Traumatic chest Pain :-

Trimodal distribution of Trauma mortality :-

1- immediate (sec. to min.) → major injury to Aorta, heart, Brainstem, spinal cord.

2- Early (few hours) → hemopneumothorax, 80% subdural & epidural hematoma, Pelvic fracture, liver & spleen injury, exsanguation.

3- late (Days to weeks) → multisystem failure, sepsis.

shot Gun in chest
- 7m → soft tissue only
- 3-7m → deep fascia & internal organ
- < 3m → Massive tissue Distruction.

Approach to Patient with Traumatic chest :-

1) Primary survey ⇒ A B C D E exposure.
- A: airway — head tilt, chain lift, cervical
- B: Breath. — look, listen, feel
- C: circul. — BP, HR, Pulse
- D: Disability — AVPU, GCS
- E: remove clothes

2) Seconday survey ⇒ examine from head to toe.

Chest wall injury

1) Contusion (most common)

injury → small blood vessel damage < erythema, ecchymosis
↓
Fluid Accumulate in lung → Crepitus, Absent or limited heart sound.
↓
Cant expand → Pain on Breathing.
↓
hypoventilation
↓
Dyspnea

2) Sternal fracture

-death due to :-
- Pulmonary contusion
- Cardiac contusion
- Cardiac temponade
- Cardiac rupture.

3) Rib fracture 50% of chest Trauma.

↳ Rib 1, 2, 3 + sternum → Great force to fracture

↳ Rib 4-9 → most common fractures

↳ Rib 10-12 (Floating) → less common to fracture.

4) Flail chest (Paradoxical movement)

more than 3 fractures in Different Places become detached from Rib Cage

Complications :-
- pulmonary contusion
- hemothorax.

we Give Pain killer → ↓ hypoventilation → ↓ hypoxia.

Pulmonary injury

1) simple, closed Pneumothorax :- (spontaneous)
- lung tissue disrupted → Air Go to Pleural space
- Can progress to tension.

*2) open pneumothorax :-
Penetrating - Trauma → wound > 2/3 Tracheal Diameter (10cm)
sucking chest wound → Air enter pleura → lung collapse
→ Tracheal deviation to opposite side
→ Hyper-resonance sound.
→ Abscent Breathing sounds.

management :- - chest tube.
- Dressing 3 way valve

*3) Tension Pneumothorax :-
- Air escape to pleural space that act as a one way valve through injury to visceral pleura.
→ mediastinal shift → impaired venous return
→ hypotension

S & S :- hypoxia, Air hunger, shifted Trachea, dilated neck vein, hypotension & Abscent Breath sound, hyper-resonance.

management :- - Decompression by needle in 2nd intercostal midclavicular line.
- chest tube in 5th intercostal Anterior Axillary line.
- Thoracotomy indications :-
  - Complete pneumothorax
  - hypotension after Blood replacement
  - Chronic, recurrent Pneumothorax
  - complicated with hemothorax & epeyma.
  - leak for 5-7 days.

Pleura can tolerate 3000 ml of Blood.

- Hemothorax → Flat neck veins.

management :-
- Treat hypovolemic shock
- decompression.
- urgent thoracotomy
  # >1500ml/Blood or 30ml per hour.

Pericardial temponade

↳ injury to coronary Artery or myocardium
↳ Pericardium tolerate 200-300 ml Blood.

Beck's Triad :-
- hypotension
- Dilated neck vein
- muffled heart sound

management :- Pericardiocentesis - needle 45° toward the Apex from xiphoid Process.

Indication for Thoracotomy :-

1) Cardiac Temponade.
2) Massive Air leak.
3) Massive hemothorax (>1500 ml)
4) Great vessel injury
5) Esophagus Rupture.
6) Diaphragmatic injury.
7) Tracheo esophageal fistula.

Abdominal Pain :-

- 5% of emergency department
- 15-30% need surgery
- Causes :-
  - unknown 40%
  - Gastrointeritis 7%
  - PID, UT, nephrolithiasis & Appendicitis (3%)
- Visceral Pain → mesenteric ischemia
- Somatic Pain → cholycystitis
- Reffered → MI

Causes of Abdominal Pain :-

1) surgical — inflammation
   — obstruction
   — Ischemia
   Perforation / Rupture.

2) Gyne — ectopic Pregnancy
   — PID
   — Ruptured ovarian cyst
   — Endometriosis.
   / Torsion of Testis

life threatening conditions in Abdomen :-

1) Ruptured ectopic Pregnancy
2) Ruptured AAA
3) Bowel Perforation.
4) MI (inferior leads)
5) mesenteric ischemia.

