

ABC: Primary Survey in Polytrauma

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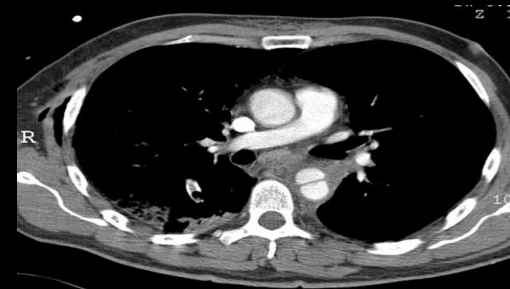
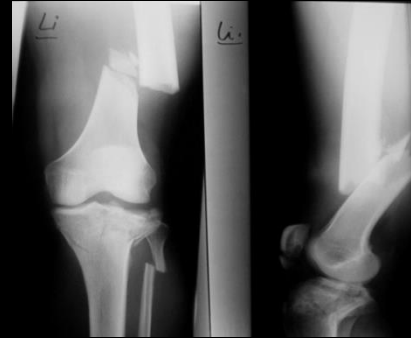
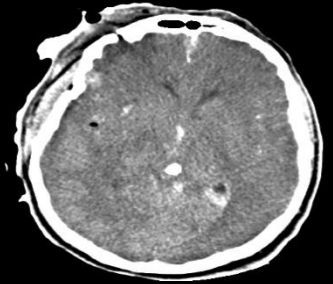
Disclosures: None



Trauma care

- Morbidity and mortality as low as possible by fast, systematic and effective evaluation and treatment
- Prioritise
- **TIME IS LIFE**

Polytrauma



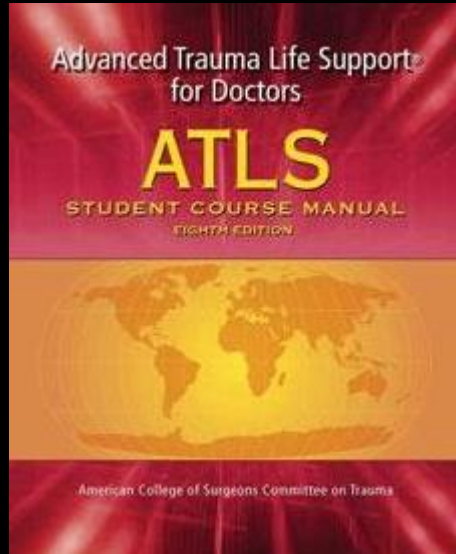
Advanced Trauma Life Support (ATLS)

- ATLS[®] concept
 - pre-hospital phase
 - standard of care 1st (golden) hour
 - level-1 trauma centers



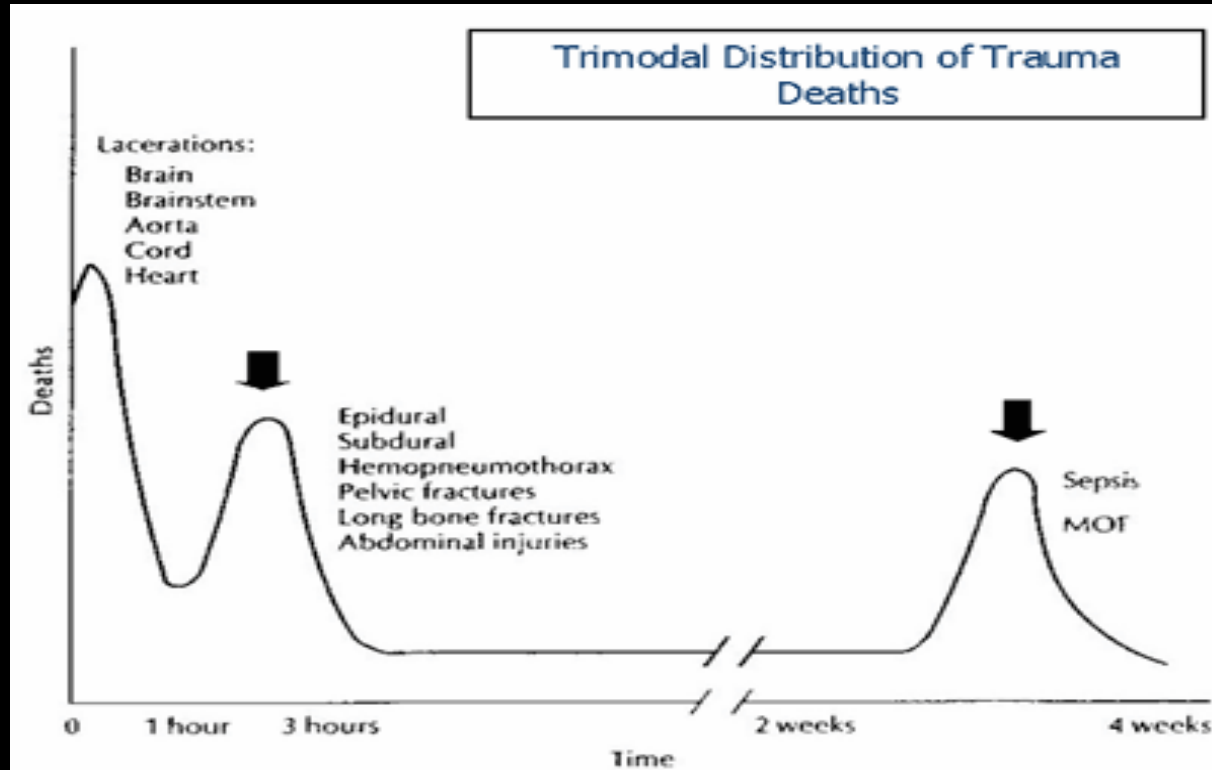
Background

“Treat first what kills first”



“Do not further harm”

Mortality in Trauma



Mortality in Trauma

- Overall:
 - TBI 50%
 - Bleeding 30%
 - Sepsis 5%
- Causes of death in OR:
 - Bleeding 82%
 - TBI 14%

