University Hospitals of Leicester NHS
NHS Trust

Leicester Children's Hospital

Chest Drain Insertion and Management UHL Children's Hospital Guideline

Staff relevant to:	Medical and Nursing staff caring for children requiring a chest drain
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Written by: Reviewed by:	Adrian Low, Claire Westrope Claire Westrope, Lauren Maughan & Jade Wilkinson
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Related Guidelines and Policies:	
C11/2012	Chest Drain Insertion UHL Neonatal Guideline
C127/2016	Pleural Empyema UHL Childrens Medical Guideline
C35/2021	Mobilisation with Drains and Lines UHL Childrens Intensive Care Guideline

Contents

1. Indications

This guidance can be used as an aid and learning tool by medical, nursing and allied health professional staff involved in the insertion of a chest drain, care of the chest drain, and safe removal of a chest drain inserted into a paediatric patient within Leicester Children's Hospital including PICU, CICU & East Midlands Congenital Heart Centre, Ward 10 and Ward 12.

2. Precautions/Considerations

In paediatric patients with a chest drain, a chest drain will be inserted as an invasive procedure to:

- Remove the fluid or air from the pleural space or mediastinum
- Re-expand the lungs and restore normal negative intra-pleural pressure and respiratory function.

Conditions requiring a chest drain insertion include:

- pneumothorax
- haemothorax
- hydrothorax- pleural effusion
- chylothorax
- empyema
- post-operative cardiac or thoracic surgery

The National Patient Safety Agency recently raised concerns about the reported risks associated with chest drain insertion. NPSA reported 12 deaths relating to chest drain insertion and 15 cases of serious harm between January 2005 and March 2008.
The Medicines and Healthcare Products Regulatory Agency (MHRA) reported nine incidents between 2003 and 2008, all but one relating to the use of Seldinger type drains. Common themes from a review of incidents reported to the NPSA, MHRA, local investigations and literature included lack of supervision of junior doctors, the level of experience of clinicians inserting chest drains, inadequate imaging and lack of knowledge of existing clinical guidelines.
NPSA alert (2020) - Deterioration due to rapid offload of pleural effusion fluid from chest drains

Chest drain insertion flowchart

Chest drain indicated?
- •Pneumothorax
- •Haemothorax
- •Pleural effusion
- •Chylothorax
- •Empyema

- When draining fluid ultrasound should be used- use a skin marking pencil if necessary

Drain sizing guide

- o Newborn: 8-12 FG
- o Infant 12-16FG
- o Child 16-24FG
- o Adolescent 20-32FG

On heparin? — Yes → Stop heparin 4 hours before procedure after review with consultant & surgeon

Coagulopathy (INR >2) or Platelets **less** than $50x10^9/L$ — Yes → Correct coagulopathy or platelet deficiency → If emergency, consider high bleeding risk

Post- cardiac/ pneumonectomy/ lobectomy — Yes → Consult surgical team

Fill in LocSSIp – consent obtained?

Prepare patient for chest drain insertion

Insert drain (Seldinger or blunt dissection). Consider ultrasound guidance

Secure drain (2 points- insertion point & Griplock/ omental tape)

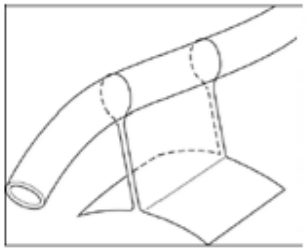
Connect to unidirectional flow drainage (kept below patient level)

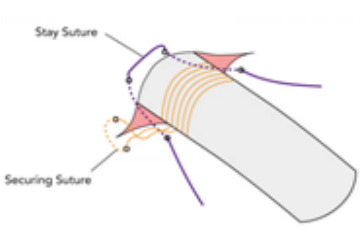
Chest X-ray + analgesia

Consider clamping drain for 1 hour once 10ml/kg fluid removed → Mobilisation allowed if non-bubbling chest drain after discussion with consultant (do not clamp when mobilsing)

