Olive View-UCLA MEDICAL CENTER

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES

Policy Title:	**CHEST TUBE: MANAGEMENT OF (ADULT AND PEDIATRIC)**		
Category:	1 - Provision of Care	**Policy No.:**	129
Originally Issued:	4/1/1986	**Update (U)/Revised (R):**	1/7/2019
Distribution:	**Hospital-Wide** ☒	**If not Hospital-Wide, Other:**	

PURPOSE:

To provide a guideline for the set-up and preparation for chest tube insertion and management/maintenance of chest tube drainage systems.

DEFINITION(S):

None

POLICY:

The physician, who must have privileges in chest tube insertion, inserts chest tubes. The registered nurse assists with the insertion procedure and manages the chest tube drainage system.

EXPECTED OUTCOME:

- Removal of air, fluid or blood from the pleural space.
- Relief of respiratory distress.
- Re-expansion of the collapsed lung as validated by chest x-ray.

OBJECTIVES:

- A chest tube is inserted to facilitate the removal of fluid, blood and/or air from the pleural space or mediastinum.
- To assess the type and amount of drainage from the pleural space.
- To restore negative pressure to the pleural space.
- To promote re-expansion of a collapsed lung, and relieve respiratory distress associated with a collapsed lung.
- To improve ventilation and perfusion of the lung.

EQUIPMENT LIST:

- Personal protective equipment: caps, masks, sterile gloves, gowns, drapes
- Chest tube per physician's preference (type, size appropriate for age)
- Chest tube insertion kit (pre-packaged)
- Disposable chest drainage unit
- Heimlich valve on pediatric crash cart
- 1% or 2% Lidocaine, without epinephrine, for topical use
- Chlorhexidine solution

- 4x4 gauze sponges
- Tape, 1, 2 or 3 inches
- 2 rubber shod clamps to keep at bedside
- Suction source
- Connecting tubing

PROCEDURE:

1. Assessment

- Assess for significant medical history or injury including chronic lung disease/pulmonary disease, spontaneous pneumothorax, and therapeutic procedures associated with pneumothorax/hemothorax e.g., central line placement) or mechanism of injury.
- Assess respiratory system for tachypnea, dyspnea, decreased or absent breath sounds on the affected side, asymmetrical chest movement, hyper-resonance on the affected side (pneumothorax), dullness/flatness on the affected side (hemothorax, pleural effusion), sudden sharp chest pain, anxiety, restlessness or apprehension, tachycardia, hypotension, dysrhythmia, tracheal deviation to the unaffected side, and neck vein distension.
- Assess results of Chest X-Ray and arterial blood gases (if immediate intervention not necessary).

2. Interventions

- Prepare all supplies and equipment for chest tube insertion (see procedure).
- Continuous observation of respiratory status.
- Prepare patient and family, explain the procedure.
- Obtain consent from the patient, if able, or identified decision maker. (Written consent is required unless implied consent in a life-threatening situation).
- Assist patient to the desired position preferred by the physician.
- Administer pain medication as ordered.
- Set-up chest tube drainage system.

WARNING

- The collected contents of the chest drainage system should not be used for reinfusion.
- Chest tubes should not be clamped except when changing the chest tube drainage system or if specifically ordered by physician.
    - In the event of an air leak, clamping chest tubes could lead to tension pneumothorax.

3. Evaluation

- Compare patient's vital signs and respiratory assessment after chest tube insertion with the baseline assessments prior to the procedure (identifies the effects of chest tube insertion and the occurrence of developing complications).

- Report the following conditions if they persist despite nursing interventions: tachypnea, decreased or absent breath sounds, hypoxemia, tracheal deviation, muffled heart tones, tachycardia, hypotension, dysrhythmias, fever.
- Evaluate chest tube drainage system for the type and the amount of drainage.
  - ***Rapid drainage of excessive amounts, >200cc/hour, of fluid/blood may result in shock and needs to be reported immediately to the physician.***
- A sudden decrease in drainage may indicate dislodgement of the chest tube or malfunction in the system, and must be reported to the physician and corrected.
- Report any new onset of clots or any obstructions restricting proper drainage.
- Mark the drainage level on the outside of the drainage collection chamber in hourly or shift increments and document.

4. Education

- Assess the patient's/family's understanding of the patient's condition.
- Instruct the patient to sit in a Semi-Fowler's position, unless contraindicated.
- Instruct patient to cough and deep breathe, splinting the affected side.
- Instruct the patient to not lie on the tubing and to keep it free from kinks.
- Encourage passive and active range-of-motion exercises for the arm on the affected side.
- Instruct patient/family about activity as prescribed while maintaining the drainage system below the level of the chest.
- Instruct the patient on the availability of prescribed medications to control pain and other relief strategies.

