CHEST TUBE MANAGEMENT

North Shore LIJ

INSTITUTE for NURSING
EDUCATION, PRACTICE, RESEARCH

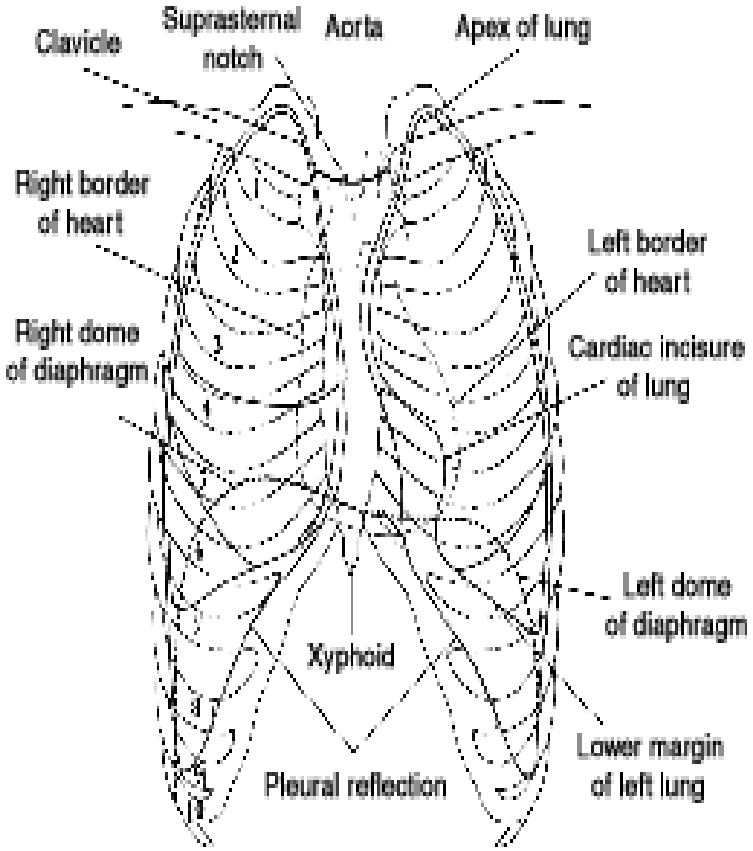
Chest Tube Management

- Clinical Indications
- Anatomy and Physiology overview
- Chest tube set-up
- Patient and chest tube management
- Chest tube removal

Clinical Indications for Chest Tube Insertion

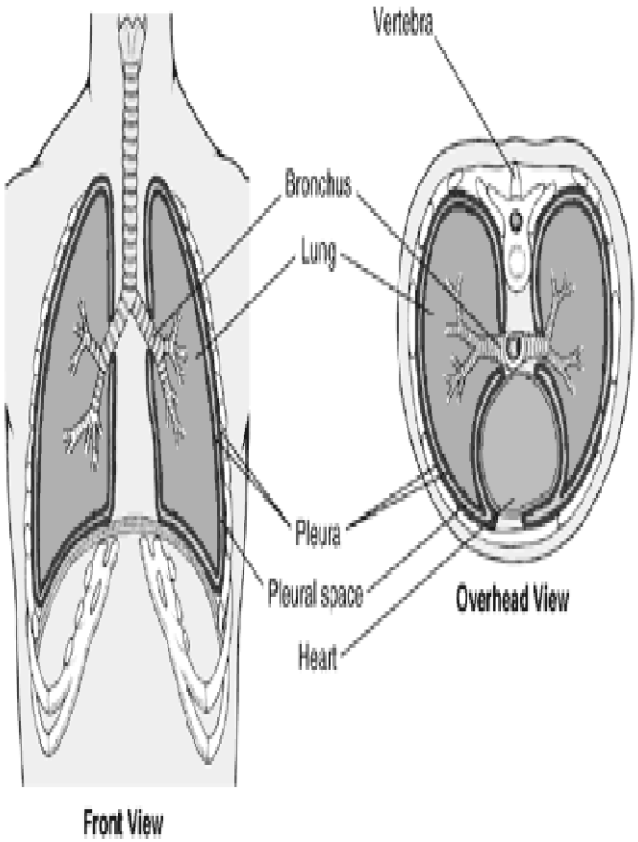
- To remove either air or fluid from the pleural space, which allows for the re-establishment of negative intrapleural pressure
- Examples include:
  - **Pneumothorax**-air in the pleural space
  - **Hemothorax**-blood in the pleural space
  - **Pleural Effusions**
    - Pus
    - Chyle (lymph-white fluid)
    - Malignant effusions

