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KINGSTON GENERAL HOSPITAL

NURSING SERVICE

CHEST TUBE REMOVAL

LEARNING GUIDE

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This learning guide has been developed
by
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Note: This learning guide contains information current at the time of distribution. Policies and procedures are frequently revised. Please refer to related policies and procedures contained in the Nursing Policy and Procedure Manuals for ongoing, current information.

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1.0 INTRODUCTION

Chest tubes are usually removed when the fluid drainage has almost ceased and/or an air leak has healed. A pleural tube is generally removed when the drainage has been less than 150mL in 12 hours (for Dr. Reid's patients, less than 112mL in 12 hours), and there has been no air leak in 24 - 48 hours. Mediastinal chest tubes are generally removed if there has been less than 100mL of drainage over 8 hours. (Mediastinal tubes should have no air leak prior to removal.) The physician makes the decision to remove the tube(s), and once the decision is made, an order is written. Authorized nurses in ICU, CVRI, CECU, ECU and Kidd 3 can remove both mediastinal and pleural chest tubes. Patient care is enhanced when nurses remove chest tube(s) for the following reasons:

- The nurse caring for the patient knows that patient, and can teach the patient about the procedure and the role that he/she will play in chest tube removal.
- The nurse, knowing when chest tube removal will take place, can provide the patient with appropriate and timely analgesic.
- The nurse is familiar with the patient's usual routines, so that the flow of care is not interrupted by having to wait for someone else to discontinue the chest tube(s).
- The nurse can assess how the patient has tolerated the procedure, and if there were any related complications.

After the chest tube has been removed, the patient is closely monitored. There is usually some drainage from the site even after the chest tube has been removed. If the physician wishes a chest X-ray to be done following chest tube removal, the physician completes a requisition. Nurses should auscultate lung sounds post removal, and report abnormal findings such as absent air entry.

1.1 Authorization Requirements

The information contained in this learning guide will prepare you for removal of chest tubes. Chest tube removal is an added nursing skill. To become authorized for chest tube removal, the nurse will:

- complete a written test (80% pass); and
- demonstrate to the Clinical Instructor or delegate the removal of a mediastinal or pleural chest tube.

1.2 How to Use This Learning Guide

Step 1: Review the list of competencies on the following page.

Step 2: Read the learning guide.

Step 3: Keep a record of any questions or concerns that you may have as you read through this learning guide.

Step 4: Complete the Learning Guide Evaluation Form, and submit it to your Clinical Instructor or delegate.

Step 5: Complete the Written Test for chest tube removal and submit to your Clinical Instructor or delegate.

Step 6: Detach the Competency Checklist and ask your Clinical Instructor or delegate to complete it when you demonstrate chest tube removal in the clinical setting.

1.3 Competency Statements

Upon authorization for the Added Nursing Skill of Chest Tube Removal, the nurse will meet the following competencies:

1. Conduct a thorough nursing assessment of a patient who has either a mediastinal or pleural chest tube and confirm criteria for removal, i.e., lung expansion, resolution of an air leak, and decreased fluid drainage.
2. Confirm the presence of a written physician's order.
3. Assess the patient's comfort level and ensure the provision of analgesia as necessary.
4. Educate the patient in the appropriate breathing sequence for chest tube removal and assist the patient to practice prior to removal.
5. Remove either a mediastinal or pleural chest tube.
6. Conduct a thorough nursing assessment of a patient following either mediastinal or pleural chest tube removal.
7. Document relevant information and communicate concerns/problems to the attending staff.

2.0 REVIEW OF ANATOMY AND PHYSIOLOGY

2.1 Anatomy

Pleurae and Pleural Space

Each lung is covered with two thin layers of serous membrane, collectively called the pleurae. The inner layer, the **visceral pleura**, covers the surfaces of each lung, as well as the fissures between the lobes. It is inseparably attached to the lung surface.

The **parietal pleura,** covers the internal surface of the thoracic wall, the lateral surface of the mediastinum, the superior surface of the diaphragm, and the lung apices.

Both the visceral and parietal pleurae have a blood supply and a lymphatic supply through which they secrete and absorb fluid. The surfaces of the visceral and parietal pleurae are moistened by minimal amounts of serous fluid. The potential space between the visceral and parietal pleurae is termed the **pleural cavity** or pleural space. This pleural space is called a 'potential' space because it has the capacity to hold a large amount of fluid. One to two litres of fluid moves across the pleural space each day, but because the fluid is constantly being secreted and absorbed, only 10-20mL of the pleural fluid remains in the pleural space at any one time (Kersten, 1989).

This fluid lubricates the pleural surfaces as they move against each other when the lung size changes during breathing.

Pathologies such as congestive heart failure, cancer, pancreatic disease or liver disease, can result in an accumulation of fluid within this space.

