	<p>POLICIES & PROCEDURES</p> <p>Title: CHEST TUBES: ASSISTING WITH INSERTION, CARE OF, ASSISTING WITH REMOVAL</p> <p>I.D. Number: 1113</p>
<p>Authorization:</p> <p><input checked="" type="checkbox"/> SHR Nursing Practice Committee</p>	<p>Source: Nursing</p> <p>Date Revised: October 2016</p> <p>Date Effective: November 1999</p> <p>Scope: SHR and Affiliates</p>

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For the purpose of this policy, client will be used when referring to clients, patients, and residents.

DEFINITIONS

Chest tubes are one-way drains that allow fluid (serous, sanguineous, purulent) and/or air to escape the pleural or mediastinal space. They are placed to re-establish normal negative pressure in the pleural space, to promote re-expansion of the lung and to prevent reflux of fluid and/or air into the pleural or mediastinal space from the drainage unit.

Examples of chest tubes are large bore traditional chest tubes, pig tail drains, Jackson Pratt drains, PleurX® drains and Heimlich Valve. These drains can be attached to suction (direct or indirect) or allowed to drain passively (**See Appendix A**).

Passive drainage relies on either gravity or the difference in pressure between the pleural space and the outside of the body to allow fluid to passively flow. The fluid is collected in a drainage unit.

Active drainage uses negative pressure to remove fluid from the pleural or mediastinal space to a drainage unit outside of the body. If the drainage unit has an adjustable negative pressure setting, this setting is to be ordered by the practitioner.

Practitioner – used to refer to Physician and Nurse Practitioner

1. PURPOSE

- 1.1 To safely care for clients with chest tubes.
- 1.2 To maintain patency of chest tubes.
- 1.3 To minimize the risk of infection, damage, displacement and other complications associated with the care and use of chest tubes.

2. POLICY

- 2.1 Registered Nurses (RNs), Graduate Nurses (GNs), Registered Psychiatric Nurses (RPNs), Graduate Psychiatric Nurses (GPNs), Licensed Practical Nurses (LPNs), and Graduate Licensed Practical Nurses (GLPNs) will assist practitioners with the insertion and removal of chest tubes, as well as maintain and care for chest tubes.

Note: Chest tubes will **NOT** be flushed by all nursing staff. An RN certified in the RNSP (Advanced RN Intervention) Interpleural Irrigation and/ or Medication Administration may irrigate chest tubes when working in their targeted area.

- 2.2 Chest tubes attached to a drainage unit with adjustable suction levels require a practitioner's order for amount of suction. See Appendices B-G for specific instructions.
- 2.3 Drainage units must be maintained below the chest level in an upright position with no dependent loops or kinks in the tubing.
- 2.4 A bottle of sterile water must be located at the bedside to use in case of accidental disconnection of chest tube from drainage unit.
- 2.5 Two (2) chest tube clamps must be with the client at all times while chest tubes are in place.
- 2.6 All connections between the client and drainage unit must be secured with waterproof tape or zip ties as per practitioner's preference.
- 2.7 Chest tubes may be clamped on a practitioner's order to assess if chest tube is ready for removal. The order should also include when to unclamp the chest tube. Should the client experience respiratory distress, the nurse will unclamp the chest tube and immediately notify the practitioner.
- 2.8 Chest tube may be clamped for less than a minute:
- to change drainage unit
 - to locate an air leak source (unexpected continuous bubbling in the water seal compartment)
 - to assess bubbling and fluctuation/tidaling of the unclamped chest tube when 2 chest tubes are attached to the same drainage unit

Note: When clamping chest tubes, the clamps will be placed in opposite directions close to the insertion site to ensure the tube is fully clamped.

- 2.9 Placement is confirmed by a chest x-ray as ordered.

Note: While chest tubes are in place daily chest x-ray may be ordered

- 2.10 Chest tubes will not be inserted or removed in Long Term Care Facilities.

3. PROCEDURE

3.1 Insertion - Assisting With

Note: Long Term Care facilities and Home Care will not assist with insertion of chest tubes.

Note: Practitioners will insert chest tubes wearing sterile PPE (except face shield & mask) and use sterile technique.

