

PROTOCOL FOR: Chest Tube

DESIRED PATIENT

- OUTCOMES:
1. Adequate oxygenation and ventilation will be maintained.
 2. Extrapulmonary air will be promptly evacuated.
 3. Patent, infection-free drainage system will be maintained.
 4. Pain and discomfort will be minimized.

PROCEDURE: Procedure for Assisting with Chest Tube Placement and Setup

EQUIPMENT:

- Trocar chest tubes (size 8F, 10F, 12F, 16F)
- closed thoracotomy tray
- chest drainage system
- sterile gloves
- Sterile Q tips
- Betadine solution
- Collodion
- adhesive tape
- wall suction set up
- sterile water
- Xeroform gauze/Vaseline gauze
- Lidocaine 1%
- Analgesic as ordered

PROCEDURE:

- | <u>ACTION</u> | <u>POINTS OF EMPHASIS</u> |
|--|---|
| 1. Set up equipment using sterile technique. Place appropriate size chest tube on sterile field. | |
| 2. Prepare chest drainage system and connect to suction set up. | |
| 3. Set up wall suction to 80cm. Set section control dial to level ordered (10-20cm). | 3. For Atrium Chest Drain, the orange suction monitor bellows should expand across the suction monitor window to confirm suction operation. |
| 4. Administer analgesic prior to chest tube insertion. | |
| 5. Position infant and restrain limbs as needed. | |
| 6. After the chest tube placed, connect | |

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drainage system to chest tube using a straight connector.

7. Check for evidence of airleak once the chest tube is connected to suction.
8. Tape all connections once the chest tube has been connected to suction.
9. During procedure, assess cardio-respiratory status and for signs of pain.

CLINICAL
ASSESSMENT

- AND CARE:
1. The following must be assessed on chest tube insertion/admission at least every 4 hours unless superceded by other protocols and :
 - a. vital signs (to include BP)
 - b. breathing pattern, rate, symmetry
 - c. quality and equality of breath sounds by auscultation
 - d. location of PMI (Point of Maximum Impulse).
 - e. quality of heart sounds
 - f. color, perfusion
 - 1) *report signs of hypovolemia*
 - g. activity level
 - h. Oximetry trends
 - i. Assess chest tube and insertion site and report any bleeding, drainage, other signs of infection, crepitus or dislodgment of chest tube. Note level of chest tube at the insertion site.
 - j. Chest tube drainage system for:
 - 1) uninked and unobstructed tubings with no dependent loops in the system.
 - 2) drainage system below level of infant.
 - 3) connections secured and taped with adhesive.
 - 4) fluctuations in water seal chamber.
 - 5) bubbles in water seal chamber indicative of continued air leak or leak within the system.
 - a) *report signs of new or recurrent air leak or persistent vigorous bubbling which is unchanged after system check*
 - 6) 2 cm. water seal level.
 - 7) Suction level maintenance as ordered (usually 10 to 20 cm H₂O).
 2. Assess amount of drainage on insertion and then every 8 hours - more frequently if drainage is excessive. Mark date, time, drainage level on collection chamber and document on the intensive care flowsheet.

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If a sample of drainage needs to be obtained for analysis and there is no sampling port on the chest drain, the drainage tubing of the Atrium drain may be accessed. Prep the tubing with alcohol (using friction). Insert a needle attached to a syringe to sample the drainage. The tubing will seal itself.

3. Pain is assessed and documented on pain scale at least q 4 hours.
4. Chest transillumination may be performed every 8 to 12 hours in conjunction with initial assessment.

CHEST TUBE CARE:

1. Chest tubes are never to be routinely milked or stripped. Drainage may be promoted by lightly tapping the chest tube or drainage tube or by changing drainage tube position to facilitate gravity flow. Milking may be ordered by MD, Advanced Practitioner when pleural effusions or hemothoraces are present.
2. Clamping of chest tubes is to be avoided, especially when positive pressure ventilation is delivered.
3. Placing a chest tube to underwater seal:
 - a. Disconnect the chest drain tubing from suction connecting tubing.
 - b. Turn off suction.
 - c. Place the open end of the chest drain tubing into a sterile 4x4 or 2x2 package and tape closed. This will protect the open end of the tube and maintain a pop-off within the system.

POSITIONING:

1. Ideal position may be dictated by the site of the air leak and placement of the chest tube within the pleural space to achieve the best evacuation.
 - a) *Report position which is not tolerated.*
2. Connection between the chest tube and connecting tubing should be visible at all times, despite position changes.
3. Maintain comfort and body alignment and provide support/containment as needed. Consult with Advanced Practitioner/physician regarding use of analgesics.

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SAFETY: Emergency needle aspiration set-up is to be at the bedside of any infant at risk for pneumothorax.

EMERGENCY

MEASURES:

1. DISCONNECTION: In the event of disconnection between the chest tube and the connection, both exposed ends should be thoroughly cleaned with alcohol swabs. Allow the alcohol to dry for 30 seconds, then reconnect chest tube and connecting tubing and retape. The RN will remain with the infant while the chest tube is disconnected, observing for respiratory distress which may indicate the need for immediate re-initiation of suction.

Following resumption of system continuity, assessment will be performed and incident discussed with MD/Advanced Practitioner to determine further action.

NOTE: If tube connections have been contaminated with urine, stool, or other secretions, a new drainage system must be attached.

2. DISLODGMET: If the chest tube is accidentally pulled out, promptly apply several 4x4s to the chest wall, hold securely. Direct other staff to notify AP/physician and prepare for chest tube reinsertion.

If increased respiratory distress occurs, this may be due to a tension pneumothorax. Removing pressure and the dressing briefly to allow air to escape may alleviate respiratory distress. This may need to be repeated until the chest tube is replaced.

3. EXCESSIVE AIR LEAK: If the water seal chamber is bubbling continuously and excessively, check the infant and system for air leak.
 - a. Check chest tube position for slippage. Look for visible holes on chest tube, indicating that chest tube is no longer in the pleural space.
 - b. Secure all connections and re-tape.
 - c. Pinch chest tube close to the chest wall; if bubbling stops, then air leak is inside. Notify MD/AP.
 - d. Apply pressure with fingers around chest tube, as air may be entering chest around the wound. If bubbling

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decreases with pressure, notify MD/AP to discuss re-securing chest tube.

- e. If a leak in system suspected and is uncorrected by securing connections, the entire collection drainage system may need to be changed.

DOCUMENTATION: Pain Scale

APPROVAL: Nursing Standards Committee

EFFECTIVE DATE: 2/89

REVISION DATES: 4/90, 6/91, 9/92, 12/94, 3/97, 6/99, 10/00, 9/03, 1/05, 3/06