

PARKLAND HEALTH & HOSPITAL SYSTEM
Nursing Services

Section: Respiratory
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**INSERTION, MAINTENANCE AND
DISCONTINUATION OF THE CHEST TUBE(S)**

POLICY: The licensed nurse shall be responsible for properly setting up and maintaining the chest tube system. Qualified nursing personnel shall assist the provider with the insertion and discontinuation of the chest tube(s).

PRACTICE

STATEMENT: To provide a system which removes air and fluids from the pleural space or mediastinum.

To restore negative pressure in the pleural cavity or mediastinum.

To re-expand a partially or totally collapsed lung.

EQUIPMENT: Chest tube (thoracostomy) tray
Chest drainage system
Thoracostomy tube, 28 or 36 French, straight or right angle
Wall suction regulator or portable suction system with bottles & tubing
Suction canister
Connecting tubing
3/8" X 3/8" X 3/8" Connector; (Y type for 2 chest tubes)
250 ml Sterile Normal Saline
Xylocaine 1%
10 ml syringe with 23-gauge needle
2-0 silk suture
60 ml syringe with 18-gauge or smaller needle
Chlorhexidine
4x4 gauze sponges
Personal protective equipment — PPE (gown, goggles, masks)
Sterile gloves
Occlusive tape
Dressing material
Vaseline gauze (if requested by provider)

PROCEDURE:

Preparation of Chest Drainage System

1. Use a standard luer slip-tip syringe to inject 30cc of sterile water or saline through the needleless injection site on top of the unit into the "Patient Airleak Meter".
2. Stand the drainage system on the floor or hang on the side/foot of the bed below the level of the patient's chest.
3. Prepare the suction as ordered.
4. Gather the suction equipment including canister, tubing and wall suction regulator (or portable suction). Set up suction system at bedside.

Assisting with the Insertion of Chest Tube(s)

1. Explain procedure, if feasible.
2. See "Mark the Site" Procedure—NSG 23-06. <http://intranet.pmh.org/home/PP-Index/Nursing/23-06.pdf>
3. See "Time Out" Procedure—NSG 23-07. <http://intranet.pmh.org/home/PP-Index/Nursing/23-07.pdf>
4. Medicate the patient as ordered by the provider.
5. Position the patient as provider request.
6. Personnel assisting provider should don appropriate personal protective equipment.
7. Open 4 x 4 gauze and pour Bacteriostatic Solution onto them. Assist provider and assemble supplies.
8. Assist with the skin prep and insertion of chest tube(s).
9. Once chest tube is inserted, remove the cap (cover) from the long tubing of the chest drainage system and aseptically attach to the thoracostomy tube. Tape the connector securely, maintaining visibility through the clear connector. Ensure that all clamps are open.
10. *Negative Pressure Indicator:* Negative pressure exists in the collection chamber when the picture of a palm tree can be seen in the indicator window.

During gravity drainage, the indicator may intermittently indicate a negative pressure in the collection chamber with patient respiration, if there is an air leak. During suction drainage, the pressure indicator should indicate a negative pressure continuously.

CAUTION: If the negative pressure indicator does not show the picture of a palm tree as described, 1) check patient connections for leaks, 2) check tubing connections on the unit. If all connections are secure and the picture of a palm tree does not appear, replace the unit. The negative pressure indicator does not confirm drainage tube patency. Check drainage tube patency and seal with system review.

A check valve provides the one-way seal which allows air to exit from the pleural space while retarding the reverse flow of air. Water is not required to achieve this one-way seal.

11. The fluid in the patient air leak meter is used for air leak detection and is not a water seal. The patient air leak meter indicates the approximate degree of air leak from the chest cavity. Observe bubbling in the columns of the Patient Air Leak Meter. The meter is labeled from LOW (1) to HIGH (7). The higher the numbered column through which the bubbling occurs, the greater the degree of air leak.
12. If suction is ordered by the provider, attach external suction to the suction port of the chest drainage system. Turn the dial on the Dry Suction Control to the level of suction ordered by the provider. Turn on and increase the external suction until the orange float is visible in the window of the Dry Suction Control section. Correct amount of suction is NOT totally achieved until the orange float is visible in the window.
13. Apply an occlusive dressing and tape. Vaseline gauze may be ordered by the provider and applied to provide a seal around the insertion site.
14. Obtain chest X-ray to verify tube placement.

Maintenance of the Chest Tube(s)

1. Mark the drainage level on the collection chamber per unit standard or as ordered by the provider. Document drainage on flow sheet (in ICU) or on I&O sheet (on floors). Note the time and date on the collection chamber. If the container tips over and drainage is in all three chambers, the container may be turned onto the right side to allow drainage to collect in the first column again.

2. Continued bubbling in the Patient Air Leak Meter could be a patient leak or system leak if not on suction. To determine the source of the leak, pinch the collecting tube nearest the patient. If bubbling stops, it is a patient leak. If bubbling continues, assess system for leak and correct or attach a new chest drainage system. New onset of air leak must be reported to the provider.
3. Do not allow dependent loops, kinks, or pressure on tubing as it may interfere with chest drainage. Always maintain the collection system below the level of the patient's chest.
4. When it is necessary to transport a patient receiving added suction, the external suction source must be removed. The suction port must be left open to air. Upon return of the patient, suction is resumed as ordered by the provider. Ensure the collection device remains upright during transport.
5. Notify the provider immediately if the patient develops cyanosis, rapid shallow breathing, subcutaneous air, chest pain, or excessive bleeding.
6. When the chest tube system is implemented, and every system review thereafter, assess and document the following:
 - a. Respiratory assessment and pain management
 - b. Assessment of dressing
 - c. Presence/absence of subcutaneous air
 - d. Chest tube size and location
 - e. Drainage color and amount
 - f. Mark drainage level on collection chamber with date and time. Record output on Intake and Output Record.
 - g. Presence/absence of palm tree symbol in negative pressure indicator
 - h. Presence of air leak
 - i. Amount of suction delivered
7. Change dressing, utilizing aseptic technique, when soiled or as ordered by the provider. A dry, occlusive dressing must be in place at all times. Label dressing with date, time and nurse's initials.
8. DO NOT strip chest tubes. DO NOT clamp a chest tube.

Obtaining Specimens

1. Specimens may be collected from the resealable sampling port on the drainage tubing.
2. Use aseptic technique utilizing a needle with syringe when collecting specimens.
3. Follow directions provided by the manufacturer.

Discontinuation of Chest Tube

1. The chest tube must be discontinued/removed by the provider.
2. The site is immediately covered with Vaseline gauze and 4x4's (for pleural chest tube sites). Sterile 4x4's are used for mediastinal sites. The occlusive dressing is taped securely.
3. The dressing is to remain intact for 72 hours or as ordered by the provider. Write the date, time and initials on the dressing. The dressing is changed daily thereafter.
4. The provider may obtain a chest X-ray within 24 hours of removing the chest tube.