Bleeding #1 cause of death in OR

Pre-Hospital

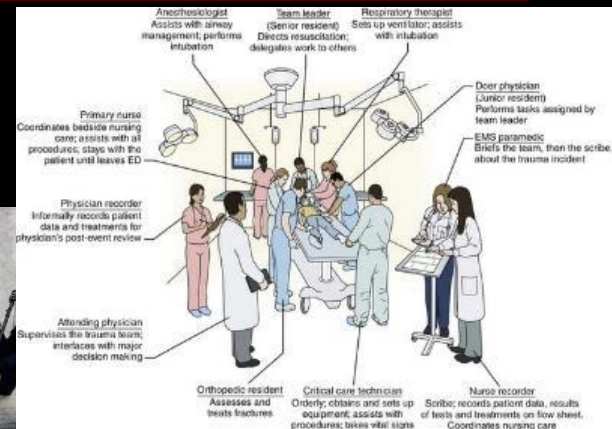
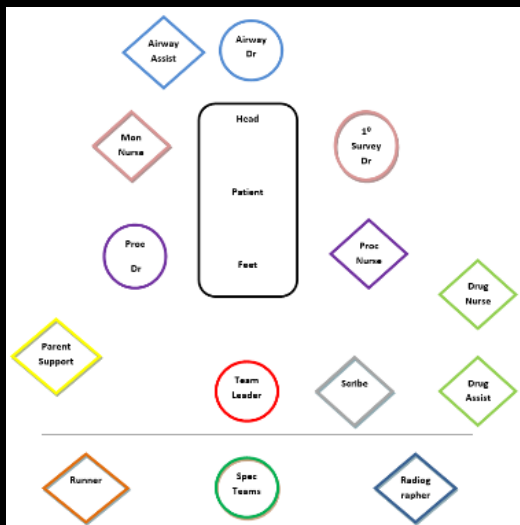
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- MIST

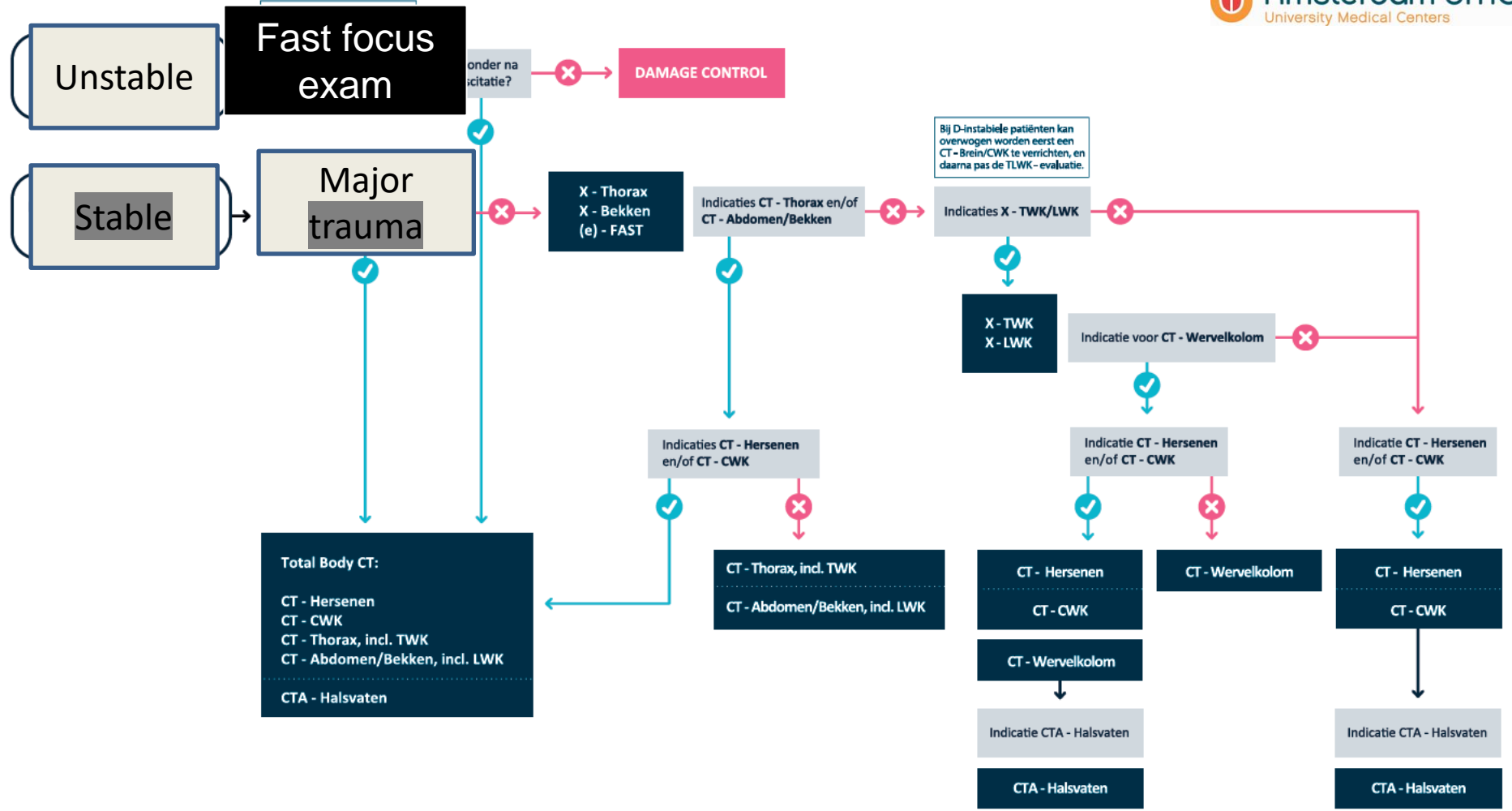


Trauma rooms



Trauma room - Team





II.

- Primary & secondary survey

ATLS - primary survey

- A - airway with control of the cervical spine
- B – breathing and ventilation
- C – circulation and control of haemorrhage
- D – disability (neurological status)
- E – exposure of the whole patient

treat first what kills first

Primary Survey - Surgery

A: Free/Tube Immobilisation C-spine

B: Breath sounds, RespR /min, SatO₂ %

C: BP / mmHg HR /min

- Abdomen
- Pelvis
- pulse

D: E*M*V* pupils LR

E: log-roll



Primary survey

Major/High

Minor/Low

A : Airway

- Endotracheal tube
- C-Spine immobilisation
 - Imaging C-Spine not part of A



A : Airway

- LeFort
- Mandibular #
- Trachea/larynx



A : ETT position

- ETT too high
 - Tip should not be visible above sternal notch
- Distal ETT malposition



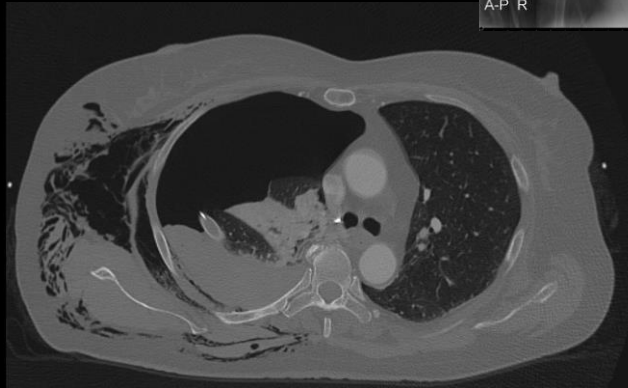
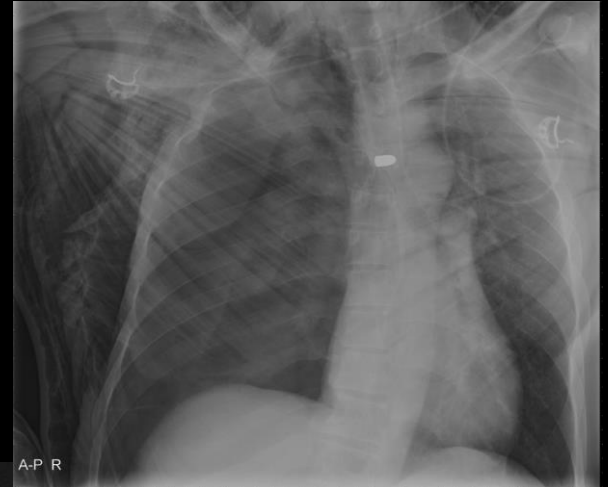
B : Breathing



