UHL Neonatal Unit Chest drain insertion (Neonatal pigtail drain)

University Hospitals of Leicester NHS Trust

Trust ref: C11/2012

Contents

1. Introduction and Who Guideline applies to 1
Key Points 1
2. Procedure 2
Steps for Chest Drain Insertion 2
Analgesia 6
3. Education & Training 7
4. Auditable standard: 7
5. References 7
6. Key Words 7
Appendix A: Setting up a chest drain 8
Appendix B: UHL Neonatal Service Procedure Checklist: Chest Drain 15

1. Introduction and Who Guideline applies to

This guideline is aimed at all Health care professionals involved in the care of infants within the Neonatal Service. For chest drain insertion in PICU or chest drain management within the Children's Hospital please refer to:

Chest drain Insertion and Management UHL Childrens Hospital Guideline.pdf Trust ref: C41/2016

Key Points

- Neonatal pigtail chest drains can be used to drain a pneumothorax, haemothorax or pleural effusion
- Consider requesting a second person to be gowned to assist in the procedure.
- Complete a Procedure Safety Checklist – includes sections for before, during and after procedure (see Appendix)
- A conventional chest drain insertion technique may also be used as an alternative.

2. Procedure

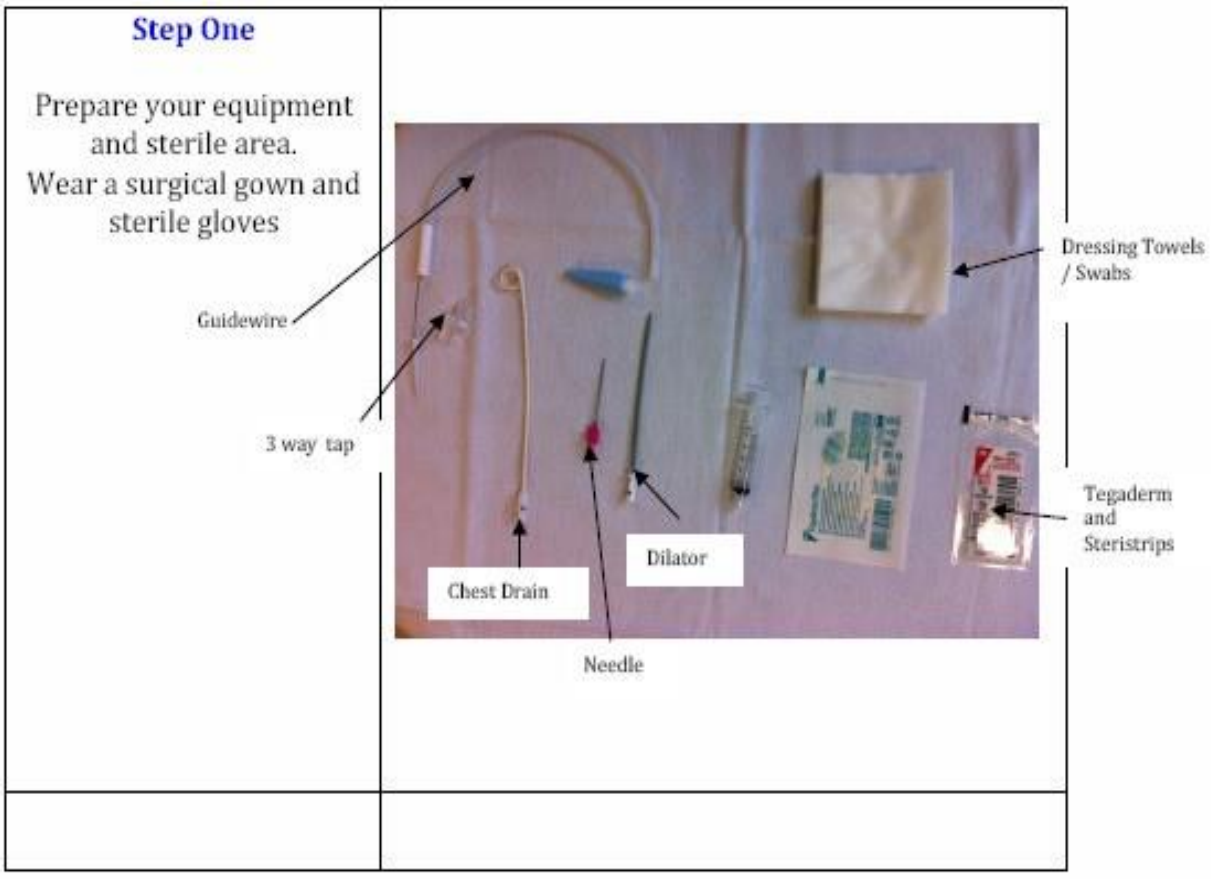
The neonatal drains come in two sizes:

- 8.5 French gauge for preterm babies and
- 10 French gauge for term babies.