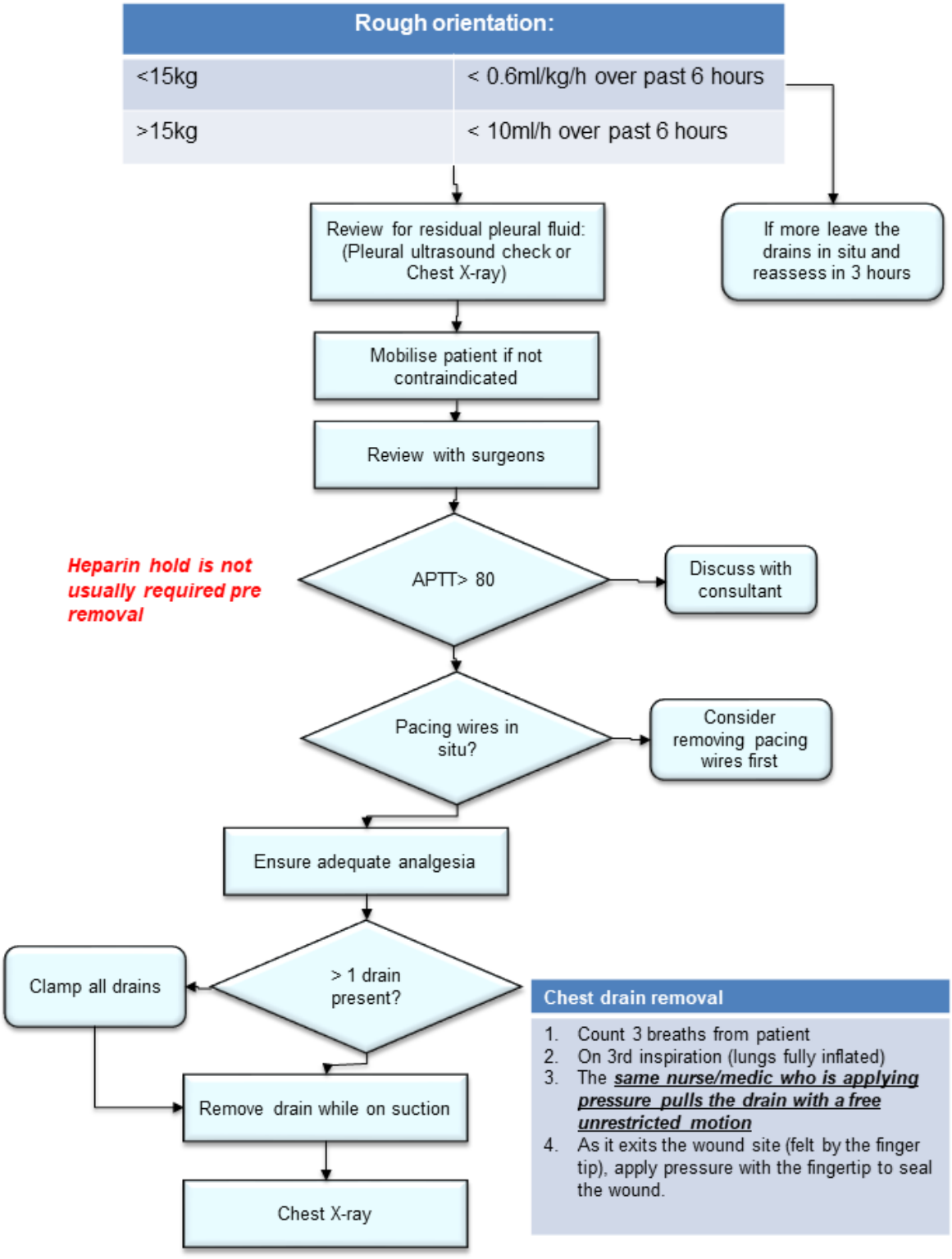
Equipment needed

- Sterile gloves, gown, mask & drapes.
- Skin antiseptic solution
- Gauze swabs
- Syringes and needles (21–25 gauge)
- Lignocaine 1% or 2%
- Scalpel and sutures
- Instrument for blunt dissection/ cut down set
- Chest tube / Seldinger chest drain set
- Connecting tubing
- Closed drainage system (including water)
- Dressing





Chest drain removal flow chart



Section 2.1: Chest Drain Insertion Technique

Pre-drainage assessment

- The person inserting the chest drain is personally responsible for carrying out all the pre-insertion checks though supervision should still be given as appropriate.
- Complete LocSSIP
- Assess risks/benefits of inserting a drain out of hours,
- Review patients obs/EWS
- Review up to date chest imaging and confirm side of abnormality
- Review allergies and medications (anti-platelet and anti-coagulation therapy)
- Consent (informed or implied)
- Where possible, any coagulopathy or platelet defect should be corrected prior to chest drain insertion. Platelet levels of at least 50x10 9/L are acceptable as per the current UHL Blood Transfusion guideline.
- The differential diagnosis between a pneumothorax and bullous disease requires careful radiological assessment.
- Lung densely adherent to the chest wall throughout the hemithorax is an absolute contraindication to chest drain insertion.
- The drainage of a post pneumonectomy/ lobectomy space or space following congenital diaphragmatic hernia repair should only be carried out by or after consultation with surgeon/surgical team.
- On Warfarin: Drains should not be inserted with an INR higher than 2 (if emergency, consider high bleeding risk). Consider switching warfarin to heparin.

Equipment

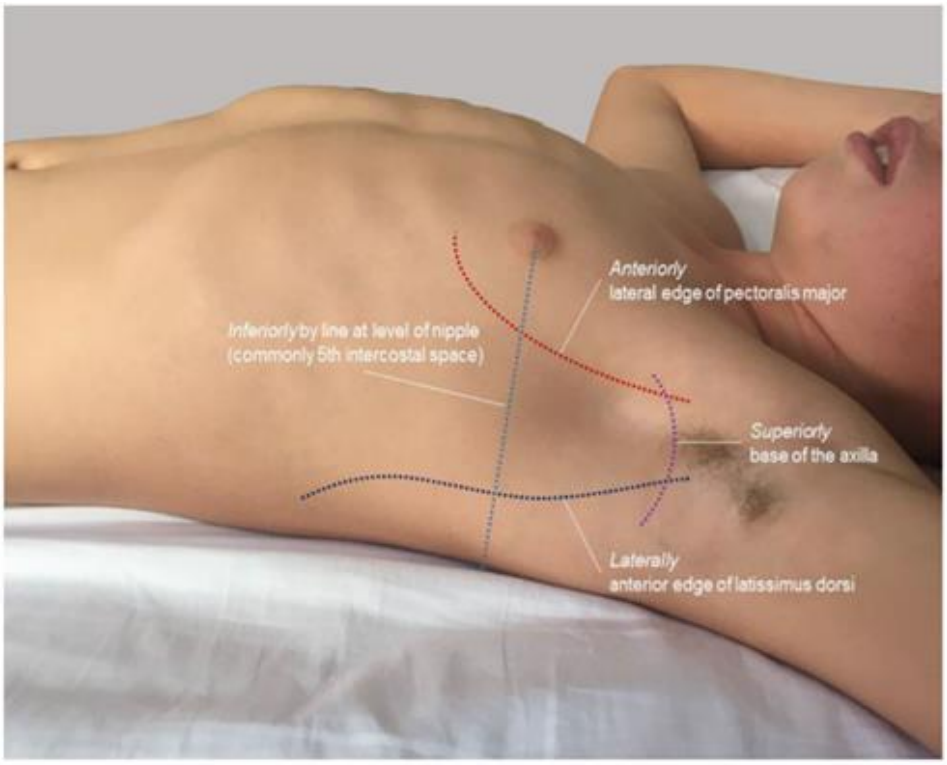
- Sterile gloves, gown and facemask.
- Skin antiseptic solution, e.g. iodine or chlorhexidine in alcohol
- Sterile drapes
- Gauze swabs
- A selection of syringes and needles (21–25 gauge)
- Local anaesthetic, e.g. lidocaine 1% or 2%
- Scalpel and blade
- Suture
- Instrument for blunt dissection/ cut down set
- Chest tube / Seldinger chest drain set
    - Newborn: 8-12 FG
    - Infant 12-16FG
    - Child 16-24FG
    - Adolescent 20-32FG
- Connecting tubing
- Closed drainage system (including sterile water if underwater seal being used)
- Dressing

Patient Position and Insertion site

The preferred position for drain insertion is on the bed, slightly rotated, with the arm on the side of the lesion behind the patient's head to expose the axillary area. Insertion should be in the "safe triangle" illustrated in figure below. This is the triangle bordered by the anterior border of the latissimus dorsi, the lateral border of the pectoralis major muscle, a line superior to the horizontal level of the nipple and an apex below the axilla. Drains are usually placed in the 4th or 5th intercostal space just anterior to the mid-axillary line – roughly level with the nipple or the lower border of the scapula.

In emergency situations the second intercostal space in the midclavicular line is accessed but, due to cosmetic reasons, a more permanent drain is placed in the usual position. When

draining fluid an ultrasound should be used to guide thoracocentesis or drain placement- use a skin marking pencil if necessary.



RCH Chest drain guidelines

Aseptic Technique
An aseptic technique should be used for insertion of the chest drain.