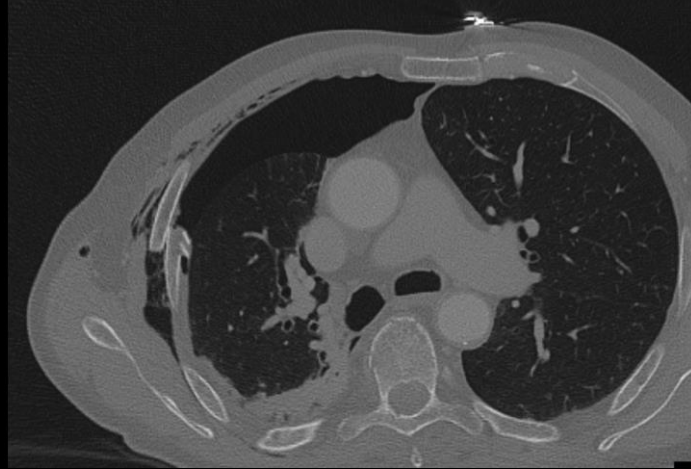
B : Breathing

- XR- Chest:
 - Major/primary survey
 - Tension pneumothorax
 - Massive hemothorax
 - Flail chest
 - large contusions
 - Open chest-PTX
 - Tubes & lines
- XR- Chest:
 - minor /secondary survey
 - simple PTX
 - hemothorax
 - rib fractures
 - pulmonary contusion

B: Tension PTX

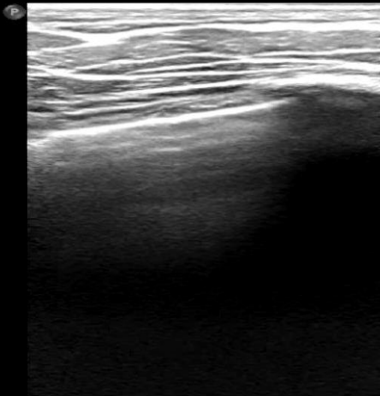


B: PTX

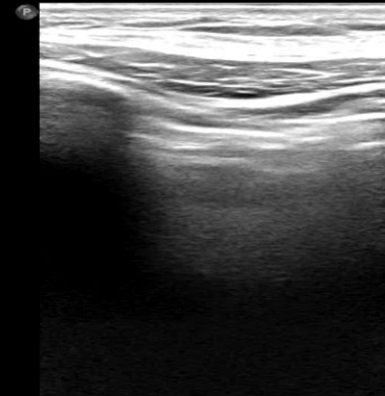


B: PTX -Pleura sliding

Superfic
L12-3
14Hz
RS
2D
76%
Dyn R 60
P Low
HRes

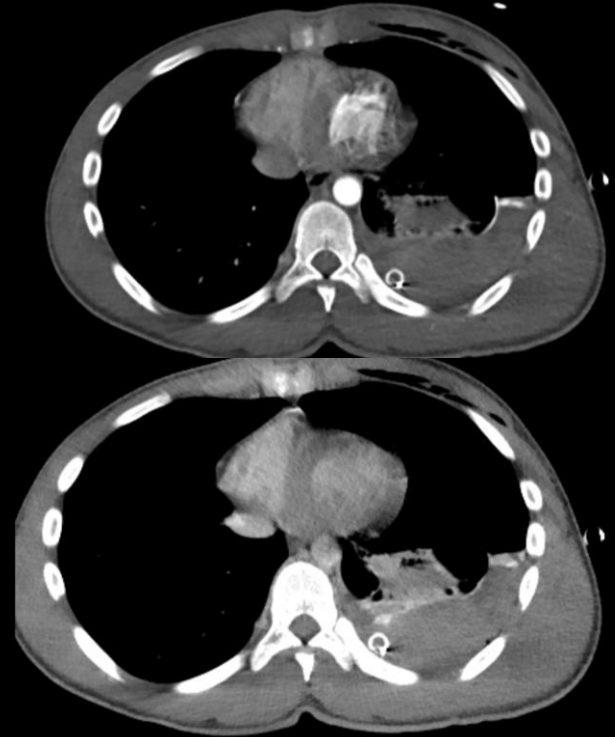
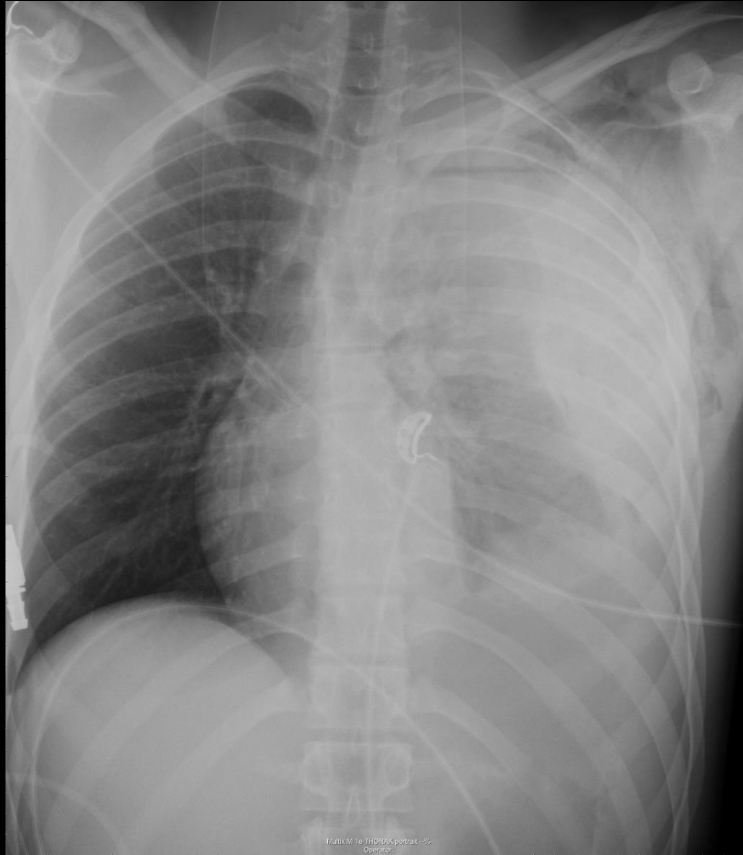


