Tunnelled Pleural Catheter Information and Care Instructions

Diagnostic Imaging – Interventional Radiology

Hours: **Monday – Friday, 9:00 am – 4:00 pm**

Phone: **705-325-2201, extension 3619**

What is a tunnelled pleural catheter?

A tunnelled pleural catheter is a silicone tube that is used to drain the pleural space around the lungs. The tube is passed through the subcutaneous tissues over a distance of several centimetres (the tunnel) and is then brought out through the skin (the exit site).

The purpose of the catheter is to drain pleural fluid that is causing symptoms such as shortness of breath or chest discomfort. The catheter goes under your skin (tunnelled) and exits your body in a comfortable position. It needs to travel under your skin to reduce the risk of causing an infection in the pleural space.

A 1 cm long cuff made of polyester is attached to the portion of the catheter that is under the skin. During the first few weeks after the tunnelled pleural catheter has been placed, the patient's own tissues will grow into this fabric, thereby providing both an infection barrier and a fixation mechanism (the tube will be difficult/impossible to pull out without surgical dissection).

At the time of insertion the tunnelled pleural catheter is capped with a blue CLAVE® connecter, which should only be changed using the attached protocol (see page 5). If a different adapter is going to be used, it must be changed using the attached protocol (see page 5).

It is very important to make sure that the tunnelled pleural catheter is never left open to the air, as this could cause a pneumothorax that can make the lung collapse.

During the initial post-insertion period (first 48 to 72 hours):

Continuous drainage should be performed until drainage of the pleural space is complete (minimal or scant drainage per day). No more than about 1500 cc should be drained during any consecutive twelve hour period; if this amount is reached, clamp the connecting tube (never clamp the pleural catheter itself) for an appropriate period of time, then resume drainage.

It usually takes about 48 to 72 hours for drainage of the pleural space to be complete. Once this happens, the tunnelled pleural catheter can be disconnected from the connecting tube and bag (leaving the connecter in place). Intermittent drainage is then carried out periodically, as dictated by symptoms (see below).

After the initial drainage period:

The catheter should be drained every other day or more frequently if necessary (as determined by symptoms such as chest discomfort or shortness of breath). Each drainage may last up to two hours.

Do not drain more than 1500 cc per session.

STEPS TO FOLLOW WHEN DRAINING A TUNNELLED PLEURAL CATHETER:

Note: **It is very important to make sure that the tunnelled pleural catheter is never left open to the air, as this could cause a pneumothorax.**

Equipment required:

- Alcohol swabs
- New connecting tubing and drainage bag must be used with each drainage:

    a) Needleless system: Patients are sent home with a CLAVE® needleless connecter, connecting tubing (14 French with male Luer lock) and a leg bag with drainage valve. If desired, may use secondary IV set in place of connecting tubing and empty IV bag in place of leg bag.

    b) Needle system: If preferred, may switch to a needle system. Change CLAVE® adapter using attached protocol (see page 5). Use 18 gauge needle, secondary IV set and empty IV bag to collect fluid.

- To speed up drainage, evacuated bottles can be used in place of drainage bags (if available).

Procedure:

- Place patient in a comfortable position.
- Maintain sterile technique.
- Examine the tunnelled pleural catheter and its connecter carefully. Check for blood strands or fibrin. If blocked, follow the "changing the PRN adapter" using the attached protocol (see page 5).
- Clean connecter thoroughly with alcohol swab.
- Needleless system: Attach male Luer lock on connecting tube to the connecter.
- Needle system: Attach 18 gauge needle to secondary IV set and push through the adapter. Use tape to secure secondary set to the adapter while the fluid is draining.
- Put the drainage bag lower than the patient's chest to drain the pleural fluid.
- To start the flow of pleural fluid, ask the patient to breathe deeply or cough. Asking the patient to walk around may also start the flow. Pleural fluid should run freely — if not, reposition the patient for better drainage.
- Pleural drainage should take from 30 to 90 minutes per session. Do not drain more than 1500 cc per drainage session. If using a leg bag with drainage valve, use the valve to empty the bag (making sure to kink connecting tube before opening valve).
- Wait five minutes once the pleural fluid stops flowing. Remove connecting tube from PRN adapter.
- Document volume of fluid. Dispose of fluid according to policy. Discard drainage supplies that were used.