3.1.1 Gather supplies:

- chest tube insertion tray
- applicable chest drainage unit
- chest tube (of appropriate size)
- masks
- face shield
- sterile gowns for practitioner
- sterile gloves for practitioner
- clean gloves for assistant
- antiseptic solution: Chlorhexadine 2% without alcohol 70%
- local anesthetic Xylocaine 1% with Epinephrine
- 12ml syringe
- 25, 21, 18 gauge needles as required
- alcohol swabs
- extra sterile towels (optional)
- sutures (e.g. #2-0 silk with needle)
- sterile water
- sterile scissors
- suction regulator and tubing
- sterile Y connector and tubing (for multiple chest tubes)
- chest tube clamps (2 per chest tube)
- sterile occlusive dressing - practitioner's preference
- waterproof tape for taping the tubes
- stethoscope
- disposable incontinence pad

3.1.2 Administer analgesic as ordered prior to chest tube insertion.

3.1.3 Assemble chest drainage unit according to package insert. **(See Appendices B-G).**

Note: *If there are two or more chest tubes being inserted on the same side, they may be attached to the same drainage unit using a Y connector*

3.1.4 Position the client as requested by the practitioner.

3.1.5 After insertion connect chest tube to drainage unit. **(See Appendices B-G).**

3.1.6 Secure all connections as per practitioner preference. Examples include lengthwise circumferentially around the connection or double spiral in opposite directions.

3.1.7 Apply a sterile occlusive dressing over the insertion site and tape securely

Note: *Petroleum dressing may be placed around the chest tube insertion site to seal an air leak.*

3.1.8 Immediately following insertion, assess q15 minutes for a minimum of an hour or until client is stable.

- Vital signs including SpO₂
- Rate, depth and ease of respirations
- Skin color
- Lung auscultation
- Heart sounds for clients with mediastinal chest tubes
- Insertion site
- Amount, and type of drainage

- Note:** *For mediastinal chest tubes, drainage is to be checked q 30 min x 4 hours.*
- Function of the drainage unit (**See Appendices B-G** for assessment of each type of drainage unit)
 - Client comfort
 - Occurrence of subcutaneous emphysema

3.2 Care and Maintenance

3.2.1 Perform ongoing assessments q4 hours for the first 24 hours , after insertion then every shift and as needed. They include:

- Vital signs including SpO₂
- Rate, depth and ease of respirations
- Skin color
- Lung auscultation
- Heart sounds for clients with mediastinal chest tubes
- Insertion site
- Amount, and type of drainage

Note: For mediastinal chest tubes:

- Report to practitioner any losses greater than 250 mls/hr or more than 100 mls x 4 hours
- Drainage amounts are assessed q1h until chest tubes are removed
- Function of the drainage unit (See appendices B-G for assessment of each type of drainage unit)
- Client comfort
- Occurrence of subcutaneous emphysema

3.2.2 Change drainage unit when they are full or not functional.

3.2.3 If a chest tube becomes disconnected, submerge the distal end in sterile water while assembling and attaching a new drainage unit. It is acceptable to clean the end with an alcohol swab and reconnect the drainage unit if necessary. Notify the practitioner.

3.2.4 Change the dressing on adults chest tube sites every 48 hours or more frequently if needed or ordered as such.

Note: Pediatric chest tube dressing changes are done only when needed and are done either by a practitioner or with a practitioner present.

3.2.4.1 Perform hand hygiene and don PPE

3.2.4.2 Carefully remove soiled dressing

3.2.4.3 Remove soiled gloves, perform hand hygiene

3.2.4.4 Don clean gloves

3.2.4.5 Clean around chest tube with chlorhexadine swab/sticks, allow to dry

3.2.4.6 Use skin barrier protectant such as Skin Prep™ or Cavilon™ on the skin to protect the skin

3.2.4.7 Place 4x4 drain sponges around the chest tube (Petroleum dressing is used for all pediatric clients and for adults when there is a leak around the insertion site)

3.2.4.8 Place 4x4 on top of tube

3.2.4.9 Use cloth like-tape to secure dressing (NOT waterproof or elastic tape)

3.2.5 Perform ongoing assessment for various types of chest tubes and drainage units. **(See Appendices B-G).**

3.3 Documentation

3.3.1 On appropriate nursing record:

- date, time, chest tube size, insertion site, practitioner inserting chest tube and client's tolerance
- assessment of drainage unit
- respiratory assessment for pleural chest tubes
- cardiac and respiratory assessment for mediastinal chest tubes
- drainage amount, color and consistency
- suction settings
- chest x-ray