At the root of the lung, the parietal pleura becomes continuous with the visceral pleura. The pleurae, in effect, form one continuous sheet, with both inside and outside layers.

Diaphragm

The diaphragm is the main muscle of respiration. It stretches across the bottom of the thorax, separating the thoracic cavity from the abdominal cavity. The external intercostal muscles extend from one rib to the rib below. The function of the external intercostals is to draw the ribs upward and outward to enlarge the thoracic cavity and increase lung volumes.

Mediastinum

The mediastinum lies in the middle of the thorax between the two pleural sacs that contain the lungs, and between the sternum and the vertebrae. These structures are all contained within their own viscerae. The superior limit of the mediastinum is the thoracic inlet (between the manubrium and the first thoracic vertebra). The trachea and esophagus descend into the thorax through this inlet. The diaphragm forms the inferior border of the mediastinum. The contents of the mediastinum include the heart, aorta, thymus, vagus and phrenic nerves, esophagus, trachea, lymphatics, nodes and numerous other vessels.

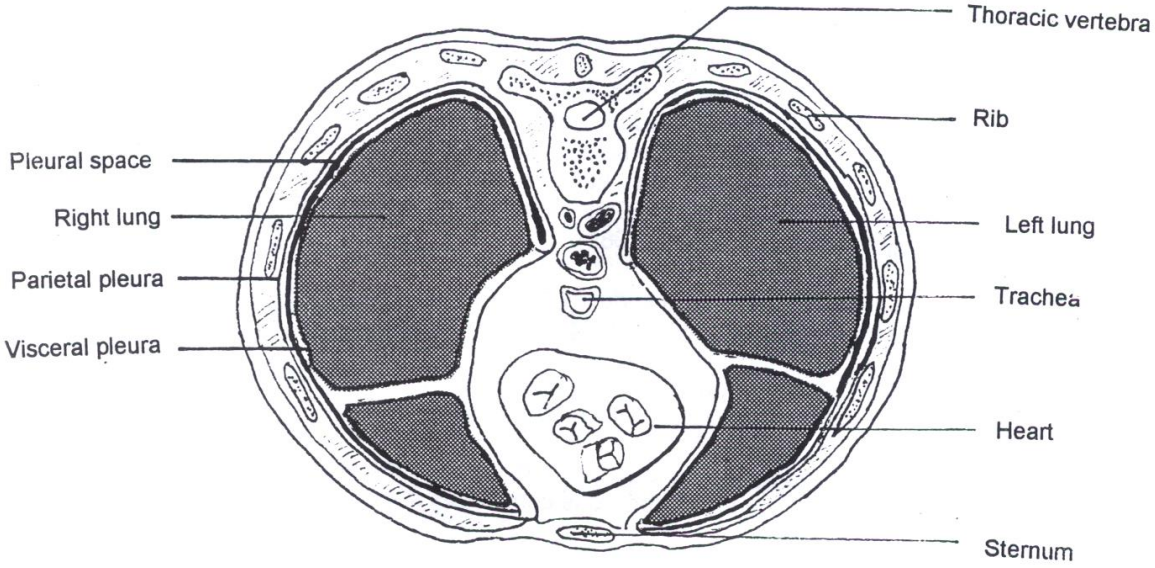

Figure 1: Transverse View of the Thorax
Illustrating Pleurae and Lungs

2.2 Physiology

Air moves in and out of the lungs based on pressure changes. The diaphragm contracts and moves downward and the external intercostal muscles move the rib cage up and out. The lungs expand because of the movement of the diaphragm and the chest wall. The surface tension of the pleural fluid holds the pleurae together, thus preventing the lungs from collapsing.

When the chest wall moves, the parietal pleura moves, pulling the visceral pleura, and the lung along with it. This increases the volume within the thorax and decreases the pressure within the lung, i.e., intrapulmonary pressure. The volume change in the thorax makes the pulmonary pressure lower (- 2 mmHg) than the atmospheric pressure (0 mmHg). Air flows into the lungs because of this pressure gradient. This is inhalation or inspiration.

