Chest Tubes: Thoracic Percutaneous Pigtail Drainage Catheters or Small Bore Chest Tubes - Assisting with Insertion

Chest Drainage System: Pleur-Evac® Sahara

Site Applicability

All VCH & PHC Acute Care sites

Practice Level

Registered Nurses

1. **Specialized:** Intraprocedure care is restricted to Registered Nurses (RN) with:
   - ECG monitoring knowledge and skill to identify and respond to arrhythmias
   - Knowledge of the pharmacology of the drugs they are administering and any relevant antagonists
   - Adequate opportunity for practice caring for patients after interventional procedures (4 to 5 days/month)
2. Patients receiving Procedural Sedation must be cared for by a RN with Critical Care or High Acuity qualifications, or Procedural Sedation Certification (VCH only) as per

   PHC: NCS6259: Protocol for Procedural Sedation in Clinics and Procedure Rooms or
   NCS6388: Protocol for Procedural Sedation and Analgesia (PSA) Emergency Departments

   VCH: D-00-12-30079: Procedural Sedation and Analgesia PSA - General or
   D-00-12-30078: Procedural Sedation and Analgesia PSA - Emergency Department
3. Registered Nurses are responsible for monitoring and managing patients with pleural percutaneous pigtail catheters (or small bore chest tubes) and chest drainage systems (CDS), with the Physician or Nurse Practitioner (NP).

Policy Statement

1. Emergency equipment stays with the patient at all times and must accompany the patient on transport. See Emergency Equipment
2. Using their knowledge, skills and judgment, the RN assesses risk to patient stability during transport off the unit. The nurse collaborates with the Physician, NP and interdisciplinary team to identify staff with the appropriate skill set to accompany the patient on transport.
   - **VCH**: **VA & Richmond:** D-00-07-30106 Transport for Tests/Treatment: Patient Accompaniment
3. Use aseptic technique when accessing chest tubes, chest drainage systems or insertion sites.
4. Patients with pleural chest tubes leaving the unit for diagnostic tests or treatments are accompanied by an RN (or have tests done portably) when:
   - Assessment of an air leak is between the range of 4 to 7 on the Pleur-Evac®
   - Chest Tube was inserted in the last 24 hours
   - Drainage exceeds these volumes:
     - Sanguinous drainage over 100 mL/hr
     - Serous fluid over 1000 mL/hr
   - Suction is required during transport (if ordered)

   Or with clinical conditions that require frequent nursing assessments or interventions of the:
   - Airway and respiratory system
   - Hemodynamic and cardiopulmonary system
   - Neurological system
     - Close or constant care

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- Elopement risk; risk to self or others

5. **PHC & Richmond Hospital**: Instillation of medication or other substances into a chest tube is a Physician or Nurse Practitioner responsibility.

   VCH: **VA:** See PCG C-520: Pleurodesis

6. **PHC & Richmond Hospital:** Irrigation of chest tubes is a Physician or Nurse Practitioner responsibility, except when the skill is within the competency list of the unit/program, and after education from a Nurse Educator or delegate.

   VCH: **VGH:** See D-00-12-30008: Thoracic Percutaneous Pigtail Drainage Catheter (PPDC): Irrigation & Removal

Need to Know

1. Pleural percutaneous pigtail drainage catheters or small bore chest tubes are inserted by a Radiologist, Thoracic/Respiratory Resident or other Physician with expertise inserting chest tubes. Where available, a Diagnostic or Interventional Procedure area is the preferred location for insertion, using ultrasound, CT or x-ray imaging. See Preprinted Prescriber orders, where available.
2. The Physician inserting the chest tube obtains informed consent for the procedure.
3. Review coagulation results and medications altering clotting factors. Report lab abnormalities or medications to the Physician or NP. Inform them if the patient is on anticoagulants.
4. Ensure the patient has **patent** IV access
5. The RN monitors the patient throughout the insertion procedure. See assisting with procedure
6. If the Physician uses procedural sedation for chest tube insertion refer to:

   PHC: NCS6259: Protocol for Procedural Sedation in Clinics and Procedure Rooms or
   NCS6388: Protocol for Procedural Sedation and Analgesia (PSA) Emergency Departments

   VCH: D-00-12-30079: Procedural Sedation and Analgesia PSA - General or
   D-00-12-30078: Procedural Sedation and Analgesia PSA - Emergency Department
7. A percutaneous pigtail drainage catheter (or small bore chest tube) is inserted in a clean environment, using aseptic technique
8. An order is required from a Physician or Nurse Practitioner (NP) to apply or discontinue suction to a chest tube. See Preprinted Prescriber Orders where available.
9. Chest tubes must be attached to an approved chest drainage system (CDS). Consult with the Physician or NP before changing another system to a Pleur-Evac® or other approved chest drainage system. See Maintenance of the Pleur-Evac® Chest Drainage System.
10. Clamping chest tubes requires a Physician or NP order. Before clamping, assess the patient and chest drainage system for an air leak. If there is bubbling in the air leak meter with deep breathing or coughing, do **not** clamp the chest tube. Notify the Physician or NP for an order (unless changing the chest drainage system, assessing for an air leak, or other situations listed in Maintenance of the Pleur-Evac® Chest Drainage System: Clamping a percutaneous pigtail drainage catheter damages the tubing lumen, occludes the catheter and complicates removal. Use the stopcock to occlude drainage on percutaneous pigtail drainage catheters. If there is no stopcock, double clamp **only** the soft end of the connecting tubing. See Maintenance of the Pleur-Evac® Chest Drainage System: Clamping.
11. Do not clamp a chest tube (or close the stopcock on a percutaneous pigtail drainage catheter or small bore chest tube) during transport or while mobilizing, unless specifically ordered by the Physician or NP.
12. To prevent obstruction of a percutaneous pigtail drainage catheter or small bore chest tube, potential pneumothorax and other adverse outcomes, the stopcock **must** remain open, unless ordered closed by the Physician or NP.

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Quick Links

Equipment & Supplies

PHC:

St. Paul's Hospital (SPH) and **Mount St. Joseph Hospital (MSJ):**

- Thoracentesis or centesis tray from Medical Device Reprocessing Department (MDRD)
- Additional equipment collected from Diagnostic/Interventional Procedure area
- **MSJ only:** Same equipment as above or Emergency Chest Tube Insertion and Local Anesthetic trays

VCH:

Vancouver Acute (VA):

- Pleur-Evac® chest drainage system (sent with the patient to the procedure area)

Coastal:

- Procedure tray
- Percutaneous pigtail drainage catheters or small bore chest tube size 8 to 26 (according to Physician preference)

ALL: Additional Equipment & Supplies

- Suction equipment (set up and functional)
- Emergency equipment. See List and Policy
- Personal protective equipment: Goggles/face shield, cap, mask, gown, gloves
- Skin Prep – Tinted 2% Chlorhexidine and 70% Alcohol solution, swab stick, or Solu-prep wipe
- Local anesthetic – Lidocaine 1% or 2%
- Atropine IV (intravenous), reversal agents for medications (e.g. Narcan), oxygen, cardiac arrest equipment (located in the department)
- Transport box
- Pleur-Evac® or other approved chest drainage system
- Percutaneous pigtail drainage catheters or small bore chest tube size 10 to 20 (according to Physician preference)
- Extension tubing
- Stopcock
- White cloth zinc tape (for spiral taping connections) (PeopleSoft #00023539) or nylon cable ties if used
- Sterile specimen container
- Primed IV normal saline 250 mL, with macro-drip (10 gtt/mL) tubing (to treat symptomatic hypotension/bradycardia, as per Physician order)

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Procedure

Assisting with Insertion and Intra-procedure Care

Prior to Procedure:

1. Perform hand hygiene
2. Ensure that the primed IV normal saline and reversal agents for medications (e.g. Narcan) and anticholinergics (e.g. IV Atropine) are available in the procedure room. Vasovagal induced bradycardia can occur when entering the pleural space
3. Position patient for the procedure as requested by the Physician
4. The Physician inserting the percutaneous pigtail drainage catheter (or small bore chest tube) obtains informed consent (before administration of narcotics or sedatives)
5. Educate the patient and family on the insertion procedure. See Patient and Family Education
6. Before the procedure, the RN monitors and documents vital signs, cardiopulmonary assessment (Patient Assessment & Interventions), and pain
7. Ensure **patent** IV access
8. Administer analgesic at the appropriate time for peak effect at insertion time
9. Put on personal protective equipment (PPE), sterile gown, mask, gloves, and cap; lead gown or other radiation protection devices
10. Using aseptic technique, drape and prepare the equipment table
11. Prepare sterile equipment, solutions and medications for the insertion procedure
12. Assist the Physician preparing the Lidocaine syringe (for local anesthetic of the insertion site)
13. Label medications using the sterile pen and medication labels as per protocol VCH and PHC Preparation of Parenteral Medications by Syringe
14. Label all solutions
15. When finished preparing the equipment table, remove the sterile gown and gloves, perform hand hygiene

Assisting with Insertion Procedure:

1. Assist the Physician with sterile gloves and gown, mask, and cap as needed
2. Perform hand hygiene
3. Before starting the procedure, and when the Physician inserting the chest tube is present, perform a time-out to verify the correct patient, site and procedure, using:

   PHC:
   - Bronchoscopy suite: Bronchoscopy time-out sheet (PHC RE 065) or
   - Radiology: Regional Interventional Radiology Procedure Checklist (PHC RA-139)

   VCH:
   - Radiology: Regional Interventional Radiology Procedure Checklist (v3.5 2013/10)
4. The Physician surgically prepares, drapes and anaesthetizes the insertion site
5. Reassure the patient throughout the procedure
6. The RN monitors and documents vital signs, cardiopulmonary assessment and pain
   - Continuous (automated) ECG, BP, pulse and pulse oximetry monitoring every 5 minutes during the procedure
7. The patient may cough when the needle enters the pleural space, and again when the lung expands. Monitor the patient closely for vasovagal induced bradycardia and symptomatic hypotension. Treat as per Physician orders or call a code.
8. If the Physician orders and collects a specimen of pleural fluid, transfer it to the appropriate labeled specimen container. See Maintenance of the Pleur-Evac® Chest Drainage System: Collecting a Specimen.
9. Prepare the chest drainage system as per instructions in the package and Appendix A - Setting up the Pleur-Evac®

10. The Physician passes the sterile end of the percutaneous pigtail drainage catheter (or small bore chest tube) extension tubing to the RN. Remove the cap from the long drainage tubing on the Pleur-Evac®. Keeping the exposed ends sterile, connect the catheter to the chest drainage system.
11. After the procedure, the RN monitors and documents vital signs, cardiopulmonary assessment, chest tube drainage, air leak and pain:
    - Q15 min x 2
    - In 30 min x1
    - Q1 hour x 4
12. If the Physician uses procedural sedation for percutaneous pigtail drainage catheters insertion, follow monitoring standards in the guidelines until recovery scores are met (see Need to Know)
13. Spiral tape all connections with white cloth zinc tape or secure with nylon cable ties (if used). Waterproof tape is difficult to remove and may increase the risk of accidental disconnection
    - Tear tape in half lengthwise, spiral taping over connections in both directions (similar to a candy cane or DNA helix)
    - Leave connector unobstructed to allow visualization of drainage
    - Tape over the ends to reinforce

    
14. The Physician inserting the catheter or chest tube is responsible for safe removal of sharps
15. Do not discard non-toothed stainless steel forceps. Return to Medical Device Reprocessing Department (MDRD) or other sterile processing department.
16. If disposing the chest drainage system, clamp the long drainage tubing with the blue C-clamp, or tie a knot in the tubing (to prevent splashing).
17. Discard used supplies in the appropriate waste or biohazardous waste receptacle in the dirty utility or service room.
18. Remove personal protective equipment (PPE) and wash hands
19. The Physician completes the Preprinted Prescriber orders (where available)
20. If ordered by the Physician, arrange for a chest x-ray or ultrasound prior to transport back to the clinical area. See:
    PHC: Policy
    VCH: VA & Richmond: Transport for Tests/Treatments: Patient Accompaniment
21. To prevent obstruction of the percutaneous pigtail drainage catheter (or small bore chest tube), potential pneumothorax and other adverse outcomes, the stopcock **must** remain open during transport. See Need to Know #10 to 13
22. If the Physician used procedural sedation, refer to Procedural Sedation and Analgesia Guidelines prior to transport back to the unit