3.4 Report to the practitioner:

- excessive drainage or sudden change in amount of drainage
- no fluctuation/tidaling in the water seal compartment
- blockage is suspected
- sudden change in client's condition:
 - rapid shallow breathing
 - deterioration of SpO₂
 - cyanosis
 - pressure in the chest
 - sudden onset of severe pain
 - subcutaneous emphysema
 - hemorrhage
 - symptoms of mediastinal shift or cardiac tamponade (dyspnea, chest pain, tracheal deviation, decreased blood pressure, increased pulse, cool and mottled skin, elevated CVP)
 - Untoward changes in client's condition

3.5 Removal - Assisting With

NOTE: Long Term Care facilities and Home Care will not assist with removal of chest tubes.

3.5.1 Gather supplies:

- stitch cutter or sterile scissors
- sterile occlusive dressing, e.g. petroleum dressing with cloth like tape, or practitioner's preference
- chlorhexidine swabs/sticks
- dressing tray
- sterile towels
- scissors
- gloves (clean for assistant, sterile for practitioner)
- masks
- face shield
- chest tube clamps
- SpO₂ monitor
- Stethoscope
- Disposable incontinence pad

3.5.2 Administer analgesic prior to chest tube removal.

3.5.3 Perform hand hygiene and don PPE.

- 3.5.4 Position the client as requested by the practitioner.
- 3.5.5 Once the chest tube has been removed, apply an air occlusive dressing and leave in place for a minimum of 24 hrs.

Note: Dressings may be changed *prn* if wet or non-occlusive

- 3.5.6 Auscultate lungs and heart and assess vital signs and SpO₂
- 3.5.7 A chest x-ray may be ordered post-removal.
- 3.5.8 Document on appropriate nursing record:
- Date and time of removal
 - Practitioner removing chest tube
 - Chest tube site
 - Respiratory and cardiac status
 - Vital signs including SpO₂
 - Any medications given for procedure
 - Client's tolerance
 - Chest x-ray done following removal

4. REFERENCES

Atrium University downloaded December 28, 2015

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Briggs, D. (2010) Nursing care and management of patients with intrapleural drains. Nursing Standard. 24(21), 47 – 56.

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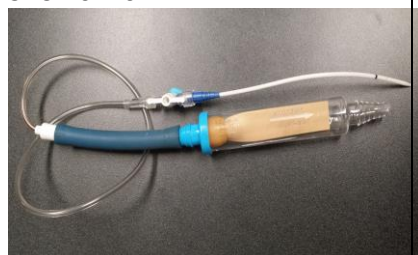



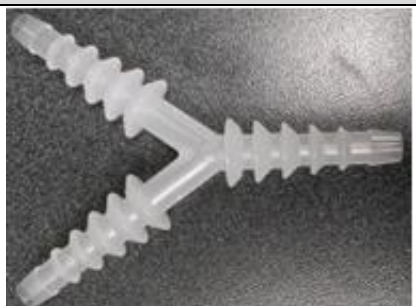
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Perry, A. & Potter, P. (eds) (2010). Closed chest drainage systems in Clinical Nursing Skills and Techniques 8th ed. Mosby. Pp. 655 – 676.

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Appendix A

Chest Tubes			
<p>Large Bore Chest Tube</p> <ul style="list-style-type: none"> Placed at the bedside for adult Placed in the OR or PICU for pediatrics Available in a variety of sizes Connects to: <ul style="list-style-type: none"> Atrium Oasis Atrium Mini Oasis 		<p>Pigtail Drain</p> <ul style="list-style-type: none"> Placed in interventional radiology Connects to: <ul style="list-style-type: none"> Tru-Close drain Heimlich Valve 	
Drainage Device			
<p>Atrium Oasis™ SKU #46783</p> 	<p>Atrium Express Mini 500™ Purchased</p> 	<p>Tru-Close Drain® SKU #62100</p> 	
All In One Chest Tube System			
<p>Heimlich Valve SKU #62402</p> 	<p>PleurX® SKU# 202629</p> 	<p>Jackson Pratt SKU# 88757 (bulb)</p> 	
Connectors			
<p>9 Inch Tube Connector SKU# 46882 from SPH Stores</p> 	<p>Y-Connector SKU# 42830</p> 		

