Department of Anesthesia Techniques

Defibrillators
Cardia arrest

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Reversible causes of cardiopulmonary arrest

- The “5 H”s and “5T”s that can lead to cardiopulmonary arrest

1• **Hypovolemia**

2• **Hypoxia**:

3• Hydrogen ions (acidosis):

4• Hyperkalemia

5 • Hypothermia

Reversible causes of cardiopulmonary arrest

1. **T**ablets or toxins
2. Cardiac **t**amponade:
3. **T**ension pneumothorax:
4. **T**hrombosis of a coronary artery:
5. **T**hrombosis of the pulmonary artery

Hypovolemia:

- should be suspected in all cases of arrest associated with rapid blood loss.
- Trauma
- gastrointestinal hemorrhage
- nontraumatic rupture of major arteries such as an aortic aneurysm.
- Relative hypovolemia can be the clinical manifestation of other underlying conditions such as severe sepsis or anaphylaxis leading to **vasodilation and extensive capillary leak.**

a large amount of fluid (crystalloid, colloid, blood) should be rapidly administered and the cause of the hypovolemia corrected

Hypoxia

- is a common cause of cardiac arrest in the pediatric population. Tracheal intubation with the delivery of a high concentration of oxygen is often required while the cause of the hypoxia is determined and definitive management instituted.

Hydrogen ions (acidosis):

- The high hydrogen ion concentration also increases myocardial irritability and arrhythmia formation.

Hyperkalemia:

- seen in patients with renal insufficiency, diabetes, and profound acidosis. Peaked T waves and a widening of the QRS complex, with the electrical activity eventually deteriorating to a sinus-wave pattern, herald hyperkalemia. Treatment includes the
- administration of calcium chloride, sodium bicarbonate, insulin, and glucose.

Hypothermia:

- All resuscitation efforts should be continued until the patient is euthermic.

Tablets or toxins:

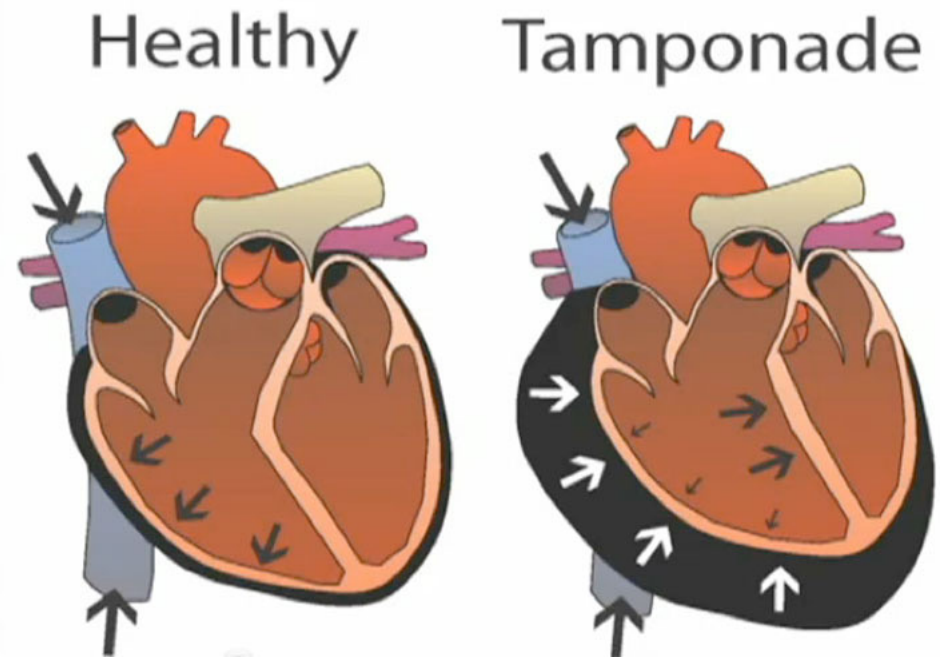
- Ingestion of these items should be considered primarily in younger patients with an out-of-hospital cardiac arrest.

common intoxications include:

- carbon monoxide poisoning after prolonged exposure to smoke or exhaust fumes from incomplete combustion
- cyanide poisoning
- drug overdoses

Cardiac tamponade

- presents with hypotension, a narrowed pulse pressure, elevated jugular venous pressure, distant and muffled heart sounds, and low-voltage QRS complexes on the ECG.
- Pericardiocentesis can be lifesaving.

