FOR VETERINARY USE ONLY

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MILA INTERNATIONAL, INC.
Medical Instrumentation for Animals
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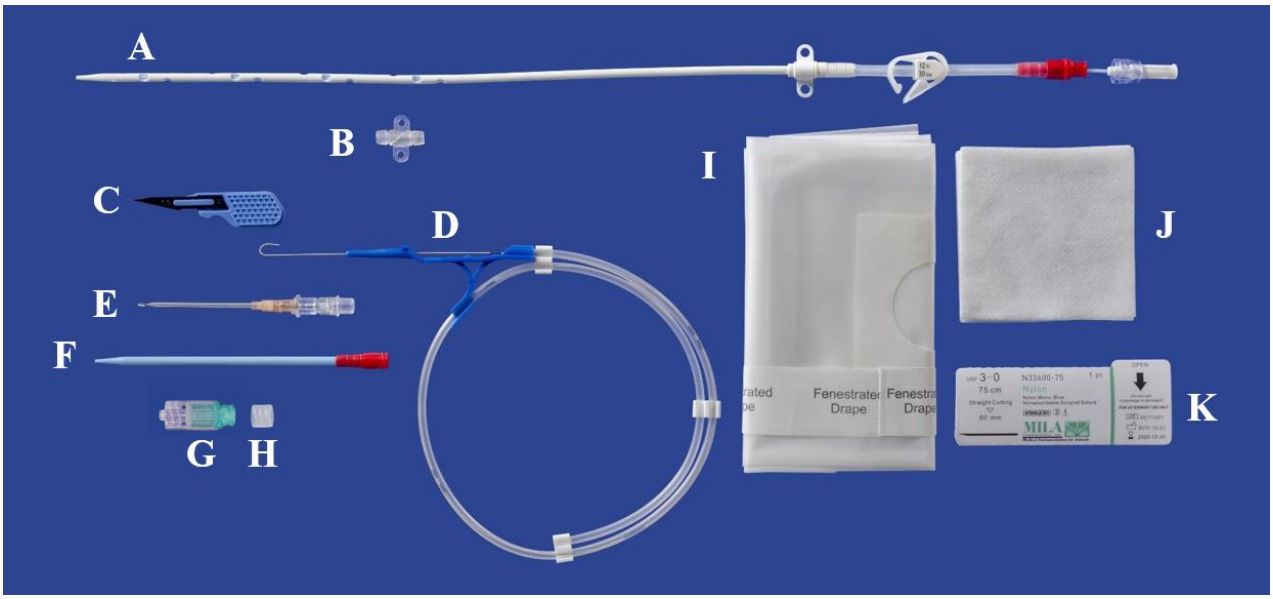
Instructions for Use

Rev. 12/27/2023

Guidewire-Inserted Chest Tube Kit

Fenestrated polyurethane catheter inserted percutaneously with the Seldinger Technique for drainage and/or lavage of the pleural cavity.



Kit Contents

A. Fenestrated Chest Tube
(CT12Fr16 shown)

B. Suture wing

C. #11 Scalpel

D. Guidewire

E. Catheter-over-needle introducer

F. Tissue dilator

G. Stasis valve
(AKA needle-free injection port)

H. Stemless cap

I. Fenestrated drape

J. Gauze

K. 3-0 nylon suture
on a straight, cutting needle

Note: CT12Fr16 is shown above and includes a hollow stylet. All other product codes include a suture wing with clamp and do not include items C, I, J, and K.

Indications for Use

The MILA Guidewire Chest Tube Procedure Kit is a small-bore catheter designed for indwelling drainage, evacuation, and/or lavage of the pleural cavity. Indicated conditions include pneumothorax, pyothorax, hemothorax, recurrent pleural effusion, and post-thoracotomy treatment.