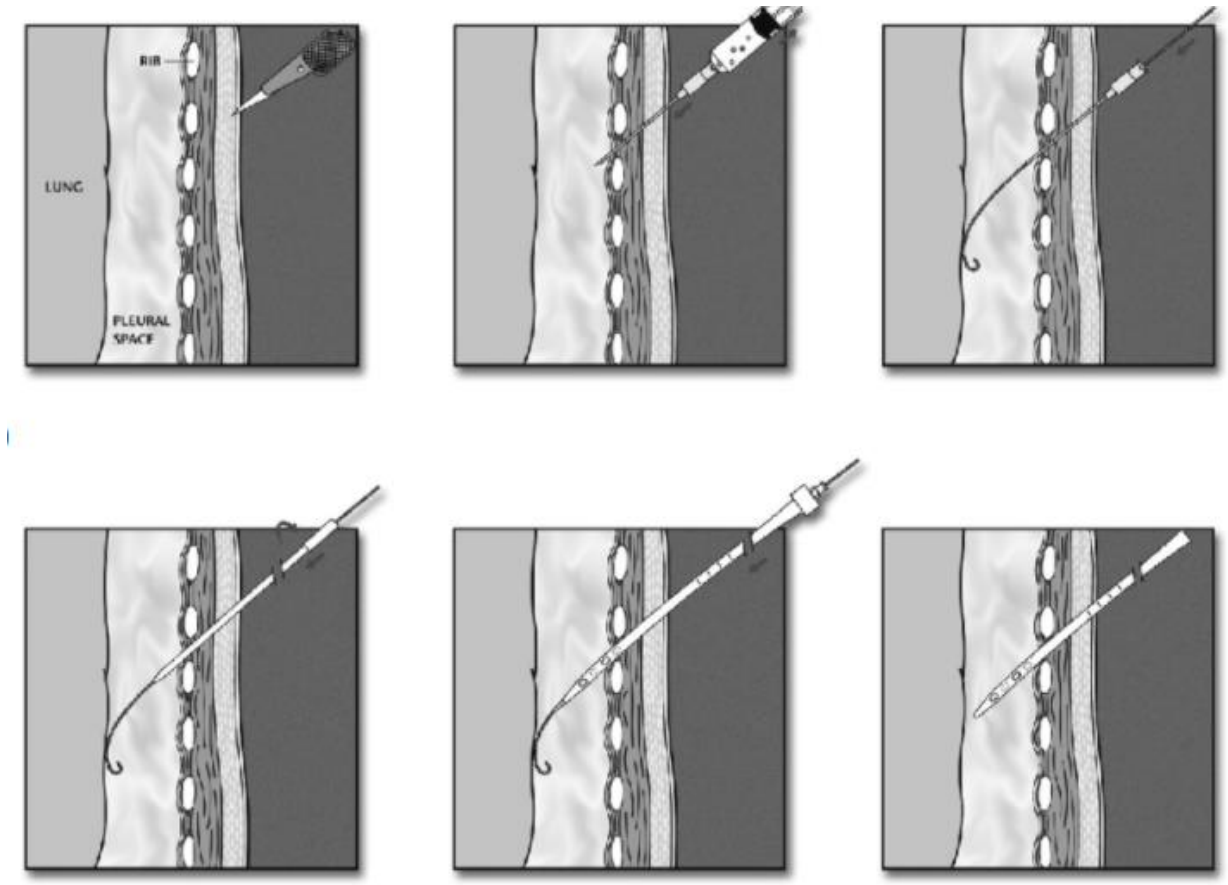
Insertion of Chest Drain

Insertion of a chest tube should never be performed with any substantial force since this risks sudden chest penetration and damage to essential intrathoracic structures. This can be avoided either by the use of a Seldinger technique or by blunt dissection through the chest wall and into the pleural space before catheter insertion.

The approach depends on the experience of the user though blunt dissection is preferred for insertion of bigger drains. The Seldinger technique results in less discomfort and scarring for the patient as well as there being a better seal around the drain.

Seldinger technique

The Leicester NICU chest drain insertion guidelines have a very useful pictorial guide on the Seldinger technique. Link:
Chest Drain Insertion UHL Neonatal Guideline C11/2012



Percutaneous insertion of a chest tube using the Seldinger technique. Source: Thal-Quick Chest Tube Instruction Manual. Cook Critical Care. Cook Incorporated, 1987.

Small bore chest tubes are usually inserted with the aid of a guide wire by a Seldinger technique. Blunt dissection is unnecessary as dilators are used in the insertion process.

Identify surface landmarks and infiltrate insertion site and deeper tissues with local anaesthesia

Use a Seldinger needle and syringe to localise the position for insertion by the identification of air or pleural fluid

Insert the needle over the top of the lower rib in the space at approximately a 60-90º angle.

Create a small amount of negative pressure with the syringe as the needle is advanced. Advance the needle until a 'pop' is felt. This will indicate pleural penetration. Air flows into the syringe when the pleural space is entered.

Disconnect the syringe and pass a guide wire through the hub of the needle.

Remove the needle, keeping the guide wire in place and make a tiny incision in the skin to accommodate the dilator. Pass a dilator over the guide wire into the pleural space. The entire dilator does not enter the pleural space.

A small bore tube can then be passed into the thoracic cavity along the wire after removing the dilator.
Remove the guide wire after an adequate amount of chest drain has been inserted.
DISCONNECT THE PATIENT FROM THE VENTILATOR (if applicable) DURING INSERTION OF CHEST TUBE TO PREVENT LUNG PENETRATION.

This procedure has been successfully used for pneumothorax, effusions, or loculated empyemas.