Anatomy and Physiology



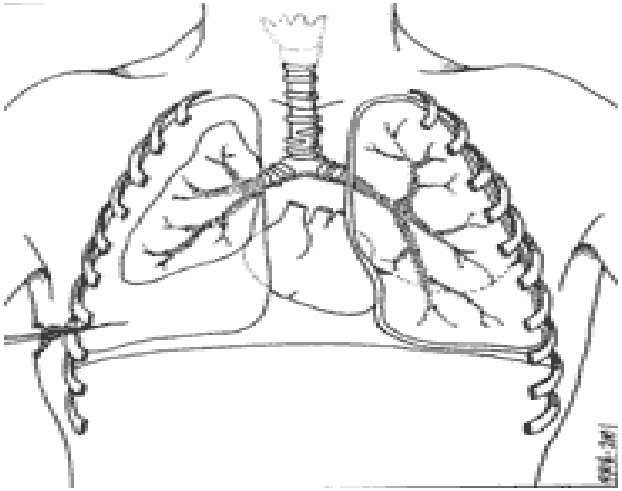
- The thoracic cavity
- The interior of the thoracic cavity

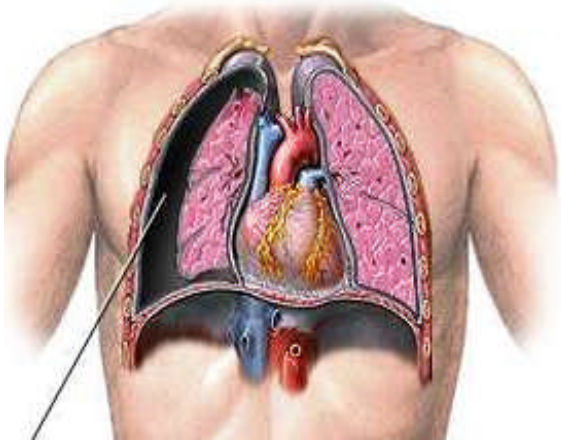
Anatomy and Physiology



- Parietal pleura
- Visceral pleura
- Pleural fluid

Pneumothorax





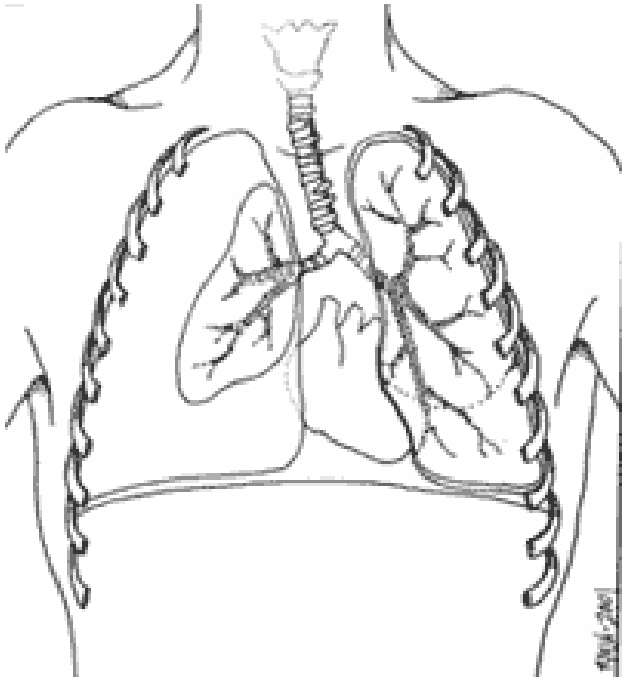
- Collection of air in the pleural space
- Risk factors include:
  - Central line insertion
  - Bronchoscopy
  - Chest trauma
  - CPR
  - Intubation
  - PEEP from mechanical ventilation
  - Lung biopsy

Open Vs. Closed Pneumothorax

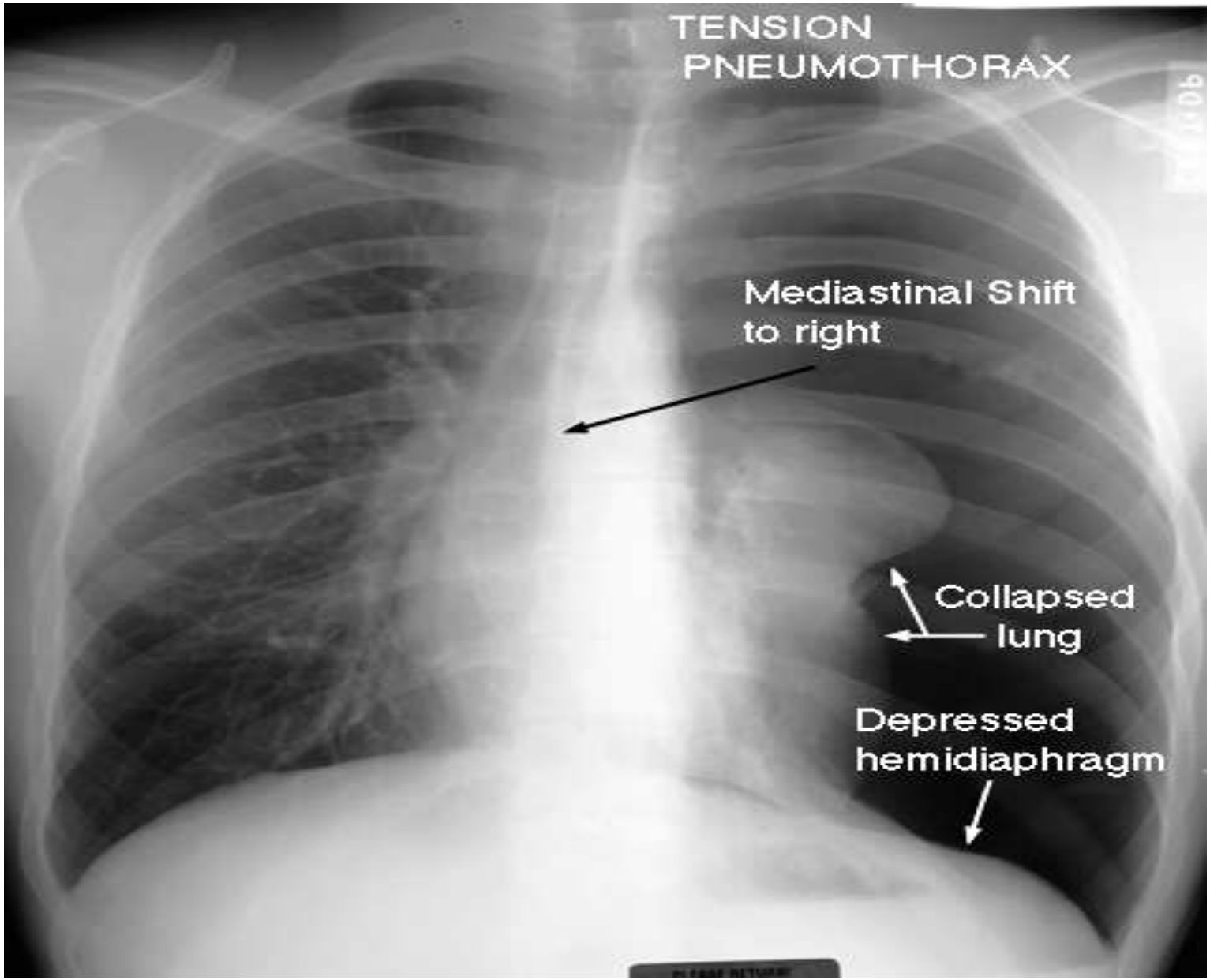
- ***Open***: air enters the pleural space from outside the body