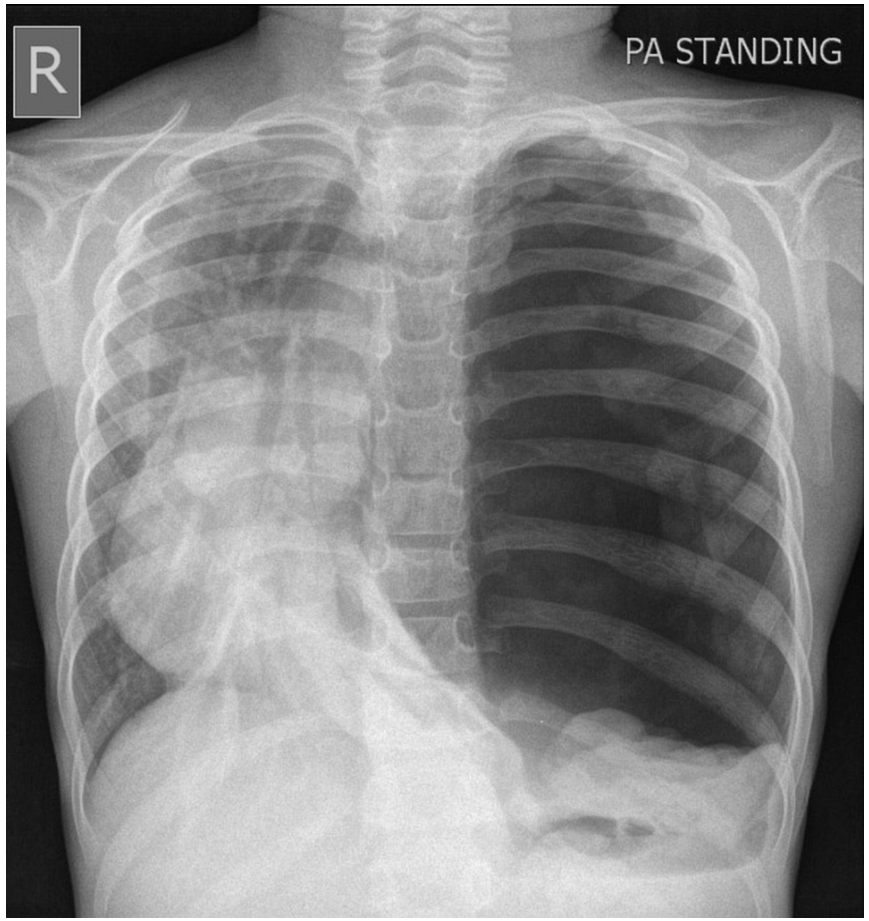


Tension pneumothorax

- This condition must be recognized immediately and
- occur in trauma patients and those receiving positive-pressure ventilation. **Signs:**
- Rapid onset hypotension
- Hypoxia
- increase in airway pressures
- Subcutaneous emphysema
- reduced breath sounds on the affected side with tracheal deviation toward the unaffected side

