



Round : Emergency medicine

Group no : B3

Done By : Johainah Taha

Initial Patient Assessment/Management

1. Rapid Primary Survey (RPS)



Approach to the Critically Ill Patient

1. Rapid Primary Survey (RPS)
2. Resuscitation (often concurrent with RPS)
3. Detailed Secondary Survey
4. Definitive Care

- Airway maintenance with cervical spine (C-spine) control
 - Breathing and ventilation
 - Circulation (pulses, hemorrhage control)
 - Disability (neurological status)
 - Exposure (complete) and Environment (temperature control)
 - Continually reassessed during secondary survey
- IMPORTANT:** always watch for signs of shock while doing primary survey (see Table 1)

A. AIRWAY

- first priority is to secure airway
- assume a cervical injury in every trauma patient and immobilize with collar
- assess ability to breathe and speak
- can change rapidly, therefore reassess frequently



Noisy breathing is obstructed breathing until proven otherwise.



Signs of Airway Obstruction

- Agitation, confusion, "universal choking sign"
- Respiratory distress
- Failure to speak, dysphonia
- Cyanosis

Airway Management

- goals → ① O₂ ② drugs IV or ETT
 - permit adequate oxygenation and ventilation
 - facilitate ongoing patient management
 - give drugs via endotracheal tube (ETT) if IV not available
- Note: start with basic management techniques before progressing to advanced (see below)

1. Basic Airway Management (Temporizing Measures) → ① C-spine ② Suction

- protect the C-spine
- head-tilt (if C-spine injury not suspected) or jaw thrust to open the airway
- sweep and suction to clear mouth of foreign material

2. Definitive Airway Management

- ETT intubation with inline stabilization of spine (Figure 1)
 - orotracheal ± Rapid Sequence Intubation (RSI) preferred — ① Rapid Sequence Intubation: quick airway secure for unconscious patient with aspiration risk, it involves administration of sedatives and paralytics medications. It's preferred in ER.
 - nasotracheal – may be better tolerated in conscious patient
 - ↳ relatively contraindicated with basal skull fracture
 - does not provide 100% protection against aspiration
- surgical airway (if unable to intubate using oral/nasal route and unable to ventilate) — ②
 - cricothyroidotomy
 - ↳ especially in maxillofacial trauma / or when there is a mass.

3. Rescue or Temporizing Measures

- nasopharyngeal airway
- oropharyngeal airway (not if gag reflex present)
- "rescue" airway devices (e.g. laryngeal mask airway (LMA); Combitube®)
- transtracheal jet ventilation through cricothyroid membrane (last resort)



Medications that can be Delivered via ETT

NAVEL
 Naloxone (Narcan)
 Atropine
 Ventolin (Salbutamol)
 Epinephrine
 Lidocaine



Indications for Intubation

- Unable to protect airway (e.g. Glasgow Coma Scale (GCS) < 8; airway trauma)
- Inadequate oxygenation with spontaneous respiration (O₂ saturation < 90% with 100% O₂ or rising pCO₂)
- Profound shock *extreme hypotension*
- Anticipatory: in trauma, overdose, congestive heart failure (CHF), asthma, chronic obstructive pulmonary disease (COPD) and smoke inhalation injury
- Anticipated transfer of critically ill patients



Added Equipment and Techniques in Intubation

- Bougie (used like a guidewire)
- Retrograde intubation (ETT threaded over a wire inserted through skin and out mouth)
- Lighted stylet (use light through skin to determine if ETT in correct place)
- Fiberoptic intubation – indirect vision using fiberoptic cable

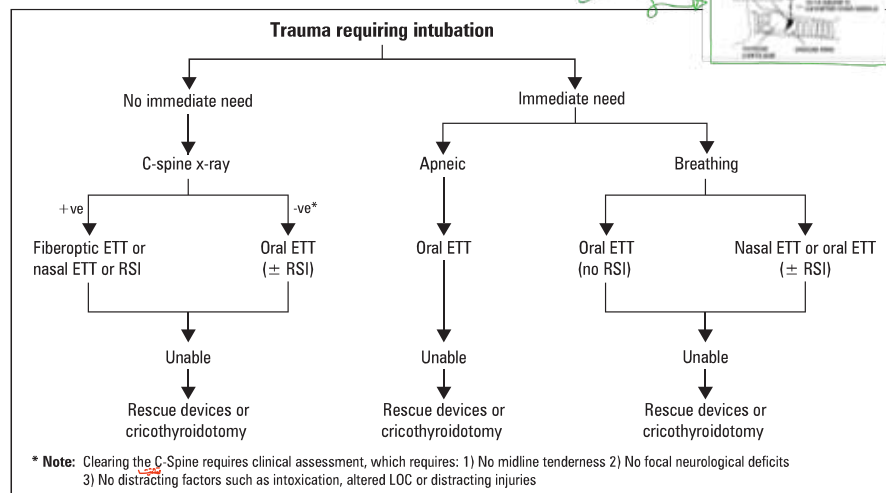


Figure 1. Approach to Endotracheal Intubation in an Injured Patient

ETT – endotracheal tube intubation; RSI – rapid sequence intubation

B. BREATHING

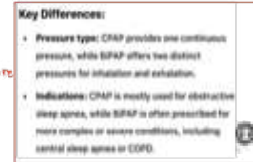
- **Look**
 - mental status (anxiety, agitation, decreased LOC), colour, chest movement (bilateral vs. asymmetrical), respiratory rate/effort, nasal flaring
- **Listen**
 - sounds of obstruction (e.g. stridor), breath sounds, symmetry of air entry, air escaping
- **Feel**
 - flow of air, tracheal shift, chest wall for crepitus, flail segments, sucking chest wounds, subcutaneous emphysema