Appendix B

Atrium Oasis™ Dry Suction Water Seal Chest Drain**What is an Oasis™ Chest Drain?**

An Oasis™ chest drain is a disposable one piece system that is used to drain air or fluid from either the pleural or mediastinal space. It has:

- dry suction that can be adjusted between -10 to -40 mmHg
- a collection chamber that allows for 2100 mls of fluid collection
- an underwater seal chamber allows for visualization of bubbling or tidaling

Set up of an Oasis™ Chest Drain

1. Ensure wall regulator is functioning correctly.
2. Dial in suction level on drainage unit to prescribed level (-20 cm H₂O preset and most commonly ordered)
3. Use sterile water at the back of the Oasis™ system to fill the underwater seal by placing it into the blue port at the top of the system.
4. Connect suction tubing to blue connector at the top of the Oasis™ system and then to the suction canister.

Note: even though suction regulators with trap bottles can be directly connected, there are regulators without trap bottles in SHR. Therefore, for consistency, **all chest tube setups will be connected to the suction canister.**

5. Place Oasis™ system below the level of the insertion site.
6. Once the practitioner is ready to connect the client to the system, hand the sterile end to practitioner to connect.
7. Turn the suction regulator on to a minimum of - 80 mmHg or until the orange bellows expands past the arrow mark.
8. Secure all tubing connections with tape as per practitioner instructions. Examples include lengthwise circumferentially around the connection or double spiral in opposite directions. Do NOT use a single spiral as this can be pulled apart.

Changing a Full Drainage System

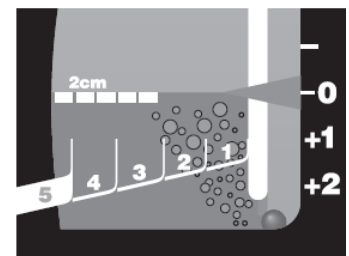
1. Set up a new system as per #1-5 above.
2. Clamp chest tube, close to client's insertion site using 2 chest tube clamps in opposing directions. Do NOT use the blue clamp on the chest tube system.
3. Disconnect full drainage unit, and connect new system.
4. Remove clamps
5. Attach ordered suction and ensure system is functioning properly
6. Assess client
7. Dispose of full system in appropriate biohazard receptacle.

Monitoring the Device

1. Assess the chest tube for:
 - Air leaks (hissing sound) at the connection sites or insertion sites
 - Loops or kinks in the drainage tubing
2. Position the unit at least one foot below the insertion site and ensure the unit stays in an upright position. If the unit accidentally tips, stand it up immediately. It may have to be replaced if the drainage has migrated from the collection chamber to the underwater seal.
3. Check the underwater seal chamber for (Section C):

3.1 Pneumothorax Chest Tube Assessment

- Bubbling with a pneumothorax (occasional is normal) corresponding with exhalation in spontaneous ventilation and inhalation with mechanical ventilation.



- Bubbling may be absent with conditions other than a pneumothorax or resolved pneumothorax.

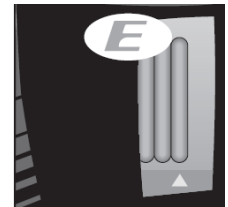
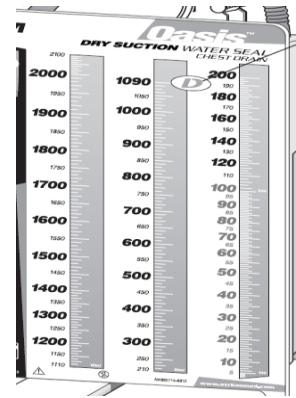
Note: A large amount of continuous bubbling may be a sign of a leak in the system or a large pneumothorax.

- Bubbling will slowly disappear as the lung re-expands.
- Tidaling (fluctuations in the fluid level that correspond with the respirations).

Note: Pediatric clients may not produce enough pressure gradient to produce noticeable fluctuations.