For information about ongoing assessment and interventions, see
- Preprinted Orders (where available)
- Patient Assessment and Interventions
- Maintenance of the Pleur-Evac® Chest Drainage System
- Basic skills text (electronic or hard copy), Assessment of Thorax and Lungs

Dressing the Insertion Site

Equipment and Supplies:

- 2% Chlorhexidine and 70% Alcohol (or swab sticks/ Solu-prep wipes with the same cleansing solution)
- Sutures as selected by the Physician
- **VCH/PHC:** No-Sting Prep Pad (Clwk website)
- Appropriate size Statlock Fixation device PHC Guideline for size of percutaneous pigtail drainage catheter/small bore chest tube
- Tegaderm IV™ or other sterile, clear occlusive dressing (to visualize and assess the insertion site)

Procedure:

1. Cleanse the insertion site and surrounding skin (if not already done)
2. Ensure there are no kinks in the percutaneous pigtail drainage catheter/small bore chest tube or dependent loops in the drainage tubing
3. To improve adhesion of the dressing and/or fixation device, prepare the surrounding skin with No-Sting Skin Prep (away from the insertion site). Allow to dry thoroughly for 30 seconds
4. Apply Tegaderm IV™ or other sterile, clear occlusive dressing
5. Pinch the end of the dressing around the percutaneous pigtail drainage catheter/small bore chest tube (to provide an occlusive seal)
6. If not sutured, secure the percutaneous pigtail drainage catheter to the patient with the appropriate size Statlock Fixation device (PHC)
7. To prevent obstruction of the percutaneous pigtail drainage catheter/small bore chest tube, potential pneumothorax and other adverse outcomes, the stopcock **must** remain open during transport. See Need to Know #10 to 13

For information about ongoing monitoring and dressing changes, see

- Patient Assessment and Interventions

Emergency Equipment

1. Assemble **Emergency Equipment – Must** be with the patient at all times and accompany the patient on transport. See Policy
   - Consider using a clear plastic bag to hang from the IV pole, or re-use the plastic bag on the back of the chest drainage system

   Emergency equipment list:
   - 2 non-toothed forceps for each chest tube (plastic or stainless steel


OR


   - 250 mL bottle sterile water
   - Petroleum impregnated gauze
   - 4 x 4 gauze dressing

For information on nursing interventions for unexpected outcomes, see Management of Potential Complications.

Patient and Family Education

Patient and Family Education	Rationale
1. Explain the procedures and how the chest drainage system works	Education may also be provided by Physiotherapy or Respiratory Therapy
2. Instruct patient to sit upright (unless contraindicated) following procedures	Facilitates drainage from the lungs and decreases work of breathing
3. Instruct the patient to change position every 2 hours keeping the tubing free of kinks	Prevents complications related to immobility and retained secretions; maintains tube patency
4. Encourage changing position in bed	Facilitates drainage of pleural effusions, if present
5. Encourage active or passive range of motion (ROM) exercises on the affected side	Limiting movement on the affected side due to discomfort at the insertion site can result in joint discomfort and potential joint contractures
6. Instruct the patient on the availability of pain medication and other pain relief strategies	Patient comfort facilitates deep breathing & coughing, mobilization, range of motion (ROM) and recuperation
7. Teach the patient the correct position of the chest drainage system and the stopcock, if appropriate	Emphasize keeping the chest drainage system upright and below the insertion site, and the stopcock open
8. Teach the patient to call the RN immediately if they have any unusual cardiopulmonary symptoms or pain, including (not limited to): • New or increasing shortness of breath (SOB) • Coughing and/or hemoptysis (blood in sputum) • Sudden sharp, focal chest pain • Drainage or wetness on the dressing • Pain at insertion site • Signs of infection	
9. Remind patient to ask for assistance prior to mobilizing	
10. If ordered by Physician or NP, and if appropriate, teach the patient how to safely disconnect and re-connect suction tubing before and after ambulating	

Documentation

PHC:

In Radiology:

- Nursing Record Radiology Interventional (PHC-RA103)
- Regional Interventional Radiology Procedure Checklist (PHC RA -139)

