

Intermittent Drainage of a Tunneled Pleural Catheter in Acute Care

Site Applicability

VCH and PHC – Acute Care Inpatient settings

Practice Level

Profession	Basic Skill	Advanced Skill
VCH – Registered Nurse (RN)		With the completion of the following additional education: <ul style="list-style-type: none"> Review of this Decision Support Tool Performing the procedure for the first time accompanied by a competent clinician
PHC - Registered Nurse (RN)	✓	

Requirements

Provider order is required to conduct pleural drainage. Orders must include the following information:

- Frequency of drainage for optimal symptom management
- Indication for drainage
- Maximum or total volume to be removed for each drainage via the tunneled catheter
- Any special parameters for when drainage is contraindicated
- Insertion site and exit site suture removal dates (insertion site suture remains in-situ for seven to ten days post-insertion while exit site suture may remain in-situ for up to four weeks)

Need to Know

A pleural catheter is a flexible chest tube inserted in the pleural space (fig 1.) to treat malignant or chronic pleural effusion by providing a means for draining pleural fluid as needed. Drainage may be done intermittently on a schedule specific to the patient's needs. Continuous drainage with or without suction may also be ordered.

Do not drain more than one liter (1 L) at any one time unless directly ordered by a provider. It is possible for re-expansion pulmonary edema to occur if too much fluid is removed too rapidly, therefore no more than 1 L should be drained every 24 hours unless ordered by a Respiriologist or the Most Responsible Provider (MRP). It is important to establish a care plan that identifies the patient's response to the drainage and interventions that aim to minimize pain and discomfort. Some patients benefit from taking a pain medication approximately 30 minutes prior to drainage; however, this should be a discussion involving the patient and the MRP as there might be instances when pre-medicating may mask the presence of chest pain, which should be a sign to pause or stop the drainage.

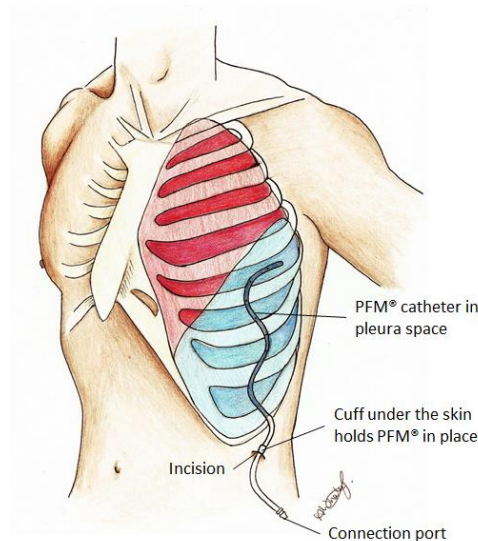


Figure 1. Diagram showing the placement of a tunneled pleural catheter in the pleural space

Equipment and Supply

See appropriate appendices in the procedure section for a list of supplies.

For information on ordering supply see [Appendix E](#)

Procedure

Pre procedure assessment

1. Assess client's vital signs (blood pressure, pulse, temperature, respiration rate and oxygen saturation).
2. Perform chest auscultation.
3. Assess client's symptoms and intensity/distress associated with pleural effusion and need for drainage. These may include pain, chest heaviness, tachycardia, cough, fatigue, and mobility impairment (e.g., reduced exercise tolerance, decreased capacity to do ADLs).
5. Perform point of care risk assessment, e.g., Patient to be in a comfortable position for the duration of the drain, clinician to have sufficient space to set-up sterile field.
6. In collaboration with the physician, determine client and family's preference to continue treatment for symptom relief as part of client's goals of care conversation.

Drainage Procedure Steps

- See [Appendix A](#) For drainage of a PleurX® pleural catheter using a PleurX® vacuum drainage bottle
- See [Appendix B](#) for drainage of a PleurX® pleural catheter using MedQuest drainage system
- See [Appendix C](#) For drainage of a PleurX® pleural catheter connecting to a disposable chest drainage system (Pleur-Evac)
- See [Appendix D](#) for trouble shooting guide for unexpected outcomes

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Discharge Planning:

Do not discharge a patient attached to a drainage system. In special circumstances, if a patient requires PleurX® attached to a drainage system, the discharge plan must be confirmed by the provider and the referral for community care must be in place prior discharge.

In preparation for the patient's discharge to help their transition to the community (home or Long-Term Care) arrange an Interdisciplinary Care Conference with the Home Health or Long-Term Care team.

Documentation

- Before procedure
 - Vital signs and respiratory assessment
- After procedure
 - Vital signs and respiratory assessment
 - How the patient tolerated the procedure
 - Site condition, dressing information
 - Drainage type and amount
- Update Plan of Care as required (next drainage due date, dressing change, etc.).
- Document in the individual's health record as per facility policy, [PHC/VCH Documentation Policy](#), and professional regulations. For Cerner sites, a pleural drain dynamic group may be added under the "Surgical Drains/Tubes section" (see screenshot below). For non-Cerner sites, document per site-specific practice.