If there is discomfort or if the patient starts coughing as the fluid is draining:

If the connecting tubing has a roller clamp, you can try slowing the drainage. The other option is to stop drainage for a short period of time (e.g., 15 to 30 minutes), then resume.

- If discomfort continues but patient is not short of breath, discontinue drainage for this session.
- If there is discomfort and patient is short of breath, notify the patient's Most Responsible Physician (MRP).

If the drainage bag fills with air:

If the drainage bag fills with air, the air must be released. Failure to release the air may result in subcutaneous emphysema (air in the soft tissues of the chest wall) or an inability of the fluid to drain. To release the air:

1) If using connecting tubing: Kink the connecting tubing (do not kink the pleural catheter) to prevent air from entering the patient's chest.

   If using a secondary IV set: Close the roller clamp.

   If using leg bag: Turn the bag so that the drainage valve is pointing up. Open the valve then gently squeeze the air out, then close the valve.

   If using an empty IV bag: Detach the bag from the end of the tubing, gently squeeze the air out, and reattach the bag.

2) Unkink or unclamp.

If fluid is leaking around the tube at the insertion site:

- If the tunnelled pleural catheter is draining fluid into the bag but there is also fluid leaking around the tube at the insertion site, leave the catheter to straight drainage for 48 to 72 hours.
- If the tunnelled pleural catheter is not draining any fluid into the bag but there is fluid leaking around the tube at the insertion site, see section below.

If there is little or no drainage from the catheter:

Reposition the patient two or three times. If that doesn't work:

- If the patient is not short of breath or experiencing chest discomfort, discontinue drainage until next scheduled drainage.
- If the tube is not draining and the patient is symptomatic, inspect the tunnelled pleural catheter, PRN adaptor and drainage tubing. If the PRN adaptor appears be a blocked, change it using the attached protocol (see page 5). If the drainage tubing is blocked, change it. 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 and this occurs between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday, call 705-325-2201, extension 3505 or 6127 and ask to speak with the Interventional Radiology staff.

If three consecutive drainages yield less than 20 to 50 cc of fluid on each occasion, contact the patient's palliative care physician. Under these circumstances, both a chest x-ray and a chest CT scan should be arranged in order to evaluate the patient 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 ADAPTER):

Note: **The connecter should be changed if fibrin has blocked the flow of pleural fluid (or if there is a suspicion that the connecter is blocked).**

Steps to follow when changing the connecter:

- Maintain sterile technique.
- Use alcohol swab to moisten and cleanse the area connecting the tunnelled pleural catheter to the PRN adapter.
- Clamp catheter manually — do not use any kind of a clamp instrument as it may damage the pleural catheter.
- Turn the connecter clockwise and counter clockwise to disconnect it from the tunnelled pleural catheter. Be careful and patient as it may take a few minutes to disconnect the connecter from the end of the catheter.
- Clean the end of the tunnelled pleural catheter with an alcohol swab.
- Attach a new connecter.
- Secure the end of the connecter to the tunnelled pleural catheter with waterproof tape.

If the tunnelled pleural catheter remains blocked after changing the connecter, the catheter may also be flushed (see attached flushing protocol on page 6).

FLUSHING A TUNNELLED PLEURAL CATHETER:

The tunnelled pleural catheter should be flushed only if it is blocked. Do not flush the catheter on a routine basis.

Equipment required:

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

Procedure:

- Maintain sterile technique.
- Draw up the normal saline, clean the end of the connecter with the alcohol swab and inject the normal saline slowly into the tunnelled pleural catheter.
- If the normal saline flushes in with ease and the patient experiences no shortness of breath, pain or discomfort, attach the drainage tubing and bag to the tunnelled pleural catheter and drain the pleural fluid.
- If there is minimal or no drainage once connected and the patient is asymptomatic, detach and discard the tubing and bag and resume drainage on the next visit.
- If there is resistance when flushing, reposition the patient and attempt again. If there is still resistance, stop the procedure and notify the patient's palliative care physician.

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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 or leakage:

- 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.

Instruct the patient not to get the dressing wet initially. 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.

Dressing Changes:

- Maintain sterile technique.
- Remove old dressing.
- Check catheter site for bleeding, drainage, leakage, signs of swelling or inflammation. 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.

Any questions or concerns regarding the above protocols should be directed to the Clinical Consultant at your agency. For any medical concerns, please contact the patient's palliative care physician. For tube-specific issues, call the hospital radiology department and ask to speak with the interventional radiologist (between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday).