

Standard Operating Procedure

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SOP Name: Chest Drain Insertion Trauma Patients			
Version	V1	Owner Name	T Cowlam MTC Clinical Lead
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First published date	December 2023	Note	
EIA			

Trigger: Patients requiring a chest drain following Trauma

Objective: To ensure chest drains are correctly inserted for Trauma patients

Responsibility: The Consultant caring for Patient

Definition

Thoracic trauma is a very common cause of morbidity and mortality, being the primary cause of death in 25% of trauma deaths, and contributing to a further 25-50%.

It should not be acceptable for a casualty to die from hypoxia or cardiovascular collapse resulting from pathology caused by trauma that can be treated emergently. Approximately 85% of chest trauma can be treated successfully without the need for surgical intervention, using techniques that are well described and taught on trauma courses. It is important to remember, however, that Major Trauma patients are likely to have other injuries, especially head injuries, which need to be identified and treated appropriately by the Trauma Team.

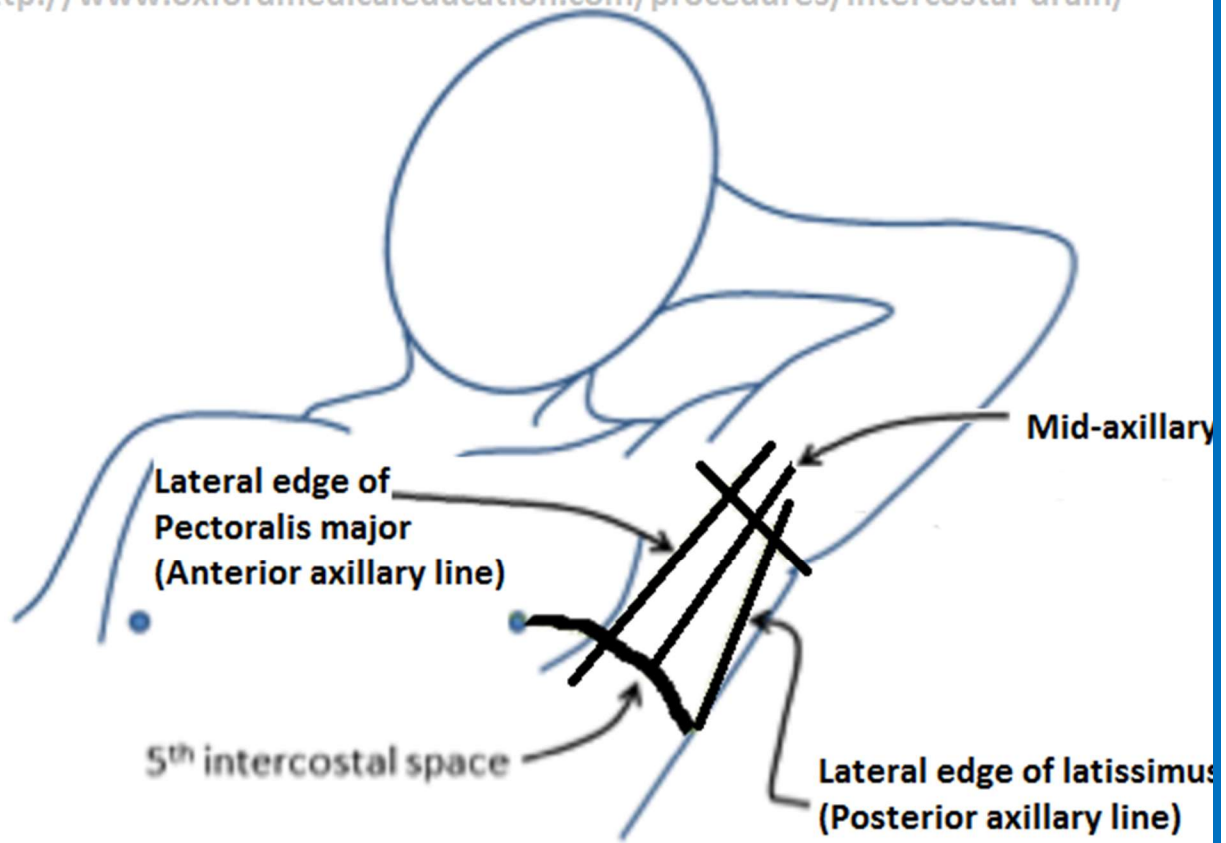
Traumatic pneumothorax and tension pneumothorax, as well as haemothorax, are pathologies that can be treated by means of pleural decompression, using needle thoracocentesis, finger thoracostomy and/or chest tube thoracostomy. These procedures have a significant risk of morbidity and mortality if performed poorly, and must therefore be performed only when indicated, and either by an experienced and competent Trauma Team member, or under direct supervision.