Blunt dissection

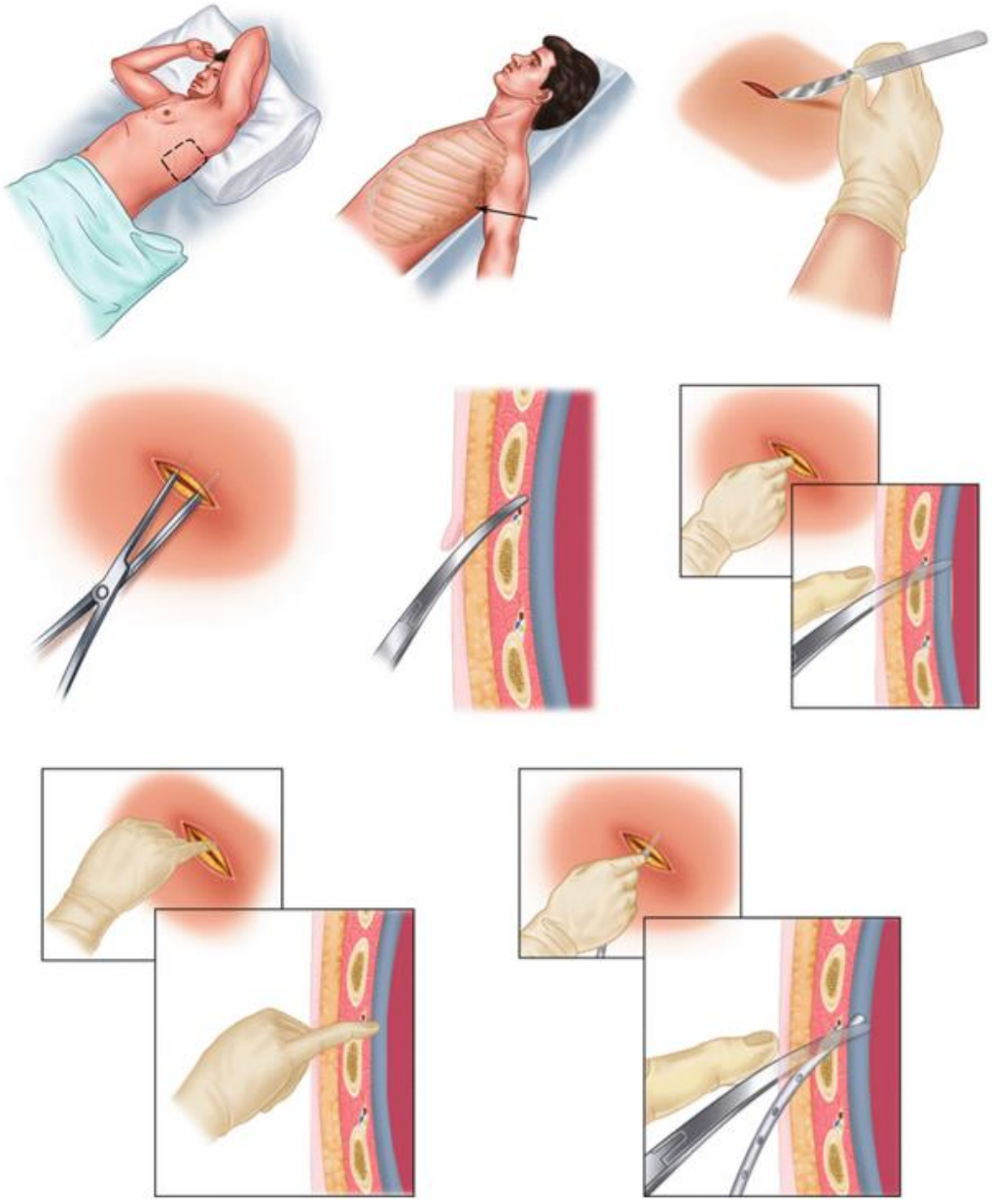
Once the anaesthetic has taken effect an incision is made. The incision should be made just above and parallel to a rib. The incision for insertion of the chest drain should be similar to the diameter of the tube being inserted.

Many cases of damage to essential intrathoracic structures have been described following the use of trocars to insert large bore chest tubes. '....If a trocar comes with a chest drain it should be discarded or only used to hold up tomato plants....'

Blunt dissection of the subcutaneous tissue and muscle into the pleural cavity has therefore become universal and is essential.

- Using a Spencer-Wells clamp or similar, make a path through the chest wall by opening the clamp to separate the muscle fibres. For a large chest drain similar in size to the finger, this track should be explored with a finger through into the thoracic cavity. The creation of a patent track into the pleural cavity ensures that excessive force is not needed during drain insertion and ensures safety of underlying structures.
- After dissecting down to the pleura, hold the forceps near the tip to control its entry into the pleura.
- Pierce the pleura by pushing the forceps over the lower rib and through the pleura using a twisting motion. A 'pop' is felt as the pleura is breached.
- Maintain the forceps in place and return the grip to the handle. Use the forceps to enlarge the pleurotomy.

DISCONNECT THE PATIENT FROM THE VENTILATOR. Remove the forceps and insert the drain preferably angled anteriorly to drain air, posteriorly to drain fluid**.**



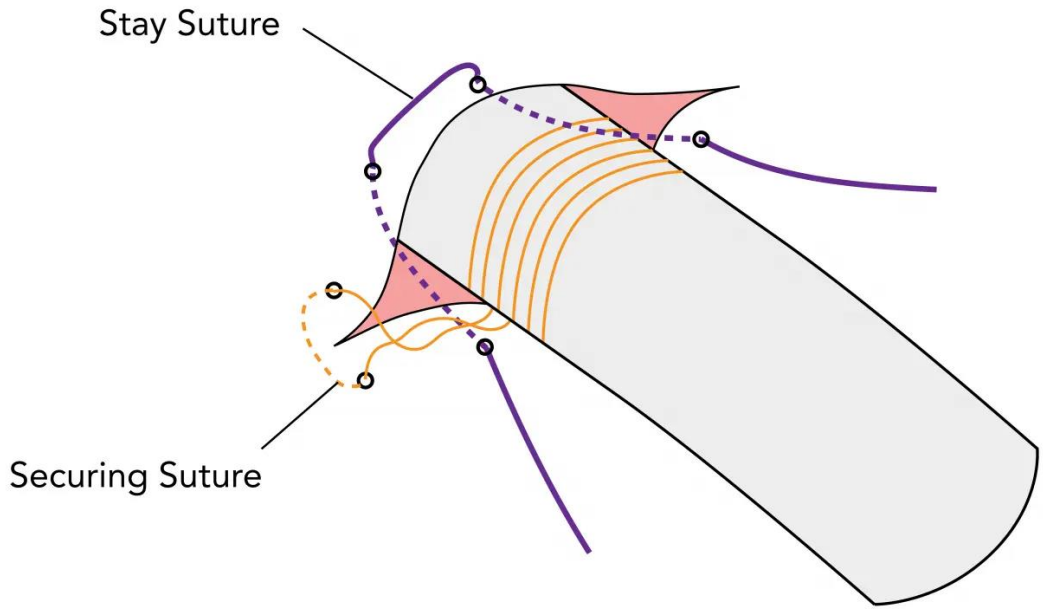
Allen B.R., Ganti L. (2016) Chest Tube Thoracostomy. In: Ganti L. (eds) Atlas of Emergency Medicine Procedures. Springer, New York, NY. https://doi.org/10.1007/978-1-4939-2507-0_23

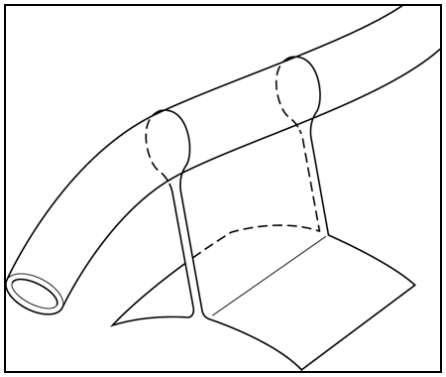
Position of tube tip

- The position of the tip of the chest tube should ideally be aimed apically for a pneumothorax or basally for fluid. However, any tube position can be effective at draining air or fluid and an effectively functioning drain should not be repositioned solely because of its radiographic position.