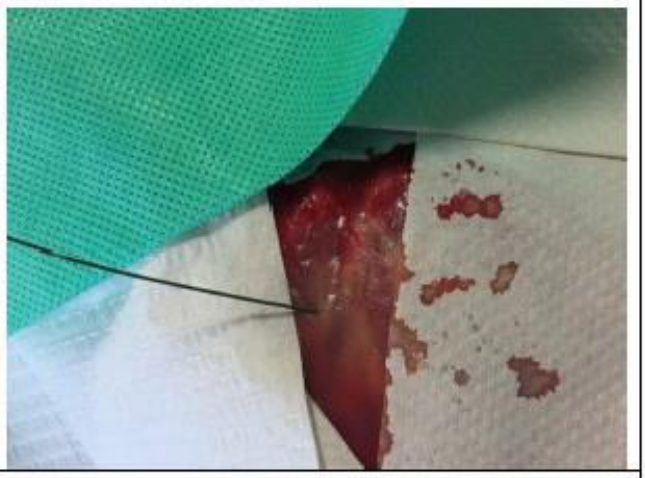
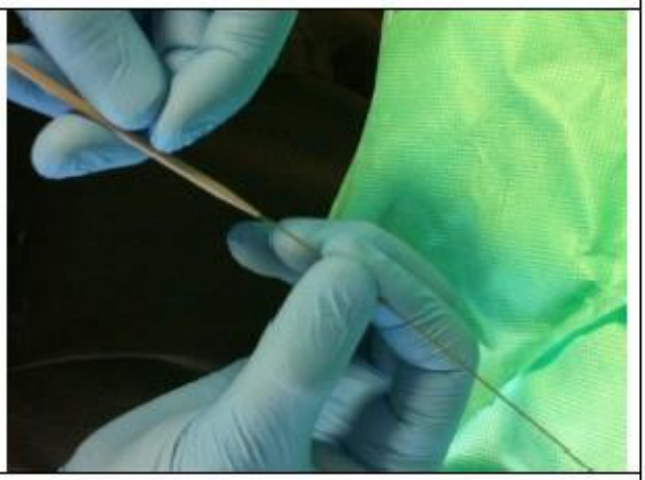
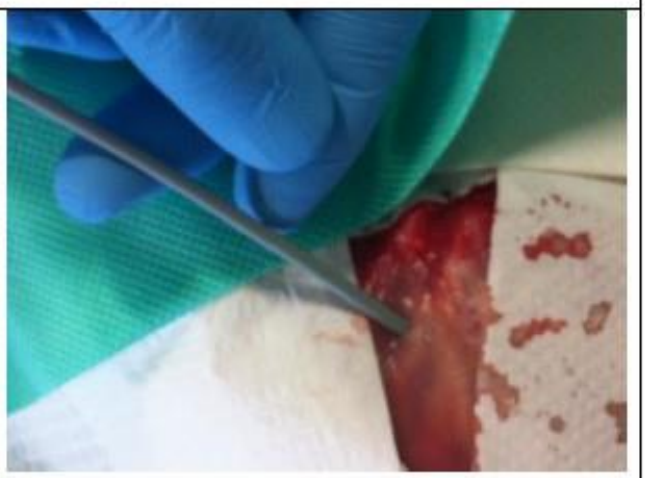
Drains should be inserted using full aseptic technique using sterile gloves and a surgical gown.