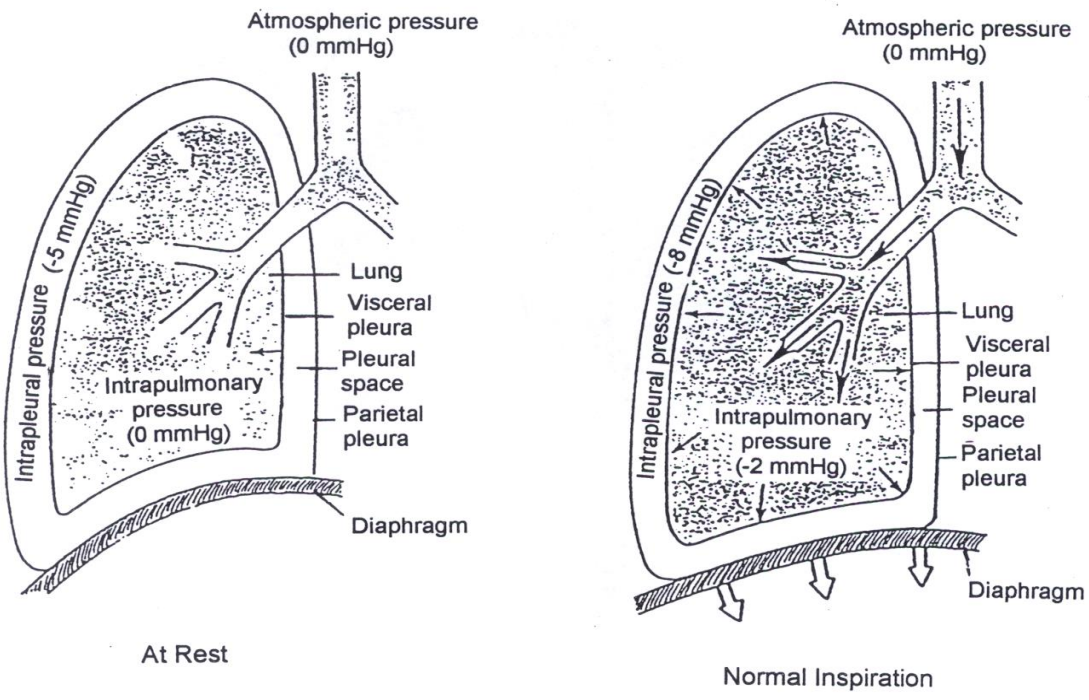

Figure 2: The Lung at Rest and During Normal Inspiration

When the diaphragm returns to its normal, relaxed state, the intercostal muscles also relax and the chest wall moves in. The lungs, with natural elastic recoil, pull inward. This is called exhalation.

The negative pressure between the pleurae maintains partial lung expansion by keeping the lung pulled up against the chest wall. Under normal conditions, there is always a negative pressure in the pleural space. This is known as intrathoracic or intrapleural pressure. The degree of negativity changes during respiration (- 5 mmHg to - 8 mmHg during inspiration). If a patient takes a deeper breath, the intrapleural pressure will be more negative, i.e., > - 8 mmHg.

If air is introduced into the pleural space, this intrapleural negative 'pull' is lost and the lung collapses (pneumothorax).

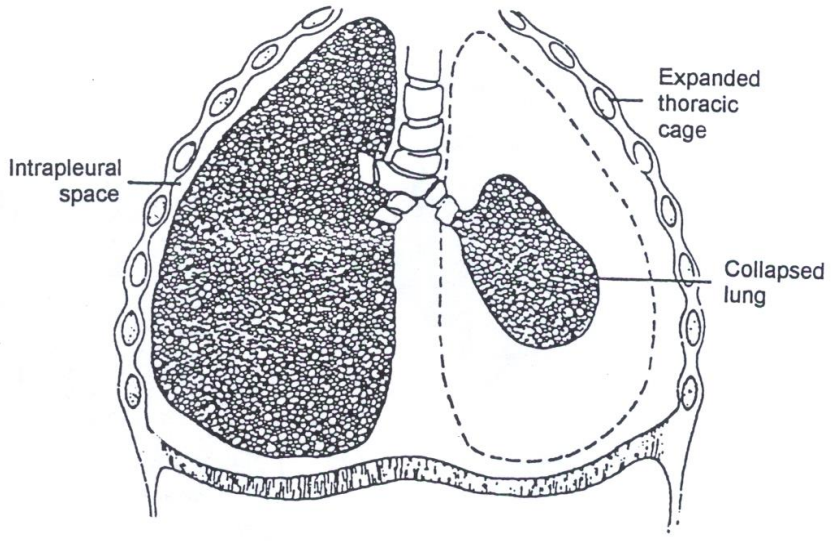

Figure 3: Pneumothorax
(Broken line indicates position of normally expanded lung to demonstrate the movement outward of the thoracic cage, which occurs with a pneumothorax.)

Note: A 'Valsalva maneuver' increases intrapulmonary pressures as high as 100 mmHg above atmospheric pressure. A Valsalva maneuver, done during chest tube removal, aids in preventing the introduction of air into the pleural space.

3.0 PLEURAL AND MEDIASTINAL CHEST TUBES

Unvented Chest Tube
Unvented chest tubes **must** be used in the pleural space and **can** be used in the mediastinal space. Blood moves through the tubing when pushed along by fresh bleeding behind it and/or assisted by suction. Because of the long transit time, the tubing may become filled with clots and the drainage impeded. Careful attention to the chest tube drainage is warranted. Unvented chest tubes can be connected to a Pleurevac.