2.2 Securing the drain

Two sutures are usually inserted—the first to assist later closure of the wound after drain removal and the second, a stay suture, to secure the drain (see illustration below)





A transparent dressing allows the wound site to be inspected by nursing staff for leakage or infection. An omental tag of tape (as shown in the picture above) allows the tube to lie a little away from the chest wall to prevent tube kinking and tension at the insertion site.

Pigtail drains require securing at 2 points at the minimum – at the insertion point and to the patient's abdomen (or side of the chest) with an omental tape or GripLock.

2.3 Initial After Care

- Continual observation for the first 15 minutes following CD insertion and then Obs every 15 minutes for the 1st hour so that Re-expansion pulmonary oedema can be identified
- Ensure adequate pain relief
- A chest radiograph should be performed after insertion of a chest drain.
- All chest tubes should be connected to a unidirectional flow drainage system (such as an underwater seal bottle) which must be kept below the level of the patient's chest at all times

- Appropriately trained nursing staff must supervise the use of chest drain suction
- Clear guidance on drainage limit - Avoid draining too much fluid too quickly. In cases of massive effusion or empyemas consider clamping the drain for 1 hour once 10 ml/kg are initially removed to prevent cardiovascular instability.
- Consider adult limits in older children and adolescents - current BTS guidance says no more than 1500mls in the 1st hour, and no more than 1000ml for smaller adults
- Plan for controlled pleural drainage (with a 3-way tap for Seldinger drains) - Stop drainage by turning the 3-way tap if any of the following red flags show:
- Chest pain or discomfort on drainage
- Persistent cough or worsening breathlessness or vagal symptoms on drainage
- Deteriorating observations
- When 1500mls removed (or other appropriate amount), reopen 3-way tap after 1 hour and allow no more than 5ml/kg or 500mls to be removed per hour
- Free drainage when drainage less than 5ml/kg/h or 500mls/h.
- POST-OPERATIVE SURGICAL PATIENTS ARE NOT INCLUDED IN THIS CATEGORY.
- A bubbling chest drain should never be clamped
- Escalate any serious complications urgently to senior decision maker

2.4 Documentation

- Pre-procedure documentation must include LocSSIP and consent
- Procedure must be recorded in medical notes by the practitioner and said practitioner must provide clear verbal and written instructions to nursing staff regarding fluid drainage management
- Post procedure documentation must include specific suction requirements

Section 3: Chest Drain Care

The following section will provide guidance for nurses and nursing associates caring for a child/ young person requiring chest drain management. This includes student nurses/ trainee nursing associates that have been assessed by their supervisor to deliver the care under the supervision of a registered nurse
This guidance needs to be performed in line with relevant infection prevention and consent policies to ensure the patient's receive safe care and that they understand the care being delivered to enable co-operation.

3.1 Bed Space/ Safety Checks

- Ensure bed space is tidy and access to emergency equipment is available and ready to use at all times.
- Resources required:
    - Closed under water seal drainage system
    - 2 chest drain clamps
    - Sterile dressing for drain insertion site if oozing fluid
    - Tape to secure tubing to patient's side (particularly on mobilising)
    - Low pressure wall suction (as directed by medical staff)
    - High pressure wall suction should also be available
    - Fluid balance/Chest drainage chart
- At least two chest drain clamps must accompany the child/young person at all times

- If low pressure suction is required (as per medical plan – usually 3-5 kpa or 22-27mmHg) then ensure high pressure suction is also available.
- Never allow the drainage bottle to be elevated above the level of the patient's chest

3.2 Patient Assessments

- Ongoing respiratory assessment must be performed, including respiratory effort, chest movement and air entry
- Assess and record vital signs regularly as per patient's condition, starting hourly and reducing as patient condition improves
- Regular pain assessments and analgesia are required for the duration of a chest drain being insitu

3.3 Chest drain monitoring requirements

- Chest drainage system
- Observe/ monitor:
  - Swinging in the underwater seal chamber with respiration, no swinging may indicate an obstruction
  - Bubbling in the underwater seal chamber, should only be seen during expiration as air and fluid drain from the pleural cavity. Constant bubbling may indicate an air leak
  - Security of the drain including; holding sutures, drain connections, occlusive dressing is intact, tubing is supported and two chest drain clamps are available at all times

3.4 Chest drain site

- Observe/ monitor:
  - Skin condition
  - Signs of infection
  - Signs of fluid leakage
  - Audible air leak
  - Subcutaneous emphysema (air leak into the tissues)