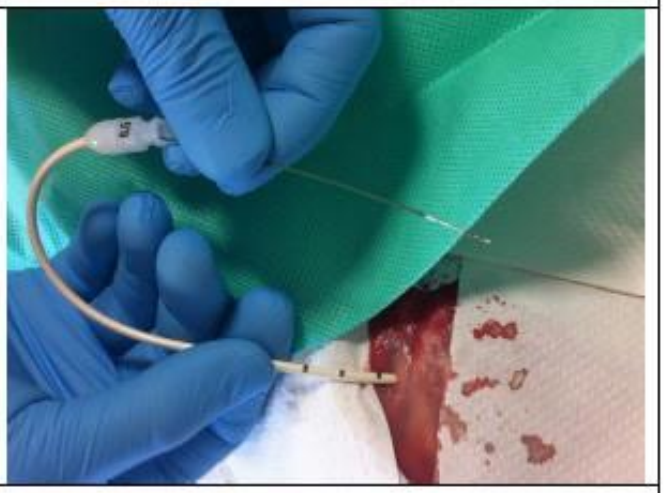
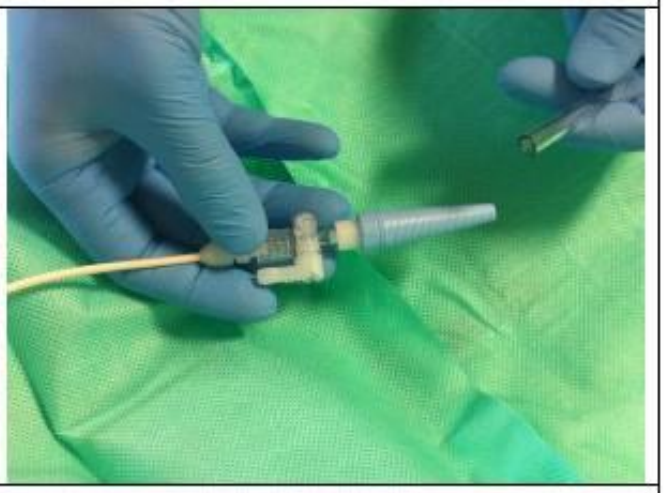
Drains can be secured with steristrips and tegaderm. A single suture securing the chest drain to the skin is recommended, particularly in an active baby.

Steps for Chest Drain Insertion



Step Two **Clean the area with chlorhexidine and cover with sterile drapes.** **The drain should be inserted in the 4/5 intercostal space in the anterior to midaxillary line** **Take care to avoid the breast tissue** **Give analgesia and local anaesthetic unless drain insertion is a medical emergency** **Attach the syringe to the needle and insert carefully through the chest wall, aspirating until you get air or fluid back.** **Be careful to insert in a controlled manner**	
Step Three **Remove the syringe. Hold the needle steady and insert the soft end of the guidewire into the chest. You should aim to insert about 5-6 cm**	

Step Four **Slide the needle off the guidewire and remove it.** **Keep hold of the guidewire at all times to stop it being inadvertently inserted too far.**	
Step Five **Slide the dilator on to the guidewire. Make sure the keep hold of the wire**	
Step Six **Using a gentle rotating action, feed the dilater through the chest wall to make a track for the drain.** **You should only need to insert 1-2cm into the chest** **Remove the dilator**	

Step Seven **Feed the end of the wire into the chest drain 'pigtail'**	
Step Eight **Feed the drain into the chest.** **Remember to keep hold of the wire** **Use the markers to guide placement of the drain**	
Step Nine **Remove the wire and attach the 3 way tap and underwater seal**	

Step Ten **Secure the drain with steristrips and tegaderm.** **Use a piece of gauze against the skin.** **Securing the drain with a single suture is recomended in an active baby** **Make sure that the dressing is airtight**	
Step Eleven **Check that the drain is secure and obtain a chest XRay**	

Analgesia

Local anaesthetic and intravenous analgesia are recommended (although time may not allow for these in the setting of a severe acute deterioration and resuscitation). Morphine can be given in a mechanically ventilated infant while intravenous paracetamol may be more appropriate in the non-ventilated infant. The dose of lidocaine (lignocaine) for infiltration at the insertion site is up to 3 mg/kg, equivalent to 0.3 mL/kg of 1% solution.

3. Education & Training

None

4. Auditable standard:

1. The position of all chest drains must be checked by x-ray following the insertion (100%).
2. A Procedure Checklist should be completed for all chest drains (100%).

5. References

1. Molloy EJ, Walsh MC (2009). Comparison of pigtail percutaneous versus traditional chest tube thoracotomy for pneumothorax drainage in neonates. Journal of Neonatal-Perinatal Medicine 2:241-245
2. Jonathan Cusack's Illustrated World of Neonatology 2012
3. BNF for children: https://bnfc.nice.org.uk/drug/lidocaine-hydrochloride.html accessed June 2018

6. Key Words

Pneumothorax, Haemothorax, Pleural effusion

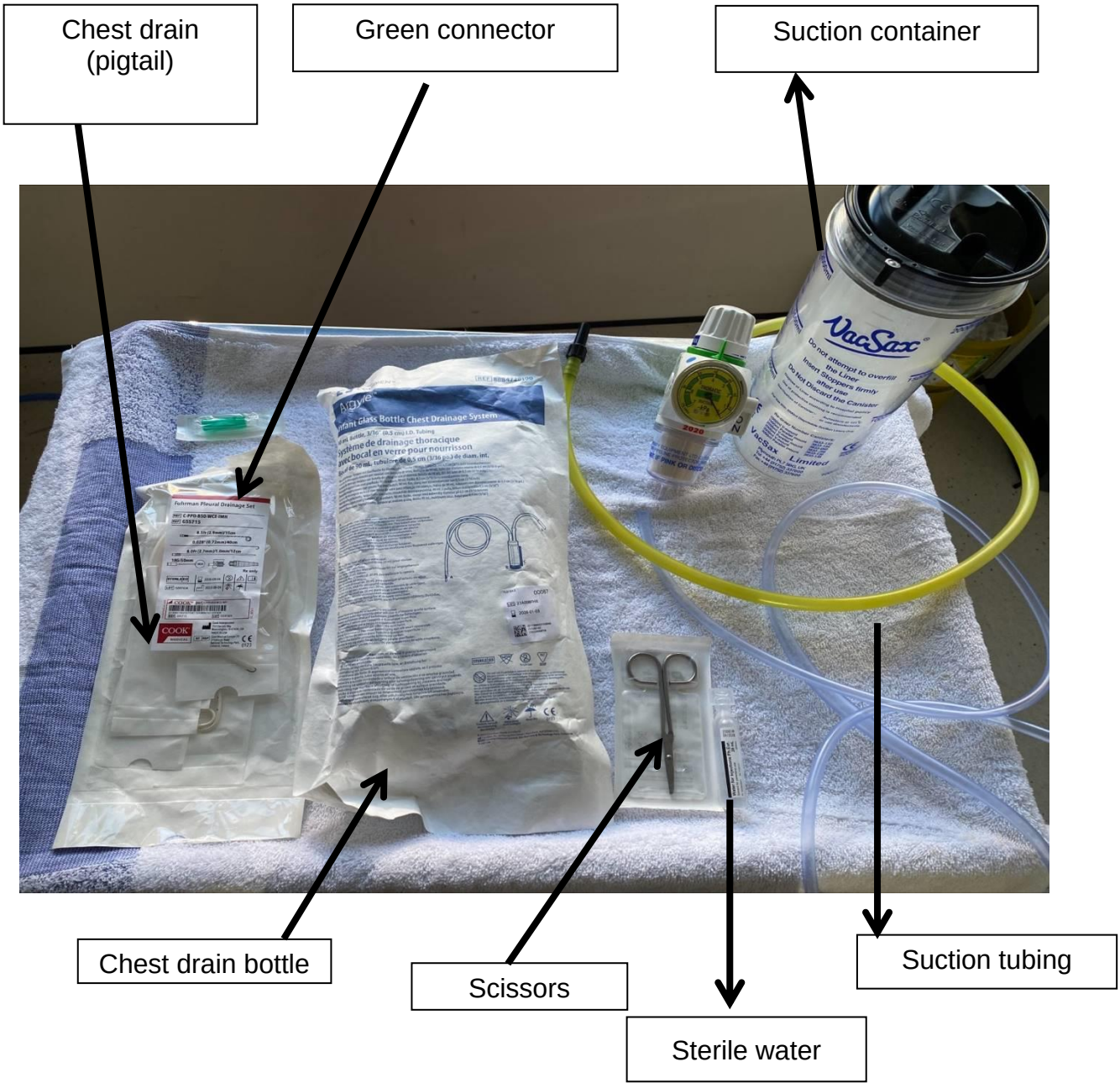
The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) Sumit Mittal – Neonatal Consultant	**Executive Lead** Chief Medical Officer

Details of Changes made during review:

June 2012	New guidance on procedure by Jonathan Cusack.
August 2015	Guidelines Meeting review (minor amendments only)
August 2015	Governance Meeting approval
May 2018	Safety Checklist added (REM)
June 2018	Neonatal Guidelines and Governance Meetings
June 2021 - Format update & related documents added	Neonatal Guidelines and Governance Meetings
February 2024 – reviewed and setting up a chest drain added as an appendix	Neonatal Guidelines and Governance Meetings

Steps 1-3: Standard set up (no suction required)
Steps 4-6: Chest drain that requires added low flow suction (thoracic suction)
Equipment needed:



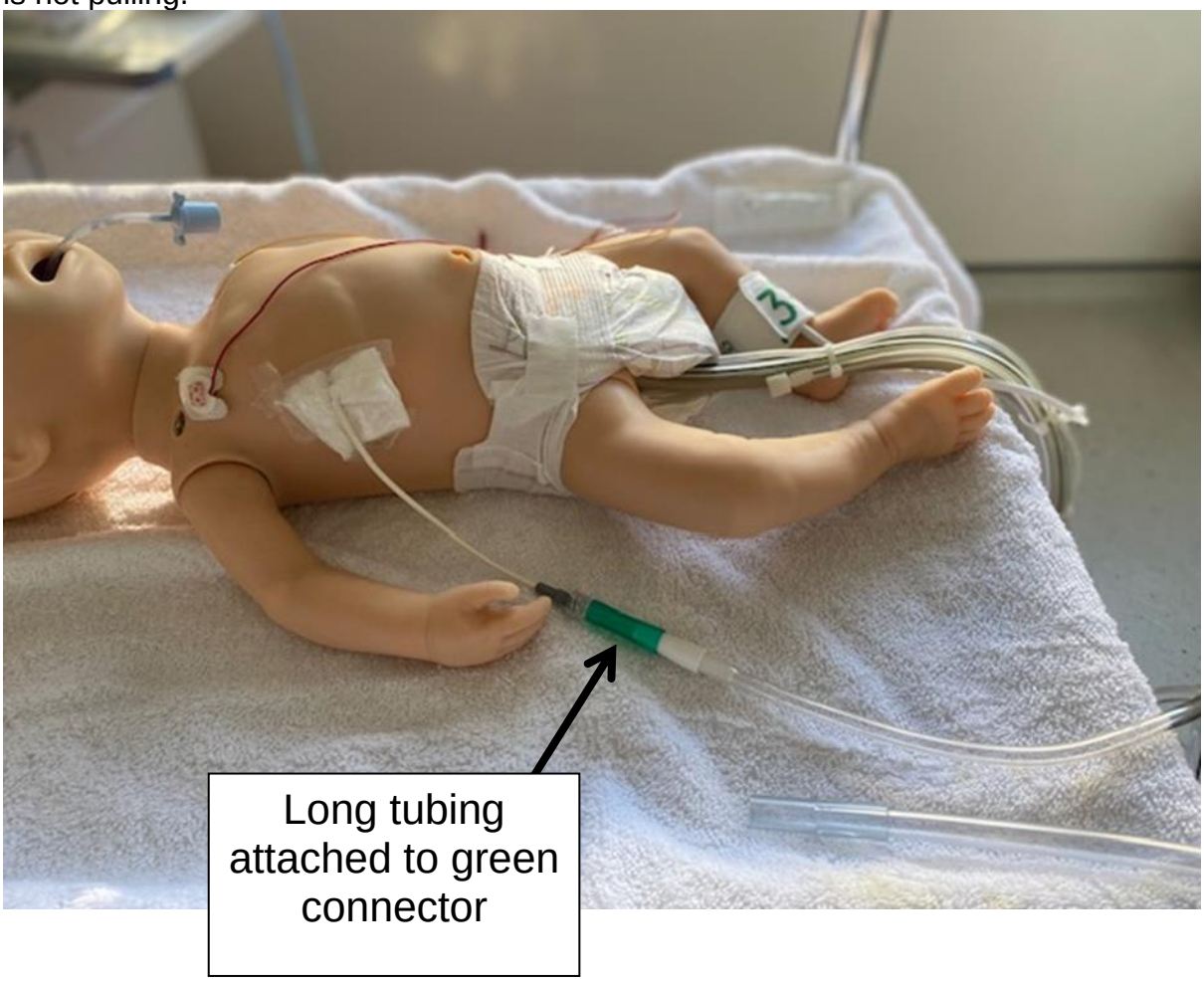
Step 1:
Following insertion of the chest drain, the green connector should be attached to the chest drain (a three - way tap can be inserted between the drain and connector at this point).

Step 2: Fill the chest drain bottle to the water level fill line with sterile water. This should be done in a sterile manner.