Contraindications

Coagulopathy Diaphragmatic hernia

Pulmonary adhesions from previous surgery

Potential Complications

Iatrogenic pneumothorax	Re-expansion pulmonary edema
Subcutaneous emphysema	Tube blockage
Tube malposition	Vasovagal syncope
Infection	Hemorrhage

Trauma to intrathoracic structures, intraabdominal structures, and/or intercostal muscles

Supplies Needed

(not included)

Clean clippers with a size 40 blade	Surgical skin prep supplies (e.g., chlorhexidine scrub, alcohol)	Sterile fenestrated drape* (such as a MILA Item PPD)
Local anesthetic (e.g., 1% lidocaine)	#11 scalpel blade*	Measuring tape
MILA Guardian Disc (Item DR7) or equivalent aseptic barrier protection		Sterile dressing

For initial evacuation:

- Luer-lock syringes
- 3-way stopcock or Centesis Adapter/Automatic 3-Way (MILA Items 2400, 2405, 2408, 2412, 175440NB, 175450NB, 175460NB)
- Extension set(s)
- Collection container
  - A sterile collection system is required for collection of autologous blood for autotransfusion (MILA Items 175440, 175450, 175460)

If continuous suction is required:

- Fluid: Chest tube suction bulb (MILA Items CG100, CG150, CG200, CG400)
- Air: continuous suction device (e.g., Pleur-Evac) and appropriate adapters (see page 6 for further details)

To facilitate one-way drainage of air or fluid (optional):

- Heimlich Valve (MILA Items H2900 and H5300)

Refer to this symbol, ⚠, for warnings and precautions throughout the instructions.

Instructions

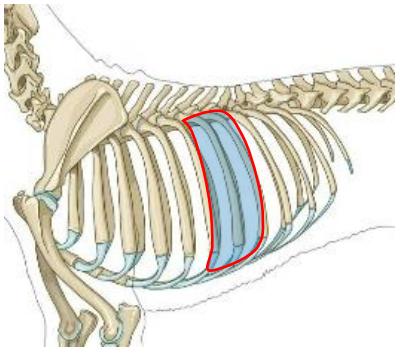
Read through all steps before the procedure.

These instructions do not include procedures for establishing cardiovascular stability or sedation before chest tube placement.

**Included in CT12Fr16 kit.*

Preparation

1. Visually inspect all components in the kit. Do not use if any part is missing or damaged.
   ***TIP**: Place the chest tube kit and supplies on the same side as your dominant hand to allow for easy access. If using an ultrasound to guide placement, use a sterile cover and gel. Keep the machine and probe cord out of the sterile field.*



2. Position the patient in sternal or lateral recumbency. Shave and antiseptically prep the lateral thorax, providing sufficient margins around the anticipated insertion site to later apply a sterile dressing.
   ⚠ Failure to properly immobilize the patient during the procedure may result in serious injury.
   - Insertion site is typically the 7-9th rib spaces in the dorsal third of the thorax for pneumothorax and in the ventral third for pleural effusion. The tip of the catheter should lie cranial to the third rib and ventral to the trachea.

3. Use external anatomical markers and a measuring tape to determine the depth of placement. Note the centimeter mark on the catheter for the maximum depth of insertion.
   - The white suture wing can be attached to the catheter to mark the required depth of placement. Tie surgeon's knots in the grooves in the suture wing to prevent it from moving along the catheter during placement.
     ⚠ Premeasurement is <u>essential</u>. All fenestrations must be within the pleural space.

4. Don sterile gloves and maintain aseptic technique. Place a fenestrated drape around the intended insertion site. Infiltrate local anesthetic at the insertion site in the subcutis, intercostal space, and into the pleural space. Allow time for the local anesthetic to take effect.
   ***TIP**: Position yourself so that the head is opposite to your dominant hand – this will allow you to easily feed the catheter cranially.*

5. *Optional*: Using a size 11 scalpel blade, make a stab incision in the skin 1-2 rib spaces caudal to the desired intercostal entry space. The incision should only be as large as the chest tube diameter. Pull the skin cranially so that the incision is above the intercostal space chosen for the insertion site. (This will "bury" the chest tube, which may help to prevent kinking and/or malposition.) Proceed with chest tube placement, using the incision as the insertion site.

Seldinger Technique for Chest Tube Placement

<u>Read through all steps before the procedure.</u>

6. **INTRODUCER**
   Firmly attach a syringe to the hub of the stylet of the catheter-over-needle introducer. Following the path of the infused anesthetic, advance the introducer catheter at a 90° angle on the cranial aspect of the rib into the pleural space while continuously aspirating with the syringe. Aspiration of air (pneumothorax) or fluid without resistance will confirm that the tip of the catheter is within the pleural space.
   ⚠ The tip of the needle should just pass the parietal pleura.