Differential Diagnosis :-

- lower lobe Pneumonia
- PE
- MI
- hepatitis, hepatic Abcess
- herpes roster, hepatic congestion
- cholycystitis, cholangitis
- Biliary colic
- Pancreatitis, Appendicitis

- lower lobe pneumonia
- PE
- MI
- Gastritis, Gastric ulcer
- Pancreatitis
- splenic rupture.
- herpes roster

- Appendicitis
- Crohn's Disease.
- Diverticulitis
- Gyne disorders
- Ischemic cholitis
- Inguinal hernia
- herpes roster

- Diverticulitis
- Gyne.
- hernia
- herpes roster

Treatment of non-Traumatic Abdominal Pain :-

- Keep fasting
- IV fluid.
- symptomatic treatment — Antacid
  — Antispasmodic
  — Analgesia (small dose)
- Antibiotic.
  - peritonitis
  - Sepsis
  - perforation.

epigastric Pain :-

- pancreatitis, peptic ulcer, Gastritis
- MI, Aortic Aneurysm.

Diffuse Pain :-

- peritonitis
- early Appendicitis
- pancreatitis
- mesenteric ischemia.
- Sickle cell Crisis
- DKA
- Aortic Aneurysm.
- Gastrointeritis
- IBD.
- heavy metal Poisoning.
- Perforated bowel
- volvulus

Abdominal Pain :-

- inflammation
- contraction of intestinal muscles
- Distention of an organ.
- loss of Blood supply.

40% of Abdominal Pain unknown etiology

7% Gastrointeritis. (Diarhea, vomiting)

3% — PID
Appendicitis
UTI
Nephrolithiasis

Somatic Pain vs. Visceral Pain

Somatic	Visceral
- well localized	- Poorly localized
- sharp	- vague & Diffused
- inflammation of the Parietal Peritoneum.	

- Cholycystitis → Somatic
- Mesenteric ischemia → Visceral
- MI → Reffered, to shoulder

Causes of Abdominal Pain :-

- inflammation
- Obstruction.
- Ischemia
- perforation.

Surgical	Gynecological	Medical
- Appendicitis	- UTI	- D K A
- cholecystitis	- PID	- P E
- pancreatitis	- ectopic Pregnancy	- lower lobe Pneumonia.
- diverticulitis	- endometriosis	- inferior leads MI.
- intestinal obstruction	- Rupture / torsion of ovarian cyst.	
- uretric calculi		
- urinary Retention		
- testicular torsion		
- intussecption.		
- mesenteric infarction.		
- Pephic ulcer		
- large bowel perforation.		

life threatening Conditions :-

1- Ruptured AAA (2 cm - 5 cm)
2- MI (epigastric Pain)
3- Mesenteric ischemia (Thrombus from AF)
↳ Pain Generalized & vague.
4- Bowel Perforation (or hollow viscus)
5- Ruptured ectopic Pregnancy.

* 5% come to the ER with abdominal pain, 15% - 30% will require surgery
* 40% of them unknown etiology
* 7% gastroenteritis : Diarrhea, Vomiting?
* 3% Appendicitis, then PID, UTI, Nephrolithiasis

Visceral pain : Mesentric ischemia
Somatic pain : cholecystitis
referred pain : MI

* common non-tramatic Abdominal pain causes : inflammation, Obstruction, ischemia, perforation (Rupture.)
  - Diabetic Ketoacidosis

* Life threatening conditions
  1. Rupture of AAA, Normally 2 cm
  2. MI in inferior leads
  3. Bowel perforation
  4. Ruptured ectopic pregnancy
  5. Mesentric ischemia

Non-traumatic chest pain

- Cardiac
- non-cardiac

*Stable angina : follow up.

Acute coronary syndrome MI ~~NSST~~ ST, unstable angina الذبحة الصدرية غير المستقرة

Life threating conditions in chest pain:

1. Myocardial ischemia
2. Pulmonary embolism
3. Aortic dissection
4. Cardiac tenponde
5. Tension pneumothorax
6. Acute esophageal perforation

Angina: Levinings sign

1. oxygen mask + pulse orimeter
2. cardiac Monitor
3. Blood pressure monitor.

Unstable angina ↑10 min Not by Rest Not resolved by nitroglycerin.

Stable angina 2-5 min Relieved by rest episodes

→ Aspirin, Nitroglycerin, Hypotension CI / MI inferior.
↓ if Bleeding
↓ clopredegrine "plavix"

inferior	II III AVF		
lateral	I AVL V5.V6		
Anterior	V1 - V4	Septal	V1, V2
left main stenosis	AVR		

ABDOMINAL TRAUMA

Injury → Blunt → 80% → Different history
→ penetrating

Hemodynamically stable
↳ ABC

- Fast: focused abdominal sonography for trauma
  ↳ can detect pericardial temponade
  Dis-adv. : cannot assess hollow perforations, operant dependent, Retroperitoneal Sth
- DPL : Detect bowel injury?
- ct · scan.