In Bronchoscopy Suite:

- Bronchoscopy Suite Time-Out Sheet (PHC-RE 065)
- Bronchoscopy Suite Procedure Documentation (PHC-NF 306)
- Respiratory Services Bronchoscopy Report (PHC-RE021)

Other Areas:

- Chest Tube Assessment flow sheet (PHC NF-224) (except in Critical Care)
- 24 Hour Flowsheet
- Interdisciplinary Progress Notes
- Clinical Pathway document
- 24 Hour Fluid Balance Record

VCH:

- Radiology – Regional Interventional Radiology Procedure Checklist (v3.5 2013/10)
- Tube/Drain Flowsheet
- Patient Care Flowsheet
- 24 Hour Fluid Balance Record
- Clinical Pathway document
- Interdisciplinary Progress Notes

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Document on the Interdisciplinary Progress notes or unit specific documentation form:

- Cardiopulmonary assessment and vital signs before, during and after insertion
- Date and time of insertion
- Name of the Interventional Radiologist, Radiologist, Thoracic/Respiratory Resident or other Physician inserting the percutaneous pigtail drainage catheter/small bore chest tube
- Location of insertion site
- Size of percutaneous pigtail drainage catheter/small bore chest tube
- Description of procedure and patient tolerance
- Type of chest drainage system
- Unexpected outcomes and nursing interventions
- Presence, absence and trend of tidalling and bubbling in the air leak meter
- Amount, color, and characteristics of drainage
- Mark the volume of drainage on the Pleur-Evac® (or other chest drainage system), with an indelible marker and on the fluid balance record
- Amount of suction, if ordered
- Patient and family education

Related Documents

- Chest Tubes and Chest Drainage Systems: Maintenance of the Pleur-Evac® Sahara
- Chest Tubes: Large Bore: Assisting with Insertion
- Chest Tubes: Large Bore: Assisting with Removal
- Chest Tubes: Patient Assessment and Interventions: Large Bore and Percutaneous/Small Bore Chest Tubes, Chest Drainage System: Pleur-Evac® Sahara
- Chest Tubes and Chest Drainage Systems: Management of Potential Complications
- Chest Tubes: Thoracic Percutaneous Pigtail Drainage Catheter or Small Bore Chest Tube - Assisting with Removal
- Chest Tubes and Chest Drainage Systems: Heimlich Valve

References

1. Antunes, G., Neville, E., Duffy, J., Ali, N., et al. (2003). BTS Guidelines for the Management of Malignant Pleural Effusions. Thorax, (Suppl. II), 58: ii 29-ii 38. doi :10.1136.thorax.58.suppl_2.ii29
2. Briggs, D. (2010). Nursing care and management of patients with intrapleural drains. *Nursing Standard*, 24 (21), 47-55.
3. British Thoracic Society Pleural Disease Guideline Group. (2010). BTS Pleural Disease Guideline 2010-A Quick Reference Guide. Thorax, Vol. 65, Supplement 2, 1-11. Retrieved April 22, 2014 from https://www.brit-thoracic.org.uk/document-library/clinical-information/pleural-disease/pleural-disease-guidelines-2010/pleural-disease-guideline-quick-reference-guide/
4. Chest Tube Placement (Assist). Mosby's Nursing Skills (2011). St. Louis, MO. Elsevier. Retrieved April 22, 2014 from www.mosbysnursingskills.com
5. Chest Tube Placement (Perform). Mosby's Nursing Skills (2011). St. Louis, MO. Elsevier. Retrieved April 22, 2014 from www.mosbysnursingskills.com
6. Closed Chest Drainage System. Mosby's Nursing Skills (2011). St. Louis, MO. Elsevier. Retrieved April 22, 2014 from www.mosbysnursingskills.com
7. Chest Tubes & Chest Drainage Tubes. (2013). University Health Network Policy and Procedure Manual.
8. Davies, H., Davies, R. Davies, C. et al. (2010). Management of Pleural Infection in Adults: British Thoracic Society Pleural Disease Guideline. Thorax 2010, (Suppl. 2), 65: ii 41-ii 53. doi:10.1136/thx2010.13700
9. Domke, M. (2010). Get a positive outcome from negative pressure. Nursing *Made Incredibly Easy*. Retrieved July 24, 2013 from http://www.nursingmadeincrediblyeasy.com
10. Durai, R., Hoque, H., & Davies, T. (2010). Managing a Chest Tube and Drainage System. *Association of periOperative Registered Nurses*, 91(2), 275-283.

11. Gordon, C. E., Feller-Kopman, D. Balk, E.M., Smetana, G.W. (2010). Pneumothorax following thoracentesis;a systematic review and meta-analysis. *Archives of Internal Medicine*, 170 (4), 332-339.
12. Halm, M. (2007). To Strip or Not to Strip? Physiological Effects of Chest Tube Manipulation. American Journal of Critical Care, 16 (6), 609-612.
13. Providence Health Care. (2013). Preparation of Parenteral Medications for Administration by Syringe. Providence Health Care Medication Administration Policies. Retrieved May 2, 2014 from http://phcconnect/index.html
14. Society of Interventional Radiology, Association of periOperative Registered Nurses, and Association for Radiologic and Imaging Nursing. (2012). Joint Practice Guideline for Sterile Technique during Vascular and Interventional Radiology Procedures. Journal of Interventional Radiology, (23), 1603-1612.
15. Teleflex Medical. Understanding Chest Drainage. Retrieved January 22, 2015 from http://www.teleflex.com
16. Vancouver Coastal Health. (2005). Acutely Ill Patient in Radiology, Care of. PCG A-072. Vancouver Coastal Health PolicyNet. Retrieved May 2, 2014 from http://vchconnect.vch.ca
17. Vancouver Coastal Health. (2006). Chest Centre T-12. Thoracic Percutaneous Pigtail Drainage Catheter (PPDC). PCG C-176. Vancouver Coastal Health PolicyNet. Retrieved April 22, 2014 from http://vchconnect.vch.ca
18. Vancouver Coastal Health. (2010) Percutaneous Pigtail Drainage Catheter (PPDC) - Thoracic and Abdominal. PCG C-36. Vancouver Coastal Health PolicyNet - Coastal. Retrieved April 22, 2014 from http://vchconnect.vch.ca
19. Vancouver Coastal Health. (2007) Pleural Chest Tube: Care and Management of Patient with PCG C- 430. Vancouver Coastal Health PolicyNet. Retrieved April 22, 2014 from http://vchconnect.vch.ca
20. Vancouver Coastal Health. (2005) Radiology Site and Side Identification. CP 200. Vancouver Coastal Health PolicyNet. Retrieved May 2, 2014 from http://vchconnect.vch.ca
21. Vancouver Coastal Health. (2010). Transport for Tests/Treatments: Patient Accompaniment. T-215. Vancouver Coastal Health PolicyNet. Retrieved May 2, 2014 from http://vchconnect.vch.ca
22. Yarmus, L., Feller-Kopman, L., (2012). Pneumothorax in the critically ill patient. Chest, 141 (4), 1098-1105.

Developed by

CPD Developer Lead: General Nurse Educator, Professional Practice and Nursing, PHC

Other members:

Nurse Practitioner, Adult Thoracic and Lung Transplant Surgery Program, Chest Centre VGH
Respiratory Nurse Clinician Breath Program, LGH
Clinical Nurse Educator, Chest Centre VGH
Clinical Nurse Educator, Emergency, RH
Clinical Nurse Specialist, Heart Centre, PHC
Nurse Educator Cardiac Surgery Intensive Care Unit, PHC
Clinical Nurse Educator, Chest Centre, VGH
Clinical Nurse Educator, Richmond Hospital
Clinical Nurse Educator, Medicine 2South, RH
Nurse Educator, Professional Practice PHC

Consulted:

Department Head, VCH Division of Thoracic Surgery
RN, Radiology, SPH, PHC
Medical Director Medical Imaging, PHC
Department Head Medicine, PHC
Respirologist, VCH
Interventional Respirologist, PHC
Respirologist, PHC
RN, Bronchoscopy Suite, SPH, PHC

Endorsed by

VCH: *(Regional SharePoint 2nd Reading)*
- Health Authority Profession Specific Advisory Council Chairs (HAPSAC)
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- Operations Directors
- Professional Practice Directors

PHC: Professional Practice Standards Committee

Final Sign-off & Approval for Posting by

Vice President Professional Practice and Chief Clinical Information Officer, VCH

Professional Practice Standards Committee, PHC

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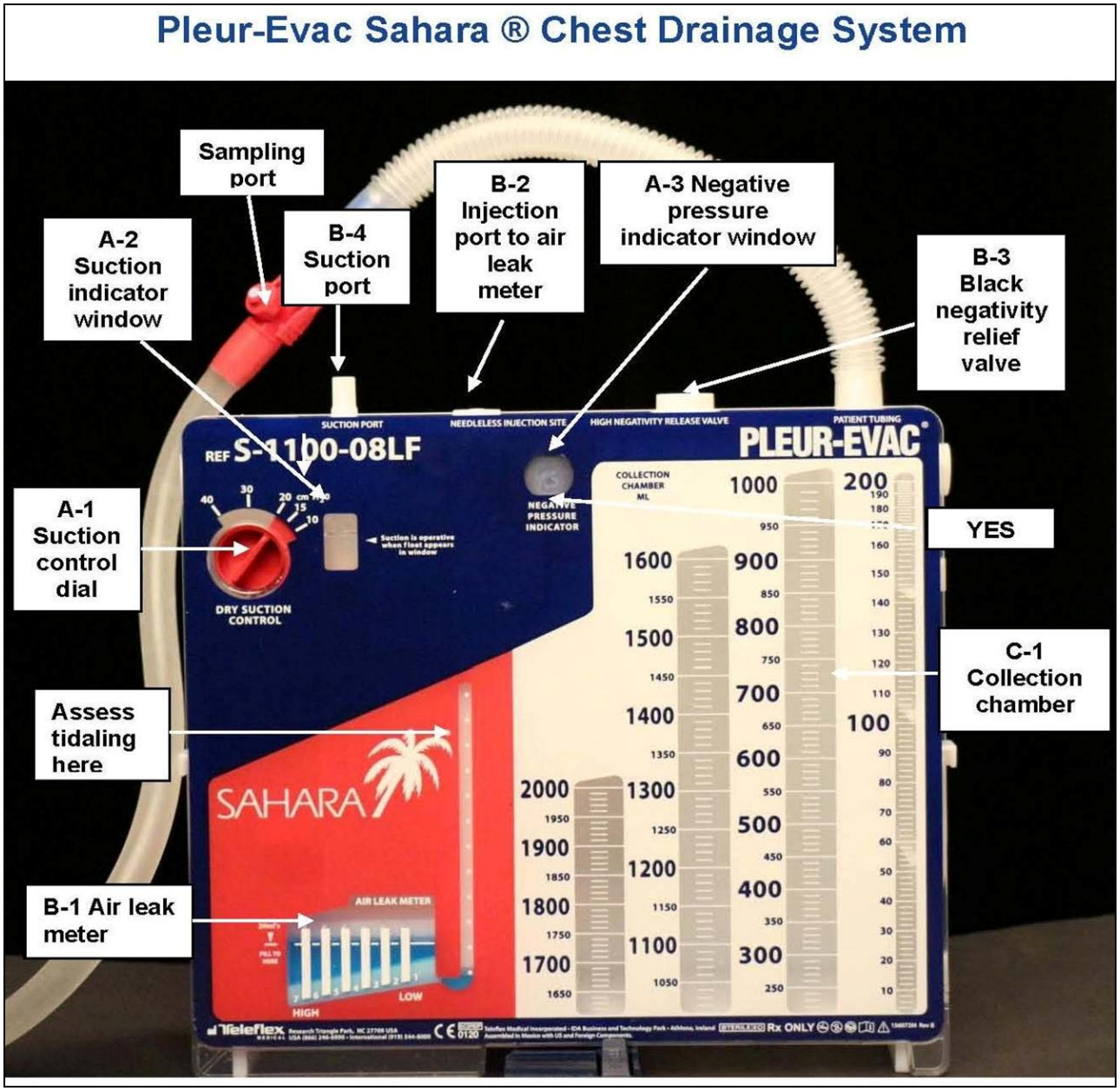
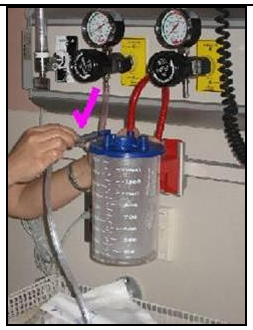
Appendix A: Setting up the Pleur-Evac Sahara® Chest Drainage System (CDS)

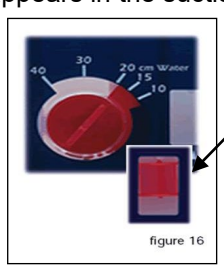


Chest Tubes and Chest Drainage Systems: Patient Assessment and Interventions

Nursing interventions aim at maintaining patency and sterility of the chest drainage system, monitoring for complications and evaluating the effectiveness of medical treatments and/or nursing care.

If the patient is in respiratory distress at any time despite interventions, call Physician or NP immediately, or call a code

Procedure	Important Information
1. To set up the Pleur-Evac® chest drainage system, follow the instructions on the package insert and below	
2. Ensure the suction device and tubing is set up and functional. Suction tubing **must** be connected to the suction drainage container.	  Correct ✓ Incorrect X To reduce the risk of fluid or chest tube drainage entering the wall suction system, do **not** connect suction tubing directly to wall suction regulator
3. Stabilize the chest drainage system on the floor stand, or hang it on the bed or stretcher from the attached hooks	To promote drainage and prevent backflow into the pleural space, keep the chest drainage system below the level of the insertion site
4. Ensure the blue C-Clamp attached to the drainage tubing remains open. To prevent accidental closure, place the clamp away from the patient or remove it	• The C-clamp occludes only fluid, not air • If ordered, use the stopcock to occlude drainage on percutaneous pigtail drainage catheters. If there is no stopcock, double clamp **only** the soft end of the connecting tubing. See Maintenance of the Pleur-Evac® Chest Drainage System: Clamping
5. Fill the air leak meter (B-2) with the supplied 20 mL sterile saline syringe	• The air leak meter must be filled to assess tidalling and to quantify the size of the air leak from 1 (low) to 7 (high)
6. For gravity drainage, keep the suction port (B-4) open to air and unobstructed 	• Normal intrapleural pressure is always negative. Negative pressure decreases with inspiration and increases with expiration • The one-way valve on the chest drainage system allows air to exit on expiration and prevents atmospheric air from entering on inspiration • When on gravity drainage, the negative pressure indicator "YES" may be seen intermittently with patient respirations • When on suction drainage, the negative pressure indicator "YES" should be continually visible

Procedure	Important Information
7. To initiate or increase suction drainage: • Rotate the suction control dial (A-1) to the prescribed setting (preset at - 20 cm water) • Connect the suction tubing from the wall suction to the suction port (B-4) on the chest drainage system • Adjust the wall suction regulator until the orange float (A-2) appears in the suction indicator window  figure 16	• Confirm that the orange float appears in the suction indicator window continuously when attached to suction • Higher suction levels may be ordered for patients with a large pneumothorax, empyema, thick pleural effusions, or stiff lungs
8. Spiral tape all connections with white cloth zinc tape or secure with nylon cable ties (if used) • Tear tape in half lengthwise, spiral taping over connections in both directions (similar to a candy cane or DNA helix) • Leave connector unobstructed to allow visualization of drainage • Tape over the ends to reinforce 	• White cloth zinc tape secures connections firmly and is: • easy to tear • easy to remove • waterproof • biodegradable and disposable Waterproof tape is difficult to remove and may increase the risk of accidental chest or connecting tube disconnection.
10. Avoid dependent loops by positioning the chest drainage tubing horizontally or coiled on the bed • If dependent loops cannot be avoided, lift and drain the tubing when drainage accumulates	• Dependent or fluid-filled loops may obstruct drainage of fluid and/or air, increase intrapleural pressure and reduce effectiveness of suction
11. Maintain tubing free of kinks	• Prevents obstruction of drainage and/or air from the chest tube
12. To prevent pulling on the chest tube site, consider securing the drainage tubing to the patient's gown with a blue clamp, an elastic band and pin, or clip supplied (on Pneumostat device)