TIS0.2 MI 1.3
M2
Superfic
L12-3
14Hz
RS
2D
76%
Dyn R 60
P Low
HRes
8mm
6.0cm *** bpm

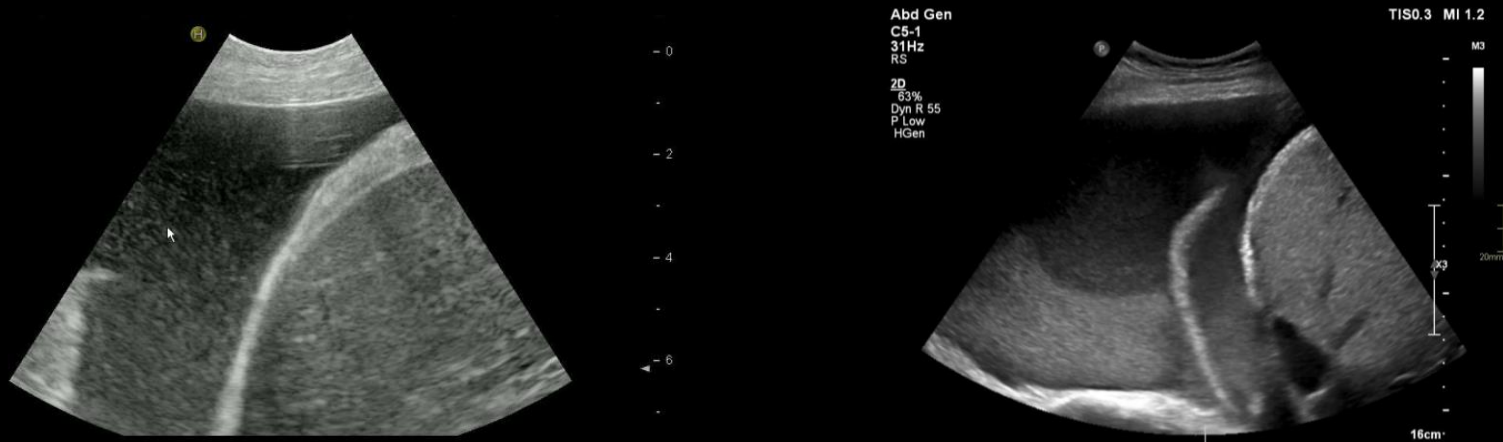


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M2
Superfic
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HRes
8mm
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Massive/Tension HTX

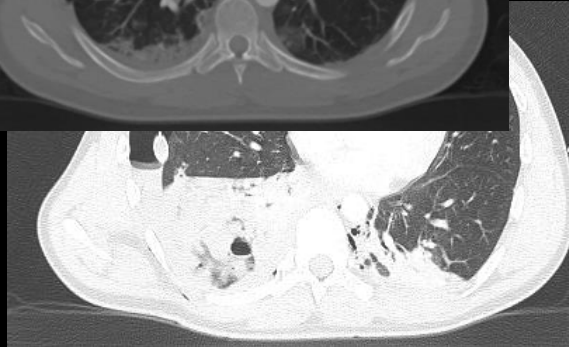
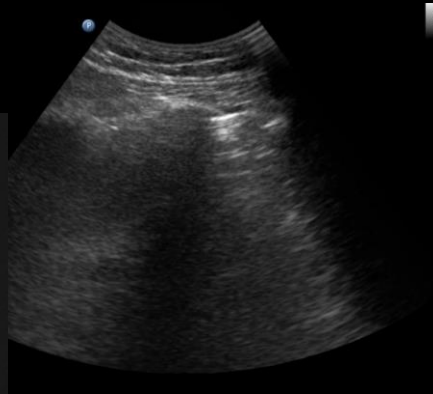
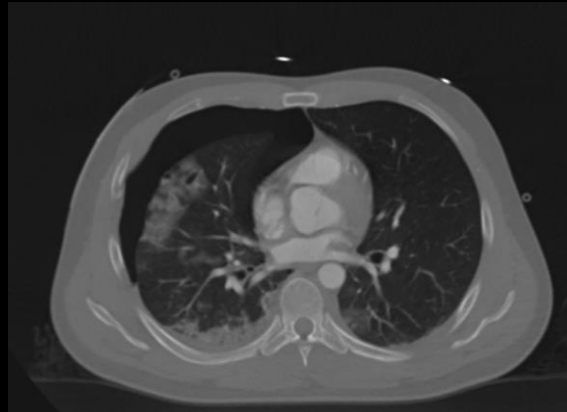
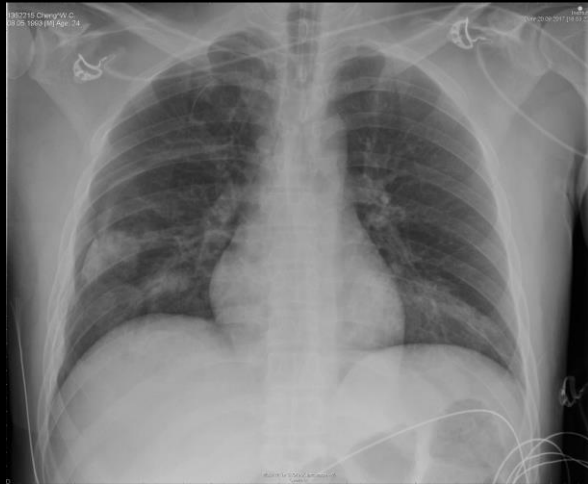


B- HTX/Pleural fluid



Lung Contusion / Laceration

- Peripheral parenchymal lesion



B : Breathing

- XR- Chest:
 - primary survey
 - Tension pneumothorax
 - Massive hemothorax
 - Flail chest met long contusie
 - Open PTX
 - Tube & lines



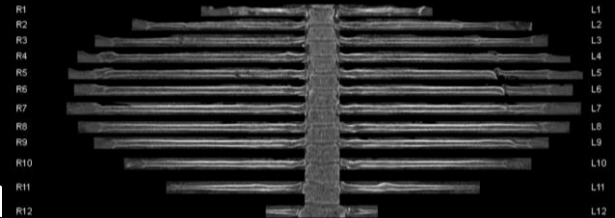
B : Breathing

- XR- Chest:
 - Minor/primary survey
 - simple PTX
 - simple hemothorax
 - rib fractures
 - pulmonary contusion
 - Less impact on clinical condition
 - secondary survey analysis



B : Breathing

- XR- Chest:
 - Minor/primary survey
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 - rib fractures
 - pulmonary contusion
 - Less impact on clinical condition
 - secondary survey analysis



C : Circulation

- Often haemorrhage (Blood on the floor & 4 more)

STOP THE BLEEDING

- stop the bleeding!