Surgical Drains/Tubes	
#1 Other: PleurX Chest Ri...	
Activity	
Department Placing Surgic...	
Collection Device	
Tube Care	
Site Condition	
Site Care	
Site Dressing	
Dressing Activity	
Dressing Assessment	
Drainage Method	
Amount of Suction	mmHg
Unexpected Events	
Patient Response	
Output	mL
Output Description	
Irrigant In	mL
Irrigant Out	mL

Patient and Family Education

- Provide education in language that the patient and their family understand and do teach back to ensure that learning has taken place.

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- If needed, use (virtual or in-person) interpreter to ensure the patient understands the information that is being provided.
- Provide education for the patient regarding what the procedure entails (usual length of drainage, typical side effects that they might experience during the drainage, etc.)
- Provide education for the patient regarding when to notify the nurse during the drainage, such as when discomfort occurs
- Provide education for patient and family regarding risk for infection, tube dislodgment, personal care/showering with the catheter in-situ
- If client is being discharged home with a pleural catheter, provide contact information for community resources for any questions or concerns
- The patient must register with the [BC Palliative Care Benefits program](#) to cover the cost of the supplies needed for a pleural drainage upon discharge. Specifically, the supplies indicated in Appendix A and B for pleural drainage with either the PleurX[®] or MedQuest systems. Further discussion with the patient regarding funding is recommended prior to insertion, as it might require an exploration of alternative options to clinically manage the symptoms. If the patient is not eligible for this program, ask if they have other options to fund their supplies (e.g., private health care insurance or ability to pay for own supplies).

Related Documents

- For community-specific requirements, refer to the [Pleural Effusion – Intermittent Drainage Using a Tunneled Pleural Catheter \(Community and Long-term Care\)](#) Guideline

Appendices

[Appendix A](#): Drainage of a PleurX[®] pleural catheter using a PleurX[®] vacuum drainage bottle

[Appendix B](#): Drainage of a PleurX[®] pleural catheter using MedQuest Drainage System

[Appendix C](#): Drainage of a PleurX[®] pleural catheter connecting to a disposable chest drainage system (Pleur-Evac)

[Appendix D](#): Troubleshooting guide

[Appendix E](#): Supply ordering information

Appendix A: Drainage of a PleurX® pleural catheter using a PleurX® vacuum drainage bottle

Equipment and Supplies

- 2 chlorhexidine swab sticks (to cleanse skin at insertion site)
- 1 PleurX® procedure pack
 - Vacuum bottle with drainage line (Figure 1)
 - Wrapped in blue sterile pad
 - Sterile gloves
 - 1 foam catheter pad
 - 4x4 gauze
 - New cap
 - Transparent dressing, large
- 1 absorbent pad (to protect bedding/clothing)
- 1 pair non-sterile gloves
- 1 sterile drape OR 1 sterile dressing kit
- 2 chlorhexidine wipes
- Alcohol pads (to cleanse catheter)
- Plastic bag for garbage
- Yellow biohazard bag for drainage bottle disposal



Figure 2. Supplies included in the PleurX® procedure pack

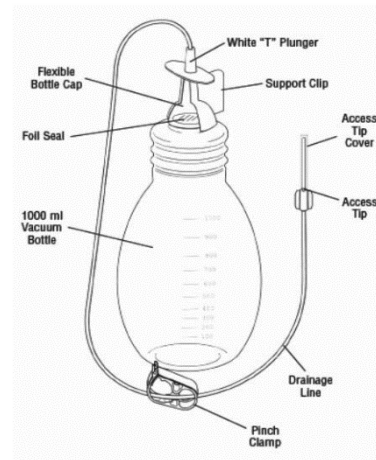




Figure 3. PleurX drainage bottle

Procedure

Steps	Pictures for Reference
<p>Setting up:</p> <ol style="list-style-type: none"> 1. Check provider's order for: <ul style="list-style-type: none"> • frequency of drainage, • parameters of drainage, and • maximum volume to be drained. 2. Gather equipment and bring to patient's bedside. 3. Perform hand hygiene, don appropriate PPE, and establish a clean working area. 4. Position the patient in a comfortable Semi-Fowlers or side-lying position. Ensure that there is clear access to the site and sufficient space for the sterile drape. 5. Perform pre-procedure assessment and obtain vital signs. 6. Place an absorbent pad below the patient's pleural drain dressing and to protect the bedding. 	 <p><i>Figure 4. PleurX site with old dressing</i></p>
<p>Removing the old dressing:</p> <ol style="list-style-type: none"> 1. Place sterile drape under PleurX® catheter. 2. Remove old transparent dressing from site and discard in plastic bag. 3. Uncoil PleurX® catheter with sterile forceps. 4. Observe the insertion site for any redness, swelling, or fluid around the catheter. If present, continue with the procedure but document and report to the provider when finished. 5. Assess the insertion site to observe whether the cuff is visualized or not. If the cuff is exposed, notify MRP for further direction. 	 <p><i>Figure 5. PleurX site after old dressing is removed exposing the foam catheter pad</i></p>

Establishing the sterile field:

1. Remove sterile equipment and supplies from their packages and place them on sterile field.
2. Open PleurX® procedure pack:
 - a. Peel open vacuum bottle package and add the drainage bottle to the sterile field.
 - b. Open the blue package and add foam catheter pad, 4x4 gauze, new white cap, and large transparent dressing on the sterile field.
 - c. Remove non-sterile gloves, discard, and wash hands.
 - d. Don sterile gloves.



Figure 6. Establishing the sterile field with the PleurX catheter on sterile drape

Preparing the PleurX® vacuum bottle:

1. Remove the paper from the tubing and discard.
2. Check that the support plastic clip is in place and the foil seal is not broken.
 - If the support plastic clip is not in place and the foil seal is punctured, you will need a new vacuum bottle.
3. Ensure the clamp on the tubing is closed.

Attaching the drainage line set to patient:

1. Using a gentle counterclockwise twisting motion, remove the white cap from the PleurX[®] catheter valve and discard.
2. Wipe the external surface of the valve with an alcohol swab and allow drying for 30 seconds. Be careful not to touch the internal surface.



Figure 7. Close-up of PleurX catheter tip with the valve with the white cap



Figure 8. Use of an alcohol swab to clean the valve

3. Remove plastic protector sheath from the tip of the drainage line.
4. Insert tip of the drainage line into the catheter valve. There will be a click when it locks into place. Do not push too forcefully.
5. Ensure that the valve and the tip are fully engaged. If they are not, it is possible for them to separate. If this occurs, a new drainage set should be used to avoid potential contamination of the PleurX[®] catheter.

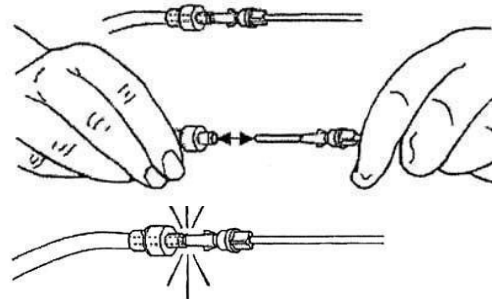


Figure 9. Connection between the PleurX valve and the tip of the drainage line. With the two components disconnected (top), the expected click upon connection (middle), and all parts connected (bottom)

Activating the suction on the vacuum bottle:

1. Remove the plastic clip by pulling on the wing.
2. Push the white T plunger through the foil seal.

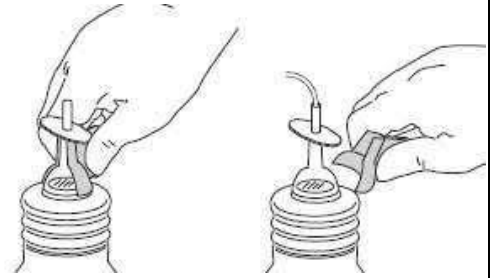


Figure 10. Removal of the plastic clip by pulling the wing



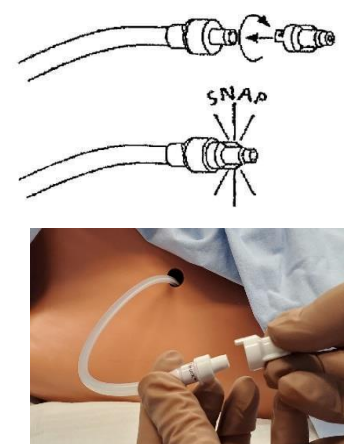
Figure 11. Pushing white T plunger through foil seal to activate suction

Draining the fluid:

1. Slowly open the PleurX® tubing clamp.
2. Set the clamp to have a steady flow of fluid that the patient is able to tolerate.
3. Sometimes when draining the pleural fluid, the patient may experience pain, or cough. This is usually due to the lung re-expanding or the shifting of the intrathoracic structures.
 - Pause the procedure if there are any symptoms of pain, increased dyspnea, or if the patient is unable to tolerate it.
 - Once symptoms have improved, slowly restart the drainage.
 - If pain or discomfort occurs after pausing the drain, try repositioning the patient.
 - If the pain continues, stop draining until the pain subsides, then slowly open the clamp



Figure 12. PleurX tubing clamp which controls rate of drainage

<p>and continue until no more drainage is seen, or the patient experiences more pain or coughing and are unable to tolerate the procedure.</p> <ol style="list-style-type: none"> Only remove the ordered amount of fluid. If drainage slows or stops suddenly, ask the patient to take a deep breath, cough, or change position to see if further drainage can be stimulated. Stop the drainage when: <ul style="list-style-type: none"> there is no further drainage, the patient is unable to tolerate the drain due to pain and/or dyspnea, or maximum drainage as ordered has been reached. When the drainage is complete, fully close the drainage tubing roller clamp. Pull drainage line out of PleurX[®] catheter. 	
<p>Capping the system:</p> <ol style="list-style-type: none"> Wipe the external surface of the valve with an alcohol pad and let dry for 30 seconds. Do not clean inside the valve. Place the new PleurX[®] cap over the catheter valve, gently twisting clockwise until it snaps into its locked position. <p>NOTE: Do not use force as the interlocking piece on the PleurX[®] catheter can be easily broken and cannot be repaired. If broken, replace the whole PleurX[®] catheter.</p>	 <p><i>Figure 13. Capping the system with a new white cap after drainage</i></p>

Applying new dressing:

1. Cleanse around catheter site with a Chlorhexidine swab stick and let dry for one (1) minute.
2. Cleanse the catheter from the insertion site towards the catheter cap with an alcohol swab.
3. Place foam catheter pad in place around the drain insertion site.
4. Coil PleurX[®] catheter on the foam catheter pad.
5. Cover with 4x4 gauze pads and large transparent dressing.

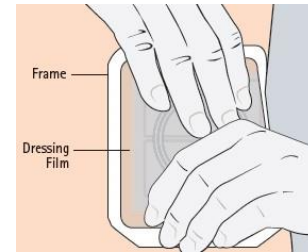


Figure 14. Application of new dressing -foam catheter pad (top) and application of clear occlusive dressing (bottom)

Post-procedure:

1. Dispose of vacuum bottle(s) in biohazard bags in the soiled utility room.
2. Post-procedure: perform patient assessment and obtain vital signs.

Appendix B: Drainage of a PleurX® pleural catheter using MedQuest Drainage System

Equipment and Supplies

- 2 chlorhexidine swab stick (to cleanse skin at insertion site)
- 1000 mL Pre-Vac Wound Drainage Bottle with connecting tube (ePro# 00108835, Figure 14)
- Dressing supplies
 - Sterile dressing kit
 - Drain gauze (in some settings, Mepilex foam could be used in lieu of drain gauze)
 - Large transparent dressing such as Tegaderm to dress PleurX® insertion site
 - 4x4 gauze
- MedQuest Safety Drain Line Adapter SA5200 (ePro# 00108836, Figure 16)
- MedQuest sterile cap S55300 (ePro# 00113798) or equivalent (Figure 15)
- 1 absorbent pad (to protect bedding and clothing)
- 1 pair non-sterile gloves
- 1 pair of sterile gloves
- Alcohol swabs (to cleanse catheter)
- Plastic bag for garbage
- Yellow biohazard bag for drainage bottle for disposal

NOTE: A Procedure Pack contains the following (adjust supply list as needed):



- 2 pairs chemo rated gloves
- split foam pad
- 12-4x4 gauze pads
- 3 alcohol wipes




Figure 15. Supplies needed for drainage with a MedQuest drainage system



Figure 16. MedQuest drainage bottle

<ul style="list-style-type: none"> • 1 barrier film • 1 blue valve cap (which will not be used) • safety clamp • large transparent dressing 	 <p><i>Figure 17. MedQuest sterile cap (left) and PleurX© cap (right)</i></p>  <p><i>Figure 18. MedQuest Safety Drain Line Adapter</i></p>
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Procedure

Steps	Pictures for Reference
<p>Setting up:</p> <ol style="list-style-type: none"> 1. Check provider's order for: <ul style="list-style-type: none"> • frequency of drainage, • parameters of drainage, and • maximum volume to be drained. 2. Gather equipment and bring to patient's bedside. 3. Perform hand hygiene, don appropriate PPE, and establish a clean working area. 4. Position the patient in a comfortable Semi-Fowlers or side-lying position. Ensure that there is clear access to the site and sufficient space for the sterile drape. 5. Perform pre-procedure assessment and obtain vital signs. 6. Place an absorbent pad below the patient's pleural drain dressing and to protect the bedding. 	 <p><i>Figure 19. PleurX site with old dressing</i></p>

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Removing the old dressing:

1. Place sterile drape under PleurX® catheter.
2. Remove old transparent dressing from site and discard in plastic bag.
3. Uncoil PleurX® catheter with sterile forceps.
4. Observe the insertion site for any redness, swelling, or fluid around the catheter. If present, continue with the procedure but document and report to the provider when finished.
5. Assess the insertion site to observe whether the cuff is visualized or not. If the cuff is exposed, notify MRP for future direction.



Figure 20. PleurX site after old dressing is removed, exposing the dressing (foam catheter pad or drain gauze) underneath.

Establishing the sterile field:

1. Remove sterile equipment and supplies from their packages and place them on sterile field.
2. Remove non-sterile gloves, discard, and wash hands.
3. Don sterile gloves.



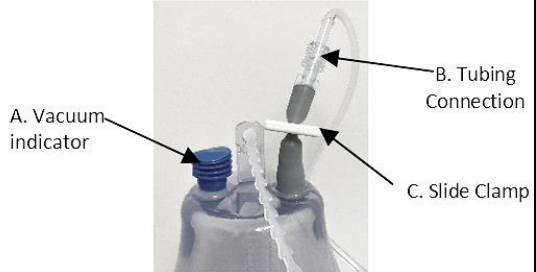


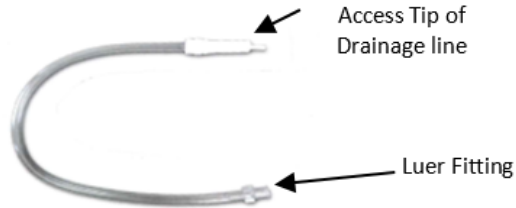
Figure 21. Establishing the sterile field with the PleurX catheter on the sterile drape

Preparing the MedQuest vacuum bottle:

1. Take out the MedQuest vacuum bottle from the packaging.
 - Ensure that both the side clamp and roller clamp are closed.
 - Ensure the vacuum indicator is at a “MAX” line. If not, do not use this product. Refer to Figures 22 and 23, for reference.



Figure 22. MedQuest vacuum bottle showing differences between vacuum indicators. Left shows a patent compressed vacuum indicator while the right shows an ineffective decompressed vacuum indicator

	 <p>Figure 23. Vacuum indicator is compressed (above, blue) versus vacuum is depleted when the indicator is decompressed (below, green)</p> 
<p>Attaching the drainage line and adapter set to the patient:</p> <ol style="list-style-type: none"> 1. Connect the bottle tubing to the Luer fitting end of the MedQuest Safety Drain Line Adapter SA5200. 2. Using a gentle counterclockwise twisting motion, remove the cap from the PleurX[®] catheter valve and discard. <i>Note: the images show a white PleurX[®] cap while the MedQuest cap is more transparent.</i> 3. Wipe the external surface of the valve with an alcohol swab and allow drying for 30 seconds. Be careful not to touch the internal surface. 4. Remove the plastic protector sheath from the Access Tip of the MedQuest Safety Drain Line Adapter. 5. Insert the Access Tip of the MedQuest Safety Drain Line Adapter into the PleurX[®] catheter valve. Ensure that the valve and the access tip are fully engaged. If they are not, it is possible for them to be accidentally separated. If this should occur, a new drainage set should be 	 <p>Figure 24. Safety Drain Line Adapter connection with MedQuest drainage bottle.</p>  <p>Figure 25. MedQuest Safety Drain Line Adapter</p>

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used to avoid potential contamination of the PleurX® catheter.



Figure 26. Close up of the PleurX valve end being cleaned by alcohol swab

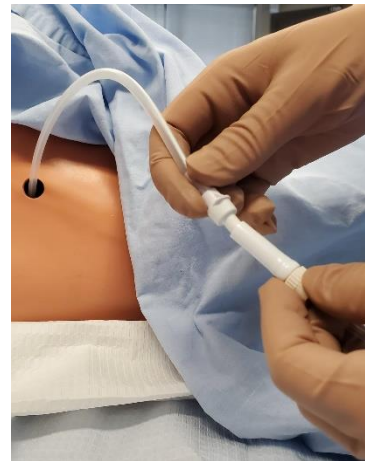


Figure 27. Connection of PleurX valve end with Access tip of the drainage line

Draining the fluid:

1. To activate vacuum drainage, release the slide clamp.
2. Start the drain.
 - Slowly open the roller clamp of the vacuum bottle tubing.
 - Set the clamp to have a steady flow of fluid that the patient can tolerate.

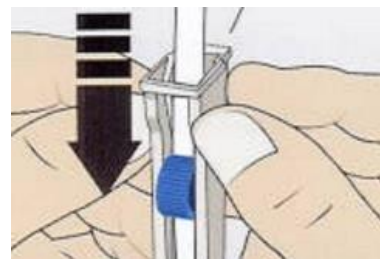
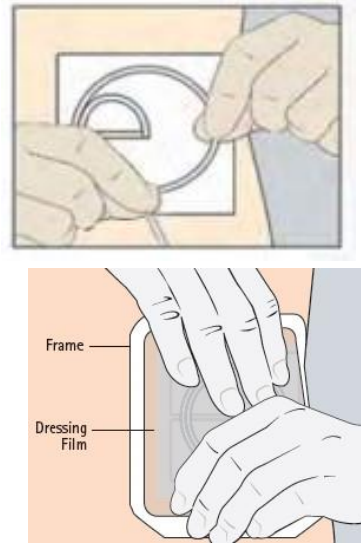