3.1 Location of Chest Tubes

Chest tubes are usually classified according to the **location** into which they are inserted. (pleural or mediastinal).

Pleural Chest Tubes
Pleural chest tubes are usually inserted into the anterior chest area, preferably anterior to the mid-axillary line to prevent the patient from lying on the tube.

To drain air, pleural tubes are placed in the lung apex at the 2nd and 3rd intercostal space (ICS), mid-clavicular line (MCL). Occasionally, the location of a tube to drain air is located in the fourth ICS in the mid to anterior axillary line.

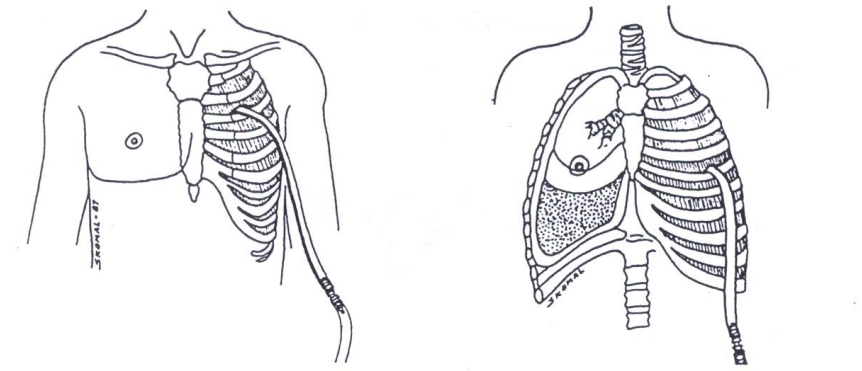

Figure 4: Chest Tubes in Position
Adapted from: Carroll, P. (1988). Understanding Chest Tubes. New York: Pfizer Hospital Products Group.

To drain fluid, the tube is placed in the lateral chest area at the fifth or sixth ICS, anterior axillary line (AAL) and sometimes as low as the eighth or ninth ICS, mid-axillary line (MAL). Once the tube is in situ, the tip of the tube is advanced several inches into the pleural space along the surface of the lung.

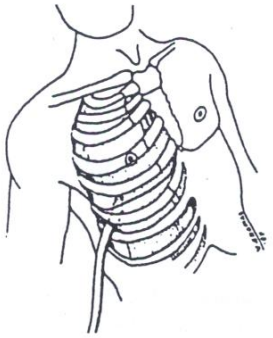

Figure 5: Pleural Chest Tube in Position
Adapted from: Carroll, P. (1988). Understanding Chest Tubes. New York: Pfizer Hospital Products Group.

Mediastinal Chest Tubes
Tubes are inserted just before chest closure during cardiac surgery to drain the mediastinal space.

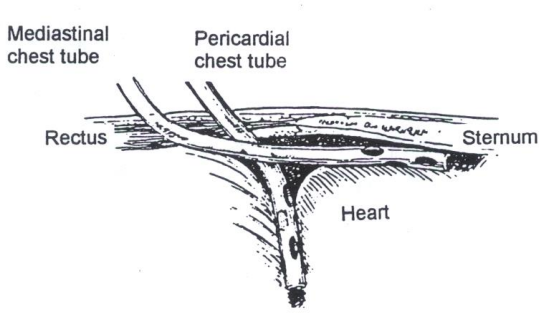

Figure 6: Mediastinal and Pericardial Chest Tubes
Adapted from: Fishman, N.H. (1983). Thoracic Drainage: A Manual of Procedures. Chicago: Year Book Publishers.

Chest tubes must be connected to a closed drainage system, e.g., Pleurevac. They function to drain the mediastinal space and to assist lung re-expansion, if surgery either intentionally or unintentionally extended into the pleura of the lung.

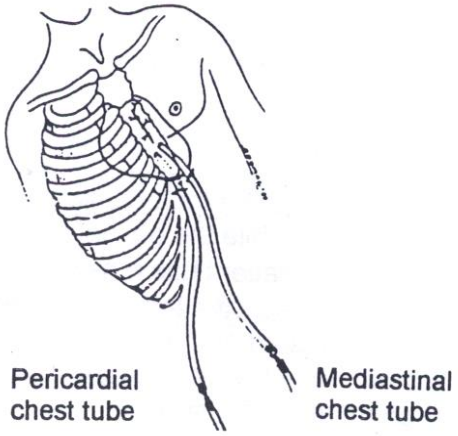

Figure 7: Unvented Chest Tubes in Position
Adapted from: Carroll, P. Understanding Chest Tubes. New York: Pfizer Hospital Products Group

Following lung surgery, two pleural chest tubes are usually used. One is directed anteriorly to remove air; the other is directed posteriorly through a lateral incision to drain fluid. The tubes are placed in the pleural space, through a puncture wound, two or three ICS's below the surgical incision.