- ***Closed or "Spontaneous"***: the injured visceral pleura allows air to escape into the pleural space of the lung

Tension Pneumothorax



- ***EMERGENT SITUATION***!!
- Air escapes into the pleural space during inspiration but can't escape during expiration
- If left untreated, can lead to death



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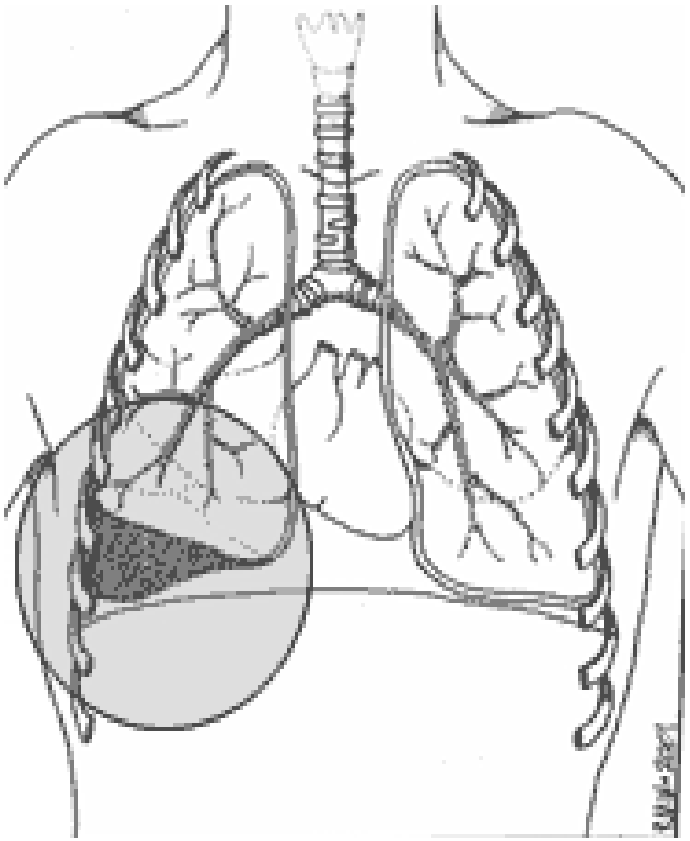
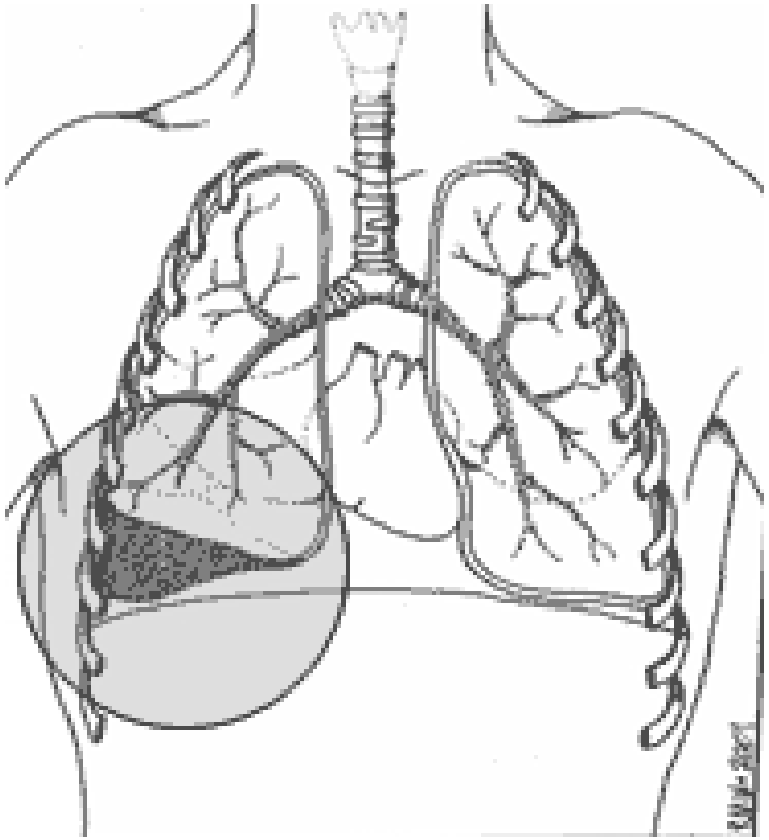
Hemothorax