Water level fill is marked on the glass bottle

Step 3:

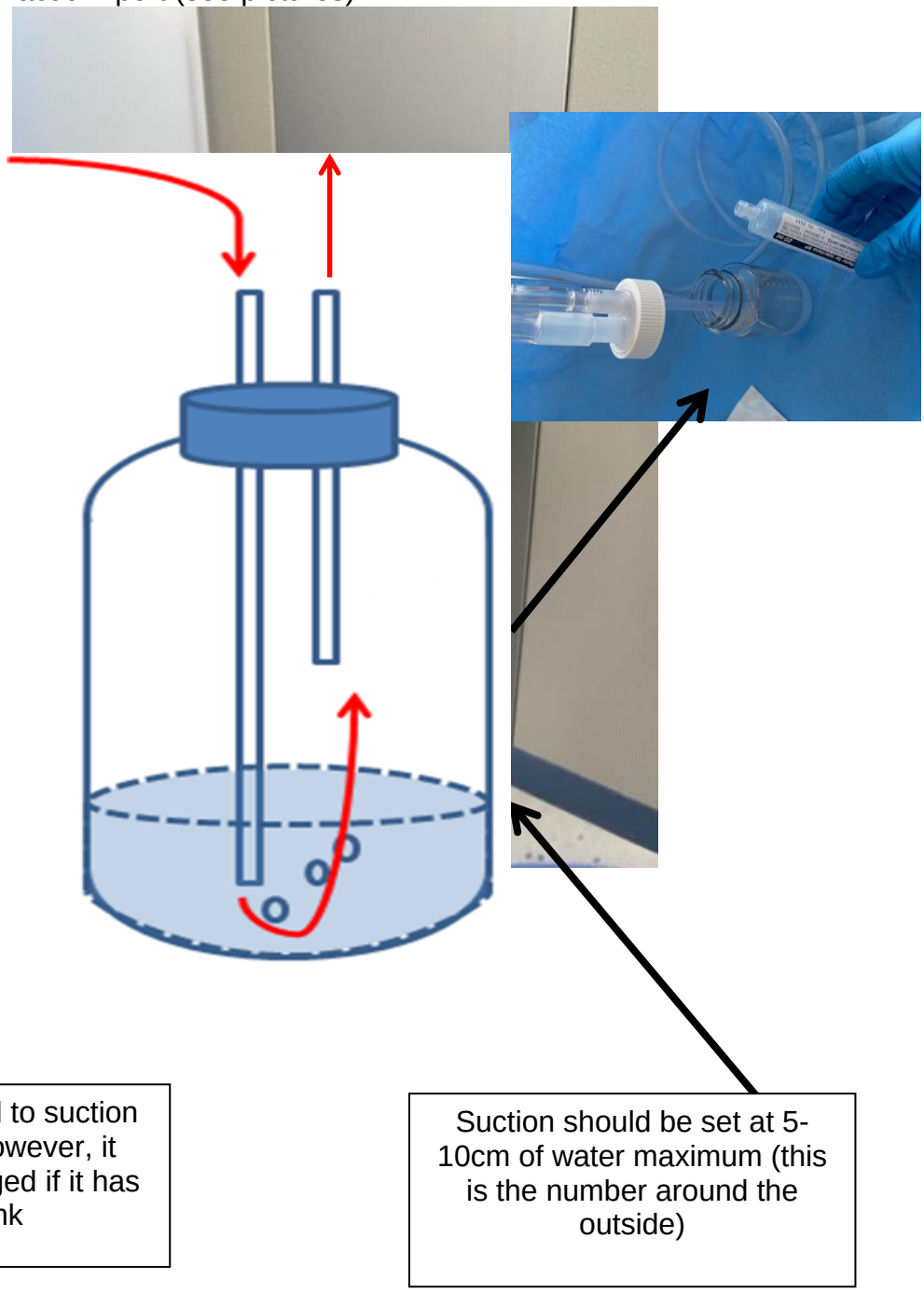
Connect the longer piece of tubing from the chest drain bottle to the green connector in a sterile manner. Ensure there is enough slack in the piping and that it is not pulling.



If low flow suction is not required, you have now completed the set up.
If low flow suction is required, please move on to step 4

Step 4:

If low flow suction is required, you need to use the low flow thoracic suction attached to the yellow vacuum port (see pictures)



Filter is connected to suction head already, however, it needs to be changed if it has turned pink