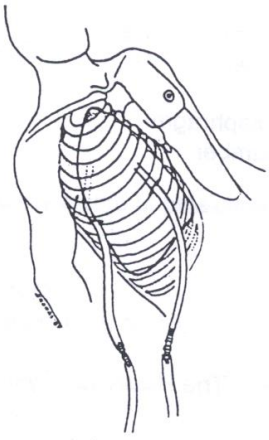

Figure 8: Two Pleural Chest Tubes in Position
Adapted from: Carroll, P. (1988). Understanding Chest Tubes. New York: Pfizer Hospital Products Group.

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3.2 Complications of Chest Tubes

Air Leak

An air leak occurs when air enters the patient's chest tube drainage system. Bubbles begin to appear in the underwater seal chamber. The leak can begin as very small, and progress to a larger leak. The nurse should assess for air leaks on the initial patient assessment. When assessing for an air leak, you will note bubbling in the underwater seal chamber.

Assessment of Air Leak

The RN will:

- Assess the leak by watching the underwater seal with the patient taking deep breaths and coughing, while the patient is on and off suction.
- Notify the resident if a patient has a new air leak.
- Assess for increase in size if a leak is not new, and notify the resident of any increase. This is indicated by the 6 chambers in the underwater seal of a Pleurevac system. As a leak gets larger, the bubbling will begin to progress from the first chamber to the sixth.

S1: Suction Control Level and Indicator
S2: Suction Tubing
W1: Water Seal Pressure Scale
W2: Patient Air Leak Meter
W3: Positive Pressure Relief Valve
W4: High Negativity Float Valve
W5: Filtered Negativity Relief Valve
W6: Self-Sealing Diaphragm
C1: Collection Chamber

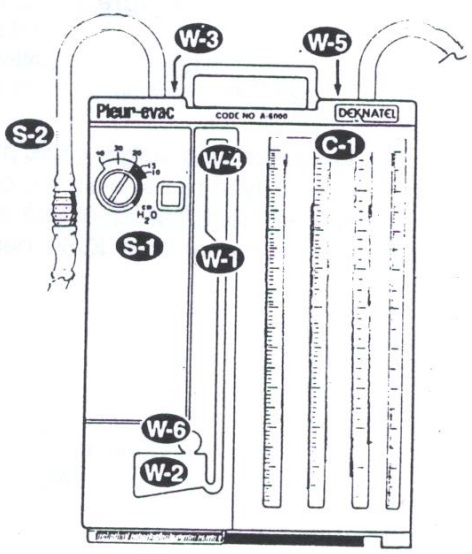

Figure 9: The Pleurevac System

Causes of Air Leak

1. Air entering the chest tube drainage system.
   Intervention
   - Ensure all connections are tight and secure.
   - Ensure no punctures are present in the tubing (if so, change the Pleurevac set-up).

2. Air entering at insertion site.
   Intervention
   - Ensure occlusive dressing is in place.
   - Change or reinforce the dressing as needed.
   - Ensure the tube is well sutured at the site. If not contact the resident.

3. Air entering at OR site.
   - Observe for increase in the size of the leak.
   - CT changed by the resident.
   - Patient may return to the OR.

Subcutaneous (S/C) Emphysema

This refers to an escape of air into the subcutaneous tissues. Escaped air may travel through tissue for some distance. S/C emphysema is common and not usually dangerous.

Assessment

Subcutaneous emphysema is detected by observation and palpation. The RN will:

- Observe for any "puffing out" of the skin.
- On palpation note a "Rice Krispies"-like effect under the skin.
- Observe and palpate for S/C emphysema at the chest tube site and around the incision line.
- Assess the progression by marking the area with pen.
- Note that areas that have S/C emphysema may be tender and uncomfortable.

Nursing Interventions

- Observe for progression.
- Notify physician if not already aware of presence of emphysema.

Treatment

- Treat the cause of the air leak.
- Once the leak has been taken care of, the S/C emphysema will slowly resolve.

4.0 NURSING ACTIONS/RATIONALE FOR REMOVAL OF A CHEST TUBE (PLEURAL OR MEDIASTINAL)

NURSING ACTIONS	RATIONALE
1. Position the patient in the most appropriate position for chest tube removal (supine, a degree of semi-Fowler's on the unaffected side). Obtain a linen saver pad. It is important to assess the patient's need for analgesic and to ensure that a physician's order has been written prior to beginning the procedure.	This allows for adequate viewing of the chest tube insertion sites and is most comfortable for the patient.
2. Turn the chest tube suction off, if applicable.	If a pleural tube is being removed, ensure that there is no bubbling in the water seal chamber (to ensure that air has been removed from the pleural space). **If the patient has two chest tubes into the same lung and there is an air leak present, you can still pull one tube as long as the other remains.** Turning the suction off also decreases resistance when removing the chest tube(s).
3. Remove the chest tube dressing without exerting tension on the tube(s). Assess the site for signs of infection and collect swab for culture if a discharge is present.	
4. Prepare occlusive dressing.	The dressing must be occlusive to prevent air from entering the patient's chest via the chest tube insertion site. This prevents a pneumothorax if the pleural space has been entered.
5. Glove (use clean, non-sterile) and using sterile gauze, cleanse the site with cleansing solution. Allow at least 30 seconds contact time.	
6. Remove the securing suture. Do not clamp the CT, unless ordered by physician. (The pleural tube is clamped only during removal of just he mediastinal, in case there is communication.)	Unnecessarily creates increased intrathoracic pressure.
7. Instruct the patient to take a deep breath, hold it and bear down slightly (Valsalva Maneuver). You will tell them to hold it while removing the tube, then tell them to breathe again when you have control of the site.	Practise this with the patient prior to removing the chest tube(s). **If the patient is unable to obey commands or is on a ventilator, remove the chest tube(s) at the beginning of exhalation, just at the end of inspiration.**
8. Loosely apply the occlusive dressing over the chest tube insertion site(s); 1-3 adaptic, or 2 jelonet, 6+ 4X4 gauze.	If dressing leaks, it can be reinforced with gauze or ABD pad. It is best to leave the adaptic for 24 hours where possible.

NURSING ACTIONS	RATIONALE
9. Remove the chest tube(s) in a swift downward motion. Two or more adjacent tubes, (e.g., mediastinal and/or pleural chest tubes) can be removed together. If any resistance is met while removing the chest tube(s), stop the procedure, redress the insertion site with an occlusive dressing and notify the physician.	It can be more comfortable for the patient to remove two adjacent chest tubes together.
10. Secure the occlusive dressing over the site. Hypafix tape is preferred.	The occlusive chest tube dressing may be removed in 24 hours.
11. Assess patient and auscultate chest. Notify X-ray if a chest X-ray has been ordered post chest tube removal.	Astute nursing assessment is essential following chest tube removal. See Section 5.0 (Complications, Side Effects and Nursing Assessment).
12. Document in the Progress Notes: • the date and time of removal; • the condition of the site; and • patient's tolerance of the procedure. Document on the Fluid Balance Record: • amount of drainage.	
13. Report to physician: • any resistance met while removing the chest tube; • if the site appears infected; or • any complications arising from the chest tube removal. If there are any queries that a patient may have developed a pneumothorax subsequent to the removal of a chest tube, attempts should be made to obtain a portable CXR STAT.	Astute nursing assessments can identify clinical indicators of a pneumothorax with or without a CXR. IF the patient clinically shows signs/symptoms of a pneumothorax, a portable CXR is required.

5.0 COMPLICATIONS, SIDE EFFECTS AND NURSING ASSESSMENT

Astute nursing assessment is essential following chest tube removal. Nursing assessment includes observing the patient for signs/symptoms of respiratory distress, checking vital signs and auscultation of breath sounds. Patients must be observed for the following potential complications.

POTENTIAL COMPLICATON	LOCATION OF CHEST TUBE	CAUSE	SIGNS/ SYMPTOMS	NURSING INTERVENTIONS
1. Cardiac Tamponade	Mediastinum	Accumulation of blood in mediastinum (can be life threatening)	• decreased venous return; • decreased cardiac output; • jugular venous distention; • increased central venous pressure; • decreased blood pressure; • muffled heart sounds; • pulsus paradoxus.	• Notify physician STAT. • Arrange STAT portable X-ray and prepare for needle aspiration.
2. Recurrent Pneumothorax	Pleural space	a] Entry of air into the pleural space through the chest tube tract.	• may hear the air entering the pleural space (sucking sound) through the chest tube exit site; • dyspnea; • asymmetric chest movements; • sudden, sharp chest pain; • decreased or absent breath sounds on affected side.	• Apply air occlusive dressing. • Ensure patient performs a Valsalva maneuver **or** remove the pleural chest tube at the beginning of exhalation. • Notify physician. • Arrange STAT portable CXR. • Check O_2 sat. • Elevate head of bed. • Obtain chest tube insertion cart/ supplies.
		b] Air leak undetected before the chest tube was removed.	• dyspnea; • asymmetric chest movement; • sudden, sharp chest pain; • decreased or absent breath sounds on affected side; • subcutaneous emphysema.	• Ensure there is no air leak prior to removal of the chest tube. • Notify physician. • Arrange STAT portable CXR. • Check O_2 sat. • Elevate head of bed. • Obtain chest tube, insertion cart /supplies.