3.5 Drain/ fluid loss

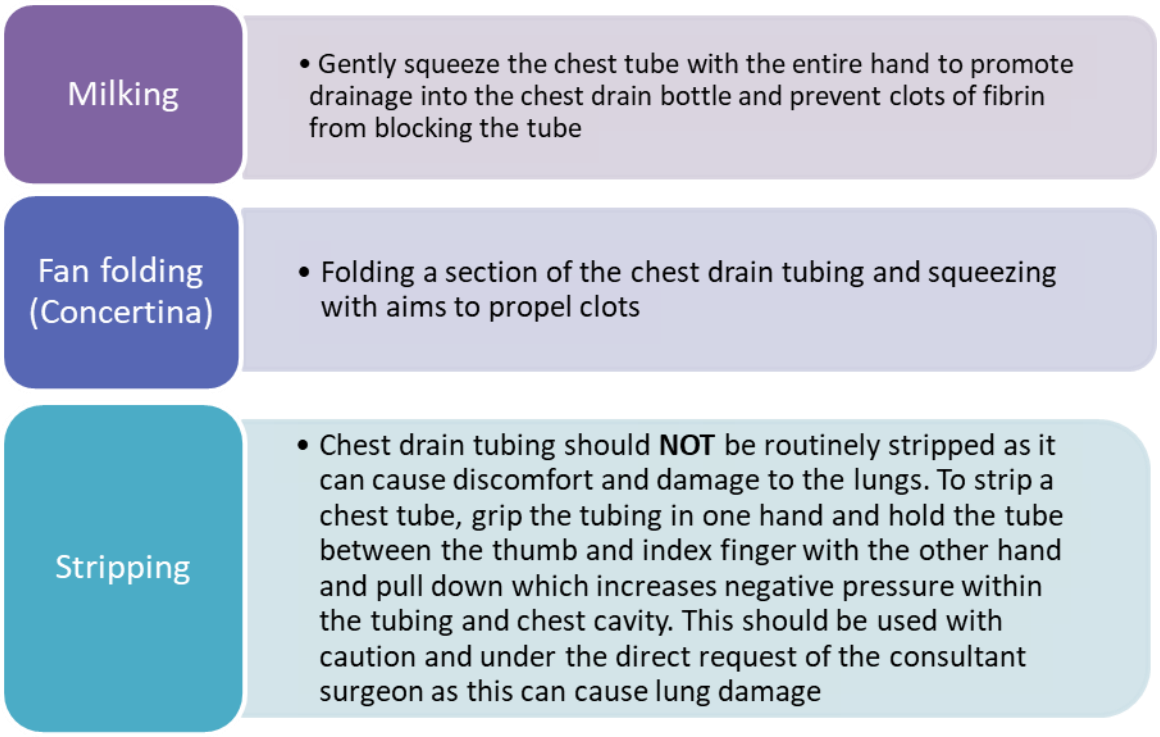
- Ensure the child/ young person is in a comfortable position (lying or sitting) prior to manipulating the tubing. Lift the redundant loops of the drain prior to recording
- Hourly recordings of drain losses are required, including observation of colour and consistency of the fluid
- Notify medical team if; sudden increase in drainage losses or a sudden pause in drainage occurs following ongoing losses
- If fluid replacement therapy is required due to increased drain losses, this needs to be prescribed and documented on the patient's fluid balance chart
- Fluid from the chest drain may require testing for infection and/ or haemoglobin and blood protein levels if losses do not reduce
- All above observations and monitoring must be documented

3.6 Clamping a chest drain

- **IMPORTANT:** Clamps should not be left on for long periods of time. If a patient has a continuous air leak (drain is bubbling all the time) **it must never** be clamped.
- Chest drains **do not** routinely need to be clamped for patient transfer or patient position changes/ movement/ mobilisation
- Drains are clamped during Urokinase installation (see Empyema UHL Childrens Medical Guideline)
- Drains may require clamping during specimen collection (See Part 3.8 – Specimen collection)

3.7 Managing/preventing a blocked drain

- Chest drains that are inserted following cardiac or thoracic surgery (mediastinal drains) will require chest tube manipulation to maintain patency whilst they continue to drain. Pleural drains may also benefit from this
- The following techniques can be used with caution to help an occluded tube, prevent cardiac tamponade and the formation of clots:



3.8 Specimen collection

- Specimens must be collected from the chest tube and not the drainage bottle. Collecting a specimen will require the use of the chest drain clamps and appropriate use a 3 way-tap if present. Obtaining a sample will require Aseptic Non-Touch Technique (ANTT).

3.9 Patient mobilisation with chest drain insitu (see also Mobilisatiion with Drains and Lines UHL Childrens Intensive Care Guideline)

- Prior to mobilising/ moving a patient check the security of the drain ensuring it is anchored to the patient's abdomen/side of the chest to minimise traction and discomfort. Incorrectly secured drains must be reviewed and secured prior to any mobilising/ movement
- Pain management is essential to achieve mobilisation, coughing and deep inspiration which is required to aid the patient
- Involve the physiotherapist team as early as possible
- Patient's with a non-bubbling chest drain may be allowed to leave the ward with/ or without nursing supervision, however, this is at discretion of the primary team consultant and must be recorded in the patient's notes
- Patients and their parents/carers must be informed of any risks they may encounter if assisting in their child mobilising and how to access help if anything untoward occurred i.e. drainage bottle above the chest level, what to do in an emergency

3.10 Maintenance

- Drainage bottle to be changed daily if full, or every 3 days
- Dressings must be changed if no longer dry and intact. If signs of infection consider regular dressing changes. No evidence suggests routine dressing changes

4. Complications

4.1 Tension Pneumothorax

EMERGENCY REQUIRING IMMEDIATE ATTENTION!

This occurs when the intrapleural pressure exceeds atmospheric pressure. Symptoms include:

- Tachycardia
- Hypotension
- Cyanosis
- Neck vein engorgement
- Tracheal deviation to the opposite side of the pneumothorax

In the event this happens:

- Escalate immediately to the medical team or '2222' call
- Administer high flow oxygen
- The medical team will perform thoracentesis (needle aspiration) to remove the air to stabilise the patient

4.2 Accidental disconnection

Accidental disconnection may result in air to enter the pleural space, causing respiratory compromise. In the event this happens:

- Immediately attend to the disconnection
- Assess the child using ABCDE for any clinical changes
- Report to the medical team as a chest X-ray may be required
- Document the incident and inform the family

4.3 Chest drain displacement or accidental removal

If drain is displaced/ accidentally removed there is a risk of air entering the pleural space. In the event this happens:

- Occlude the insertion site
- Apply sterile gauze and tape whilst continuing to occlude the hole in the skin
- Assess the child using ABCDE for any clinical changes
- Report to the medical team as a chest X-ray may be required
- Document the incident and inform the family

4.4 Blockage of the chest drain and/ or tubing

- Refer to Section 3.7 regarding managing/preventing a blocked tubes

- If this persists and there is a lack of drainage or clinical deterioration then alert to the medical team as a chest x-ray may be required to check placement. The medical team may also decide to flush the chest drain to remove the blockage to increase drainage (this must be a sterile procedure)

4.5 Other complications

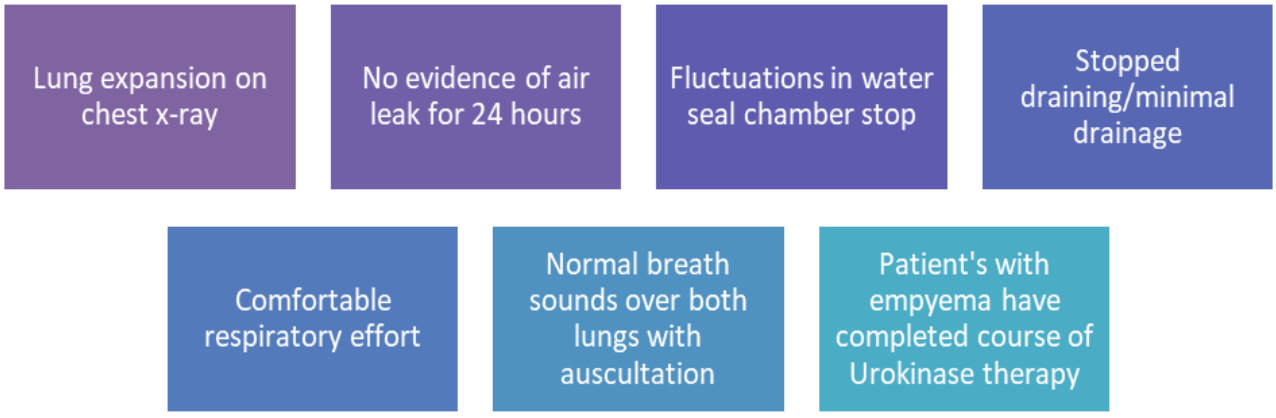
Notify the medical team if you observe any of the following:

- Clinical deterioration of the patient, consider:
    - Re-expansion Pulmonary Oedema
    - Signs of secondary infection of progression of current infection
    - Air leak/ Surgical emphysema (air leak into the surrounding tissue)
    - Drain blockage and collection of fluid in the chest
- Fresh blood draining from the chest
- If drain suddenly stops swinging/ bubbling (in case of pneumothorax and necrotizing pneumonia)

Liaise with the Paediatric respiratory team or intensive care team to support with the specific management of these situations

Section 5: Chest Drain Removal

5.1 Indications



Important points prior to chest drain removal post cardiac surgery
Presence of residual pleural fluid (pleural ultrasound check or chest Xray)
Surgical review
APTT <80 (if higher discuss with consultant) **Drains can be removed safely as long as the INR is less than 4**
Adequate analgesia
Pacing wires removed (usually)
Drain volumes (< 15kg: < 0.6ml/kg/h over past 6 hours; >15kg: > 10ml/h over past 6 hours) **Please note: Heparin hold is not required pre-chest drain removal**

Prior to removal of a chest drain the medical and surgical teams must have requested and/ or agreed for removal of chest drains

5.2 Analgesia

- Removal of chest drains is a painful procedure and analgesia must be considered alongside any distraction therapy by an appropriate member of staff
- Consider IV morphine bolus 5-15 minutes prior to procedure or oromorph 30 minutes prior to procedure (refer to BNFC and Medusa for guidance)
- In PICU/CICU the patient may require conscious sedation under a consultants decision and patient must be nil by mouth (NBM) – follow Pre-Anaesthesia Fasting Recommendations UHL Paediatric Intensive Care Guideline (C47/2021)

5.3 Pre - Procedure

The following must be considered prior to removing a drain:

- Minimum of two nursing/medical professionals are required
- Correct preparation of patient
- At minimum monitor oxygen saturations throughout the procedure in all areas and ECG monitoring for patients with a mediastinal drain
- Personal Protective Equipment (PPE) must be worn as per infection prevention policy and principles of ANTT must be applied throughout
- If multiple drains are present, isolate the drain being removed
- Continue with suction if it being applied during the procedure

5.4 Procedure

Consider type of suture that is securing the drain

Drains with mattress/ purse strings

- Ensure there is a usable mattress/ purse string suture to seal the would site and free the ends of the purse string suture with a safe sharp stitch cutter
- If there are no usable purse string suture available, inform the intensivist or surgical team who will make a decision on whether a purse string suture is necessary (occasionally a steristrip is adequate)
- The two free ends of the purse string suture are raised with tension by the 2nd member of staff to ensure the wound is sealed and then tied under tension with at least 5 knots

Drains with stay sutures

- Free the fixing/ stay suture from the skin with a safe sharp stitch cutter and with a sterile gloved forefinger place the tip of the finger in line with the top of the wound site
- **The same professional who is applying the pressure with the sterile gloved finger pulls the drain with a free unrestricted motion**
- As it exits the wound site (felt by the finger tip) apply pressure with the fingertip to seal the wound

Figure 1: Photo illustrating chest drain with 'stay/holding' suture and 'mattress/closing' suture

5.5 When to remove the drain

Count three breaths from the patient and on the third inspiration when the lung reaches full inflation (ventilated or non-ventilated) remove the drain.

Ventilated Patients	Patient spontaneously breathing and co-operative	Crying patient
• Aim to remove the drain during inspiration (positive pressure should force any air out)	• Ask to take a deep breath in and hold, then remove drain (natural tendency is to take a sharp breath in when the drain is manipulated - this is not possible if the patient is already at the end of inspiration)	• The intrathoracic pressure is elevated - this is a good time to remove the drain!

5.6 Inspect the site

The site must be inspected for any leaks and then cleaned with 0.9% saline with sterile gauze. The site must then be dried and protected with a padded soft pore dressing

5.7 Disposal of waste

The chest drain and tubing is disposed in an orange clinical waste bag and requires double bagging.

5.8 After the procedure

- A chest x-ray is required post removal and to be reviewed within one hour
- **IMPORTANT:** In the event of a sudden patient deterioration following chest drain removal, request an urgent chest x-ray, get senior help and consider thoracentesis (risk of pneumothorax)
- Continue regular observation of vital signs for at least four hours post drain removal
- Skin suture needs to be removed after seven days. If patient is discharged prior to this, ensure it is documented in the discharge plan.

6. Education and Training

Training and raising awareness are on-going processes. On-going awareness is promoted through the induction and continuous bedside teaching. Training is provided for medical staff during lunchtime teaching (Wednesdays) and other sessions, and at junior doctors' induction training. Nursing education is supported by the Practice Development teams, and nursing educators.

7. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Chest drains complications	Audit, datix	Consultant intensivist	ongoing	CPM/risk