- Chest
- Abdomen/pelvis
- Extremities
- Face



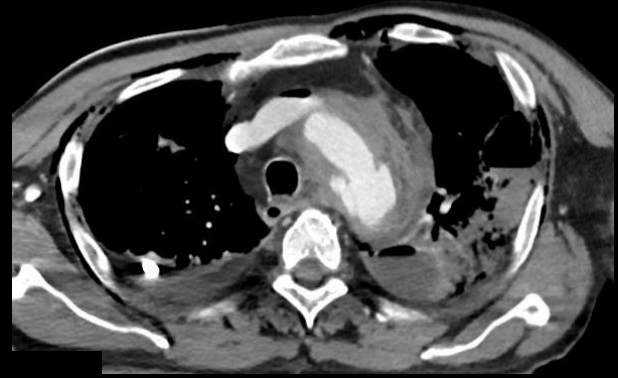
C : Circulation

- XR Chest
- XR Pelvis
- e-FAST (focussed abdominal sonography in trauma)
 - bleeding abdominal/pelvis
 - pericardial fluid
 - pneumothorax
 - myocardial contusion
 - spinal shock

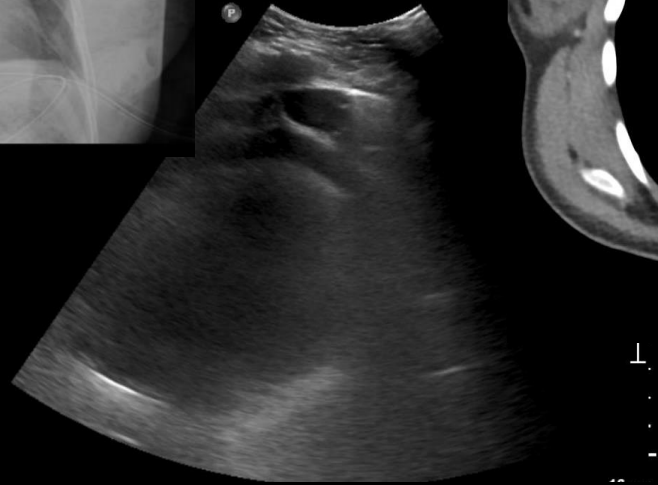
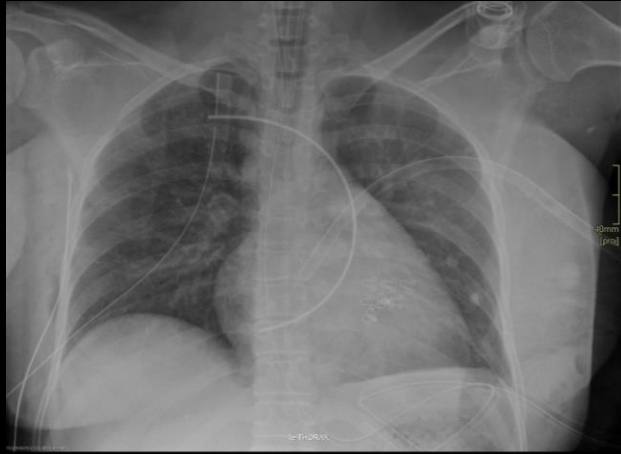


C : Chest trauma

- TAI –aortic injury
- intercostal artery injury



C : Pericardial fluid



C : Pneumopericardium

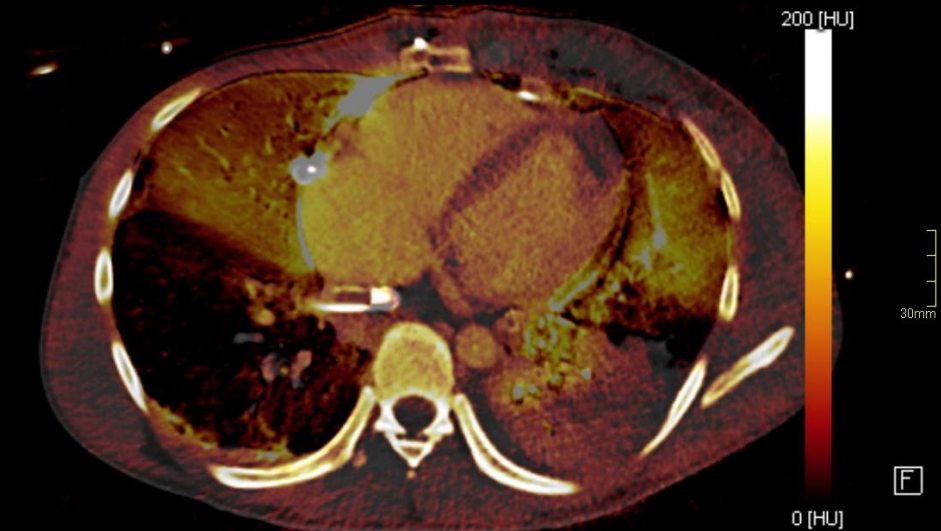
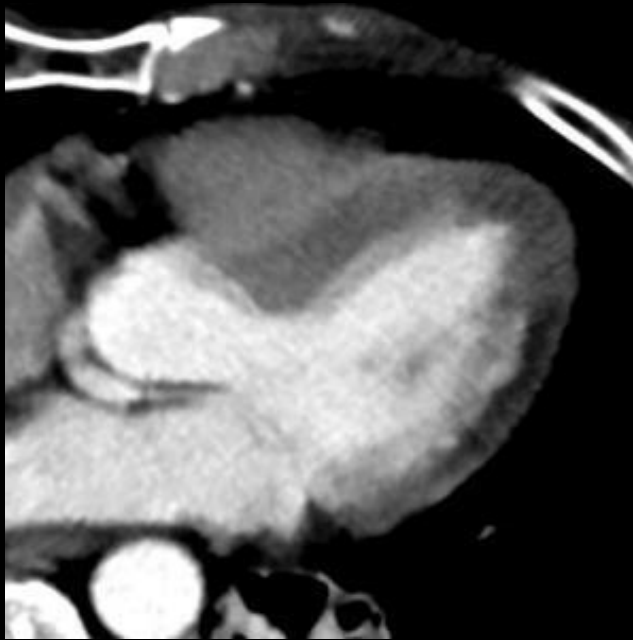


C : Heart (dys)function

- Wall motion abnormalities
- Abnormal contractility



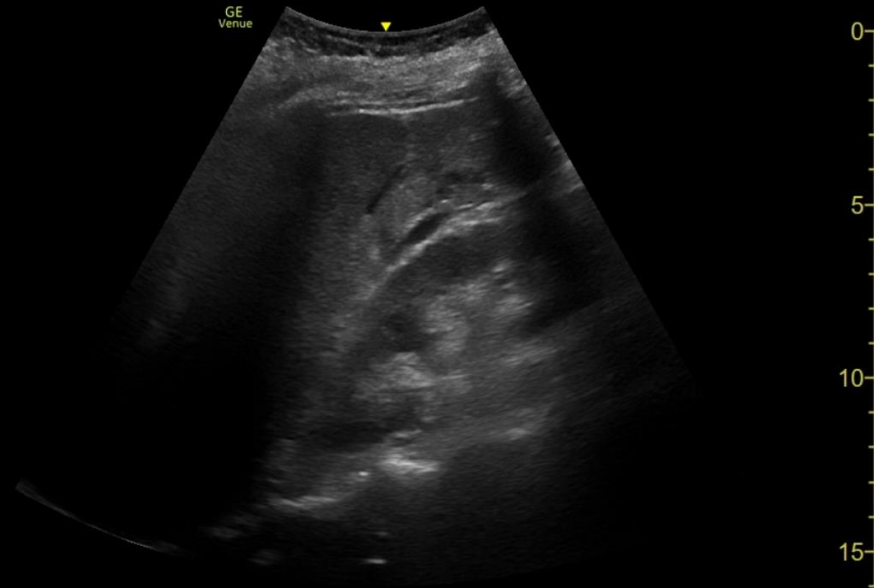
C : Myocardial infarction



C : Thoracotomy



C : Abdominal Free Fluid

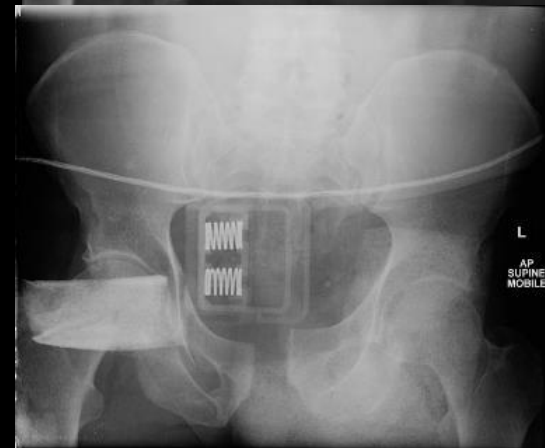
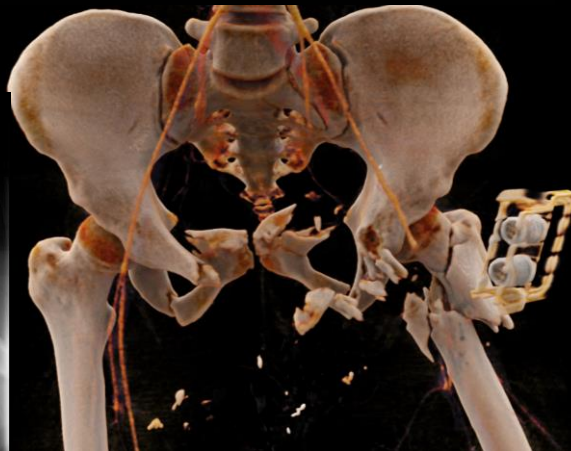
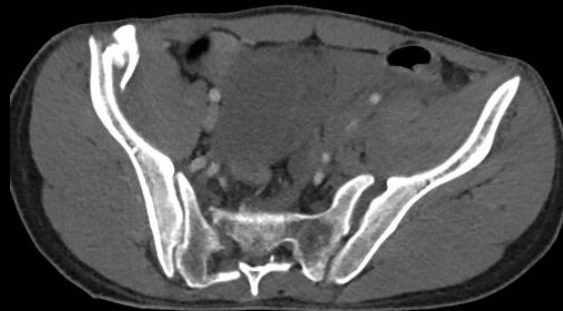


C : Liver & Spleen

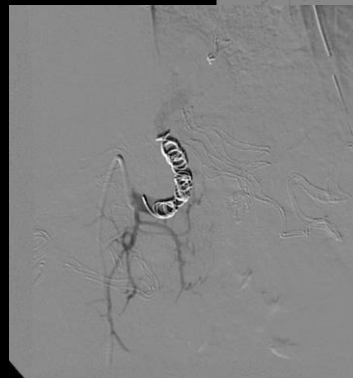
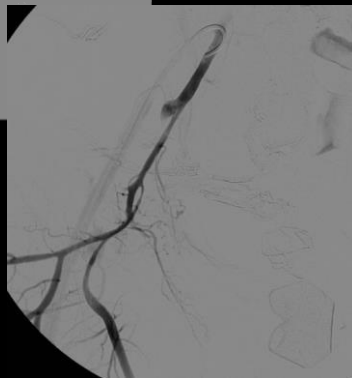
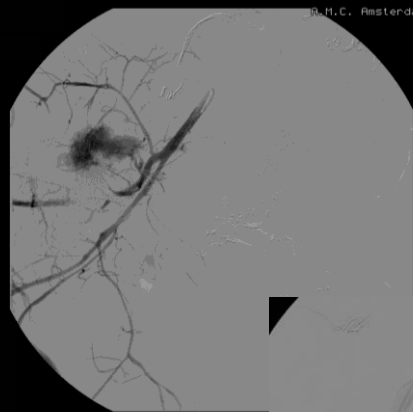
- Contrast blush



C : Pelvic Ring



C : Angio-Embolisation



D : Disability

- Neurological status & Glasgow Coma Score
 - haemorrhage
 - hypoxia / hypotension
- Brain CT in secondary survey

D : Disability

GCS ↓

– focal

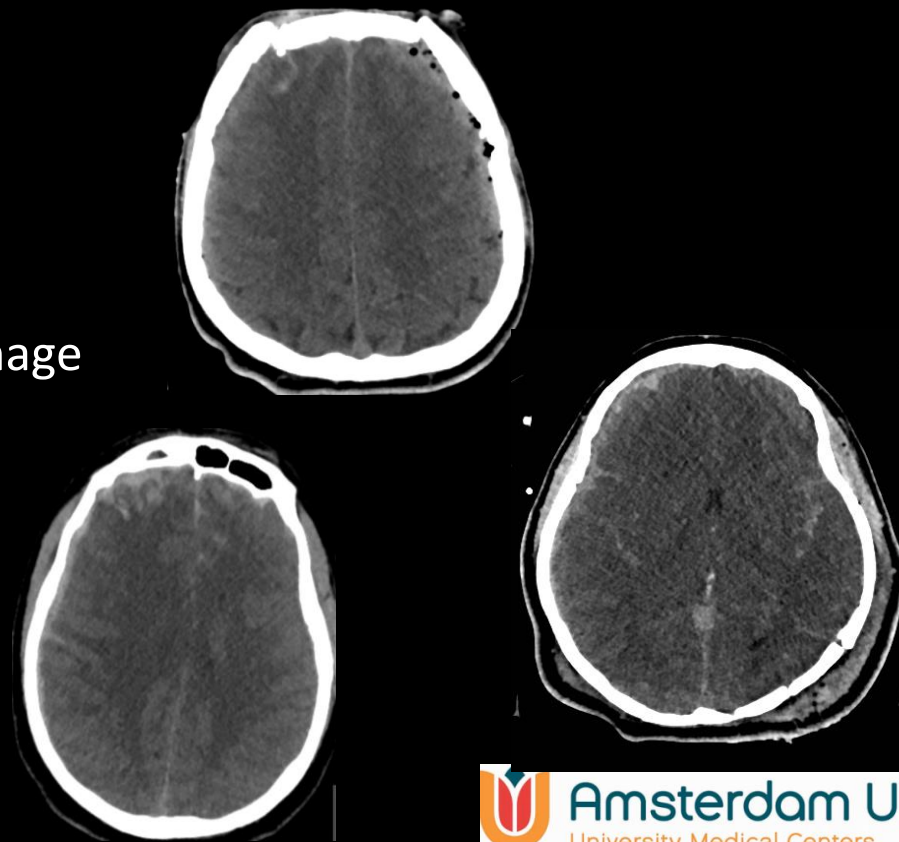
- subdural hematoma
- epidural hematoma
- brain contusion
- subarachnoidal haemorrhage