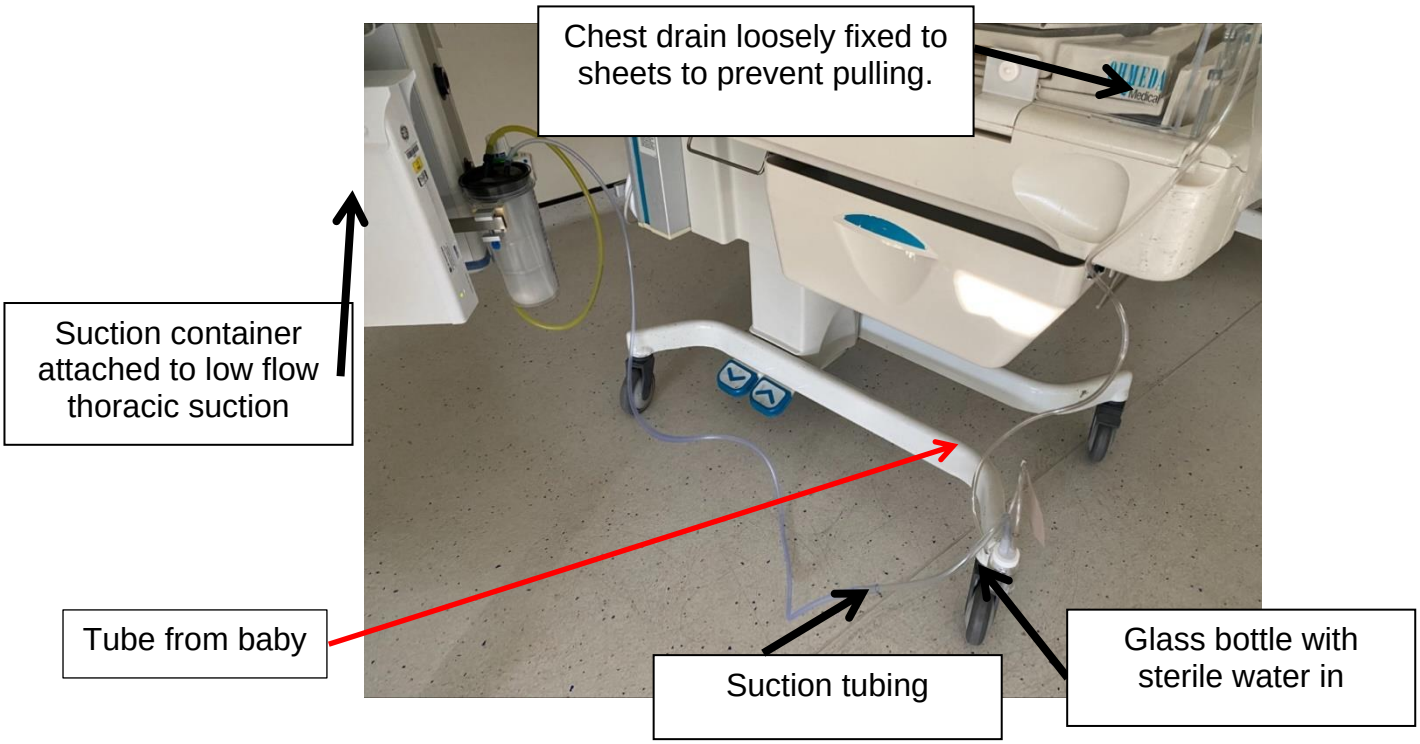
Suction should be set at 5-10cm of water maximum (this is the number around the outside)

Step 5:

Attach suction container to the low flow thoracic suction with yellow tubing.