3.2 Mediastinal Chest Tube Assessment

- No bubbling
 - Tidaling may be seen with pulse.
 - For both types of chest tubes, maintain water at fill level.
4. Check collection chamber (Section D) for volume, rate and drainage type:
- Observe color, rate of accumulation, volume of drainage
 - Change device when chamber is full.
5. Correct amount of suction that is ordered is applied
- Check suction amount in Section A
 - If suction is on the bellows in window E is to be past the white arrow to indicate the suction is on.
 - If device is to gravity suction, the bellows in Section E is not visible in the window.



Client Education

Teach client to:

- Keep the Oasis™ below the level of insertion at all times
- Keep the Oasis™ upright and from tipping
- To notify nursing staff if changes to breathing or shortness of breath

References

Atrium University downloaded December 28, 2015
http://www.atriummed.com/EN/chest_drainage/education.asp

Pictures used with permission.

Saskatoon Health Region (2003). *Chest Tubes Learning Package*. Saskatoon Health Region.

Appendix C

Atrium Express Mini 500™**What is the “Mini™” Chest Drain?**

The Mini™ chest drain is a disposable one piece system that is used to drain air or fluid from the pleural space. It is primarily used for clients going home with a chest tube in place however it can also be used for clients in hospital while transitioning home. It has:

- Preset suction of -20 mmHg
- A collection chamber that allows for 500 mls of fluid collection that can be emptied
- An area to check for an air leak

Set up of an Mini™ Chest Drain

1. If suction is required, ensure wall regulator is functioning correctly.
2. Connect suction tubing to the connector at the top of the Mini™ system and then to the suction canister

Note: even though suction regulators with trap bottles can be directly connected, there are regulators without trap bottles in SHR. Therefore, for consistency, **all chest tube setups will be connected to the suction canister.**

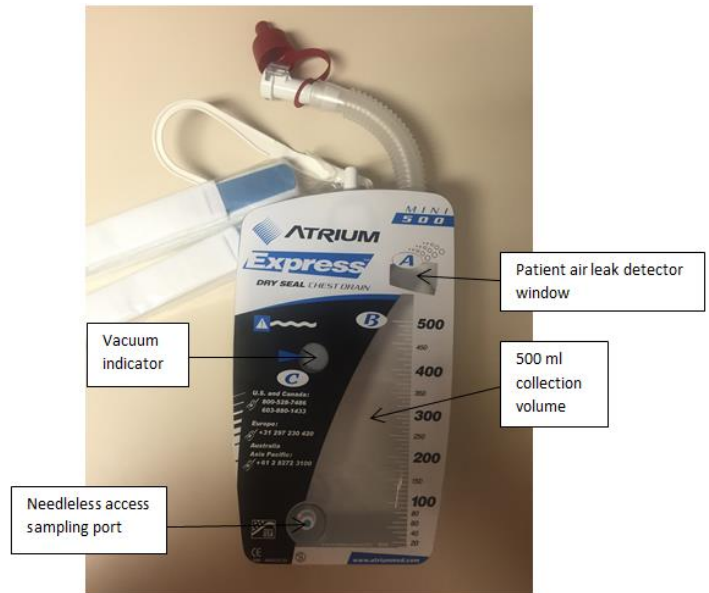
3. Place Mini™ system below the level of the insertion site.
4. Once the practitioner is ready to connect the client to the system, hand the sterile end to practitioner to connect.
5. Secure all tubing connections with tape as per practitioner instructions. Examples include lengthwise circumferentially around the connection or double spiral in opposite directions. Do NOT use a single spiral as this can be pulled apart
6. Turn the suction regulator on to a minimum of – 80 mmHg. A check mark will appear in Section C when suction is on.

Changing to a Mini™ Chest Drain from an Oasis™ Chest Drain

1. Set up Mini™ Chest Drain system as above and have it ready to attach to client.
2. Clamp chest tube, close to client's insertion site using 2 chest tube clamps in opposing directions. Do NOT use the blue clamp on the chest tube system.
3. Remove tape where the client's indwelling chest tube and Oasis tubing connect, being careful not to pull on the tube.
4. Once the tape has been removed, disconnect the 5 in 1 adaptor (with Oasis tubing attached) from the indwelling chest tube
5. Insert the new 5 in 1 adaptor provided with the Oasis Mini Express with tubing attached
6. Re-tape the connection between the chest tube and Chest tubing as in # 5 above
7. Apply suction or leave to gravity as ordered.