Figure 28. Control of drainage rate with roller clamp on MedQuest vacuum bottle

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<ol style="list-style-type: none"> 4. Sometimes when draining the pleural fluid, the patient may experience pain, or cough. This is usually due to the lung re-expanding or the shifting of the intrathoracic structures. <ul style="list-style-type: none"> • Pause the procedure if there are any symptoms of pain, increased dyspnea, or if the patient is unable to tolerate it. <ul style="list-style-type: none"> ○ Once symptoms have improved, slowly restart the drainage. • If pain or discomfort occurs after pausing the drain, try repositioning the patient. • If the pain continues, stop draining until the pain subsides, then slowly open the clamp and continue until no more drainage is seen, or the patient experiences more pain or coughing and are unable to tolerate the procedure. 4. Only remove the ordered amount of fluid. 5. If drainage slows or stops suddenly, ask the patient to take a deep breath, cough, or change position to see if further drainage can be stimulated. 6. Stop the drainage when: <ul style="list-style-type: none"> • there is no further drainage, • the patient is unable to tolerate the drain due to pain and/or dyspnea, or • maximum drainage as ordered has been reached. 7. When the drainage is complete, fully close the drainage tubing roller clamp. Pull drainage line out of PleurX[®] catheter. 	
<p>Capping the system:</p> <ol style="list-style-type: none"> 1. Wipe the external surface of the valve with an alcohol pad and let dry for 30 seconds. Do not clean inside the valve. 2. Cleanse the catheter from the insertion site towards the catheter cap with an alcohol swab. 	

<ol style="list-style-type: none"> Place the new cap over the catheter valve, gently twisting clockwise until it snaps into its locked position. 	
<p>Applying new dressing:</p> <ol style="list-style-type: none"> Cleanse around catheter site with a Chlorhexidine swab stick and let dry for one (1) minute. Place 4x4 drain gauze around the drain insertion site. Coil PleurX[®] catheter over the drain gauze. Cover with 4x4 gauze pads and large transparent dressing. 	 <p><i>Figure 29. Application of new dressing - drain gauze (top) and application of clear occlusive dressing (bottom)</i></p>
<p>Post-procedure:</p> <ol style="list-style-type: none"> Dispose of vacuum bottle(s) in biohazard bags in the soiled utility room. Post-procedure: perform patient assessment and obtain vital signs. 	

Appendix C: Drainage of a PleurX® pleural catheter connecting to a disposable chest drainage system (Pleur-Evac)

Indications for attaching PleurX® to chest drainage system:

Continuous drainage is indicated for patients who require more frequent intermittent drainage due to a larger drainage volume or clinical management. Continuous drainage may be ordered with suction or via gravity. For continuous drainage systems, ensure that all connections are securely taped with two-directional taping.



Refer to the following Clinical Practice Guidelines for more guidance on chest tube systems:

- [BD-00-07-40010](#): Chest Tube: Chest Tubes and Chest Drainage Systems: Maintenance of the Pleur-Evac® Sahara
- [BD-00-07-40011](#) Chest Tubes and Chest Drainage Systems: Patient Assessment and Interventions
- [BD-00-07-40015](#) Chest Tubes: Management of Potential Complications

Equipment and Supplies

- Two Chlorhexidine swab sticks (to cleanse skin at insertion site)
- Disposable chest drainage system (Pleur-Evac)
- White cloth zinc tape to secure connections
- Elastic band and plastic blue clamp
- Absorbent pad
- One pair of sterile gloves
- One pair non-sterile gloves
- One patient procedure kit/dressing kit (contains 2 pairs chemo rated gloves, split foam pad, 12-4x4 gauze, 3 alcohol wipes, 1 barrier film, safety clamp and large transparent dressing)
- Drain line adapter (Stores order # 00108836)
- Drainage tube to connect the drain line adapter to the CDU (Pleur-Evac) (Stores order # 00009200)
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Procedure

Steps	Pictures for Reference
<p>Setting up:</p> <ol style="list-style-type: none"> 1. Check provider's order for: <ul style="list-style-type: none"> • frequency of drainage, • parameters of drainage, and • maximum volume to be drained. 2. Gather equipment and bring to patient's bedside. 3. Perform hand hygiene, don appropriate PPE, and establish a clean working area. 4. Position the patient in a comfortable Semi-Fowlers or side-lying position. Ensure that there is clear access to the site and sufficient space for the sterile drape. 5. Perform pre-procedure assessment and obtain vital signs. 6. Place an absorbent pad below the patient's pleural drain dressing and to protect the bedding. 	 <p><i>Figure 30. PleurX site with old dressing</i></p>
<p>Removing the old dressing:</p> <ol style="list-style-type: none"> 1. Place sterile drape under PleurX® catheter. 2. Remove old transparent dressing from site and discard in plastic bag. 3. Uncoil PleurX® catheter with sterile forceps. 4. Observe the insertion site for any redness, swelling, or fluid around the catheter. If present, continue with the procedure but document and report to the physician when finished. 5. Assess the insertion site to observe whether the cuff is visualized or not. If the cuff is exposed, notify MRP for future direction. 	 <p><i>Figure 31. PleurX site after old dressing is removed exposing the dressing (foam catheter pad or drain gauze) underneath</i></p>

Establishing the sterile field:

1. Remove sterile equipment and supplies from their packages and place them on sterile field.
2. Remove non-sterile gloves, discard, and wash hands.
3. Don sterile gloves.

Preparing the equipment:

1. Prepare disposable chest drainage system.
2. Attach the drainage tube to the drain line adaptor.
3. Connect the blue end of the drainage tubing directly to the PleurEvac® drainage tubing.

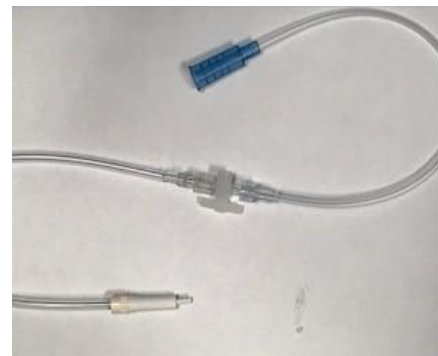


Figure 32. Drainage tubing (blue end) connected to PleurEvac drainage tubing

Preparing the PleurX® catheter:

1. Hold the PleurX® catheter firmly in your non-dominant hand.
2. Using a gentle counterclockwise twisting motion, remove cap from catheter valve and discard.
3. Wipe end of valve with an alcohol swab. Let dry for 30 seconds.



Figure 33. Remove cap from catheter valve

Attaching the drain line adapter to the PleurX® catheter:

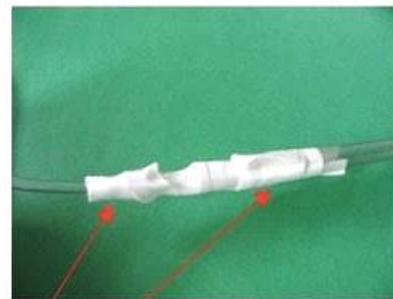
1. Hold the white PleurX® Valve Collar and the white Drain Line Adapter Hub firmly in each hand.
2. Align the white safety tip of the drain line adapter straight on with the opening of the PleurX® Valve Collar.
3. Introduce the tip of the drain line adapter the PleurX® Valve Collar.
4. Advance the Tip firmly forward until the silicone guard is flush against the white PleurX® Collar. You will feel and hear a click. Do not advance the safety tip any further.

Securing all connections:

1. Secure all connections with tape (white cloth zinc tape Stores #00023539).
2. Tape in two directions, as shown in photos to ensure the tubing will not come apart.
3. Open clamp on disposable chest drainage system.
4. Apply suction as ordered.



Tape is applied longitudinally



2nd and 3rd pieces of tape applied in spiral configuration

Figure 34. How to securely apply tape to all connections

<p>Redressing the pleural catheter site:</p> <ol style="list-style-type: none"> 1. Cleanse around catheter site with a chlorhexidine swab stick and let dry for one (1) minute. Repeat with second swab. 2. Place foam split dressing around catheter. 3. Coil the pleural catheter on top of the foam dressing. 4. Cover with a 4x4 inch gauze and large transparent dressing. <p>Securing the connections:</p> <ol style="list-style-type: none"> 1. Coil and secure excess drainage tubing to patient's gown with elastic band and blue clamp. 	
<p>Post-procedure:</p> <ol style="list-style-type: none"> 1. Assess and document drainage type and amount, and patient's tolerance to the procedure. Check vital signs, respiratory status, and general condition. 	

Appendix D: Troubleshooting guide

Contacts for Troubleshooting:

- Weekdays – unit Nurse Educator or designate (a clinician who is familiar with pleural drainage systems)
- Weekends/After-hours – Palliative Care team or other clinician/clinical team that is familiar with pleural drainage systems