Breathing Assessment

- measurement of respiratory function: rate, pulse oximetry, arterial blood gas (ABG), A-a gradient

Management of Breathing

- nasal prongs → simple face mask → oxygen reservoir → CPAP/BiPAP
- Venturi mask: used to precisely control O₂ delivery
- Bag-Valve mask and CPAP to supplement ventilation



- **Interventions:**
 - 1-O₂ according to spo₂
 - 2-Pneumothorax therapy
 - 3-Ventilation therapy

C. CIRCULATION

Definition of Shock

- inadequate organ and tissue perfusion with oxygenated blood (brain, kidney, extremities) (see Table 2)

Table 1. Major Types of Shock

Hypovolemic	Cardiogenic	Distributive (vasodilation)	Obstructive
Hemorrhage (external and internal)	Myocardial Ischemia	Septic	Cardiac tamponade
Severe burns	Arrhythmias	Anaphylactic	Tension pneumothorax
High output fistulas	Congestive Heart Failure	Neurogenic (spinal cord injury)	Pulmonary embolism
Dehydration (diarrhea, DKA)	Cardiomyopathies		Aortic stenosis
	Cardiac valve problems		Constrictive pericarditis

Clinical Evaluation

- **early:** tachypnea, tachycardia, narrow pulse pressure, reduced capillary refill, cool extremities and reduced central venous pressure (CVP)
- **late:** hypotension and altered mental status, reduced urine output

Table 2. Estimation of Degree of Hemorrhagic Shock

Class	I	II	III	IV
Blood Loss	<750 cc	750-1500 cc	1500-2000 cc	>2000 cc
% of blood volume	<15%	15-30%	30-40%	>40%
Pulse	<100	>100	>120	>140
Blood pressure	Normal	Normal	Decreased	Decreased
Respiratory rate	20	30	35	>45
Capillary refill	Normal	Decreased	Decreased	Decreased
Urinary output	30 cc/hr	20 cc/hr	10 cc/hr	None
Fluid replacement	Crystalloid	Crystalloid	Crystalloid + blood	Crystalloid + blood

Management of Hemorrhagic Shock

- secure **airway** and supply O₂
- TREAT THE **CAUSE** OF THE SHOCK
- control external **bleeding**
 - direct pressure
 - elevate extremities if no obvious unstable fracture
 - consider vascular pressure points (brachial, axillary, femoral)
 - do not remove impaled objects as they tamponade bleeding
 - tourniquet only as last resort
- prompt surgical consultation for active internal bleeding
- **infusion** of 1-2 L of NS/RL as rapidly as possible → 2 large bore (14 gauge) IVs wide open
- **warm** blood/IV fluids, especially for massive transfusions
- replace lost blood volume at **ratio of 3:1 with crystalloid**
- if inadequate response, consider ongoing blood loss (e.g. chest, abdomen, pelvis, extremities) → operative intervention required
- indications for blood transfusion
 - severe hypotension on arrival
 - shock persists following crystalloid infusion
 - rapid bleeding



Shock in a trauma patient is **hemorrhagic** until proven otherwise.



Causes of Shock

SHOCKED
 Septic, Spinal/neurogenic, Hemorrhagic
 Obstructive (e.g. tension pneumothorax, cardiac tamponade, pulmonary embolism)
 Cardiogenic (e.g. blunt myocardial injury, arrhythmia, MI)
 anaphylactic
 Endocrine (e.g. Addison's, myxedema, coma)
 Drugs



Estimated Systolic Blood Pressure Based on Position of Most Distal Palpable Pulse

	sBP (mmHg)
Radial	> 80
Femoral	> 70
Carotid	> 60



Hemorrhage Management

RED
 Rest
 Elevate the bleeding area above the level of the heart if possible
 Direct pressure on the bleeding site



Fluid Resuscitation

Give bolus until HR decreases, urine output picks up, and patient stabilizes
 Maintenance: 4-2-1 rule
 first 10kg: 4cc/kg/hr
 10-20kg: 2cc/kg/hr
 remaining weight: 1cc/kg/hr
 replace ongoing losses and deficits (assume 10% of body weight)



Since only 30% of infused isotonic crystalloids remains in intravascular space, you must give **3x estimated blood loss**. *1L → give 3*



Initial Management of Any Patient in Shock

- 1 ABCs
- 2 IV fluids
- 3 Oxygen
- 4 Monitor (HR, BP, urine, mentation, O₂ sat.)
- 5 Control hemorrhage



Method of Assessing Level of Consciousness

AVPU
Alert
Responds to Verbal stimuli
Responds to Painful stimuli
Unresponsive



Unproven or Harmful Treatments for Hemorrhage Shock

- Trendelenburg position
- Steroids (used only in spinal cord injury)
- MAST garments
- Vasopressors

Vasopressin versus Norepinephrine Infusion in Patients with Septic Shock

NEJM 2008; 358:877-87

Study: Multicenter, randomized, double-blind trial
Patients: 778 patients with septic shock

Intervention: Low-dose vasopressin (0.01 to 0.03 U per minute) or norepinephrine (5 to 15 ug per minute) in addition to open-label vasopressors and a minimum of 5ug of norepinephrine.