7. **GUIDEWIRE**
   Remove the stylet and hold the catheter in place with your non-dominant hand, using your thumb to cover the end. With your dominant hand, remove the cap from the guidewire housing and use the thumb notch to retract the J tip into the straightener. Place the blue introducer tip into the catheter hub and advance the guidewire into the pleural space.
   ***TIP:** Hold the introducer hub with the thumb and index finger of your non-dominant hand, bracing the flat side of your hand against the patient to hold it steady.*

All MILA Guidewire chest tube kits include a 60cm guidewire with measurement markings every 10cm.

10cm	20cm	30cm	40cm	50cm
—	— —	— — —	— —	—

⚠ Take note of the measurement markings as they pass into the introducer to avoid inserting too much of the guidewire, which can lead to injury and/or malposition of the chest tube.

8. **TISSUE DILATOR**

Keep the guidewire stationary with one hand and remove the introducer catheter with the other. Do not let go of the guidewire. Slide the dilator over the guidewire and into the insertion site. Gently twist the dilator between your fingers as you push through the tissue. Do not use excessive force. The dilator should only be passed over the guidewire so far as to allow its greatest diameter to pass through the chest wall. If necessary, use a size 11 scalpel to enlarge the insertion site in the skin by holding the blunt edge of the blade parallel to the guidewire.

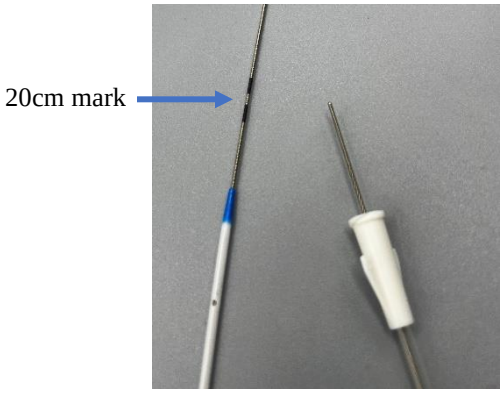
⚠ To avoid bending the guidewire with the dilator, pause to move the guidewire in and out about 1cm, ensuring that it can move easily. Do not feed the guidewire and dilator as one unit.

9. **CHEST TUBE**

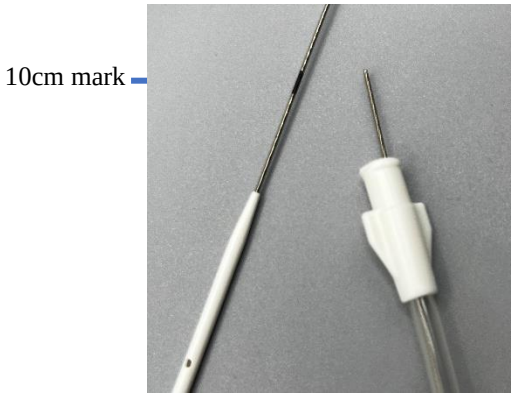
Keep the guidewire stationary with one hand and remove the dilator with the other. Thread the chest tube over the guidewire. Grasp the guidewire as it exits the catheter hub (this may require retracting the guidewire from the insertion site).

⚠ **DO NOT INSERT THE CATHETER IF THE WIRE HAS NOT EXITED THE EXTENSION HUB.**

⚠ For 30cm chest tubes, only ~10cm of the guidewire will be in the patient when it reaches through the entire catheter to the extension hub. Take care to keep the guidewire stationary when feeding onto the catheter.



20cm Chest Tube



30cm Chest Tube

While keeping the guidewire stable with your non-dominant hand, advance the chest tube into the pleural space by gently twisting and pushing it in, close to the insertion site. Advance the catheter cranially, parallel to the spine. Once all fenestrations are well into the pleural space and the catheter is inserted to the pre-measured depth, remove the guidewire (and stylet for 12Fr tubes).

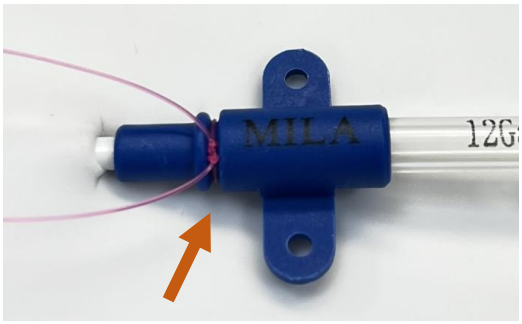
⚠ When the guidewire is removed, immediately clamp the extension on the catheter to prevent air from entering the pleural space. Securely attach the stasis valve before proceeding.

⚠ If necessary to prevent the catheter from curling back, the guidewire and catheter can be fed in unison.

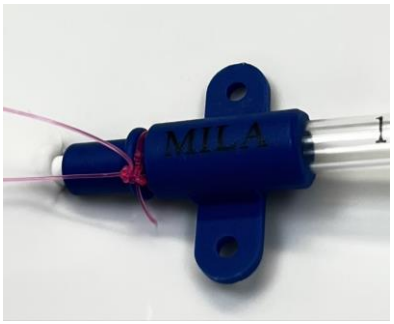
DO NOT INSERT THE CATHETER IF THE WIRE HAS NOT EXITED THE EXTENSION HUB. ALWAYS HOLD ONTO THE GUIDEWIRE.

Securement

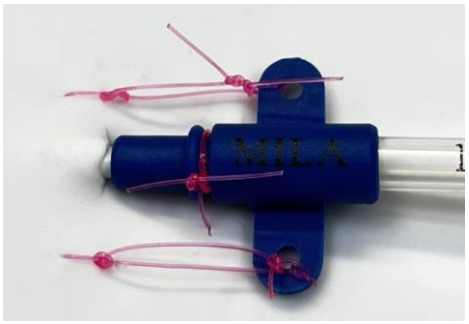
10. If the full length of the chest tube is inserted, secure the chest tube in place at the insertion site. First, tie a knot around the notch at the hub, using the loose ends to suture to the skin. Then thread the suture through the eyelets, suturing bilaterally, cranial to the insertion site.



Tie a surgeon's not around the notch in the hub.

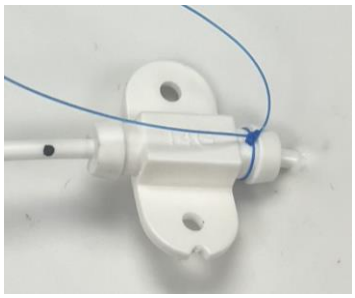


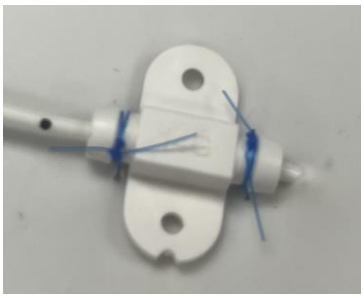
Suture to the skin under the notch.

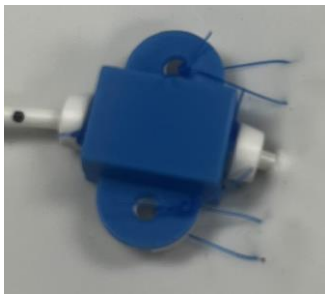


Suture the wings bilateral to the insertion site.

11. If the chest tube is not inserted to its full length, attach one of the included suture wings at the desired depth and secure it to the catheter by tying circumferential sutures into the notches or by clipping on the blue wing clamp. Thread the suture through the wing eyelets and suture bilaterally to the skin cranial to the insertion site.







12. *Optional*: Secure the catheter extension to the skin using another suture wing.

13. Evacuate the pleural space using a syringe and a 3-way stopcock or centesis adapter until negative pressure is maintained. Remove the 3-way stopcock or centesis adapter* and check that the stasis valve is fully connected.

    If necessary, connect a Heimlich valve and/or a closed suction device.

⚠ A 3-way stopcock is not necessary to keep the chest tube closed – the stasis valve is only opened when a syringe or other male luer is attached.

⚠ Keeping a 3-way stopcock attached to the chest tube may result in pneumothorax if left open by mistake.