- Blood within the pleural space
- Causes include:
  - Trauma
  - GSW
  - Stabbing
  - Fractured ribs
  - Malignancy
  - Complication of anticoagulation therapy

Pleural Effusion

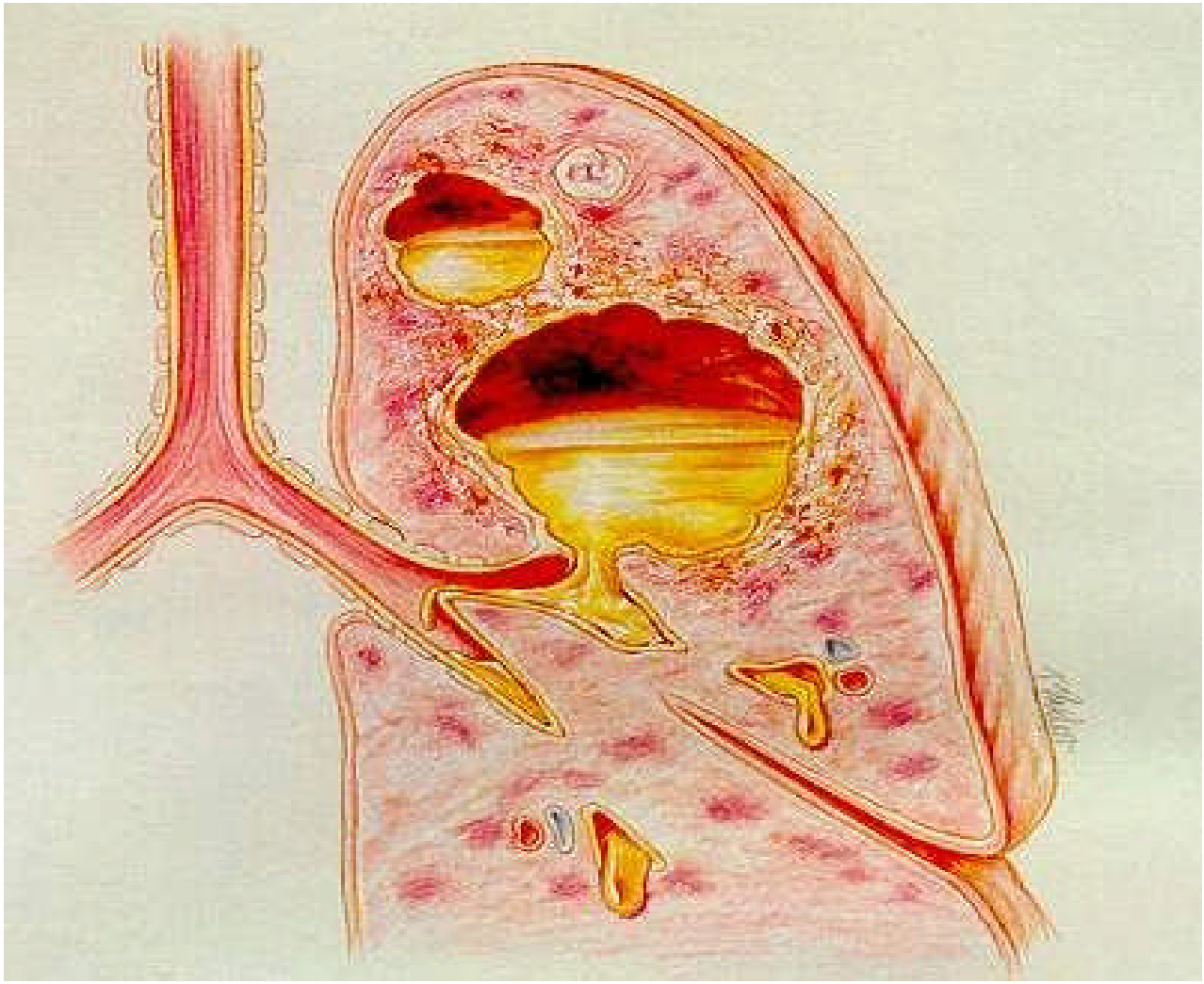


- Accumulation of fluid within the pleural space
- Examples:
  - Pus (empyema)
  - Chyle (lymphatic fluid)
  - sero-sanguinous drainage
  - Clots from surgical procedures
  - Malignant effusions

PLEURAL EFFUSION ??

- How do you know what this CXR represents without correlating to the patient's clinical condition?-
  - Could be Pneumonia-consolidation, Hemothorax or Pleural effusion

EMPYEMA

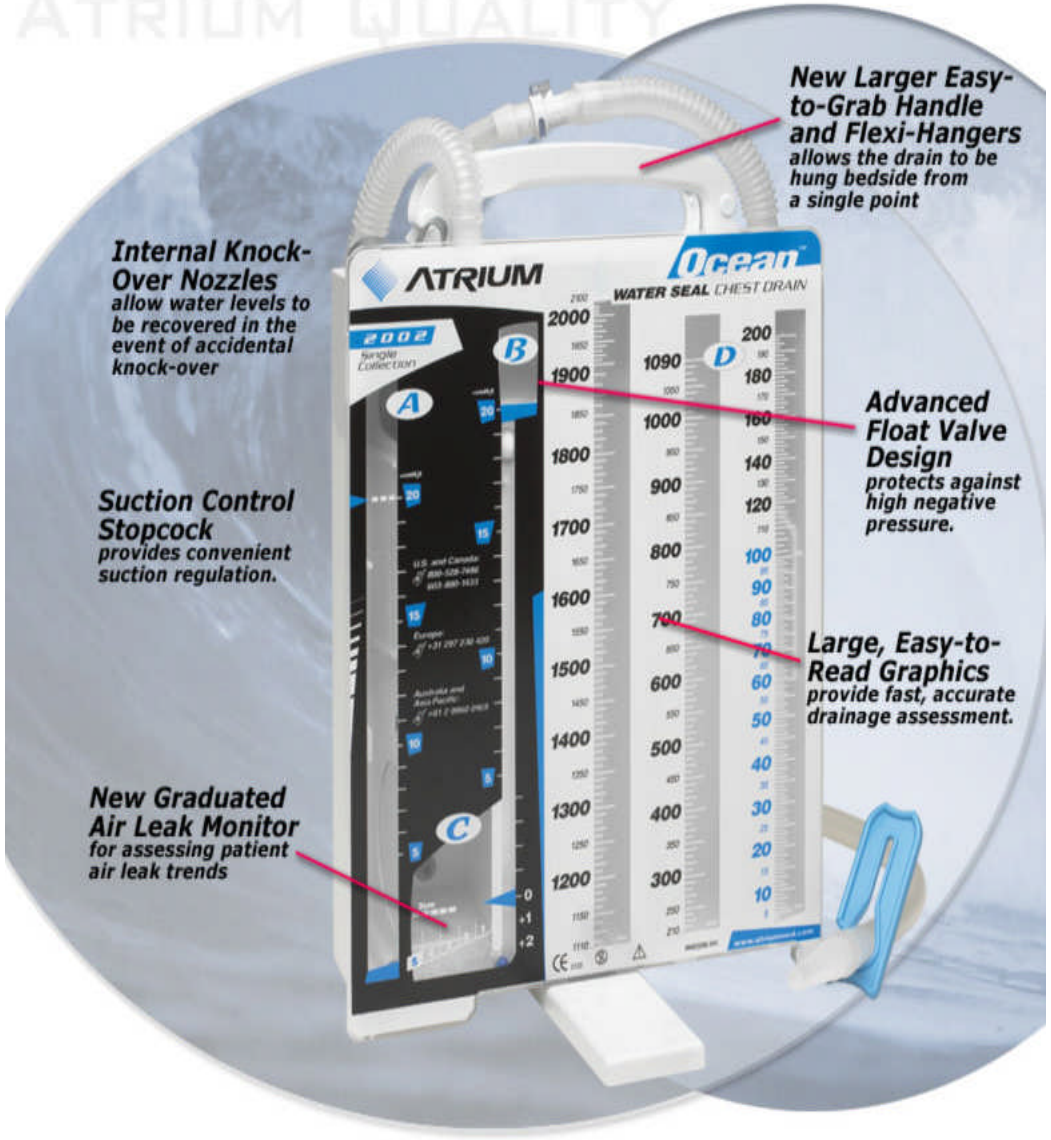


Why do the Lungs Stay Expanded?

- **Click the below link for a brief review:**

http://www.youtube.com/watch?v=Hn0SHGuUVak&feature=related

Atrium Chest Drainage System



- Three Basic Components:

A. Suction control

B. & C. Water seal

D. Collection Chambers

Atrium Chest Tube Set up

- Please click the link below to watch a video on the simple steps to setting up a chest tube

http://www.youtube.com/watch?v=w65OgC3mVBk&feature=related

Dry Suction Collection

- Depending on the provider and the patients' condition, you may see an order for a chest tube to dry wall suction

http://www.youtube.com/watch?v=GWxKZbKAxe8&feature=related

Patient Assessment and Management

- To be performed every 2 hours and/or as needed:

➢ Change position

➢ Encourage upright position

➢ Deep Breathing/ Incentive Spirometer

➢ OOB to chair every shift

➢ Pain Assessment

Patient Assessment and Management

- Dressing
  - Clean, dry and intact
  - May mark the dressing. If needs to be changes may notify the surgical resident.
- Tube
  - All connections should be tight and secure
  - No dependent loops, kinks or obsructions
  - No stripping or “milking”→ increased intrathoracic pressure
- Drainage unit
  - Keep unit below patients chest
  - Assess for tidaling/bubbling
  - Make sure water is filled to proper level of ordered suction

Patient Assessment and Management

- Drainage unit (con't)
  - If you notice an air leak, assess location (if leak is in the patient or drainage unit) and contact provider
  - Can be taped to the floor
    - If knocked over, you may need to get a new unit
    - Document all drainage prior to changing unit
    - Can change unit at the bedside but must be done quickly