CPR

Abdominal Trauma :-

- Abdominal injury < 80% Blunt / Penetrating

- Organ involved in :-

Blunt trauma → Spleen 50%, liver 40%

Penetrating → stapping, Gun shot

Approach to Blunt trauma pt :-

- Type / velocity
- pt. side.
- intrusion.
- status
- Type of collision.
- Restraints

- ABC
- FAST
- CT scan
- Lab work.

#

	Advantages	Disadvantages
FAST/ US	- Rapid, Portable can repeat test, no Risk of Contrast non-invasive, Cardiac temponade (non-hypovolemic Reason of hypotension)	- Cant visualize Retroperitoneal injuries. - Operator dependant - Can't Assess hollow organ perforation.
CT	- define organ injury - not operator D. - Good for Retro-Peritoneal organs - non-invasive.	- not Great for hollow viscus - Cost - for stable pt. - Contrast complicatio
DPL		

findings on CXR that suggest intra-Abdominal injury :-

- lower Rib fracture
- Free Air under Diaphragm.
- Diaphragmatic hernia.

Shock :-

- low tissue Perfusion.
- Shock Pt Develop :-

1) hyperkalemia → ↓ O_2 & Glucose → cell Death → lysis → K+ to Blood.
2) Metabolic Acidosis → because of switching from Aerobic to Anaerobic → (Glucose → Pyruvate → lactic Acid) > 2 mmol/L
3) Edema → cell death → inflammatory mediators → EC injury → extravasation.
4) Tachycardia & VC
5) Hyperventilation (↑ CO_2 elimination)
6) ↓ Urin output
7) ↑ ADH, Aldosterone, Cortisol (↑ symp.)

↑JVP ↔ edema ↔ [2] Cardiogenic shock (failure to Pump)
↳ MI, myopathy, injury, valve Disease, Arrhythmia.

[3] Obstructive shock (↓ Preload due to obstruction)
↳ Cardiac Temponade, Tension Pneumothorax, Pleural effusion

SOFA score :-

[4] Distributive shock (Warm shock)
↳ hypoperfusion + vasodilation → hypotension
most common.
[A] Septic shock (SIRS ⇒ systemic inflammatory response syndrome
↳ HR > 90, RR > 20, WBC > 12000 or < 4000, Fever > 38.3c or < 36°c.
- PCO2 < 32 mmHg
- Mean Arterial Pressure < 65
[B] Neurogenic shock → sc injury → ↓ symp. → VD & Bradycardia.
[C] Anaphylactic shock.
↳ histamine
الفرق بينها و بين Reaction II Ig G mediator

[5] Endocrine shock

#how much BV loss to develope hypotension?
- child 50%
- Adult 30-40%

Bacteremia :- Presence of bacteria in Blood without signs of infection

Sepsis :- SIRS (signs) + documented infection (suspected source of infection.

septic shock :-
- hypotension
- sepsis
- Refractory shock. (need Fluid > 1h)

Shock Types :-

[1] Hypovolemic shock (Most Common) – Cold Shock –
→ Hemorrhagic (4 stages)
→ Non-hemorrhagic. (Burn, dehydration, vomit) Gastrointeritis

	I	II	III	IV
Blood loss *	< 750 ml <15%	750-1500 ml 15-30%	1500-2000 ml 30-40%	>2000 ml >40%
HR *	* early sign * <100 slight tachy	100-120 First sign	120-140	>140
BP	normal	normal	Decreased hypotension late	Decreased
PP systole Diastole	normal	decreased (↑ Diastolic Pressure) & systole Fixed	decreased (↓ systolic)	decreased (↓↓↓ systolic)
RR	14-20	20-30	30-40	>35
indicator Urin output *	normal >30ml/h	20-30 ml/h	5-~~20~~ 15 ml/h	negligible (Anuria)
mental status *	Conscious managed by observation.	Conscious but Anxious crystalloid	~~Conscious~~ Anxious Confused crystalloid + colloid	Coma "

normal Adult .5ml/kg/h / children 1-2 ml/kg/h. 0 mL/h.

Management :-

1- ABC.
2- Fluid Resuscetation 250-500 ml in 5-10 min.
3- Drug – vasopressin (not Given in hypovolemic shock but in septic shock) or Distributive.
– Dobutamine (+ve inotropic) → ↑ contractility in Cardiogenic shock
– wide spectrum Antibiotic (emperical) → septic shock
4- Monitor HR, BP, Urin output, O2 SAT & ECG, CVP (fluid monitor)
↳ ↑ 2-5 when we Give fluid. (250-500 in 5-10 min)
5) surgery
6) lactate is normal → end of resuscitation.