ruptures. A thoracotomy is done to excise or oversew blebs (usually at the apices of the lungs). The overlying pleura is then roughened or irritated to induce scarring and adhesion to the surface of the lung. In some cases, the parietal pleura may be partially excised. These procedures can be done using video-assisted thoracoscopic surgery (VATS), a minimally invasive surgical technique (Way & Doherty, 2003).

**NURSING CARE OF THE CLIENT WITH CHEST TUBES**

**PREPROCEDURE CARE**
- Ensure a signed informed consent for chest tube insertion. 
  *This invasive procedure requires informed consent.*
- Provide additional information as indicated. Explain that local anesthesia will be used but that pressure may be felt as the trocar is inserted. Reassure that breathing will be easier once the chest tube is in place and the lung reexpands. The client may be extremely dyspneic and anxious and may need reassurance that this invasive procedure will provide relief.
- Gather all needed supplies, including thoracostomy tray, injectable lidocaine, sterile gloves, chest tube drainage system, sterile water, and a large sterile catheter-tipped syringe to use as a funnel for filling water-seal and suction chambers. *These supplies are used during the insertion procedure to establish a water-seal drainage system.*
- Position as indicated for the procedure. Either an upright position (as for thoracentesis) or side-lying position may be used, depending on the site of the pneumothorax.
- Assist with chest tube insertion as needed. The procedure may be performed in a procedure room, in the surgical suite, or at the bedside. Although chest tube insertion is a relatively simple procedure, nursing assistance is necessary to support the client and rapidly establish a closed drainage system.

**POSTPROCEDURE CARE**
- Assess respiratory status at least every 4 hours. *Frequent assessment is necessary to monitor respiratory status and the effect of chest tube.*
- Maintain a closed system. Tape all connections, and secure the chest tube to the chest wall. *These measures are important to prevent inadvertent tube removal or disruption of the system integrity.*
- Keep the collection apparatus below the level of the chest. *Pleural fluid drains into the collection apparatus by gravity flow.*
- Check tubes frequently for kinks or loops. *These could interfere with drainage.*
- Check the water seal frequently. The water level should fluctuate with respiratory effort. If it does not, the system may not be patent or intact. Periodic air bubbles in the water-seal chamber are normal and indicate that trapped air is being removed from the chest. *Frequent assessment of the system is important to ensure appropriate functioning.*
- Measure drainage every 8 hours, marking the level on the drainage chamber. Report drainage that is cloudy, in excess of 70 mL per hour, or red, warm, and free flowing. Red, free-flowing drainage indicates hemorrhage; cloudiness may indicate an infection. Emptying the drainage would disrupt integrity of the closed system.
- Periodically assess water level in the suction control chamber, adding water as necessary. *Adequate water in the suction control chamber prevents excess suction from being placed on delicate pleural tissue.*
- Assist with frequent position changes and sitting and ambulation as allowed. Chest tubes should not prevent performance of allowed activities. *Care is needed to prevent inadvertent disconnection or removal of the tubes.*
- When the chest tube is removed, immediately apply a sterile occlusive petroleum jelly dressing. *An occlusive dressing prevents air from reentering the pleural space through the chest wound.*

**NURSING CARE**

Health Promotion

Health promotion activities to prevent spontaneous and traumatic pneumothorax primarily involve health teaching. Initiate and participate in programs to prevent smoking among children and teenagers. Teach safe behaviors such as always wearing a seat belt in an automobile, diving safely, and using precautions to prevent falls when working or recreating in high places.

Assessment

The client with pneumothorax may be in acute respiratory distress, necessitating rapid and focused assessment.

• Nursing history: current symptoms and their duration; precipitating factors or activities if known; previous episodes of pneumothorax; smoking history; chronic pulmonary diseases such as COPD
• Physical assessment: general appearance and degree of apparent respiratory distress; evidence of chest trauma; vital signs, oxygen saturation, skin color, level of consciousness; respiratory excursion, percussion tone, and breath sounds anterior and posterior chest; neck vein inspection, position of trachea; peripheral pulses

**Nursing Diagnoses and Interventions**

Maintaining or restoring adequate alveolar ventilation and gas exchange is highest priority for the client with a pneumothorax. Chest tubes may interfere with physical mobility, contributing to a high risk for injury.

**Impaired Gas Exchange**

Loss of negative pressure in the pleural cavity and the resulting collapse of lung tissue can cause poor chest expansion and loss of alveolar ventilation. As the pneumothorax is removed or re-absorbed, ventilation and gas exchange improve.

• Assess and document vital signs and respiratory status, including rate, depth, lung sounds, and oxygen saturation at...