Monitoring the Device

1. Assess the chest tube for:
 - Air leaks (hissing sound) at the connection sites or insertion sites
 - Loops or kinks in the drainage tubing
2. Position the device at least one foot below the insertion site and ensure the device stays in an upright position.
3. The unit can be turned to the side for short periods to check for air leaks. This is done by turning the chamber to the side when there is fluid in it so that the collection volume numbers are on the



bottom. Section A will show bubbling if there is an air leak. Once air leak check has been done, turn the unit upright.

4. Check collection chamber (Section B) for volume, rate and drainage type:
 - Observe color, rate of accumulation, volume of drainage
 - Empty collection container as ordered. Don PPE prior to emptying. See client education section for details on how to do this.
5. Correct amount of suction that is ordered is applied
 - Suction is preset at -20 mmHg and is either on or to gravity.
 - If suction is on, a check mark will be displaced in section C.

Client Education

Teach client to:

- Keep the Mini™ below the level of insertion at all times
- Keep the Mini™ upright and from tipping
- Notify nursing/practitioner if changes to breathing or shortness of breath
- Empty collection chamber as ordered (daily or BID):
 - Clamp tube with blue clamp on system
 - Disconnect chamber from tube by pressing clear button
 - Turn chamber towards the words "Mini 500" but not completely upside down and empty into an appropriate receptacle.
 - If practitioner requires, measure and keep track of amounts emptied
 - Reattach and immediately open blue slide clamp.

References

Atrium Medical Corporation (2011) *Atrium Express™ Mini 500 Patient Instructions for Use*. Retrieved on December 30, 2015 from <http://www.vnamd.com/wp-content/uploads/2013/09/Mini-500-Patient-Instructions.pdf>

Atrium Medical Corporation (2003) *Atrium Express™ Dry Seal Chest Drain Mini 500 Wall Chart*. Retrieved on December 30, 2015 from <http://www.atriummed.com/PDF/ExpressMiniWallChart.pdf>

Appendix D

Tru-Close® Suction Drainage System**What is a Tru-Close® Drainage System?**

A Tru-Close® drain is a closed suction system that collects both fluid and/or air. This system connects to drainage tubes via a luer lock, however the luer lock can be cut off so it can be attached to other types of drainage tubes. Traditionally, these drainage collection devices have been used for draining abscesses, however, they are being seen more frequently for draining fluid from the pleural space.

The Tru-Close® drain has an anti-reflux valve that prevents both air and fluid from backing up into the catheter/drain/pleural space. The system has hydrophobic filter vents which allow for air that has been collected to vent out of it. Air can also be gently squeezed from the bag while it is upright through these vents.

The fluid will fill the bellows on the top side of the drain, as it fills compress the bellows completely. This will push the fluid from the bellows into the collection bag and reapply the suction. If suction is not required, leave the bellows full of fluid and the system will remain on "gravity" suction.



The system comes in 300ml, 500ml and 1000ml drainage bags which are placed in the biohazard bin once full.

Set Up of a Tru-Close® Drainage System

1. Open system and have ready and below the level of the insertion site.
2. Once the practitioner is ready to connect the client to the system, hand the sterile end to practitioner to connect.
3. If suction is ordered by the practitioner, compress the bellows. If it is not ordered, leave the bellows open and ensure the system remains below the level of the insertion site.
4. Nursing staff will mark output from drain on bag as per unit guidelines or as ordered.

Changing a Full Tru-Close® Drainage System

1. Open new Tru-Close® and have it ready and below the level of the insertion site.
2. Clamp chest tube, close to client's insertion site using 2 chest tube clamps in opposing directions.
3. Unscrew the luer lock on the full Tru-Close® and set aside. Attached new Tru-Close® to luer lock.
4. Unclamp chest tube clamps.
5. Apply suction if ordered.
6. Assess client

Monitoring the Device

1. Assess the chest tube for:
 - Air leaks (hissing sound) at the connection sites or insertion sites
 - Loops or kinks in the drainage tubing
2. Position the device below the insertion site.
3. Check collection chamber for volume, rate and drainage type:
 - Observe color, rate of accumulation, volume of drainage
 - When bag becomes full or too heavy for client, change by double clamping the chest tubing before disconnecting old bag and reconnecting new bag.
 - Discard full Tru-Close® bag in biohazard bin.
4. Correct amount of suction that is ordered is applied
 - If suction is ordered, compress bellows when filled with fluid.
 - If gravity suction is ordered, bellows should remain open.

