Trauma

45 minutes highest points
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Basic principles
A; Airway
B; Breathing
C; Circulation
D; Disability
E; Exposure

Airway: Rapid sequence intubation
Breathing: Needle decompression of PNX
Circulation: 2 large bore IVs
No more than 2 L crystalloids (early use of MTP)
FAST
Unstable patients: immediate transfer to the operating room (no time for imaging)

Neck trauma zones

Neck Injuries

Zone I = clavicle to cricoid
II = Cricoid to angle of mandible
III = angle of mandible to base of skull

Zones I and III require angiography before exploration, unless patient is severely unstable

Zone II, controversial
Stable = needs angio + Laryngo + Brochoscopy + oesphago + gastrographin swallow
Unstable needs surgical exploration
What are the signs of instability?
Large expanding or pulsatile haematoma-active external bleeding hoarsness-subcutaneous emphysema-dysphagia-oropharyngeal bleed-neuro deficit...
Cardiac / thoracic trauma

- Internal juglar v = ligation
- Carotid = always repair even in hemiplegia. May need a graft. Only time to ligate is coma
- Vertebral artery = embolize if contralateral is intact. If found at exploration ligate
- Esophagus = repair with drainage in most cases. If delayed Dx or severe associated injuries do cervical oesphagostomy, ligate GE junction and Jejunostomy

Larynx and trachea
- Tracheostomy, most are repaired by collar incision. For thoracic trachea = R thoracotomy
- Thoracic Duct = common in left subclavian inj. Commonly missed at first exploration. Effusion; triglycerides > 200, protein > 3 gm, lymphocytes > 60%
- Conservative tt for three weeks. If fail = ligate. Where to ligate

Cardiac trauma

- Patient may present with hypotension, and shock, haemothorax or in tamponade)
- Beck triad (Tamponade); distended neck veins- muffled heart sounds – hypotension
- Shock with elevated CVP;
- Tamponade # tension PNX
- Difference > Air way pressure

Cardiac trauma (diagnosis)

- **Echocardiogram (FAST)**
  - Should be available in the ER. > 90 % sensitivity and specificity
- **Pericardiocentesis**
  - Not a diagnostic test; only done for temporary relief of blood in the way to the OR. Blood is not clotted
Cardiac trauma (diagnosis)

- **Subxiphoidal exploration** (Pericardial window)
- Definitive diagnostic test in stable patient
- Good test to rule out tamponade in patients who do not have tamponade
- Positive pericardiocentesis or window =
- Blood = median sternotomy
- Most 95% cardiac injuries are repaired without Bypass

Sub xiphoidal pericardial window

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ER (RESUSCITATIVE THORACOTOMY)

- **Indications**
  1) penetrating chest injuries with failure of aggressive resusc to raise BP >80mmhg (12% survival)
  2) penetrating chest or abd injuries who lost vitals during transfer
  3) blunt injuries who had vitals before arrival (3% survival)

ER thoracotomy , open

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ER THORACOTOMY (Steps)

- Left anterolateral thoracotomy down to the table
- Control obvious source of bleeding e.g left hilum
- Open pericardium , watch phrenic nerve
- If no injury is seen , extend to the right chest
- Open cardiac massage . Clamp the Aorta

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Traumatic Rupture of Aorta

- Rapid deceleration injury with shearing force
- Most common site is just distal to the left subclavian 60% . Followed by distal thoracic aorta 20%
- 60% die at the scene . 40 % make it to the hospital, third of which die during initial resuscitation
Stents in thoracic aorta

Abdominal trauma
- Penetrating;
- GSW – Laprotomy
- Stab wound; may start with laparoscopy
- Blunt;
- CT abdomen pelvis + FAST

Pancreatic injury
- Principles of treating pancreatic injury ;(must open lesser sac )
- 1- control of bleeding (Suturing or resection)
- 2- Debridement of devitalized pancreatic tissues
- 3- leaving a drain
- 4- Ductal injury suspected (distal pancreatectomy for head and tail which include injuries to the left of SMA , SMV – ductal injury of head and neck are treated by drainage )

Duodenal injuries
- Simple lacerations with less than 50% circumference are repaired primarily
- More complex injuries:
  - in first part of duodenum can be treated by resection (antrectomy and resection of first part of duodenum) ;
  - second part of duodenum can not be resected so repair has to be done with other complex manuvers e.g adding pyloric exclusion which is closing the pylorus with absorbable sutures which give 4 weeks for duodenum to heal before it re open . Another open to avoid stricture in large injuries is using jejunal serosal patch
  - Whipple is only rarely used in very severe non reconstructable combined head pancreas and duodenal injury with distal common bile duct injury (mortality is very high in Whipple trauma)
Spleen injuries

- Haemodynamically stable are treated non-operatively with serial H/H. The presence of blush on CT scan is an indication of embolisation. Also grades IV and III.
- Haemodynamically unstable need immediate splenectomy.

Colon injuries

- Primary repair is possible in most stab wounds.
- For severe injuries, right colon can be resected with primary anastomosis (right hemicolectomy with ileotransverse anastomosis).
- Left colon may also be repaired primarily but has higher chance of leak compared to right.

Pelvic fractures

- Rectal injuries
- Should be suspected in bleeding per rectum in any trauma patient. Severe pelvic fracture patients.
- Diverting colostomy

Abdominal vascular trauma

- Retroperitoneal haematoma
- Zones
- Vascular Control (proximal –distal)

Supra celiac control

Hypovolemic shock
Unstable patients to the OR for laparotomy, up to 40% have associated solid organ injury (liver, spleen) as the reason for shock.
Angioembolisation of hypogastric vessel
External fixation
Visceral rotations