Outcome: Mortality rate 28 days after start of infusions.

Results: No significant difference between the vasopressin and the norepinephrine groups at 28 days or 90 days. However, in patients with less severe septic shock, mortality rate was lower in the vasopressin group.



Foley Contraindications

- Blood at urethral meatus
- Scrotal hematoma
- High-riding prostate on DRE



NG Tube Contraindications

- Significant mid-face trauma
- Basal skull fracture

- transfusion options with **packed red blood cells (pRBCs)**
 - **crossmatched** if possible
 - type-specific (provided by most blood banks within 10 minutes)
 - ♦ preferred to O-negative un-crossmatched blood if both available
 - **O-negative (children and women of child-bearing age)**
 - **O-positive if no time for cross-match (males/postmenopausal women)**
 - anticipate complications with massive transfusions
 - consider replacement of **other blood products (platelets, FFP)** after 2-4 units pRBCs
- transfusion with **fresh frozen plasma (FFP)** *→ Stoppage of blood flow.*
 - used for clinical evidence of **impaired hemostasis**
 - ongoing hemorrhage, **PT >1.5x** normal range

D. DISABILITY

- assess **level of consciousness** by **AVPU** method (see sidebox) or **GCS**

Glasgow Coma Scale (GCS)

- for use in trauma patients with **decreased LOC**; good indicator of **severity** of injury and neurosurgical prognosis
- may be used for metabolic coma, but less meaningful
- most useful if repeated and used for monitoring of trend
 - **change** in GCS with time is more relevant than the absolute number
 - patient with deteriorating GCS needs immediate attention
 - prognosis based on **best post-resuscitation** GCS
- reported as a 3 part score: Eyes + Verbal + Motor = Total (see Table 3)
- if patient intubated, GCS score reported out of 10 + T (T = tubed, i.e. no verbal component)

Table 3. Glasgow Coma Scale

Eyes Open		Best Verbal Response		Best Motor Response	
Spontaneously	4	Answers questions appropriately	5	Obeys commands	6
To voice	3	Confused, disoriented	4	Localizes to pain	5
To pain	2	Inappropriate words	3	Withdraws from pain	4
No response	1	Incomprehensible sounds	2	Decorticate (flexion)	3
		No verbal response	1	Decerebrate (extension)	2
				No response	1

13-15 = **mild** injury, 9-12 = **moderate** injury, ≤8 = **severe** injury

See Table 28 for modified GCS for infants and children

E. EXPOSURE/ENVIRONMENT

- **undress** patient completely and assess entire body for injury; **logroll** to examine back
- **digital rectal exam**
- keep patient warm with a blanket ± radiant heaters; **avoid hypothermia**
- warm IV fluids/blood
- keep providers safe (contamination, combative patient)

2. Resuscitation

الإسعاف

- done simultaneously with primary survey
- attend to ABCs (see Table 4)
- manage life-threatening problems as they are identified
- vital signs q5-15 minutes
- ECG, BP and O₂ monitors
- Foley catheter and nasogastric (NG) tube if indicated
- tests and investigations: CBC, electrolytes, BUN, Cr, glucose, amylase, INR/PTT, β-hCG, toxicology screen, cross and type

Table 4. 2005 AHA CPR Guidelines

Step/Action	Adult: >8yrs	Child: 1-8 years	Infant: <1 year
Airway	Head tilt-chin lift		
Breaths	2 breaths at 1 second/breath		
Foreign-body airway obstruction	Abdominal thrust		Back slaps and chest thrusts
Compressions			
Compression landmarks	In the centre of the chest, between nipples		Just below nipple line
Compression method: push hard and fast and allow for complete recoil	2 Hands: Heel of 1 hand, second hand on top	2 Hands: Heel of 1 hand with second on top, or 1 Hand: Heel of 1 hand only	2 fingers
Compression depth	1 ½ to 2 inches	About ⅓ to ½ the depth of the chest	
Compression rate	100/min		
Compression-ventilation ratio	30 compressions to 2 ventilations		
Compression-only CPR	Hands-only CPR is preferred if the bystander is not trained or does not feel confident in their ability to provide conventional CPR or if the bystander is trained but chooses to use compressions-only		
Defibrillation	Immediate defibrillation for all rescuers responding to a sudden witnessed collapse. Compression (5cycles/2min) before AED is considered if EMS arrival is > 4-5 minutes after the call		No defibrillation

3. Detailed Secondary Survey

- done after rapid primary survey problems have been addressed
- identifies major injuries or areas of concern
- full physical exam and x-rays (C-spine, chest, pelvis – required in blunt trauma, consider T-spine and L-spine)

HISTORY

- “SAMPLE”: Signs and Symptoms, Allergies, Medications, Past medical history, Last meal, Events related to injury

PHYSICAL EXAMINATION

Head and Neck

- pupils
 - assess equality, size, symmetry, reactivity to light
 - inequality/sluggish suggests local eye problem or lateralizing CNS lesion
 - relative afferent pupillary defect (swinging light test) – optic nerve damage
 - extraocular movements and nystagmus
 - fundoscopy (papilledema, hemorrhages)
 - reactivity/level of consciousness (LOC)
 - reactive pupils + decreased LOC → metabolic or structural cause
 - non-reactive pupils + decreased LOC → structural cause (especially if asymmetric)
- palpation of facial bones, scalp

Chest

- inspect for midline trachea, flail segment: ≥2 rib fractures in ≥2 places; if present look for associated hemothorax, pneumothorax, and contusions
- auscultate lung fields
- palpate for subcutaneous emphysema