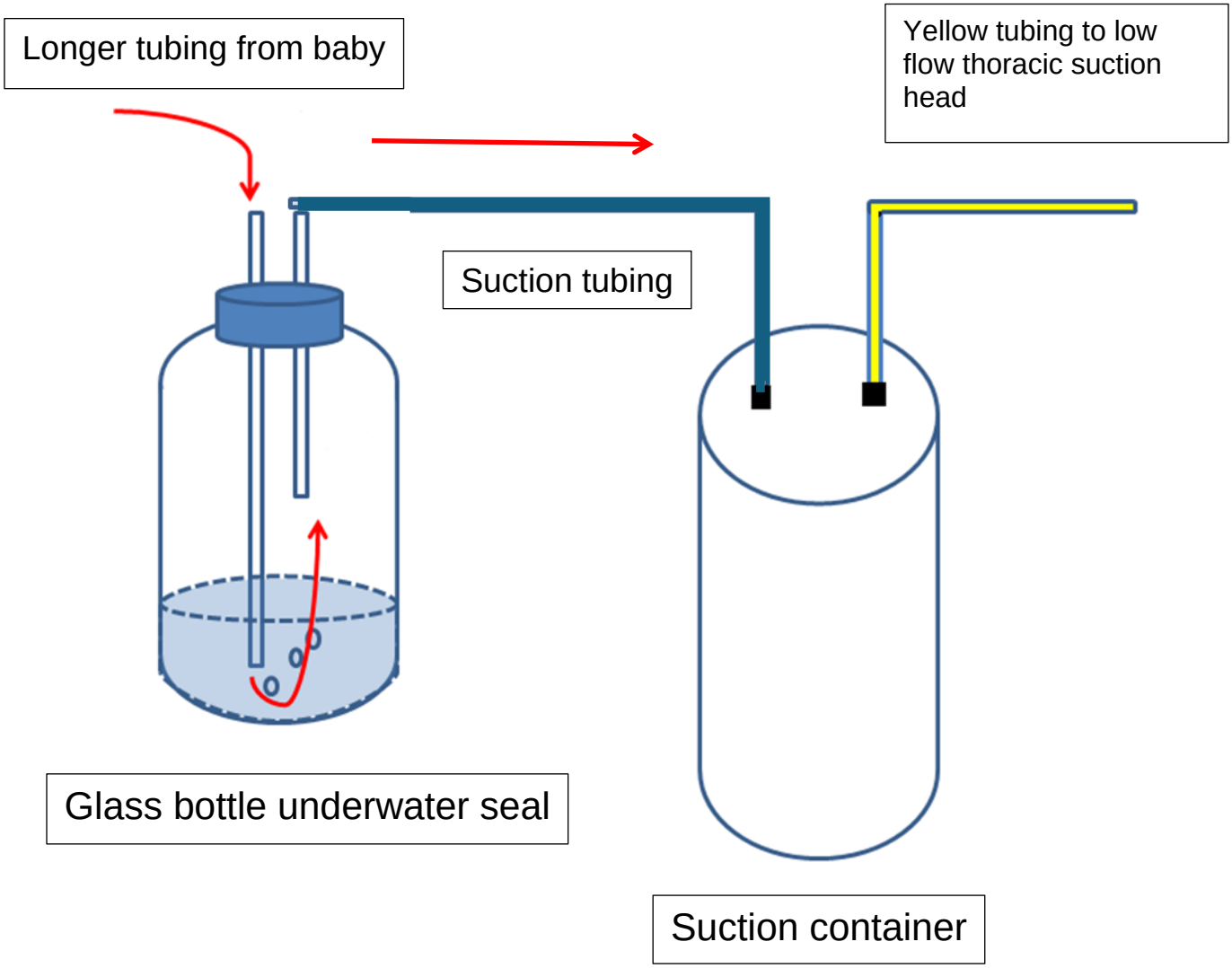
Step 6:

Remove the short tubing from the glass bottle. Attach clear suction tubing between the glass bottle and the suction container.



Once the suction is on and the drain is open the set-up is complete.

Summary:
Chest drain → long thin tubing → glass bottle (with sterile water) → suction tubing → suction container → yellow tubing → low flow thoracic suction



UHL Neonatal Service Procedure Checklist: Chest Drain

Patient Sticker
Hospital No:
Name:

DOB:

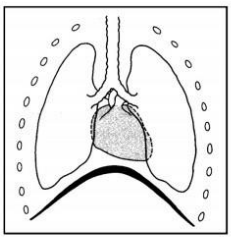
Operator:
Signed:

Observer/Assistant:
Signed:

DETAILS OF PROCEDURE
Clinical indication: **Date of Procedure:**

Confirmation of procedure and site of insertion (please mark on diagram) Yes ☐

RIGHT **LEFT**



BEFORE PROCEDURE

Consent gained / parents updated	Yes ☐	N/A ☐	(only N/A in emergency situations)
Confirmation of patient	Yes ☐		
Patient positioned for comfort/ ease of access	Yes ☐		
Sedation/analgesia (always less than 100mcg morphine when < 1000g)	Yes ☐		
Observations stable/ bloods acceptable	Yes ☐	No ☐	**Details** _____
Equipment functioning and complete	Yes ☐		

DURING PROCEDURE

Observations stable	Yes ☐	No ☐	**Details** _____
Sterility maintained/ sterile drape to cover infant	Yes ☐		

POST-PROCEDURE

Securely fixed (as appropriate)	Yes ☐				
Sterile dressing used (as appropriate)	Yes ☐				
Removal of Sharps	1. Insertion needle ☐	2. Guidewire ☐	3. Other sharps ☐		
Specimen labelled (pleural fluid)	Yes ☐				
Procedure documented in notes	Yes ☐				
Confirmation of position	CXR ☐				

Confirmed by (print name and sign): _____

COMPLICATIONS

Complications	No ☐	Yes ☐	**Details** _____
Equipment issues	No ☐	Yes ☐	_____

UHL Neonatal Service Procedure Checklist - Safety Standards for Invasive Procedures