Client Education

Teach client to:

- Keep the Tru-Close® below the level of insertion at all times
- Client can be taught to compress bellows if suction is ordered and client is competent
- To notify nursing staff if changes to breathing or shortness of breath

References

UreSil® (Oct 2012). *Tru-Close® Suction Drainage System*. Retrieved on December 30, 2015 from <http://www.uresil.com/library.aspx>

Appendix E

Heimlich Valve**What is a Heimlich Valve?**

A Heimlich valve is a type of chest tube used for pneumothorax. It is a one way valve that lets air escape while preventing air from entering the chest. It is most often placed at the bedside.

The chest tube itself is very small in diameter and is placed high in the chest. It is attached to the Heimlich valve via luer lock. It is essential that nursing assesses that the stopcock at the luer lock site is always flowing with the direction of the tubing (as in the picture) as the chest tube will be considered “clamped” when the stopcock is turned any other way.

**Set Up of a Heimlich Valve**

There is nothing for nursing to do to set up for the insertion of the Heimlich valve. The kit comes complete with the chest tube and the Heimlich valve in a sterile set which the doctor will connect once the chest tube is inserted.

Monitoring the Device

1. Assess the chest tube for:
 - Loops or kinks in the drainage tubing
 - Position of stopcock is running the direction of the tubing to ensure it is not clamping off the tube.
2. Position the device below the insertion site.
3. Check for any drainage coming from device

Note: Heimlich Valves are not recommended for clients with large amounts of drainage. If a Heimlich Valve begins draining 50 mls or more the practitioner may order the removal of the Heimlich Valve, and connection of the chest tube to a water seal chest drainage unit. The Heimlich valve itself should not be attached to a suction unit.

- If the Heimlich valve is draining small amounts of fluid, a vented drainage device may be attached to collect drainage. Examples include urometer bag, simple catheter bag, or leg bag. It is not recommended to attach a Heimlich valve to a water seal chest drainage unit such as the Oasis™ system. If there is significant drainage, remove the Heimlich valve from the chest tube and attach an Oasis™ or whatever is ordered
4. Monitor the valve for fluttering with breathing. This indicates that air is still exiting the pleural space.

Client Education

Teach client to:

- Keep the Heimlich Valve below the level of insertion at all times
- To notify nursing staff if changes to breathing or shortness of breath
- To notify nursing staff if there is drainage coming from the Heimlich Valve
- To ensure the stopcock is always running in the direction of the tubing to ensure it is open.

Appendix F

Jackson Pratt Drain**What is a Jackson Pratt Drain?**

A Jackson Pratt drain is an active drain that use negative pressure to remove fluid from an area inside the pleural space a drainage unit outside of the body. Jackson Pratt drains are surgically inserted.

Set Up of a Heimlich Valve

There is nothing for nursing to do to set up for the insertion of the Jackson Pratt drain as they are inserted in the operating room.

Monitoring the Device

1. Assess the chest tube for:
 - Air leaks (hissing sound) at the connection sites or insertion sites
 - Loops or kinks in the drainage tubing
2. Position the device below the insertion site.
3. Check collection chamber for volume, rate and drainage type:
 - Observe color, rate of accumulation, volume of drainage
 - Empty the device when chamber is full:
 - double clamp the tubing prior to opening the top
 - empty the bulb
 - squeeze the bulb side to side as it creates a higher pressure gradient than the bottom up method
 - wipe the spout with an alcohol swab and allow to dry
 - cap the top
 - Unclamp the bulb.
4. Check the bulb frequently to ensure it is emptied and suction remains intact.