Abdomen

- assess for peritonitis, abdominal distention, and evidence of intra-abdominal bleeding
- FAST (Focused Abdominal Sonogram in Trauma), diagnostic peritoneal lavage (DPL) or CT
- rectal exam for GI bleed, high riding prostate and anal tone (best to do during the log roll)
- bimanual exam in females as appropriate

Musculoskeletal (MSK)

- examine all extremities for swelling, deformity, contusion, tenderness, range of motion
- check for pulses and sensation in all injured limbs
- log roll and palpate thoracic and lumbar spines
- palpate iliac crests and pubic symphysis, pelvic stability (lateral, AP, vertical)



Unilateral, Dilated, Non-reactive Pupil, Think:
Focal mass lesion
Epidural hematoma
Subdural hematoma



Non-contrast head CT is the best imaging modality for intracerebral injury.



Signs of Increased Intracranial Pressure (ICP)

- Deteriorating LOC (hallmark)
- Deteriorating respiratory pattern
- Cushing reflex (high BP, low heart rate, irregular respirations)
- Lateralizing CNS signs (e.g. cranial nerve palsies, hemiparesis)
- Seizures
- Papilledema (occurs late)
- N/V and H/A

Neurological

- GCS
- full cranial nerve exam
- alterations of rate and rhythm of breathing are signs of structural or metabolic abnormalities
 - progressive deterioration of breathing pattern implies a failing CNS
- assess spinal cord integrity
 - conscious patient: assess distal sensation and motor
 - unconscious patient: response to painful or noxious stimulus applied to extremities

4. Definitive Care

- continue therapy
- continue patient evaluations and special investigations
- specialty consultations including OR as needed
- disposition: home, admission, or transfer to another setting (e.g. OR, ICU)

Ethical Considerations**Jehovah's Witnesses**

- Capable adults have the right to refuse medical treatment
- May refuse whole blood, pRBCs, platelets and plasma even if life-saving
- Should be questioned directly about the use of albumin, immunoglobulins, hemophilic preparations
- Do not allow autologous transfusion unless there is uninterrupted extra corporeal circulation
- Usually ask for the highest possible quality of care without the use of the above interventions (e.g. crystalloids for volume expansion, attempts at bloodless surgery)
- Patient will generally sign hospital forms releasing medical staff from liability
- Most legal cases involve children of Jehovah's Witnesses; if life-saving treatment is refused contacted CAS

Consent to Treatment: Adults

- Emergency Rule: consent is not needed when patient is at imminent risk from a serious injury (e.g. severe suffering, loss of limb, vital organ or life) AND obtaining consent is either: a) not possible (e.g. patient is comatose); OR b) would increase risk to the patient (e.g. time delay)
 - assumes that most people would want to be saved in an emergency
- any capable and informed patient can refuse treatment or part of treatment, even if it is life-saving
 - consider: is the patient truly capable? Does pain, stress, or psychological distress impair their judgment?
- exceptions to the Emergency Rule: treatment cannot be initiated if
 - a competent patient has previously refused the same or similar treatment and there is no evidence to suggest the patient's wishes have changed
 - an advance directive is available – e.g. do not resuscitate (DNR) order
- refusal of help in a suicide situation is not an exception; care must be given
- if in doubt, initiate treatment
 - care can be withdrawn if appropriate at a later time or if wishes clarified by family

Consent to Treatment: Children

- treat immediately if patient is at imminent risk
- parents/guardians have the right to make treatment decisions
- if parents refuse treatment that is life-saving or will potentially alter the child's quality of life, Children's Aid Society (CAS) must be contacted – consent of CAS is needed to treat

Other Issues of Consent

- need consent for HIV testing, as well as for administration of blood products

Duty to Report

- law may vary depending on province and/or state
 - gunshot wounds, potential drunken drivers, suspected child abuse, various communicable diseases
 - medical unsuitability to drive

stop



NOTES :: (Slides + Dr's Notes)

1. Naloxone: opioid antagonist / $\times$ RS depression / can be given every 2-3 min.
2. Atropine: $\uparrow$ HR / $\downarrow$ salivation and secretion / 1 mg every 3-5 min.
3. Salbutamol: Bronchodilator (Asthma - COPD) / 100-200 mcg per puff.
4. Epinephrine: anaphylaxis / cardiac arrest / Severe asthmatic attack.
* vasoconstriction $\rightarrow$ $\uparrow$ BP / improve HR-contraction / bronchodilation
* in anaphylaxis $\rightarrow$ 0.3-0.5 mg IM / in cardiac arrest $\rightarrow$ 1 mg IV every 3-5 min
5. Lidocaine: local anaesthesia / Anti-arrhythmic $\leftarrow$ Vent. tachy $\rightarrow$ 1-1.5 mg/kg
Fibrill.



Medications that can be Delivered via ETT

NAVEL

Naloxone (Narcan)
Atropine
Ventolin (Salbutamol)
Epinephrine
Lidocaine

- * Sign of having chest pain $\rightarrow$ Clench sign
- * Sign of airway obstruction $\rightarrow$ Choking sign

Breathing

- Goals in assessing breathing:

- 1- Securing oxygenation and ventilation
- 2- Treating life-threatening thoracic injuries

- Interventions:

- 1-O₂ according to spo₂
- 2-Pneumothorax therapy
- 3-Ventilation therapy

Examination

Inspection

Breathing, RR, cyanosis, JVD, symmetry, wounds, use of accessory muscles

Palpation

Subcutaneous emphysema, flail segments, tracheal deviation

Percussion

Hyperresonance, dullness

Auscultation

Breathing sounds

Respiratory function

ABG
Pulse oximetry
RR

Life-threatening conditions

1. pneumothorax
2. Flail chest
3. Cardiac tamponade
4. massive hemothorax

1-Pneumothorax: accumulation of air between the visceral and parietal pleura caused by injury to the lungs
lung collapse $\rightarrow$ Absent breathing sounds

Diagnosis and treatment of:

Tension pneumothorax: diagnosed clinically, symptoms like dyspnea, JVD, Tachypnea, anxiety, pleuritic chest pain, unilateral decrease or absent breath sound, tracheal deviation and hyperresonance in the affected side, treated by rapid thoracotomy or immediate decompression by needle thoracostomy followed by chest tube.

Open Pneumothorax: usually obvious with air movement through a wall defect. It is treated by chest tube and occlusive dressing over the defect without closing it on all 4 sides.



Tension pneumothorax

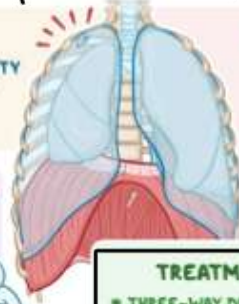
Open pneumothorax

BACKGROUND

- AIR BUILDS UP in PLEURAL CAVITY
- CAUSED by HOLE in CHEST WALL
- PUTS PRESSURE on the LUNG
- CAN LEAD to LUNG COLLAPSE

CAUSES

- TRAUMA
 - BLUNT
 - PENETRATING
- IATROGENIC
 - TRANSTRACHEAL ASPIRATION
 - LUNG BIOPSY
 - TUBE THORACOSTOMY

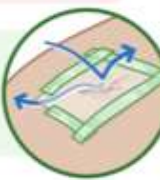


SYMPTOMS

- SUDDEN CHEST PAIN
- SHORTNESS of BREATH
- RAPID & SHALLOW BREATHING
- FAST HEART RATE
- HYPOXIA

TREATMENT

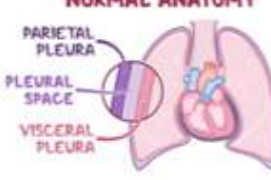
- THREE-WAY DRESSING
- CHEST TUBE
- SURGICAL REPAIR



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Tension Pneumothorax

NORMAL ANATOMY



PATHOPHYSIOLOGY

- AIR ENTERS PLEURAL SPACE
- TENSION PNEUMOTHORAX: AIR CAN'T LEAVE
- PRESSURE in LUNG, TRACHEA, HEART, and OTHER STRUCTURES

CAUSES

SPONTANEOUS / SIMPLE		TRAUMATIC
PRIMARY (without underlying lung disease)	SECONDARY (with underlying lung disease)	(from any kind of trauma, including complications from medical procedures)

CAN DEVELOP into TENSION PNEUMOTHORAX

- most commonly seen after traumatic chest injury or in those using mechanical ventilation

SYMPTOMS

- SHORTNESS of BREATH
- ACUTE CHEST PAIN
- ↓ BLOOD PRESSURE
- ↓ BLOOD O₂
- ↑ HEART RATE

TREATMENT

NEEDLE DECOMPRESSION



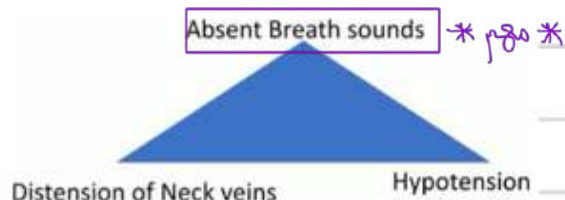
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*Treatment of tension pneumothorax:-

needle decompression, where?? 1. 2nd intercostal space midclavicular line.

2. 4th / 5th intercostal space in the anterior axillary line.

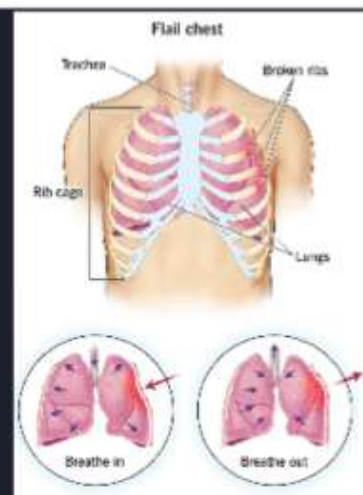
*The triad of pneumothorax:-



2-Flail chest is a traumatic disorder that happens when three or more ribs located next to each other are fractured in two or more places. This causes chest wall to become unstable, interfering with breathing

↳ it is a suspension of lung contusions (high velocity trauma) and it can lead to organ damage.

