Chest tubes therapy

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Objectives

• Background
• Indications for a chest tube
• Chest tube insertion
• Drainage systems
• Nursing Assessment and Implications
• Potential complications and troubleshooting
Background
The Mechanics of Breathing

- Lungs are elastic and have a natural tendency to collapse or recoil
- Adherence of the pleural membranes keeps the lungs pulled up against the inside of the chest wall, which counterbalances this
- This also creates a negative pressure in the space between the pleurae (intra-pleural pressure) and keeps the lungs expanded
Indications for a chest tube

- If air or fluid enters the intra-pleural space, breathing & oxygen is compromised
- If too much space is taken, there is a loss of negative pressure and the lung may collapse
- A chest tube/chest drainage system may be required to eliminate the accumulated air and/or fluid to re-establish negative pressure in the intra-pleural space
Indications for a chest tube, continued

- Pneumothorax
- Hemothorax
- Pyothorax
- Chylothorax
- Pleural effusion
• **Types of pneumothorax**

  • **Open:** air moves in from outside through chest wall  
    • E.g. Gun shot wounds

  • **Closed:** air moves out from inside through visceral lining  
    • E.g. Central line insertion, lung biopsy

  • **Tension:** from inside due to increased pressure causing mediastinal shift  
    • E.g. clamped chest tube, tube milking
Indications for a chest tube, continued

• Pneumonectomy: e.g. due to cancer (also wedge resection, lobectomy)
  • Simple: removal of the affected lung
  • Extrapleural: removal of the affected lung, part of the diaphragm and the pericardium on that side

• Bronchiectasis: e.g. due to necrotizing bacterial infection
Chest tube insertion

- Site for chest tubes
Chest tube insertion, continued

- Prep skin and locate site
- Inserted under sterile condition by MD
- Assistance from nurse is necessary
- Adhere to sterile technique
Chest tube insertion, continued

- Enter muscle to pleura
- Insert clamp through pleura and widen slit

- Create tunnel for tube
- Insert chest tube with clamp
- Manually advance tube
Chest tube insertion, continued

• If a trochar is used:
  • Guide in slowly
  • Remove trochar once tube is in and physician will insert to ½ - 2/3 length inside
  • Holes/ fenestrations must be within chest
Drainage Systems

- To re-create normal intrathoracic space, the intra-pleural environment must be:
  - Closed
  - Negative pressure
  - Sterile
Drainage Systems

• Usually used for small, uncomplicated pneumothorax
• One way flutter valve
• Has no reservoir
What to assess when your patient has a chest tube

- The placement of the unit is lower than the patient
- Connections are all tight
- Tubing is not kinked or clamped
- Check for any air leaks or bubbling
- Changes in pressure when patient breathes
- Dressing is intact
Chest auscultation

- Absent breath sounds: where lung collapsed
- Fine or coarse crackles: atelectasis
- Dull or diminished breath sounds: fluid
- Fine or coarse crackles: fluid
Other nursing considerations

• The container must always be upright
• Monitor the amount and type of drainage every 3-4 hours
• Sudden changes in drainage may be cause for concern
• Also important to know how much it drained last shift
• If the system is full, it will not drain
Other nursing considerations, continued

• Depending on where the chest tube is placed, it may mimic a friction rub upon auscultation
• At the beginning and end of your shift, mark the level of drainage on the collection chamber and document in your I&O
• Encourage incentive spirometry to promote re-expansion of the lung
Other nursing considerations, continued

- Pay attention to your order: is it to be hooked up to suction or straight drainage only?
- Dressing needs to be changed q3d and PRN

**REMINDER:** Do NOT milk or strip the chest tubes and do NOT clamp unless ordered by physician or when changing the container
### Documentation

#### Respiratory Detailed Assessment

<table>
<thead>
<tr>
<th>Breath Sounds</th>
<th>Clear</th>
<th>Absent</th>
<th>Bronchial</th>
<th>Course crackles</th>
<th>Diminished</th>
<th>Expiratory wheeze</th>
<th>Fine crackles</th>
<th>Friction rub</th>
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#### Chest Tubes

**Chest Tube Care**

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<tr>
<th>Chest Tube</th>
<th>Activity</th>
<th>Location</th>
<th>Size</th>
<th>Connectivity</th>
<th>Water Seal Chamber</th>
<th>Site Description</th>
<th>Drainage Description</th>
<th>Dressing Condition</th>
<th>Interventions</th>
<th>Patent/System Complications</th>
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**Patient's Indicated Response**

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<tr>
<th>Crepitis Location</th>
<th>Aims</th>
<th>Left</th>
<th>Right</th>
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**MUST chart in the Respiratory Detailed Assessment**
Chest tube removal

- To be performed by a physician but may require assistance
- Upon removal, patients are instructed to hold their breath to prevent a pneumothorax
- Apply jelonet, dry gauze and a cling dressing
- Change the dressing daily
Potential complications

• Pneumothorax: can also occur upon insertion or removal of chest tube
• Cardiac tamponade
• Subcutaneous emphysema
Troubleshooting: What would you do if...

1. You find your patient's chest tube has come disconnected from the tubing and collection chamber?
2. You notice a new air leak?
3. In report it is documented that the patient drained 70cc on night shift. In the last 2 hours alone, the chest tube has drained 250cc.
4. The collection chamber is almost completely full?
Questions?
References