**Client Education**

Teach client to:

- Keep the Jackson Pratt below the level of insertion at all times
- Ensure the cap on the bulb remains closed at all times.
- To notify nursing staff if changes to breathing or shortness of breath

Note: Although Jackson Pratt drains are removed by nursing staff when placed in other locations, Jackson Pratt drains placed in the pleural space are considered chest tubes and are NOT to be pulled by nursing staff.

References

Carruthers, K. H., Eisemann, B. S., Lamp, S., Kocak, E. (2013). Optimizing the closed suction surgical drainage system. *Plastic Surgical Nurses*. 33(1), 38-42.

Appendix G

PleurX® Drain**What is a PleurX® Drain?**

A PleurX® drain is a catheter that is placed in the pleural space for long term intermittent drainage of pleural effusions. The catheter has a polyester tissue ingrowth cuff that helps to secure the catheter and decrease infection by allowing the bodies tissue to grow into it. The catheter connects to a negatively pressurized bottle to drain fluid from the body. The PleurX® catheter system is used for clients to manage drainage at home.

Set Up of a PleurX®

1. Obtain/check order from practitioner for amount of fluid to drain from pleural space (do not drain more than 1 liter at one time).
 2. PleurX® kit includes:
 - 500 ml canister
 - Self-adhesive dressing
 - Alcohol swabs
 - Sterile gloves
 - Cap for catheter
 - Slide clamp
 - Gauze and catheter pads
 3. Do hand hygiene and don PPE.
 4. Remove dressing from PleurX® drain. Discard.
 5. Doff PPE and do hand hygiene.
 6. Open PleurX® Kit and place PleurX® canister on table
 7. Open procedure pack that contains sterile field and sterile gloves.
 8. Set up sterile field and don sterile gloves.
 9. Open the valve cap package and place the new valve cap on the sterile field.
 10. Open the 3 alcohol swab packages but leave the swabs in the packages on the sterile field.
 11. Close the clamp on the drainage line to the canister and remove the cover from the canister line and place it on sterile field
 12. Remove the catheter cap (twist and pull) from the client end of the catheter and discard the cap
 13. Clean around the catheter valve with alcohol swab. Once dry, insert the drainage line into the catheter valve, you will hear and feel a click when they are locked.
 14. Remove the support clip on the top of the canister then push the white "T" shaped plunger down
 15. Open the clamp on the drainage line. The fluid should now flow into the canister.
- Note:** *The client may experience some pain while fluid is being drained. If it becomes too painful, clamp off the drain for a few minutes to give the client a rest. Try draining again. If it is still too painful, stop procedure and call practitioner.*
16. Once complete, clamp the tubing then pull the tip from the valve and set the drainage line down
 17. Clean the valve with an alcohol swab and place new cap over it.
 18. Clean around the catheter with alcohol swab and once dry place foam pad around the catheter. Loop the catheter around and place on top of the foam pad. Place gauze pad over top of the catheter and cover with adhesive dressing.
 19. Discard the PleurX® drainage bottle into the hazardous waste container. Home care staff will open the top of the canister and pour the contents into the toilet. Flush the toilet and then dispose of the bottle in the client's garbage.
 20. Doff PPE and do hand hygiene.



21. Document:

- Date, time, color and amount of drainage removed
- Appearance of skin at drain site.
- Dressing applied
- Client tolerance of the procedure

Note: for video on how to access PleurX® catheter, drain fluid and change dressing, go to <http://www.carefusion.com/our-company/video-gallery?video=3583195592001>

Monitoring the Device

1. Assess the skin around the insertion site for redness, leakage of fluid
2. Assess client for signs of infection
3. Assess color of fluid drained
4. Assess client for signs of shortness of breath

Client Education

1. Teach client steps from “Set Up” if client is going home with device and will be doing drainage.
2. Have home care set up for client.
3. To notify nursing staff if changes to breathing or shortness of breath
4. To notify nursing if insertion site becomes sore or reddened.

References

CareFusion (2015). PleurX Drainage Procedure. Retrieved on June 16, 2015 from http://www.carefusion.com/pdf/Interventional_Specialties/PleurX_DFU_drainage.pdf

CareFusion (2015). Post Procedure – PleurX System, Drainage Video . Retrieved on June 16, 2015 from <http://www.carefusion.com/medical-products/interventional-procedures/drainage/pleurx/patients/pleurx-learn-how-drain.aspx>