The flail segment of the chest wall will move paradoxically, means the injured section of the chest wall moves in an opposite direction when compared with the undamaged chest wall



3-Cardiac tamponade : bleeding into pericardial sac which compresses the heart causing decreased Output

• Sign and symptoms :

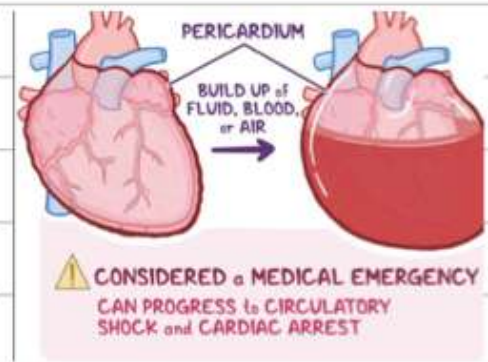
1-Tachycardia

2-Beck's Tad (hypotension, muffled heart sound , JVD)

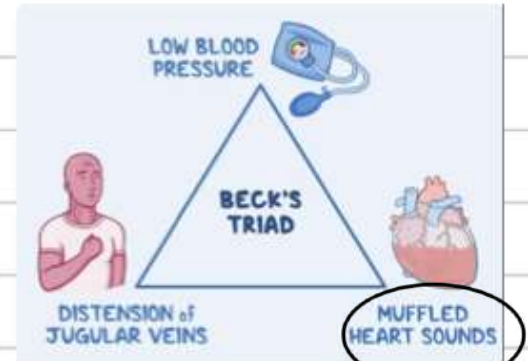
3-Kussmaul's sign (JVD with inspiration)

•Diagnosis by echocardiogram

• Treatment : pericardial window if the blood return then median sternotomy to rule out and treat cardiac injury



*Treatment: Pericardiocentesis



لے القلب کا نہ مخنوق
← مهم نغرف انہ heart sound معین ہوں

4-massive hemothorax : diagnosed by unilateral decreased or absent breath sound, dullness on percussion , CXR , CT scan, chest tube output.

Treatment

1- volume replacement

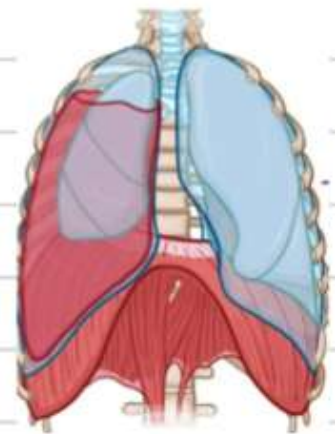
2-Chest tube

3- removal of the blood

Indication for emergent thoracotomy

1- > 1500 cc of blood on initial placement of just tube

2-Persistent > 200 cc of bleeding via chest tube per hour* 4 hours



Circulation

* in the new guidelines we can do x-ray / pelvic x-ray [but ultrasound is the fastest]

In emergencies, assessing circulation helps identify shock, control hemorrhage, and ensure proper blood flow.

- The evaluation of circulation includes both pulse assessment and hemorrhage control.
- Two primary causes of circulatory compromise (shock) are :
 1. Hemorrhage (assume shock is hemorrhagic until proven otherwise).
 2. Cardiac Tamponade (obstructive shock).
- Key aspects to inspect:
 - External bleeding.
 - Arterial bleeding: characterized by a pulsatile stream of bright red blood.
 - Venous bleeding: dark, continuous flow.
 - Internal bleeding: harder to detect and often requires surgical consultation, commonly occurring in the pleural or abdominal cavities.

• Clinical signs of shock include :

1. Tachypnea, tachycardia
2. Narrow pulse pressure → it is a compensation way to hypovolemia
3. Reduced capillary refill
4. Cool extremities
5. Reduced CVP
6. Late signs : hypotension, altered mental state & Reduced urine output

• Always monitor:

1. Pulse rate (using carotid/femoral – 10 seconds)
2. Document radial, ulnar, carotid pulses
3. capillary refill (< 2 s)
4. Blood pressure
5. JVP
6. Respiratory rate

← مريض trauma ، حثيث ادي على Radial
→ Systolic > 90 , absent < 90
لو كان absent يعني اسمع Carotid
→ if absent → the patient is dead.

• For external bleeding :

(Start by checking the surroundings, gaining consent and exposing the wound)

1. Manual compression directly over the wound or proximal to the point of bleeding
2. Tourniquets should be used to stop limb bleeding
3. Venous bleeding responds to simple pressure

If blood loss is severe....

• For circulatory compromise:

1. Insert 2 large bore IV cannula
2. Lost blood should be replaced with crystalloid solution first then with blood as soon as possible
3. For each ML of blood loss, 3 ML of crystalloid solution is given
4. Blood samples should be taken for urgent blood group and cross match as well
5. toxins CBC, pregnancy and chemistry

* Treatment of hypovolumic Shock → Fluid (3L fluid → 1L onc)

* Check pelvic injury by shaking it gently.
by iliac crest.

- Disability :
1. AVPU
 2. GCS
 3. Glucocheck
 4. Log roll → to check spinal injury.
 5. pupil size

Secondary Survey

→ when the patient is stable

History → SAMPLE

Physical examination →

Head :

- A) scalp : must be inspected and palpated for lacerations, swellings, bony depression and distortion
- B) Orbit : Palpate the margins of the orbits for depressions or irregularities
- C) eyes : examine the eyes for pupil size, red reflex. Test the eye movements and visual acuity

→ Drugs

→ Amnesia : uncal herniation → ↑ ICP
→ Cushing triad.

The face :

Asymmetry / palpation of cheekbone / missing teeth

The nose :

The nose should be palpated to exclude a fracture and detect the presence of any bloody or clear fluid discharge of cerebrospinal fluid which would suggest the presence of a fracture in the anterior cranial fossa.

The ears :

Blood or fluid coming from the ear suggests the presence of a posterior fossa fracture. The tympanic membrane must be examined with an auriscope. Bruising behind the ear (Battle's sign) suggests a fracture in the posterior cranial fossa

The neck :

Inspection, looking for bruising, wounds, deformity, also inspecting the trachea noting any deviation.

Palpate the trachea to make sure it is in midline.

Auscultation : Carotid artery, larynx.

Cervical spine : looking for any tenderness or any movement restriction.

The Chest :

Inspection : looking for bruises, lacerations, or penetrating wounds on the chest wall.

Inspect for flail chest segment, if present look for associated hemothorax, pneumothorax, and contusions

Palpate for subcutaneous emphysema.

Auscultate looking abnormal breath sound.

Abdomen :

looking for asymmetry, abdominal distension, evidence of intra abdominal bleeding : abdominal pain, increased heart rate, increased respiratory rate.

Organ assessment : liver, spleen, kidney looking for enlargement, tenderness, masses.

Liver and spleen are the most common organ to be injured.

* The most common organs affected from blunt

traumatic injury → Spleen (blunt)
→ Liver (penetration)

Examination in secondary survey:

- **FAST (focused assessment with Sonography for Trauma)**:- To look for blood in the peritoneal cavity looking at Morison's pouch, bladder, spleen, and pericardial sac.

- Indications for FAST

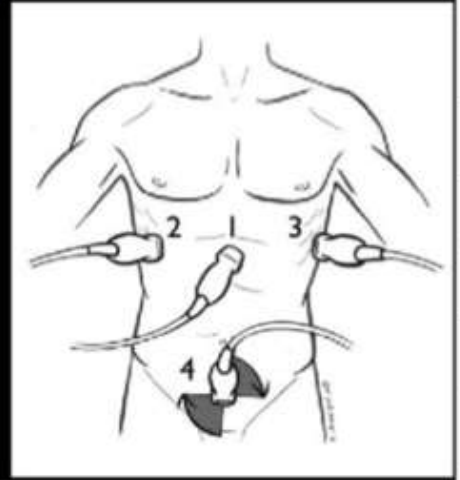
- Abdominal and thoracic trauma
- Undifferentiated hypotension or shock

- Assess four areas for free fluid:

1. Perihepatic (RUQ)
2. Perisplenic (LUQ)
3. Pericardium (subcostal)
4. Suprapubic (pelvis)

TRAUMA FAST EXAM

- 1 Cardiac-Subxiphoid
- 2 RUQ-Hepatorenal
- 3 LUQ-Splenorenal
- 4 Suprapubic Views



RUQ: perihepatic view



Subcostal: pericardium view



Pelvis: suprapubic view



LUQ: perisplenic view



- The upper and lower limbs:

1. Look for any visible signs of injury, such as swelling, deformities, bruising, or wounds over the affected area.
2. Assess the affected joint or limb for its range of motion. Observe for limitations, pain, or instability during movement.
3. Assess the sensation, circulation (pulses), and motor function of the affected limb.

Done in C

Done in D

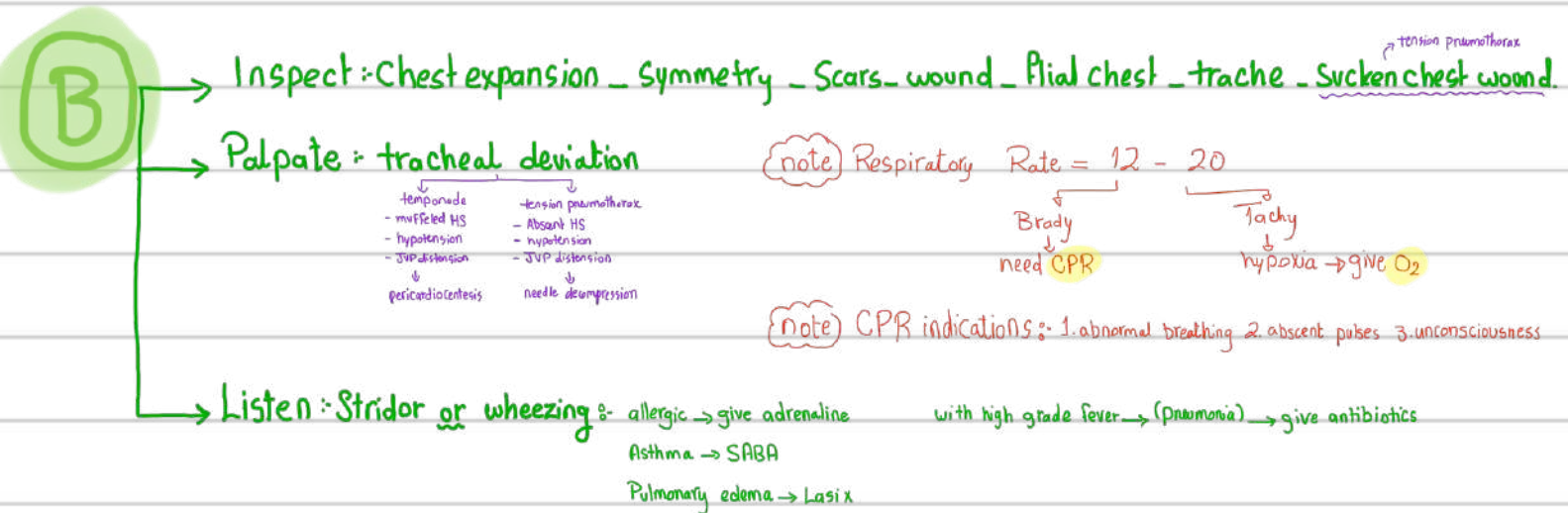
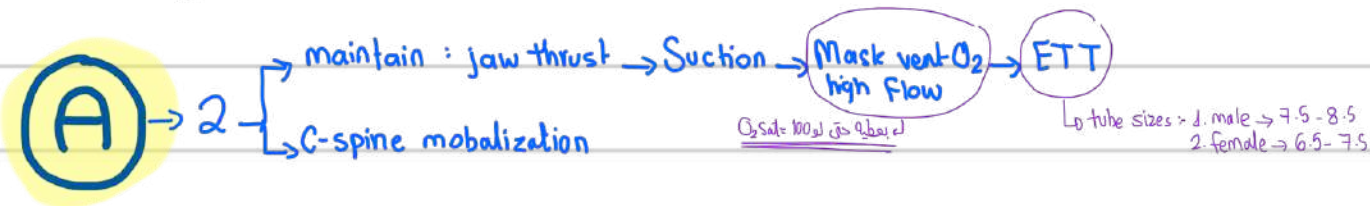
- The Pelvis :**
1. Look for any visible signs of injury, such as bruising, deformities, or penetrating wounds in the pelvic area.
 2. Gently palpate the pelvic bones and surrounding areas for tenderness, instability, or abnormal movements.
 3. Apply gentle inward and outward pressure on the iliac crest to assess for pelvic stability.
 4. Examine the genital area for signs of injury, bleeding, or trauma, especially in cases involving blunt force or direct impact to the pelvis.
 5. Rectal Examination (if indicated): In some trauma cases, a rectal examination might be necessary to assess for rectal bleeding, sphincter tone, or signs of injury related to pelvic trauma.