– diffuse

- traumatic axonal injury

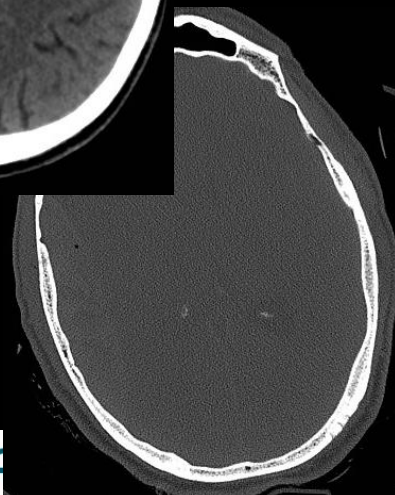
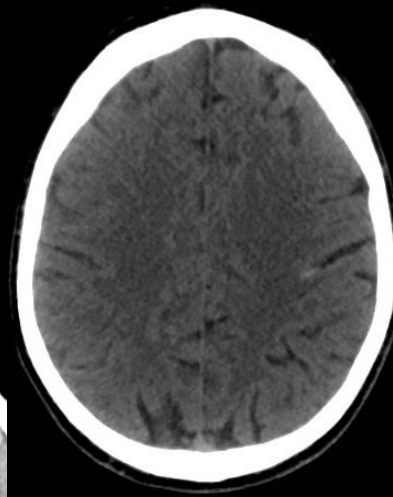
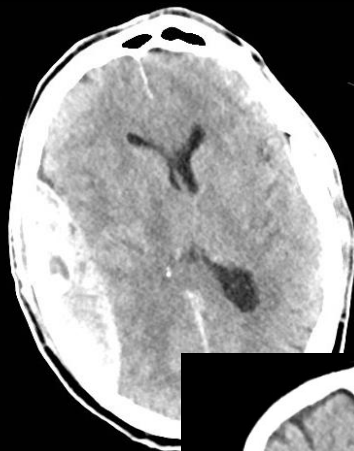
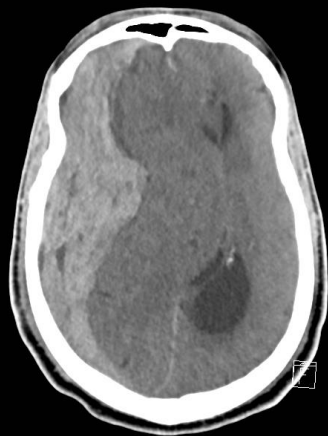
– consciousness ↓

- Hypoxia/ hypotension
- 2nd hit

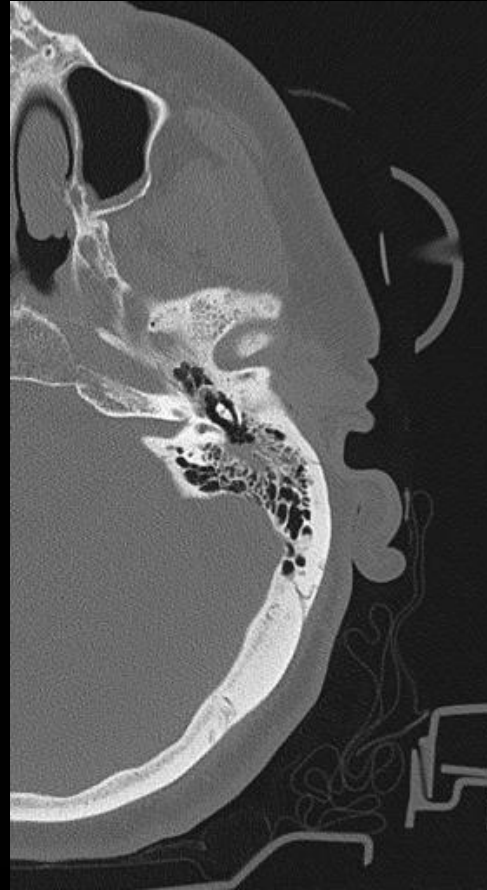
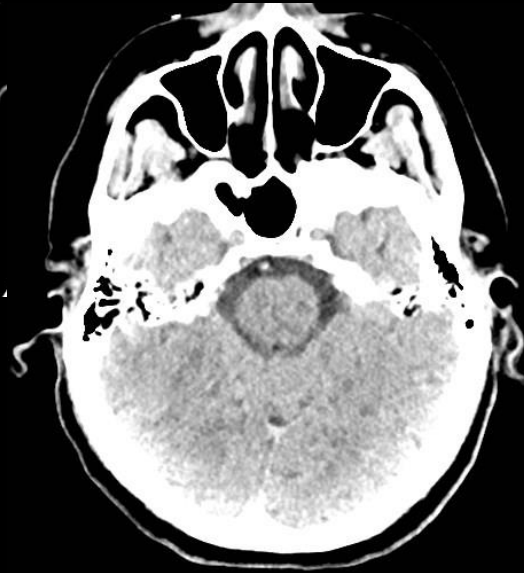