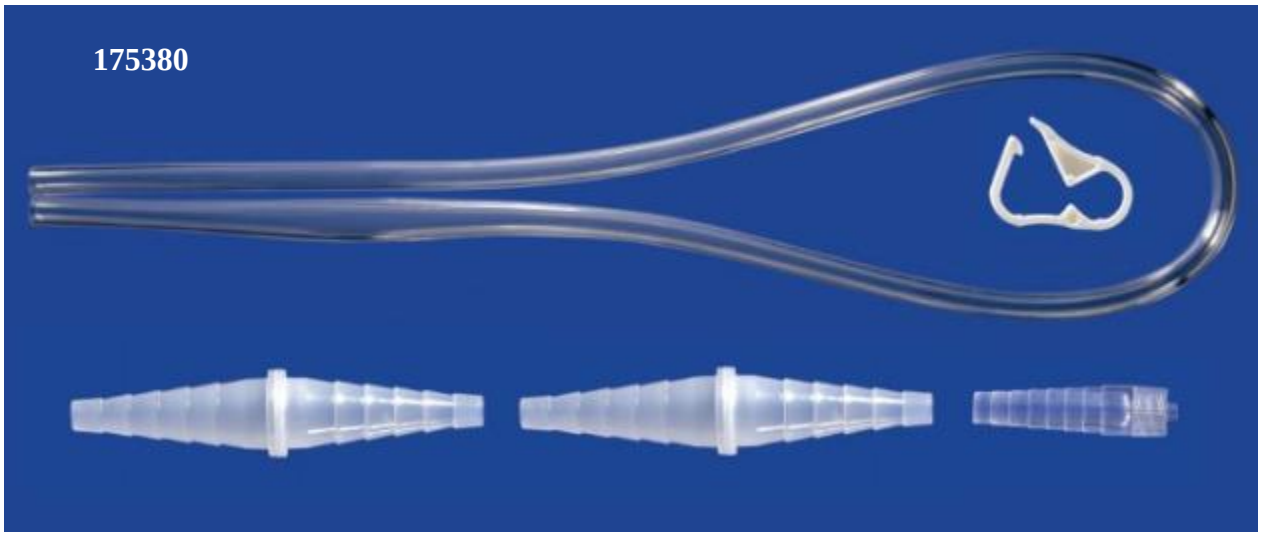
14. Cover the insertion site with a sterile bandage, according to hospital protocol.

15. Place E-collar on the patient to prevent interference. Monitor closely and regularly for any discomfort or potential complications (e.g., malposition, occlusion).

16. Confirm proper placement via radiograph or other diagnostic imaging. Document chest tube placement in the patient's medical record (see page 10).

Connection to Continuous Suction

Attaching a MILA Guidewire-inserted Chest Tube to continuous suction (e.g., Pleur-Evac) requires appropriate adapters and bubble tubing (all included in MILA Item 175380).

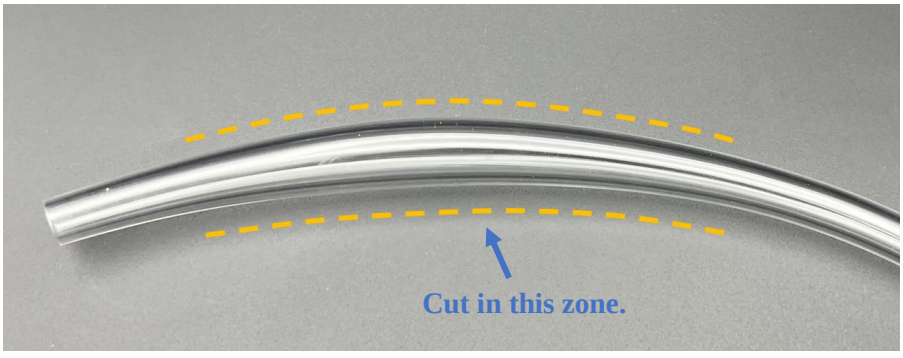


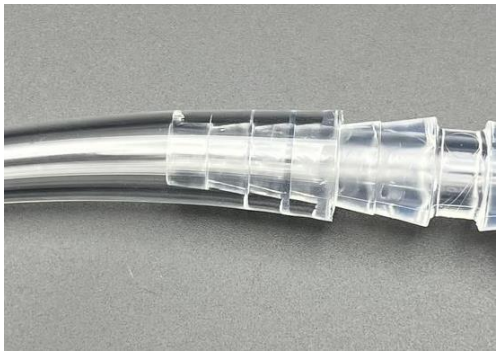
The Chest Tube Adapter Kit for Suction Systems (Item 175380) includes two dual-end barbed adapters, one barb adapter with male luer, 3 feet of bubble tubing, and one tube clamp. All components are sterile. The dual-end barbed adapters and barbed adapter with male luer are also sold individually wrapped in packs of 10 (MILA Items 2300 and 2380, respectively).
NOTE: Item 2300 is not required to connect guidewire-inserted chest tubes to continuous suction devices.

Suction System Adapters

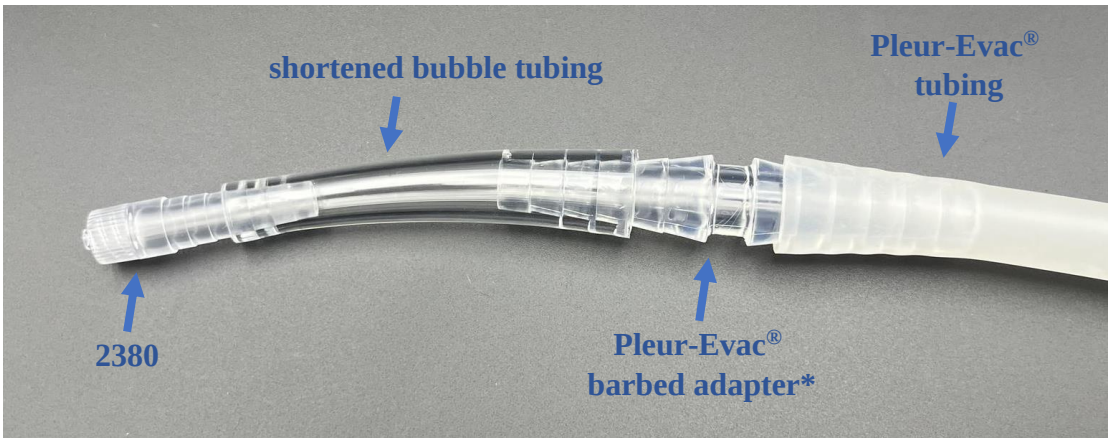
The following instructions were developed for use of a Pleur-Evac® Chest Drainage System (Teleflex). Refer to the manufacturer's instructions for Pleur-Evac® set-up and use.

1. Remove the bubble tubing from the packaging. Inspect all components – do not use if any damage is present.
2. Locate the area of the tubing with the widest diameter (the "bubble"). Use clean scissors to cut the tube at the bubble, at a diameter wide enough to fit over the large, barbed adapter on the Pleur-Evac tubing.





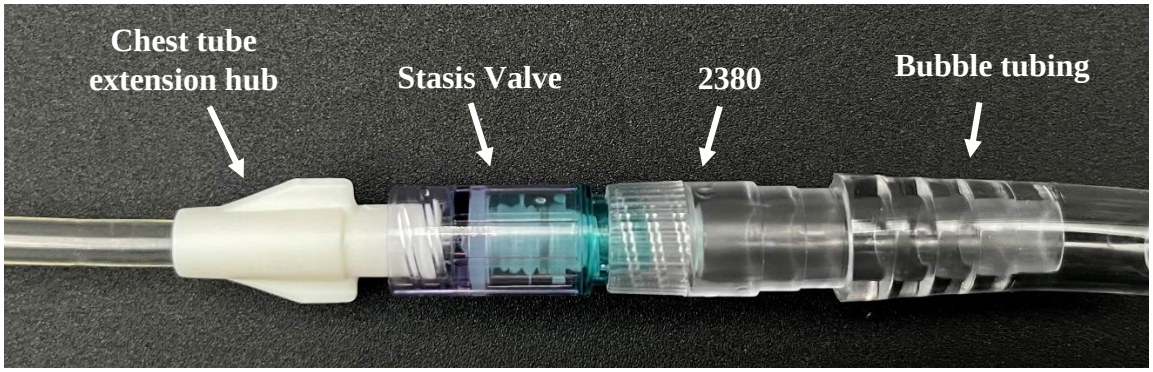
3. If necessary, cut the bubble tubing to the appropriate length. Attach the male-luer-to-barb adapter (referred to hereafter by the item number, 2380) to the other end of the bubble tubing. Ensure that both ends of the tubing fit snuggly onto the barbed adapters.



**NOTE: The large, barbed adapter between the bubble tubing and the Pleur-Evac® tubing is included with the Pleur-Evac® and should not be confused with the dual-end barbed adapters included in the Chest Tube Adapter Kit for Suction Systems (MILA Item 175380). The dual-end barbed adapters included in the 175380 kit can be used to connect the bubble tubing to the large-bore trocar chest tubes with funnel hubs or used in place of the Pleur-Evac® barbed adapter if it is damaged.*

Chest Tube Connection

1. Ensure that the stasis valve (also known as a needle-free injection port) is fully fastened onto the chest tube hub.
2. Connect the 2380 to the stasis valve and position the tubing so that it does not pull on the chest tube.