pulpo cavernous sign

- The Back :** Log roll
1. The patient must then be carefully immobilized and 'log-rolled' by a team of staff to allow examination of the spine.
 2. Look for any visible signs of injury, such as bruising, wounds, or deformities on the back.
 3. palpate the spine and surrounding soft tissues for tenderness, deformities, or abnormal movements.
 4. Assessment of Mobility and Neurological Function: Ask the patient to move their extremities and assess for any pain, weakness, tingling, or numbness. Check motor function and sensory capabilities in the extremities.

Summary

* Primary Survey → Stabilization



C

→ Bleeding :- compression → elevation → tourniquet

→ Vital Signs : PR BP - Capillary refill
↳ Radial then Carotid.

→ Puts 2 cannula, or catheter if needed.

→ CBC - Glucocheck or ind - ABGs → O_2CO_2 - acidosis :- 1. respiratory
2. toxicology
3. DKA

→ Give Crystalloids [normal saline can cause acidosis]

→ ECG :- 1. Cardiac tamponade → big small big small QRS / tachycardia /

2. Hypothermia → sinus bradycardia / J wave (osborne wave) / prolonged QT interval / atrial-vent arrhythmia

→ Blood Transfusion :-

* 1 : 1 : 1 Rule

1 unit of packed RBCs

1 unite of fresh frozen plasma

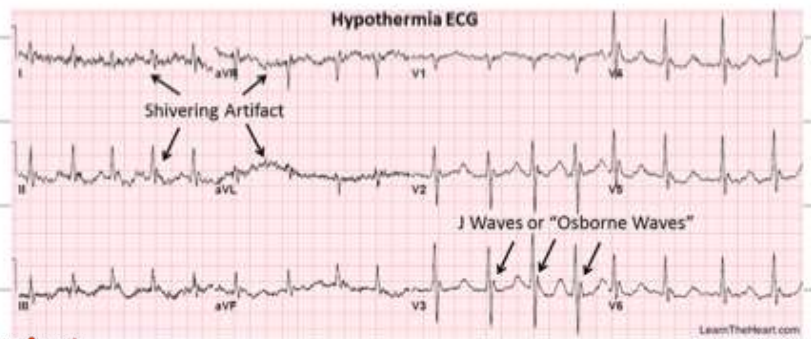
1 unit of platelets

* Cross Match

O+ → Man / postmenopausal woman.

O- → woman / Child.

**
(2) Lactic acidosis → بسيط عنه → hypotension
→ hypoxia
→ ischemia
- low PH / low HCO_3^- normal / or low PCO_2
- normal < 2
- Severe + Cause Mortality > 4



→ **N - DROPE S**: mnemonic in Primary Survey for patients with Hypotension :-

N → Neuro-status

D → Disability : GCS - assess pupils

R → Resuscitation : give crystalloids → blood

O → Oxygen

P → Pressors : give NE / Dopamine / Epinephrin

E → evacuation

S → Surgical intervention.

→ Pelvic examination → gentle movements on iliac crest.

- **Permissive hypotension** is a common clinical strategy used in **trauma management**, where controlled, lower blood pressure is allowed to avoid worsening bleeding and while waiting for definitive treatment (e.g., surgery, hemostasis).
- **Preemptive hypotension**, while not a standard term, might refer to **intentional lowering of blood pressure** before a procedure to minimize bleeding or other risks associated with that procedure.

- (الضغط المنخفض) NE / دوبايل / ابيبينفرين .
- (الضغط المنخفض) Blood Pressure .

D

- GCS
- AVPU
- Gluco check
- Log roll → Spinal examination.
- Pupil size → Anisocoria → Uncal herniation
- Check Signs of basal skull Fracture

E

- Full exposure :- to check if there is any trauma.
- Prevent hypothermia

Hypovolumic Shock