For more information please visit us online at: http://www.osmh.on.ca/diagnostics/

If you or your support person do not clearly understand the procedure, please ask for clarification

TUNNELED PLEURAL DRAIN INSERTION

What is it?

A tunneled pleural drain (also referred to as a *tunneled pleural catheter*) is a silicone tube used to drain fluid from the pleural space around the lungs, relieving symptoms like shortness of breath or chest discomfort. The tube passes through the subcutaneous tissue (the tunnel) and exits the skin at the exit site.

This tunnel helps lower the risk of infection in the pleural space. A small polyester cuff beneath the skin promotes tissue growth over the first few weeks, securing the catheter in place and acting as an infection barrier.

At insertion, the catheter is capped with a **blue CLAVE® connector**, which should only be replaced following the attached protocol (see Special Instructions). If a different adapter is required, use the same protocol.

Never leave the catheter open to the air, as this can cause a pneumothorax, leading to lung collapse.

Why do I need it?

You may require a tunneled pleural drain due to[1]:

- Pleural effusions causing respiratory failure
- Lung cancer, breast cancer, or lymphoma
- Non-malignant effusions affecting your quality of life
- Congestive heart failure or hepatic-hydrothorax
- Chylothorax (accumulation of lymphatic fluid in the pleural space due to damage or obstruction of the thoracic duct) with unknown or uncorrectable causes
- Post-lung transplant and pleural infections (rare)

HOW IS THE PROCEDURE PERFORMED?

Before

For specific questions regarding the clinical need for this procedure, please contact your ordering provider.

Patient Preparation:

You should wear loose-fitting clothing that is easy to change out of. **You will need to arrange for someone to drive you home after you have recovered from the procedure**. One support person (spouse, friend, caregiver, family member) may accompany you on the day of your appointment, but not into the procedure room.

Please bring a list of the medications you are currently taking and a list of any drug/medication allergies you may have.

You may have clear fluids up to **four hours** before the procedure. Continue taking your morning medications, **except for blood thinners** (see next page), with a small sip of water.

Please phone the Diagnostic Imaging booking line at **705-325-2201 ext. 3505** for cancellations or rebooking if you are unable to attend your appointment.

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Bloodwork[3]

Bloodwork is required and must be done within **2 weeks** of your appointment (within 72 hours for inpatients). Your doctor may order:

- INR (must be ≤ 1.8)
- PTT
- CBC (platelets must be ≥ 50×10^9/L or greater)

If you take **Warfarin (Coumadin)**, you'll need a new INR drawn the **day before** your procedure.

Important: Missing bloodwork may cause delays or your procedure to be rescheduled.

Blood Thinners / Anticoagulants / Antiplatelets Medications[3]

Stop the listed medications as per the below schedule before your procedure unless instructed otherwise. If unsure, then consult your doctor or healthcare provider about which medications to pause, for how long, when to restart them, and any concerns you may have.

Medications	When to Stop	Restart After
Acova (**Argatroban**)	2-4 hours	4-6 h
Aggrenox (**ASA/dipyridamole**)***	3-5 days	Next day
Angiomax (**Bivalirudin**)	2 hours	4 h
Arixtra (**Fondaparinux**)	2 days (3 days if eGFR is <50)	24 h
ASA (**Aspirin**)	Do not stop	N/A
Brilinta (**Ticagrelor**)***	5 days	Next day
Coumadin (**Warfarin**)*/**	5 days (recheck INR)	Same day (evening)
Effient (**Prasugrel**)***	7 days	Next day
Eliquis (**Apixaban**) **	2 days (3 days if eGFR is <50)	Second day
IV Heparin (unfractionated)**	4 hours (check PTT)	6 h
LMWH (prophylactic): enoxaparin (**Lovenox**), dalteparin (**Fragmin**)**	12 hours	Next day
LMWH (therapeutic): enoxaparin (**Lovenox**), dalteparin (**Fragmin**)**	24 hours	Next day
Plavix (**Clopidogrel**)***	5 days	6 h (if 75 mg) 24 h (if 300 mg)
Pradaxa (**Dabigatran**) **	2 days (3 days if eGFR is <50)	Next day
Savaysa (**Edoxaban**)	2 days	Next day
Subcutaneous Heparin (unfractionated)**	8 hours (check PTT)	Same day (evening)
Xarelto (**Rivaroxaban**)**	2 days (3 days if eGFR is <30)	Next day

* Consider bridging with heparin (need admission) for high thrombosis risk cases
** Consider using reversal agent if emergent or STAT
*** Consider continuation for arterial procedures including mesenteric, renal, subclavian, and infra-inguinal angioplasty/stent

Important Notes

- Patients on Warfarin (**Coumadin®**) need an **INR** test the **day before** the procedure.
- Those with **prosthetic valves**, **prior clots**, or **stroke-related atrial fibrillation** may need bridging therapy to prevent thrombosis.
- **Do not** stop blood thinners if you have **coronary or brain stents**—consult your doctor first.
- If anticoagulation is stopped, your doctor must provide instructions.
- Applies only to elective procedures, not emergencies.