POTENTIAL COMPLICATION	LOCATION OF CHEST TUBE	CAUSE	SIGNS/ SYMPTOMS	NURSING INTERVENTIONS
3. Tension Pneumothorax	Pleural space	Air rapidly accumulates in pleural space and cannot be evacuated. Pressure builds up, which collapses the lung and shifts the mediastinum, impeding venous return and cardiac output. It is life threatening and must be treated promptly.	• deviated trachea; • acute chest pain in affected side; • tachypnea; • marked, severe dyspnea; • diminished chest wall expansion on affected side; • decreased blood pressure; • jugular, venous distention; • sudden sustained increase in a mechan-ically ventilated patient (high pressure alarm).	• Notify physician Stat. • Obtain a sterile 14-gauge angiocath (this should be inserted by the physician as soon as possible to relieve tension and prevent hemodynamic collapse. **Note:** The angiocath is usually left in place temporarily while a CT is inserted, or removed and an occlusive dressing applied over the site once the air is released. • Arrange STAT portable CXR. • Obtain chest tube insertion cart & supplies.

6.0 TIPS FOR PATIENT EDUCATION

- Explain the importance of analgesic administration approximately 30 minutes prior to chest tube removal.
- Explain the procedure to the patient and practise performing a Valsalva maneuver with the patient, i.e., practise breath holding.
- Tell the patient that there may be the possibility of a chest X-ray following removal of the chest tube(s).
- Inform the patient of the need to report any unusual symptoms such as sharp, sudden pain, shortness of breath or difficulty breathing.

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8.0 WRITTEN TEST: REMOVAL OF A CHEST TUBE (PLEURAL OR MEDIASTINAL)

Please indicate your answers by circling the appropriate letters on the test answer sheet following the test questions.

1. Which statement best describes the physical relationship between both lungs and mediastinum?

   a. all three compartments are connected via direct air communications
   b. all three compartments are physically separate from each other
   c. the lungs are connected via communicating pleural spaces but the mediastinum is independent
   d. the mediastinum and right lung are connected via pleural membranes but the left lung is independent

2. Normal intrapleural pressures are in a range listed below. Select the correct range for pleural pressures.

   a. +3 to +10
   b. 0 to +4
   c. -5 to +5
   d. -5 to -8

3. Which of the following features of pleural drainage systems indicate an active pleural leak?

   a. bubbling in the water seal chamber
   b. bubbling in the collection chamber
   c. fluctuation of water in the water seal chamber with respirations
   d. no fluctuation of water in the water seal chamber with respirations

4. Anterior chest tubes for the drainage of air causing a pneumothorax is usually placed in which intercostal space (ICS)?

   a. first ICS, anterior clavicular line
   b. second ICS, mid-clavicular line
   c. fourth ICS, anterior axillary line
   d. sixth ICS, mid-axillary line

5. Chest tubes for the drainage of fluid from the pleural space are usually placed in which intercostal space (ICS)?

   a. second ICS, mid-clavicular line
   b. fourth ICS, mid-clavicular line
   c. fifth ICS, anterior axillary line
   d. seventh ICS, posterior axillary line

6. A 23 year old female admitted 3 days ago following a motor vehicle accident, has a fourth and fifth rib fracture on the left. You have just removed her left pleural chest tube that she has had for 3 days. Shortly after removal of the chest tube, she develops marked shortness of breath, has a rightward deviation of her trachea, and diminished breath sounds on the left. What condition is likely developing?

   a. closed pneumothorax
   b. tension pneumorthorax
   c. flail chest
   d. cardiac tamponade

7. Mr. Brown was transferred to your unit yesterday following his right middle lobe wedge resection. His anterior and posterior pleural tubes have remained connected to a double chamber Pleurevac overnight. His anterior chest tube has drained 100mL overnight and his posterior chest tube 200mL overnight. The physician has ordered his anterior chest tube to be removed. Prior to removal of his anterior chest tube, you should:

   i] clamp the anterior chest tube
   ii] turn off the suction
   iii] clamp the posterior chest tube
   iv) assess patient need for analgesia
   v) instruct the patient on holding breath during removal

   The correct interventions are

   a. i, ii, iii
   b. ii, iii,v
   c. i, iii
   d. ii, iv, v

8. A 42 year old female was admitted to your unit following a stabbing incident 2 days ago. On admission she was extremely agitated and required sedation to insert a right pleural chest tube. She was ventilated on an IMV of 12, Vt of 800 and FiO_2 .4. She has been weaned this morning and now is extubated. There is an order to remove her chest tube. Currently she is **confused** and **uncooperative**. Her chest tube is removed

    a. at the beginning of inspiration
    b. at the end of exhalation
    c. at the beginning of exhalation
    d. none of the above