CONTENT/STEPS

A. Preparation:

1. Confirm that an informed consent for the procedure has been obtained.
2. Explain procedure to patient and administer pain medication as prescribed.
3. Gather equipment/supplies at the bedside
4. Perform hand hygiene and don personal protective equipment as appropriate.
5. Assist the physician during insertion of chest tube as requested.
6. Connect the chest drainage system to patient thoracic catheter. A one-way seal is established for patient protection. ***(see manufacturer instructions for setting up the closed drainage system)***
7. Physician will apply a dry sterile pressure dressing to chest tube insertion site.
8. Physician to order chest-x-ray to verify placement.
9. If suction is ordered, connect the suction source to the suction port. Confirm suction is functioning by visualization of the expanded bellow across the suction monitor window (refer to manufacturer instructions for full details).

The setting of the suction control dial determines the approximate amount of suction imposed regardless of the amount of source suction. If the patient has multiple chest tubes, each tube has to have its own, separate drainage system and suction source ***(do not use "Y" connectors).***

B. Maintaining the Chest Tube Drainage System

1. Tape all connection points in the chest drainage system.
- ***Airtight connections keep the tubes together and prevent air leaks into the pleural space.***

2. One-inch tape is placed horizontally, extending over connections (a portion of the connector may be left uncovered by the tape).
- ***This secures connections but allows for visualization of drainage.***

3. Tape chest tube to the skin.
- ***This prevents side-to-side movement and accidental dislodgement of the chest tube.***

4. Keep the chest drainage system below the patient's chest level at all times.
- ***This allows proper drainage into the collecting system.***

5. Keep the drainage tubing free of dependent loops.
- If the patient is in bed, place the tube horizontally on the bed and down into the collection chamber.
- If a dependent loop cannot be avoided, lift and drain the tubing every 15 minutes.
  - ***Drainage accumulating in the dependent loops obstructs chest drainage into the collecting system and increases pressure within the lung; allow enough length for patient movement.***

6. Assess for air leaks in the system as indicated by the constant bubbling in the water-seal chamber.
- **Notify MD for presence of new air leak or loss of previously identified air leak.**
  - ***An airtight system is required to help reestablish negative pressure in the pleural space.***

7. Assess insertion site and surrounding skin for presence of subcutaneous air and signs of infection or inflammation with each dressing change.
- Dressings should be changed when soiled every 3 days or as ordered by the physician.
  - ***Crepitus may indicate chest tube obstruction or improper tube position. Skin integrity is altered during insertion and can lead to infection.***

8. Monitor type of drainage and total amount of fluid in the collection chamber.
- Decreased or absent drainage associated with respiratory distress may indicate obstruction; decreased or absent drainage without respiratory distress may indicate lung re-expansion.

9. Change chest drainage system when approaching full or if system integrity is interrupted.
- Refer to manufacturer instructions for details on changing the chest drainage system.
  - ***Clamping of the chest tube should be as brief as possible.***

10. Monitor patient's pain and intervene appropriately.

- ***Pain relief ensures comfort and facilitates coughing and deep breathing, improving outcome.***

11. In the event that the chest tube should be accidentally pulled out from the insertion site, remove the dressing and immediately apply pressure with petroleum gauze to prevent a pneumothorax.

- ***Have a co-worker notify the physician immediately! A tension pneumothorax is a life-threatening emergency!***

DOCUMENTATION

Documentation should include the following:

- Patient and family education.
- Respiratory /thoracic assessment and assessment of vital signs before and after the procedure.
- Date and time the procedure was performed, and by whom.
- The size of the chest tube, and area/site of insertion. If the patient has multiple chest tubes, they should be labeled Rt #1, Rt #2, Lt #1, Lt #2, etc. This also must be documented in the medical record.
- Connection to drainage system and amount of suction.
- Fluctuations and amount of drainage, color and odor.
- Patient's tolerance of the procedure.
- Completion and results of chest x-ray, and any other diagnostic tests done.
- Nursing interventions (e.g., measures used to control pain)

ATTACHMENTS/FORMS:

A Personal Guide to Managing Chest Drainage

REFERENCE(S)/AUTHORITY:

American Association of Critical Care Nurses, McHale Wiengand, D. (2013) AACN Procedure Manual for Critical Care (6th Ed.) Missouri: Elsevier.

Lynn-McHale D., Carlson K. AACN Procedure Manual for Critical Care 5h Ed. 2005

Genzyme Corporation. Understanding Chest Drainage (2001).

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