8. Supporting References

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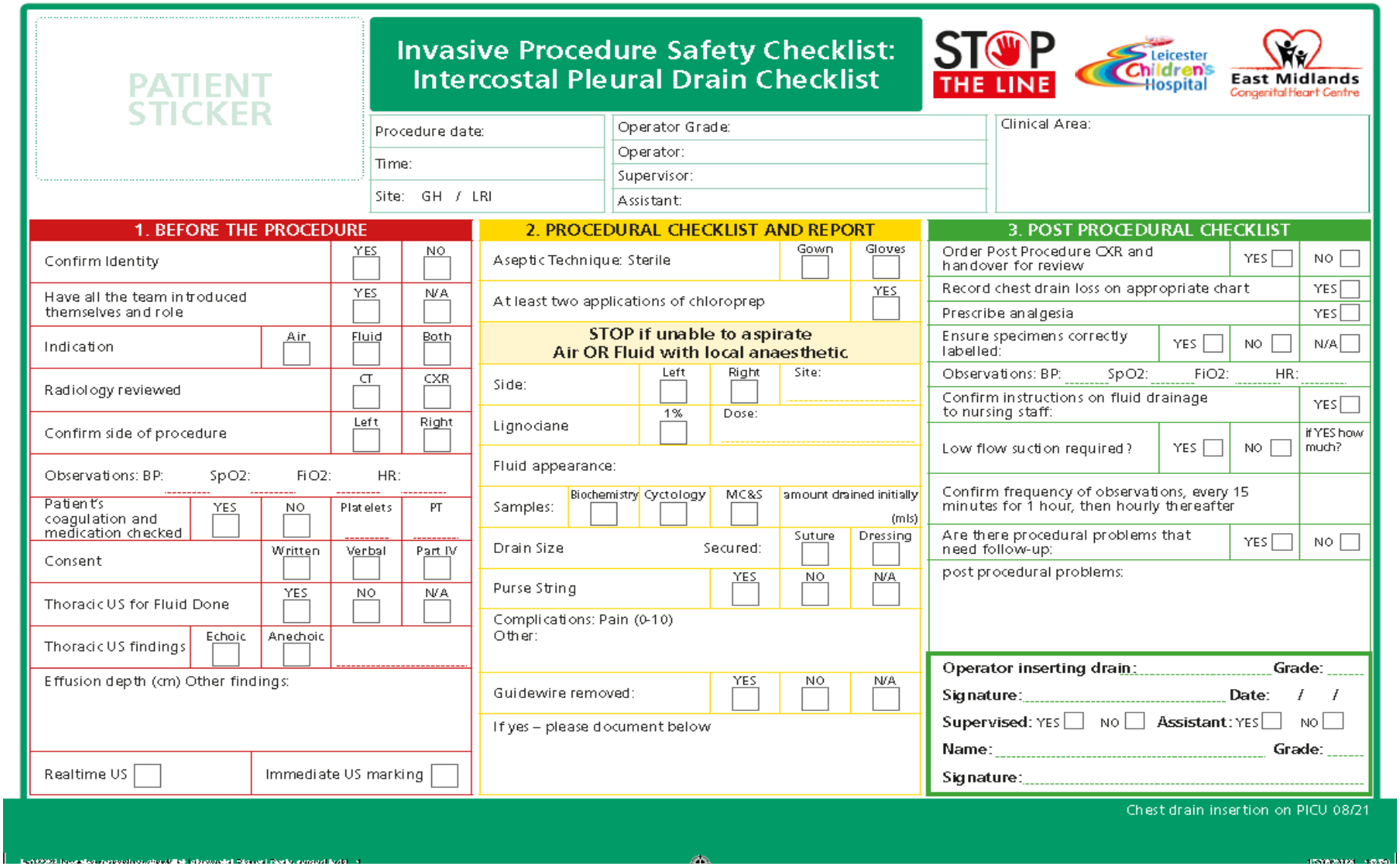
9. Keywords

PICU/CICU, Insertion, Chest drain, Pneumothorax, Seldinger technique, Blunt dissection, Haemothorax, Pleural effusion, Chylothorax, Empyema, Post-operative cardiac or thoracic surgery

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) **Claire Westrope - Consultant PICU/ECMO**	**Executive Lead:** **Chief Medical Officer**
REVIEW RECORD	
Description Of Changes (If Any); **Reviewed by J Wilkinson - practice education nurse** Children's Hospital & PICU guidelines combined (C41/2016 & C62/2019) Removed Urokinase administration advice as now added to Empyema g/l (hyperlinked to this guideline) Page 12- bed space equipment has added high pressure wall suction Section 3.7 managing and preventing a blocked drain advice updated	

Appendix 1; LocSSIP



PATIENT STICKER

Invasive Procedure Safety Checklist: Intercostal Pleural Drain Checklist

STOP THE LINE

Leicester Children's Hospital

East Midlands Congenital Heart Centre

Procedure date:	Operator Grade:	Clinical Area:
Time:	Operator:	
Site: GH / LRI	Supervisor:	
	Assistant:	

1. BEFORE THE PROCEDURE

Confirm Identity			YES ☐	NO ☐
Have all the team introduced themselves and role			YES ☐	N/A ☐
Indication	Air ☐		Fluid ☐	Both ☐
Radiology reviewed			CT ☐	CXR ☐
Confirm side of procedure			Left ☐	Right ☐
Observations: BP: ____ SpO2: ____ FiO2: ____ HR: ____				
Patient's coagulation and medication checked	YES ☐	NO ☐	Platelets ____	PT ____
Consent		Written ☐	Verbal ☐	Part IV ☐
Thoracic US for Fluid Done		YES ☐	NO ☐	N/A ☐
Thoracic US findings	Echoic ☐	Anechoic ☐	____	
Effusion depth (cm) Other findings:				
Realtime US ☐		Immediate US marking ☐		

2. PROCEDURAL CHECKLIST AND REPORT

Aseptic Technique: Sterile			Gown ☐	Gloves ☐
At least two applications of chloroprep				YES ☐
STOP if unable to aspirate Air OR Fluid with local anaesthetic				
Side:	Left ☐	Right ☐	Site: ____	
Lignocaine	1% ☐	Dose: ____		
Fluid appearance:				
Samples:	Biochemistry ☐	Cytology ☐	MC&S ☐	amount drained initially (mls)
Drain Size	Secured:		Suture ☐	Dressing ☐
Purse String		YES ☐	NO ☐	N/A ☐
Complications: Pain (0-10) Other:				
Guidewire removed:		YES ☐	NO ☐	N/A ☐
If yes – please document below				

3. POST PROCEDURAL CHECKLIST

Order Post Procedure CXR and handover for review	YES ☐	NO ☐	
Record chest drain loss on appropriate chart			YES ☐
Prescribe analgesia			YES ☐
Ensure specimens correctly labelled:	YES ☐	NO ☐	N/A ☐
Observations: BP: ____ SpO2: ____ FiO2: ____ HR: ____			
Confirm instructions on fluid drainage to nursing staff:			YES ☐
Low flow suction required?	YES ☐	NO ☐	if YES how much?
Confirm frequency of observations, every 15 minutes for 1 hour, then hourly thereafter			
Are there procedural problems that need follow-up:	YES ☐	NO ☐	
post procedural problems:			

Operator inserting drain: ____ **Grade:** ____

Signature: ____ **Date:** / /

Supervised: YES ☐ NO ☐ **Assistant:** YES ☐ NO ☐

Name: ____ **Grade:** ____

Signature: ____

Chest drain insertion on PICU 08/21