Tension pneumothorax

- Treatment: insertion of a 14- or 16-gauge IV catheter into the second intercostal space at the midclavicular line or into the fifth intercostal space at the anterior axillary line for immediate decompression
- A chest tube can be placed after the tension pneumothorax is converted to a simple pneumothorax, which does not pose a similar immediate threat to patient's life.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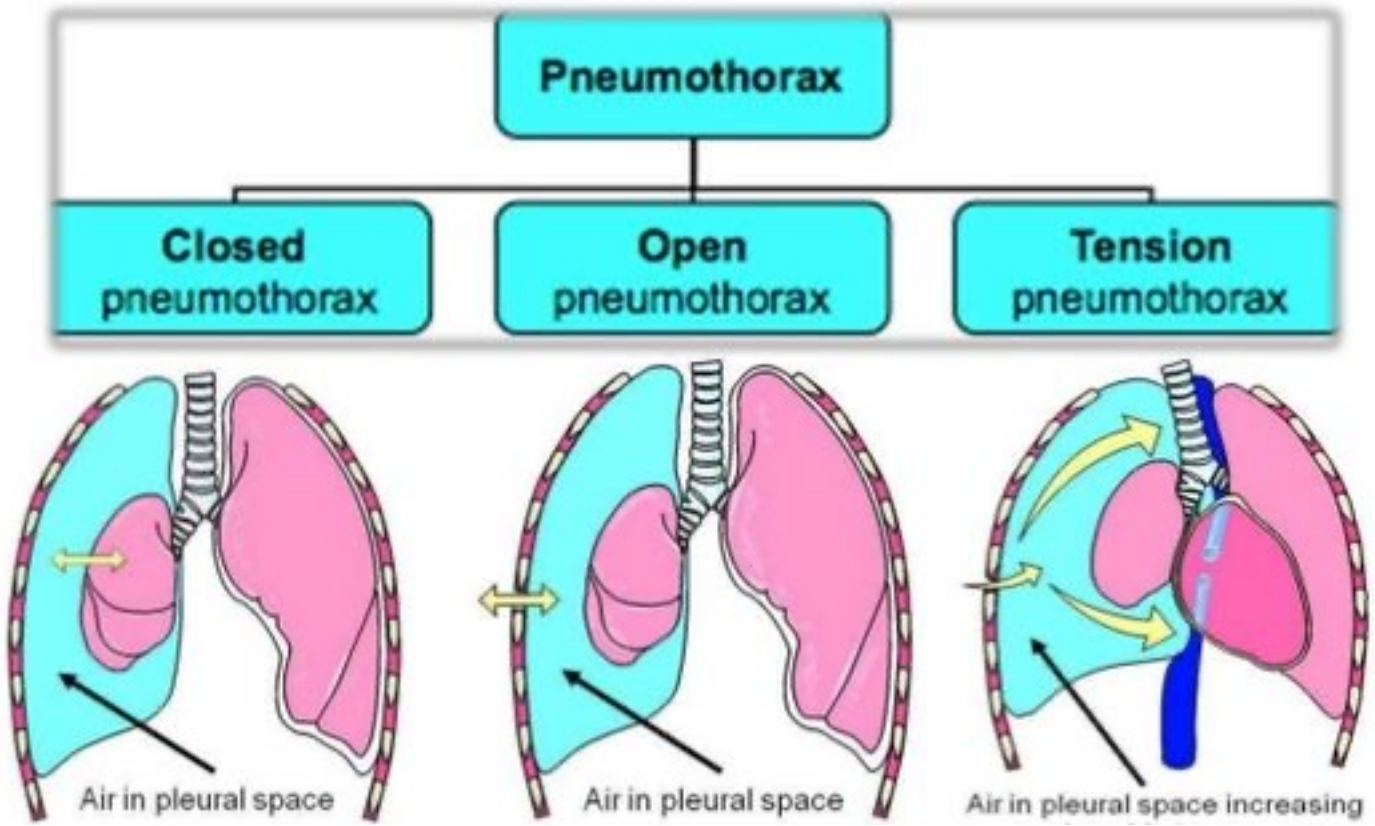
Pneumothorax
Closed pneumothorax
Open pneumothorax
Tension pneumothorax
Air in pleural space
Air in pleural space
Air in pleural space increasing

Thrombosis of a coronary artery:

- This condition can lead to myocardial ischemia and infarct.

- Cardiac catheterization(قسطرة القلب) is the primary choice
- thrombolysis is an alternative when this is not readily available.

Thrombosis of the pulmonary artery:

- Some patients may be seen initially with dyspnea and chest pain, similar to acute coronary syndromes, but those who are seen in cardiac arrest have a minimal chance of survival.
- immediate thrombolysis or surgery to unload the right ventricle while restoring pulmonary blood flow.

Asystole treatment

1. rapid institution of CPR and reversal of underlying causes such as hypoxia, hyperkalemia, and hemorrhage.
2. Defibrillation is not required , as asystole has no electrical
3. Epinephrine administration should be continued .