9. A 73 year old male who had aortic valve replacement surgery has a physician's order to have his mediastinal chest tubes removed this morning. You turn the chest tube suction off and prepare the patient/ equipment according to procedure. As you attempt to remove the two adjacent tubes together, you meet with resistance removing one (1) or the tubes. You should:

    i] stop the procedure and re-dress the insertion site with an occlusive dressing
    ii] stop the procedure and administer more analgesic to the patient prior to continuing
    iii] notify the physician
    iv] remove the chest tube with no resistance and leave the second tube in place

    a. i and iii
    b. ii and iv
    c. iv only
    d. iii only

10. Following removal of a chest tube, document in the Progress Notes

    a. date and time of removal
    b. condition of site
    c. patient's tolerance of the procedure
    d. all of the above

11. A physician orders an anterior chest tube out. The patient also has a posterior chest tube in place. Prior to pulling the anterior tube, you note that there is an air leak. You would:

    a. clarify order
    b. pull the anterior tube
    c. not pull the anterior tube

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8.1 Pleural or Mediastinal Chest Tube Removal: Test Answer Sheet

Name: _____ Date: _____

1.	a	b	c	d
2.	a	b	c	d
3.	a	b	c	d
4.	a	b	c	d
5.	a	b	c	d
6.	a	b	c	d
7.	a	b	c	
8.	a	b	c	d
9.	a	b	c	d
10.	a	b	c	d
11.	a	b	c	d

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9.0 PERFORMANCE CHECKLIST: REMOVAL OF A CHEST TUBE: PLEURAL OR MEDIASTINAL

On the following page is a Performance Checklist that will be used when you are clinically assessed for chest tube removal. Questions are also provided that may be asked of you when you remove either a mediastinal or pleural chest tube. These questions are designed to assess your knowledge about the principles underlying the skill of chest tube removal.

You will also want to refer to Nursing Policy C-2880 and Nursing Procedure C-2881 in the Nursing Policy and Procedure Manual.

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Kingston General Hospital Performance Checklist: Removal of a Chest Tube (Pleural or Mediastinal)

Name: _____ Date: _____

Assessor: _____ Unit: _____

The Registered Nurse will remove a chest tube consistent with the Performance Checklist (based on the procedure) and will correctly answer questions about the principles underlying the skill.

NURSING ACTION(S)	YES	NO	COMMENTS	RELATED QUESTIONS
1. Positions the patient to expose the chest tube(s).				What checks should be made prior to starting the procedure?
2. Turns chest tube suction off, if applicable.				
3. Removes the chest tube dressing without exerting tension on the tubes.				What would you do if there were signs of infection at the chest tube insertion site?
4. Prepares the occlusive dressing.				Why is it important that the dressing be occlusive?
5. Gloves, cleanses chest tube insertion site(s).				
6. While holding the chest tube, cuts and removes the securing suture.				
7. Instructs the patient to take a deep breath, hold it and bear down (Valsalva maneuver).				**ICU:** What would you do if the patient is on a ventilator? **Kidd 4:** What would you do if the patient is unable to obey commands, e.g., confused, sedated?
8. Loosely applies occlusive dressing over chest tube insertion site(s) with one hand.				
9. With the other hand, removes the chest tube(s) in a swift downward motion while the patient is holding his/her breath.				If resistance is met during removal of the chest tube(s) what would you do?
10. Secures occlusive dressing over site.				
11. Assesses patient and auscultates chest.				
12. Documents in progress notes: • date and time of removal; • condition of site; and • patient's tolerance to the procedure.				
13. Documents amount of drainage on the Fluid Balance Record.				

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10.0 CHEST TUBE REMOVAL LEARNING ACTIVITY EVALUATION

Learning Activity/Method (Please check one of the following):

1. _____ Lecture
2. _____ Demonstration
3. _____ Video
4. _____ Other _____

Instructions: Please evaluate the learning activity in which you participated. Your comments are valuable as a basis for improving future educational activities.

Please indicate your most appropriate response	Strongly Agree			Strongly Disagree
I feel that my learning needs were met.	1	2	3	4
The overall quality of the activity was excellent.	1	2	3	4
The content was clear and understandable.	1	2	3	4
The method(s) used enhanced my learning.	1	2	3	4
The physical setting was conducive to learning.	1	2	3	4
This will help me to meet the knowledge/skill requirements of my job.	1	2	3	4

Comment Briefly

One way that I could use the information in this session is:

Other topics that I would find interesting/useful are:

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10.1 Learning Guide Evaluation

Please evaluate this learning guide. Again, your comments will help in improving it for future use.

Check your most appropriate response	Strongly Agree			Strongly Disagree
The content was clear and easy to understand.	1	2	3	4
The content was relevant.	1	2	3	4
I feel that my learning needs were met.	1	2	3	4
This guide will help me to meet the knowledge/skill requirements of chest tube removal.	1	2	3	4

Comments:

Please submit the completed questionnaire to your Clinical Instructor or to the Nursing Education Office, Empire 2. Thank you