Problem	Potential Reason or Rationale	Intervention
Pain, cough, or dyspnea during drainage	<ul style="list-style-type: none"> • Lung attempting to re-expand or shifting of the intrathoracic structures. Note that pain may continue for several hours post - drainage. • Draining fluid too fast for client to tolerate. 	<ul style="list-style-type: none"> • Stop the drainage and reassess. If symptoms resolve re-initiate drainage at a reduced rate. If symptoms recur, stop drain and discuss with MRP to amend orders (e.g., increase drainage frequency and reduce volume of drainage and update care plan). • Recommend prn pain medication 30 minutes prior to draining.
Catheter draining mostly air	<ul style="list-style-type: none"> • Some clients drain air, as the volume of fluid in the pleural space reduces. • Air may be observed when the drainage flow diminishes. • Damage to drainage system. • Pneumothorax or Broncho-pleural fistula. 	<ul style="list-style-type: none"> • Determine whether drainage of fluid is complete and assess client for response to drainage. • Assess catheter, drainage tubing and connections for damage. • If no damage observed, there is a small risk that client may have an underlying pneumothorax or broncho-pleural fistula. Assess for acute changes in client's VS and condition and discuss with MRP.
Catheter draining frank blood	<ul style="list-style-type: none"> • Sanguineous drainage may be present when a client has a malignant effusion. • Patient may have an active bleeding point. 	<ul style="list-style-type: none"> • Stop drainage. • Assess client's condition and perform VS. • Review previous case notes to determine if new and inform MRP as indicated.
Catheter is not draining, and client has symptoms consistent with a possible pleural effusion	<ul style="list-style-type: none"> • Malfunction of drainage system. • Dislodgement of catheter. • Catheter blockage. 	<ul style="list-style-type: none"> • Determine whether drainage tubing, roller clamp and connections are functioning correctly. • Visually inspect catheter to ensure that the catheter has not become blocked with debris or dislodged (i.e., cuff is showing).

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Problem	Potential Reason or Rationale	Intervention
		<ul style="list-style-type: none"> Ask client to change positions (turning side to side, sitting up), take deep breaths and/or cough. Assess client and contact MRP for next steps. If client is in respiratory distress, urgent assessment and treatment may be required if in line with client's goals of care. Note: In some instances, blocked catheters may need replacement or may be suitable for intervention with fibrinolytic agents.
Purulent catheter drainage	<ul style="list-style-type: none"> Potential pleural infection (i.e., empyema) 	<ul style="list-style-type: none"> Perform VS and respiratory assessment. Discuss findings with Nurse Educator or designate and/or MRP to determine next steps.
Drainage volume not consistent with MRP orders. Catheter is not blocked or damaged and client's symptoms have improved.	<ul style="list-style-type: none"> Pleural effusion may have resolved 	<ul style="list-style-type: none"> Discuss with MRP/designate to determine whether catheter can be removed.
Skin reaction: loss of skin integrity, irritation, fragility or infection	<ul style="list-style-type: none"> Chlorhexidine skin reactions usually occur when chlorhexidine contains alcohol and has not had adequate drying time before application of dressing Skin reactions related to drainage kits foam dressing for PleurX[®] system 	<ul style="list-style-type: none"> Consider chlorhexidine without alcohol or Povidone Iodine 10% as an alternative for skin cleansing. Do not wash off with saline as this will affect antimicrobial properties. For additional troubleshooting or recommendations, contact Nurse Educator/designate or Nurse Specializing in Wound, Ostomy and Continence (NSWOC). Consider switching to drain gauze instead of using the foam dressing included in the PleurX[®] dressing kit/procedure pack.
Catheter cuff is exposed	<ul style="list-style-type: none"> Dislodgement of catheter Erosion of the cuff through the insertion site 	<ul style="list-style-type: none"> Catheter cuff should not be visualized as it should remain within the subcutaneous tissue If the catheter cuff is exposed, there is an increased risk for infection and dislodgment Notify the MRP for further direction

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Appendix E: Supply Ordering Information

PleurX Product #	Product Description	ePro #
50-7500B	PleurX [®] drainage kit (procedure pack) with 500 mL vacuum bottle	00067972
50-7510	PleurX [®] Drainage Bottle 1000ml with drain line	Special order ref. 507510
50-7500B	PleurX [®] Drainage Bottle 600ml with drain line	00022020
50-7235 A	PleurX [®] Valve Caps	00067974
MedQuest Product #	Product Description	ePro #
S55148	MedQuest Pre-Vac Drainage Bottle 1000ml with tubing	00108835
S55120	MedQuest Pre-Vac Drainage Bottle 600ml with tubing	00022020
SA55200	MedQuest Safety Drain Line Adaptor	00108836
S553300	MedQuest Sterile Cap	0011379
2976C	MedQuest Procedure Kit	00112585

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First Released Date:	1-APR-2004	
Posted Date:	6-MAR-2024	
Last Revised:	6-MAR-2024	
Last Reviewed:	6-MAR-2024	
Review Due by:	6-MAR-2027	
Approved By: <i>(committee or position)</i>	PHC	VCH
	PHC Professional Practice Standards Committee	VCH: (Regional DST Endorsement - 2 nd Reading) Health Authority & Area Specific Interprofessional Advisory Council Chairs (HA/AIAC) Operations Directors Professional Practice Directors Final Sign Off: Vice President, Professional Practice & Chief Clinical Information Officer, VCH
Owners: <i>(optional)</i>	PHC	VCH
		Clinical Nurse Educator, 2South Acute Medicine Telemetry, Richmond Hospital Clinical Nurse Educator, Richmond Integrated Hospice-Palliative Care Program

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