D : CT Brain

- SDH
- EDH
- SAH
- Contusion
- #



D : Eye Injury / Mastoid



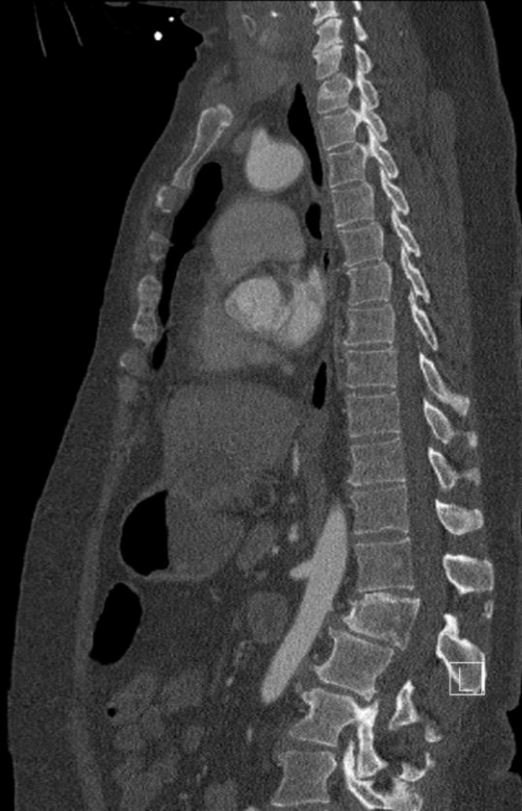
BCVI - CTA Carotids



D : C spine



D : TL spine



E : Environment & exposure

- Fractures/dislocation extremities
- Fractures trunk (minor)
- Soft tissue

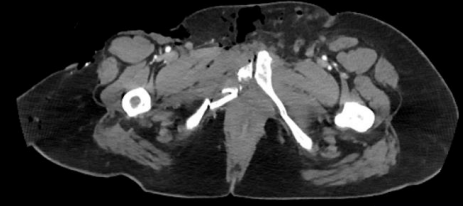
- Hypothermia
- Burns

- Chemical / radioactive agents

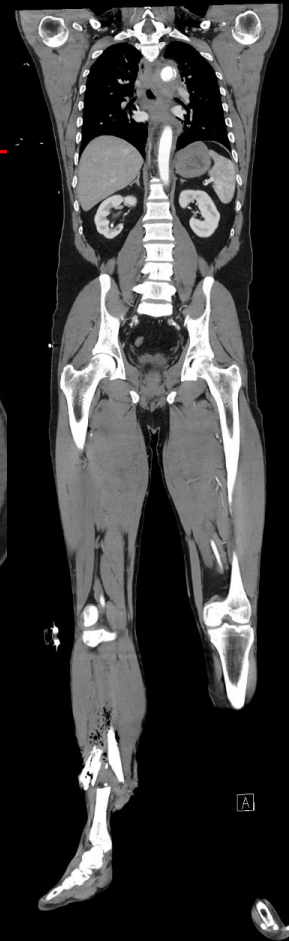
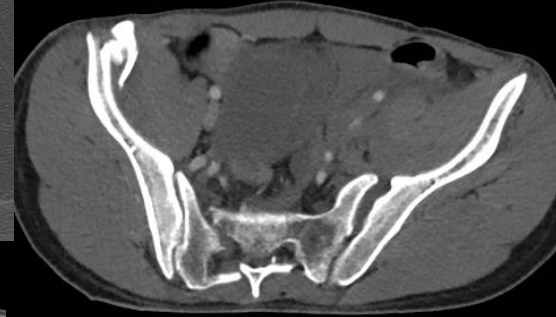
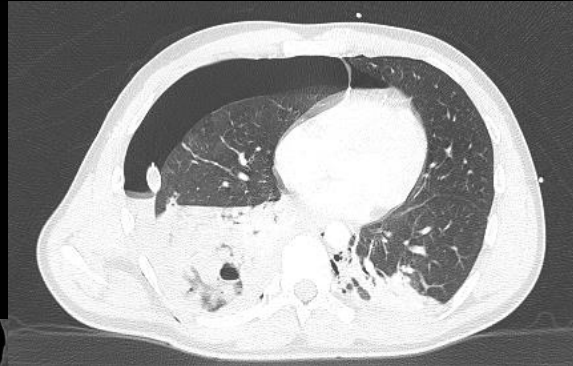
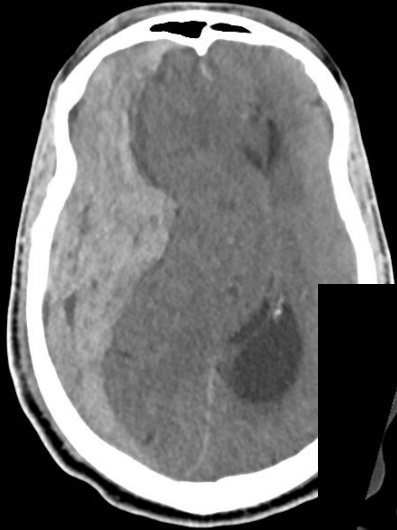


E : Environment & exposure

- Soft tissue
- Hypothermia
- Burns
- Chemical / radioactive agents



Head to Toe



Radiologist:

Date:

Life Threatening injuries

Chest	Abdomen	Head / spine
Airway obstruction	Massive hemothorax	Obiteration basal cisterns brain
Tension/open pneumothorax	Pelvic ring fracture (type B/C)	Subdural hematoma
Massive hemothorax		Epidural hematoma
Pericardial tamponade		Spinal cord injury

Primary injuries

Malposition tube	Active arterial extravasation	Midline shift brain
Larynx / trachea / bronchial injury	Liver injury	Skull base /Le Fort fracture
Pneumomediastinum	Splenic injury	Cervical body fracture
Flail chest / multiple rib fractures	Limited hemothorax	Suspected ligamentous injury
Active arterial extravasation	Other vascular injury (venous)	Cerebrovascular injury
Pneumopericardium	Intraperitoneal air	
Myocardial injury	Retropertoneal air	Thoracic spine fracture
Aortic injury	Bowel / mesenteric injury	Lumbar spine fracture
Other serious chest injuries	Other serious abdominal injuries	Sacrum / Acetabular fracture

Secondary injuries

Pulmonary contusion / laceration	Retropertoneal hematoma	Subarachnoidal hemorrhage
Aspiration	Renal injury	Brain contusion
Simple pneumothorax	Adrenal injury	Brain ischaemia/infarction
Simple hemothorax	Pancreatic injury	Diffuse axonal injury
Pulmonary edema	Gallbladder / biliary injury	Zygomatic complex fracture
Esophageal rupture	Pubic fracture	Orbital injury
Mediastinal hemorrhage	Genital injury	Naso-orbito-ethmoid fracture
Diaphragm injury	Other abdominal injuries	Nasal fracture
Chest-abdominal wall injury		Mastoid fracture
Clavicle fracture	Skeletal / Extremities	Skull vault fracture
Scapula fracture	Humeral fracture/ dislocation	Mandible fracture
Sternum fracture	Femoral fracture	
Rib fracture	Vascular injury extremity	Spinal canal stenosis
Other chest injuries	Other extremity injuries	Other craniocervical injuries

Abbreviated AMC Trauma CT Score

Radiologist Patient

Traumatologist Date

Primary

Secondary

Head

Herniation/ hematoma/#

Cervical spine

Fracture/Dislocation / SCI

Chest

PTX/HTX/Extravas/Flail chest

Aortic injury

Abdomen

Hemoperit/extravasation

Intraperitoneal /retropertoneal air

Solid organ injury

TL spine # / Pelvic Fractures

Skeleton

Long bones

ATLS - primary survey

- A - airway with control of the cervical spine
- B – breathing and ventilation
- C – circulation and control of haemorrhage
- D – disability (neurological status)
- E – exposure of the whole patient

treat first what kills first

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