hours to days eg. Fracture femur where initial fixation done till definitive treatment.
- **(0) Black: Unsalvageable not breathing:**
- Pulseless severe brain damage, extensively injured that no medical care is likely to help eg. extensive burns, major disruption / loss of chest or abdominal viscera / wall structures.

In trauma, two types of triage situation usually exist:

1.Multiple casualties: number & severity of injuries not exceed ability of facility to achieve care. Priority given to life-threatening injuries then multi-injured.

2.Mass casualties: Number & severity of injuries exceed capability & facilities available. In this situation, those with greatest chance of survival & least expenditure of time, equipment & supplies are prioritized.

- **Types of injuries:**
- 1.Blunt: Commonly due to RTA. Injuries related to mass & speed of vehicle at moment of impact; whether the occupants restrained; ejected; interaction with vehicle parts. (Speed is a critical factor); 10% increase in impact speed translates into a 40% rise in fatality risk for both restrained & unrestrained occupants. Ejection leads to severe injury.
- **Patients with seatbelt marks have been found to have a 4x increase in thoracic trauma & an 8x increase in intra-abdominal trauma.**
- 2.Penetrating: Factors include proximity of the underlying viscera to the path & velocity of the penetrating object.
- 3.Blast, e.g. bomb
- 4.Crush, e.g. building collapse
- 5.Thermal: (burns).
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- **ASSESSMENT & MANAGEMENT OF SERIOUSLY INJURED** There are three peaks:
- 1. **Immediate**: 50% of all deaths, not possible to save; usually due to massive head injury / brainstem injury / major cardiovascular event.
- 2. **Early**: within first few hours, often death from torso trauma.
- 3. **Late**: 20% of deaths. Usually from organ failure & sepsis, caused by inadequate early resuscitation & care. Here the concept of (**golden hour**) emerged to describe the urgent need for treatment of trauma victims within the first hour after injury.
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- **Preparation**
- **1. Pre-hospital phase:** a good coordination & communication pathways prior to transfer the injured from the scene of injury. This will allow time for mobilization of the team & resources at the receiving hospital.
- **2. In-hospital phase**: a resuscitation area should be available & secured. Equipment in this area should be checked daily & placed where it is immediately accessible. Warmed i.v crystalloid solutions should be prepared & ready immediately, blood may be urgently needed.
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- The team should be prepared, ideally with specialty name badges, masks, eye protection, X-ray gowns, gloves, etc.
- **Handover from pre-hospital personnel should provide informations:**
- **Mechanism of injury.**
- **Injuries identified including information on injuries to other casualties involved in the same event, vital Signs at the scene & Treatment administered.**

PRIMARY SURVEY AND RESUSCITATION; Includes early triage.

Rapid primary evaluation, resuscitation, a more detailed secondary assessment & finally initiation of definitive care.

FBC, urea & electrolytes, clotting screen, glucose, toxicology, cross-match, ECG, 2 wide-bore canula for IVF, Urinary & gastric catheters, Radiographs of cervical spine, chest & pelvis.

- **ABCDE of trauma care**
- **A – Airway maintenance & cervical spine protection:**
- **1- Check verbal response**
- **2- Clear mouth and airway with large-bore sucker**
- **3- If GCS <_8, consider a definitive airway; otherwise use jaw thrust or chin lift.**
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- **B – Breathing & ventilation:**
- **1- Give 100% oxygen at high flow**
- **2- Check for tension pneumothorax, fractured rib**
- **3- Decompress at once if tension pneumothorax is suspected (needle in the second intercostal space).**
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- **C – Circulation with hemorrhage control:**

  1- Deteriorating conscious state

  2- Pallor

  3- Rapid thready pulse is more reliable and earlier warning sign than a fall in blood pressure.

  D – Disability: neurological status

  E – Exposure: completely undress the patient and assess for other hidden injuries.

SECONDARY SURVEY

Purpose of secondary s. is to identify all injuries & perform a thorough 'head to toe' examin.

If possible, the patient's history is reviewed.

Review of patient's history (AMPLE): Allergy, Medication including tetanus status, past medical history, Last meal, Events of the incident.

- **Subsequent exam: Examine all the body for injuries, bony instability & tenderness:**
- **1.Head & face. Evaluate for maxillofacial fractures, ocular injury, open head injury & any evidence of bleeding or discharge from ears suggestive of a basal skull fracture. Inspect mouth, mandible, zygoma, nose & ears. This excludes mid-facial injury & potential airway compromise.**
- **2.Neck. Inspect & palpate cervical spine anteriorly & posteriorly for hematoma, crepitus, tenderness & evidence of steps on palpation.**
- ****In trauma where the cause is uncertain & a significant maxillofacial or head injury exist then assume a cervical spine injury until definitively excluded radiologically & clinically. The spine is immobilised with a hard collar, sandbag & tape across the forehead. Wounds should be fully evaluated & explored in OT if deeper than the platysma muscle layer.**
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- **3.Chest. Palpate & auscultate entire chest wall eg. clavicle, sternum & ribs. Sternal fractures have a high incidence of damage to underlying cardiovascular st. & monitoring for 24–48 hours after injury. Distended neck veins, distant heart sounds & narrow pulse pressure may suggest cardiac tamponade.**
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- **4.Neurological. Examine GCS (at least every 15 min). Perform a full neurological exam if patient's condition allows.**
- **Any evidence of sensori-motor disturbance requires full spinal immobilization & urgent neurosurgical or spinal orthopaedic consultation.**
- **5. Abdomen & pelvis. Inspect distension, explore local wounds to assess depth; high-velocity injuries should be evaluated in OT. Palpate iliac crests for instability to detect fractures. Inspect perineum for evidence of ecchymosis or bleeding.**

PR exam to assess tone, prostate level & bleeding. A high index of suspicion is required with abdominal injuries, so frequent re-evaluation is important as injuries may not manifest themselves in early stages.

- 6. **Extremities**. unless there is severe hemorrhage, the injury to limb is not immediately life threatening. Obviously deformed limbs should be manipulated into as near anatomical alignment as possible, remembering to document neurovascular status before and after the intervention. Palpate upper & lower limbs.
- Remember to move the relevant joints to exclude dislocations. Neurovascular status must be recorded for each limb esp. if a fracture is identified.
- **7. Log roll**. Once the patient has been evaluated anteriorly, then a log roll is performed to inspect back. Remember that at least 4 people are required for a safe log roll procedure: one for the spinal in-line traction, one for the torso & one for the pelvis & lower limbs (which ideally should be strapped together). The fourth person removes the spinal board and performs a detailed assessment of the back.
- Inspect the entire spine from occiput to sacrum for bony abnormalities. Identify any penetrating injuries or exit wounds from gunshot injuries and dress accordingly. Percuss, palpate and auscultate the posterior chest wall.
- **Re-evaluation**
- Once the patient has stabilized & regained a level of consciousness, as minor trauma may evolve into major trauma as time passes.
- Continuous monitoring of the VSs & urinary output is crucial (in adult an output of 0.5-1 ml kg/1h is adequate & in pediatric patient, it is twice this rate). Pulse oximetry is a useful real-time measure of oxygenation, reflecting state of ventilation & airway.
- **Analgesia**
- Is very important initially. Pain & anxiety can produce changes to VSs. This is done by a titrated iv opiate. The dose must be administered judiciously to avoid respiratory depression.
- **Definitive care & transfer**
- Early transfer to an appropriate care facility is the most important contributor to successful outcome. When it becomes mandatory to transfer the patient from the initial receiving hospital, the patient must be haemodynamically stable.