  - **Have Vaseline gauze and 2 clamps at pt's bedside** in case chest tube dislodges or becomes disconnected!!!

Chest Tube Emergencies

- Subcutaneous Emphysema:
  - Characterized by air beneath the skin
  - Patient presents with:
    - Symptoms of crepitus (crackling/popping sensation under the skin)
    - Airway obstruction- especially if air leak increases to face and neck
    - May require intubation

Chest Tube Emergencies

- Dislodgement
- Change in the color, consistency, or amount of drainage
- Absence of water seal fluctuation
- Frequent or vigorous bubbling in the water seal
- Hypoxemia

Signs of Improvement

- Less dyspnea
- Less pain on inspiration
- Improvement on CXR
- Respiratory status returning to normal rate for age
- Drainage decreasing
- Diminishing/ halting of oxygen requirements
- Lung remains expanded on water seal

Chest Tube Removal

- Removed by physician/PA/NP
- Can be done at the bedside
- Pre-medicate
- Wear personal protective equipment
- Explain to patient that they will need to take a deep breath and hold it
  - Provider will remove chest tube on inspiration with Valsalva maneuver; intrathoracic pressure highest at this point
- Explain that they may experience some discomfort with removal
- Have Vaseline gauze dressing ready

Chest Tube Removal

- Inspect occlusive dressing periodically for intactness and drainage
- Observe patient for alterations in respiratory status
- Make sure patient has a follow-up CXR 2 to 4 hours post-removal to ensure that the lung has not collapsed during removal

In conclusion…

- Chest tubes have multiple functionalities:
  - Assist with lung re-expansion
  - Allow fluid to be released
  - Prevent air from re-entering
- Always remember to assess your **patient** *before* the drainage unit!
- Monitor the output closely
- Document all findings on appropriate flowsheet/assessments and interventions notes