3. Unclamp the chest tube extension and activate suction according to the manufacturer's instructions.

Notes on Stopcocks

The stasis valve is *normally closed* (i.e., only opened when connected to a male luer such as a syringe).

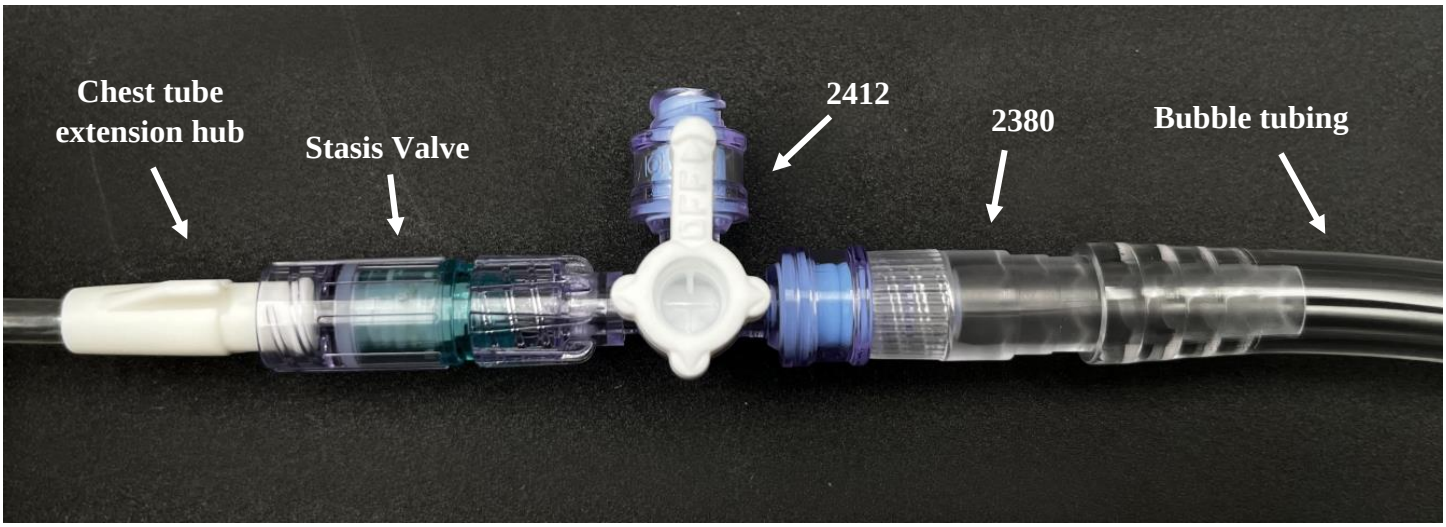
Therefore, it is *not* necessary to add a 3-way stopcock to keep the chest tube closed.

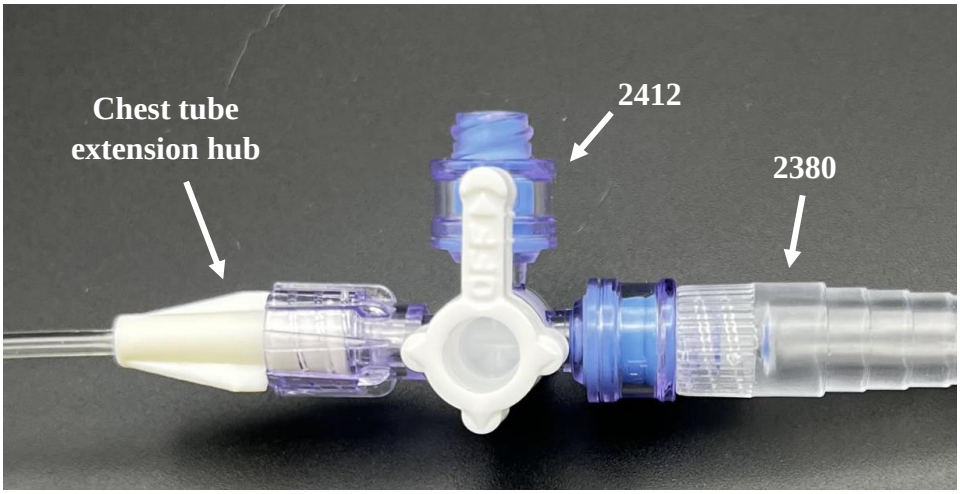
However, when used *appropriately*, a 3-way stopcock can be used with or in place of the stasis valve.

A 3-way or 4-way stopcock with integrated stasis valves (such as MILA Item 2412) is highly recommended.

The "4th way" of the 2412 is with all directions open, as shown in the photo to the right.

⚠ Using a traditional 3-way stopcock (without stasis valves) can increase the risk of iatrogenic pneumothorax if accidentally moved or left in the open position.



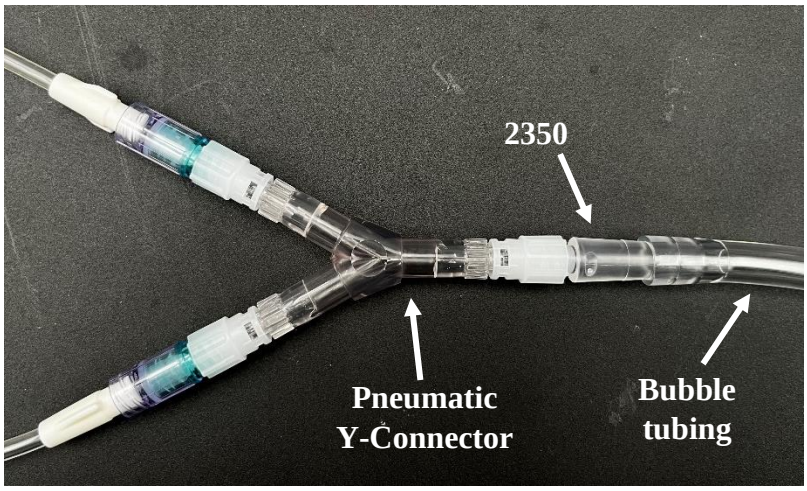


To open the connection between the chest tube and the continuous suction device, the off switch turned toward the side port (as shown above).

Bilateral Chest Tube Connection

1. To connect bilateral chest tubes to a single continuous suction device, connect a Pneumatic Y-Connector (MILA Item 2475) to the bubble tubing with a barbed adapter with a female luer (MILA Item 2350). *NOTE: This barbed adapter has a female luer, and should not be confused with MILA Item 2380, which has a male luer and is not compatible with the Pneumatic Y-Connector.*

2. Connect the chest tube extensions to the arms of the Pneumatic Y-Connector. Additional extensions may be required.



DISCLAIMER: These instructions are for supplemental education and guidance only and do not substitute professional veterinary medical advice.

Questions or comments?

Call us at 859-957-1722 or 888-645-2468
(Monday-Friday 9am-5pm EST)

or email us at
ProductSupport@milaint.com

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Chest Tube Placement Record

Place or transcribe into the patient's medical record.

Date: _____ /_____ /_____ Time: _____ : _____ am pm

Patient Name: _____ ID Number: _____

Owner: _____ Veterinarian: _____

☐ Canine ☐ Feline ☐ Other _____ Weight: _____

Indication or reason for placement: _____

Placed by: _____ Assistant/Restrainer: _____

Sedation required? ☐ Yes ☐ No _____
Drug(s), dose(s), route

_____

Tube Size: _____ Ga/Fr x _____cm MILA Lot number: _____

Depth of placement: _____cm ☐ Left ☐ Right

Comments: _____

_____

Initial aspiration after placement: _____mL of air _____mL of fluid

Description of fluid: _____

Treatment orders: ☐ Aspirate q _____ h ☐ Record PCV/TS of fluid q _____ h ☐ Perform thoracic lavage q _____ h

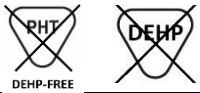
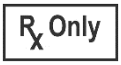
Lavage orders: _____

Placement recorded ☐ _____ Treatment orders in ☐ _____ Charges in ☐ _____

Date & time of removal: _____ Removed by: _____

Reason/cause of removal: _____

SYMBOL GLOSSARY

	Batch code/ Lot number
	Caution
	Consult instructions for use
	Contains or presence of phthalate DEHP
	Date of Manufacture
	Does not contain natural rubber latex
	Does not contain phthalate DEHP
	Do not re-sterilize
	Do not reuse
	Do not use if package is damaged
	Keep away from sunlight
	Keep dry
	Non-pyrogenic
	Non-sterile
	Not MRI safe
	Prescription only
	Temperature limits
	Sterilized using ethylene oxide
	Sterilized using steam or dry heat
	Use-by Date