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Coming To The Hospital

You must first sign-in with **Centralized Patient Scheduling & Registration (CPSR)**, which is located immediately to your left when you enter the hospital from the main entrance (off Dunlop Street, across from the gift shop). You will receive a patient wristband and be directed to the **Day Surgery department**. Day Surgery will prepare you for the procedure and bring you down to the **Diagnostic Imaging department** at your scheduled appointment time.

Please bring to the hospital your OHIP card and a list of current medications you are taking.

You may also bring a book, water, phone/tablet with earphones, and a snack in a small bag for when you are recovering from the procedure.

During

This procedure is performed in the Interventional Radiology Department of Diagnostic Imaging.

The duration of your appointment time will vary from 1 - 2 hours.

You will recover in the Post Anesthesia Care Unit (PACU) for another 1 – 2 hours

1. You will be changed from above the waist into a hospital gown.
2. A medical radiation technologist (MRT) or nurse will explain the procedure and answer any questions you have.
3. You will lay on your back on a fluoroscopy table for the procedure.
4. This is an aseptic procedure, so your skin will be cleaned where the catheter is to be inserted.
5. Sterile towels and drapes will be used to cover you and protect you from infection.
6. A radiologist will use a numbing agent called Lidocaine to numb the skin where the port goes. You may also receive conscious sedation.
7. The radiologist will use a combination of ultrasound and x-rays to insert the catheter.

Notes / Questions *(write down any notes or questions you may have for your doctor, healthcare practitioner, or the care team in Diagnostic Imaging on the day of your appointment. You can also use this space to write down a list of your current medications):*

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WHAT TO EXPECT AFTER

Recovery & Going Home

You will be sent to the **Post Anesthesia Care Unit (PACU)** to recover from the procedure. Before being discharged, bloodwork may be taken to determine if you have met recovery standards.

You will need someone to drive you home after the procedure. Don't drive for the next 24 hours or while you're taking strong pain medicine. If you were given medication to help you relax or manage pain during the procedure, then you cannot drive for the next 24 hours.

Diet & Activity

- Rest for the day and take it easy for 1–3 days (as needed).
- Have an adult family member, caregiver, or friend stay with you the night after the procedure in case you need help.
- Resume your normal diet, but if you feel nauseous, try bland, low-fat foods like rice, chicken, toast, or yogurt.
- Avoid tight clothing that may put pressure on the catheter.
- Limit arm and upper body movements that might strain the incision during the first week.
- Refrain from lifting over 4.5 kilograms (10 pounds) or doing vigorous arm activities in the first week after insertion.
- Consult your doctor or healthcare provider about when it's safe to drive.

Wound Care

NURSING INSTRUCTIONS FOR DRESSING CHANGES FOR TUNNELLED PLEURAL CATHETERS:

The tunnelled pleural catheter has two areas that have dressings: one is the skin exit site of the tube, and the other is the skin incision over the lower chest wall.

During the first 72 hours:

Check the dressing(s) for drainage, leakage, or signs of infection:

- If the exit site dressings are dry and intact, they do not need to be changed.
- If there is leakage, change the dressing once daily and as needed.

After 72 hours:

- Change the dressing at the catheter exit site every other day and as needed for two weeks. After two weeks, change the dressing weekly and as needed.
- Remove the dressing over the skin incision and leave it open to the air if it is dry and healing.

Do not to get the dressing wet. Two weeks after insertion, or once the exit site has healed, the patient may take showers with the dressing off. Following the shower, the site must be redressed with a sterile dressing as detailed below.

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Dressing Changes:

- Maintain sterile technique.
- Remove old dressing.
- Check catheter site for bleeding, drainage, leakage, signs of swelling or inflammation, or signs of infection. Culture any suspicious drainage.
- Clean around and under the catheter with normal saline.
- Apply a dry 2 x 2 gauze dressing over the exit site and cover with tape or OpSite.

Tape the catheter securely to the skin below the dressing. This will avoid undue tension and make the catheter more accessible for drainage.

Bathing

- Do not shower until your doctor, an Ontario Health atHome (Home Care) nurse, or other healthcare practitioner says it is okay to do so.
- Do not to get the dressing wet. Two weeks after insertion, or once the exit site has healed, you may take showers with the dressing off. Following the shower, the site must be redressed with a sterile dressing as described in the Wound Care section of this document.
- You may choose to cover the dressing with a waterproof material, such as plastic wrap or a purchased product (such as *AquaGuard, Leukomed T Plus, Sealtight Shield Dressing Protector, Shower Shield*, etc.) to prevent it from getting wet. You should discuss best practice options with your Ontario Health atHome (Home Care) nurse. These types of covers are available online through sites such **as Amazon Canada** or at home healthcare stores, such as **WellWise by Shoppers Drugmart**.

Medication[1,2]

- **If your doctor or healthcare provider advised you to stop any medications for this procedure then consult with them first about the safety of when you can start your medications again**;
- Otherwise, resume your normal medication schedule.
- If you **normally** take acetylsalicylic acid (Aspirin™) or another blood thinner medication, ask your doctor or healthcare provider when to start taking it again. Make sure that you understand exactly what they want you to do;
- Otherwise, **do not** take (Aspirin™) or anti-inflammatory medicines (such as ibuprofen) for one **week** after the procedure (for fresh insertions, only).

Special Instructions

Initial Post-Insertion Period (First 48-72 Hours):

- Continuous drainage should be performed until pleural fluid drainage is minimal. **Do not drain more than 1500 cc in any 12-hour period**. If this amount is reached, clamp the connecting tube (never the pleural catheter) for a while, then resume drainage.
- Usually, the pleural space is fully drained after 48-72 hours. At this point, you can disconnect the catheter from the connecting tube and bag, leaving the blue connector clave in place. Afterward, drain periodically based on symptoms.

After the Initial Drainage Period:

- Drain every other day, or more often if symptoms such as chest discomfort or shortness of breath occur. Drainage sessions may last **up to 2 hours**.
- Do not drain **more than 1500 cc** per session.

Steps to Follow for Draining a Tunneled Pleural Catheter:

Important: Never leave the pleural catheter open to the air. This could cause a pneumothorax (lung collapse).

Equipment:

- Alcohol swabs
- New connecting tubing and drainage bag for each session
    a) **Needleless System**: Patients typically use a CLAVE® connector, connecting tube, and leg bag.
    b) **Needle System** (optional): A needle system can be used. Follow the protocol (page 5) to switch to this system.
- Evacuated bottles (optional) to speed drainage.

Procedure:

1. Position the patient comfortably.
2. Use sterile technique throughout.
3. Check the catheter and connector for blockages, blood strands, or fibrin. If blocked, follow the "changing the PRN adapter" protocol (see page 5).
4. Clean the connector with an alcohol swab.
5. **Needleless system**: Attach the male Luer lock to the connector.
6. **Needle system**: Attach the 18-gauge needle to the secondary IV set and secure with tape while draining.
7. Position the drainage bag below the patient's chest.
8. To start drainage, ask the patient to breathe deeply, cough, or walk. If the flow is slow, reposition the patient.
9. Drainage should take 30-90 minutes. **Do not drain more than 1500 cc per session**. If using a leg bag, empty it using the valve (kink the connecting tube before opening the valve).
10. Wait 5 minutes after the fluid stops, then disconnect the tube from the adapter.
11. Document the fluid volume and properly dispose of the fluid and used supplies.

If the patient feels discomfort or coughs during drainage:

- Slow drainage down (use roller clamp on tubing) or stop for 15-30 minutes, then resume. If discomfort persists and there's no shortness of breath, stop for that session. If shortness of breath occurs, notify the patient's primary care physician.

If the drainage bag fills with air:

If the drainage bag fills with air, release the air to prevent complications like subcutaneous emphysema or blocked drainage.

1. For **connecting tubing**: Kink the tubing (never the pleural catheter) to stop air from entering the chest.
2. For **secondary IV set**: Close the roller clamp.
3. For **leg bag**: Turn the bag with the valve pointing up, open the valve, gently squeeze out the air, and close the valve.
4. For **empty IV bag**: Detach the bag, squeeze out the air, and reattach it.
5. Unkink or unclamp after releasing the air.

If fluid leaks around the tube at the insertion site:

- If fluid drains into the bag but leaks around the insertion site, leave the catheter on continuous drainage for 48-72 hours.
- If the catheter isn't draining but fluid is leaking at the site, refer to the troubleshooting section below.

If there's little or no drainage:

Reposition the patient. If this doesn't work:

- If no symptoms (shortness of breath or chest discomfort), then stop drainage and try again later.
- If symptomatic, inspect the catheter and change the PRN adapter or tubing if needed. If no blockage is visible, try to flush the catheter following the attached protocol (see page 6). If there is still no drainage and the patient is symptomatic then contact your family doctor or a responsible healthcare practitioner (ex: Home Care nurse).

If drainage is consistently less than 20-50 cc on each occasion:

Contact the patient's palliative care physician. In this situation, a chest x-ray and CT scan should be scheduled to assess for one of two possibilities:

1. Tube occlusion, in which case CT will show increasing pleural fluid; or
2. Spontaneous pleurodesis (which occurs in up to 50% of patients), in which case CT will show little or no pleural fluid and catheter removal should be contemplated.

Documentation:

- Document amount, colour and consistency of drainage and other observations on appropriate record.

Changing the Connector (or PRN Adaptor):

Note: Change the connector if pleural fluid flow is blocked by fibrin or if there's suspicion of blockage.

Steps for changing the connector:

1. Use sterile technique.
2. Clean the connection between the pleural catheter and PRN adapter with an alcohol swab.
3. Manually clamp the catheter (do not use any instruments to avoid damage).
4. Gently twist the connector clockwise and counter clockwise to disconnect it from the catheter. This may take a few minutes.
5. Clean the end of the catheter with an alcohol swab.
6. Attach a new connector.
7. Secure the new connector with waterproof tape.

If the catheter is still blocked after changing the connector, you may need to flush it (see flushing protocol on page 6).

Flushing a Tunneled Pleural Catheter:

Only flush the catheter if it is blocked—do not flush routinely.

Equipment:

- 10 cc sterile injectable normal saline
- 10-12 cc syringe
- Alcohol swabs

Procedure:

1. Use sterile technique.
2. Fill the syringe with saline, clean the connector with an alcohol swab, and slowly inject the saline into the catheter.
3. If the saline flows easily and there is no shortness of breath, pain, or discomfort, attach the drainage tubing and bag to drain the fluid.
4. If there's little or no drainage but the patient has no symptoms, disconnect and discard the tubing and resume drainage at the next session.
5. If flushing meets resistance, reposition the patient and try again. If resistance continues, stop and notify the palliative care physician.

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WHEN TO SEEK HELP

Call 911:

If you believe you require emergency care – **call 911**. Reasons to call 911 include:

- You have passed out (lose consciousness), or become very dizzy, weak, or less alert
- You have severe trouble breathing
- You have a fast or uneven pulse
- You experience sudden chest pain and shortness of breath; and/or
- Significant bleeding from the procedure site (i.e. bright red blood that won't stop)

Call your doctor, healthcare provider, or Health Connect Ontario immediately if you experience:

- Increased pain or swelling at or around the procedure site where the drain exits your body.
- You have new or worse pain at or around the procedure site.
- Redness or warmth around the procedure site or pus or blood draining from the procedure site.
- **Signs of infection:** increased pain, swelling, warmth, redness, red streaks, pus, or fever (more than 100°F / 38°C)
- Chills, with or without fever
- Bright red blood has soaked through the bandage / dressing over the procedure site.
- New or worsening trouble breathing
- Changes in the appearance of drained fluid
- The tube comes out or little to no fluid drains
- Health does not improve as expected
- Any other concerns

Health Connect Ontario may be reached 24-hours a day, including weekends, by:

- Calling 8-1-1
- Calling 1-866-797-0007 (TTY – *teletypewriter service*)
- Visiting https://healthconnectontario.health.gov.on.ca/ and selecting "Chat with us"

BRING THIS INFORMATION PACKAGE WITH YOU SHOULD YOU URGENTLY NEED TO SEE YOUR DOCTOR OR GO TO THE EMERGENCY DEPARTMENT OF YOUR NEAREST HOSPITAL.

Use this material for your information only. It does not replace advice from your doctor or other health care professionals. Do not use this information for diagnosis or treatment. Consult with your health care provider about a specific medical condition.

References:

1. Siddiqui F, Ihle RE, Siddiqui AH. Intrapleural Catheter. [Updated 2023 Feb 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK493229/
2. Indwelling Catheter Drainage for Chest or Abdomen: Care Instructions. My Alberta Health. Accessed November 12, 2024. https://myhealth.alberta.ca/Health/aftercareinformation/pages/conditions.aspx?hwid=abr9807
3. Patel et al. Society of Interventional Radiology Consensus Guidelines for the Periprocedural Management of Thrombotic and Bleeding Risk in Patients Undergoing Percutaneous Image-Guided Interventions—Part II: Recommendations. JVIR 2019; 30:1168–1184.

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