Following successful pleural decompression, the chest drain position must be confirmed radiologically.

The patient must be admitted onto a ward with the required medical and nursing expertise to safely and expertly care for him/her until such time as the drain can be removed.



<http://www.oxfordmedicaleducation.com/procedures/intercostal-drain/>



Thoracic trauma is a very common occurrence in the context of major trauma, and is known to have a significant morbidity and mortality if not identified or managed expeditiously and appropriately. No single trauma patient should die from potentially treatable life-threatening pathology.

This Policy aims to consolidate current guidance on the emergent treatment of traumatic pneumothorax and/or haemothorax by the Trauma Team.

The terminology of Chest drain, thoracic catheter tube, intercostal drain & Indwelling pleural catheter (IPC) are used concurrently. This policy does not cover chest drains for non traumatic medical causes, other pleural procedures nor paediatric patients.

Purpose

The overall purpose of these guidelines is to ensure a safe system for the insertion and management of trauma related chest drains, by;

- Improving decision making
- Ensuring chest drains are inserted appropriately, promptly by the correctly trained and competent clinicians who have demonstrated and evidenced competence, supported by appropriate nursing standards and hospital environment
- Ensure the procedure follows a safety checklist based upon BTS / WHO guidance

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- Ensuring patients are cared for on the correct ward locations, with appropriately trained nurses and monitoring systems
- Clarify the appropriate admitting speciality at HRI, which will not be thoracic surgery.
- Confirm duties and responsibilities of the Hospital trust.

Duties and Responsibilities

Medical Director

It is the responsibility of the Medical Director to have overall leadership, ownership of this policy and identify a lead for training of all staff involved in chest drain insertion and management as per National Patient Safety Agency guidance.

Lead for training

It is the responsibility of the Lead for training to ensure that all staff involved in the insertion and management of chest drains have access to appropriate training (appendix). Where relevant, individual care groups will have identified leads in their specific area, eg Medicine, Emergency Department, Surgery, Orthopaedic, Paediatrics. (NPSA RRR03 2008)

General Manager

It is the responsibility of the General Manager to work with the Matron and ward managers to ensure provision of appropriate equipment for the insertion and management of chest drains.

Consultant

As the professional with overall clinical responsibility for the patient, the Consultant will ensure that all medical staff are aware of these guidelines, that clinical standards are maintained and any necessary deviation from this guidance is documented and explained in the clinical notes. It is the Consultant's responsibility to identify adequately trained staff to perform the procedure.

Matron/Ward Managers

It is the responsibility of the Matron/Ward Managers to ensure that - all nursing staff are aware of these guidelines - all nursing staff are competent to undertake their role in relation to the insertion and management of patients with chest drains - all nursing staff have access to the appropriate training - any adverse incident reported that relates to the insertion and/or management of patients with chest drains is investigated and action plans developed to prevent their future occurrence.

All clinical staff

It is the responsibility of each member of staff involved in the insertion and management of chest drains:- to comply with the standards set out in these guidelines - to ensure they adhere to the training requirements set out in these guidelines - to work within their own training and competence and seek advice where necessary - to report all chest drain issues (including near miss events) using the Trust's Incident Reporting procedures These issues should be discussed at relevant Care Group Clinical Governance meetings and any identified actions resulting from incidents implemented.

Procedure

Thoracic trauma is believed to be the primary cause of death in 25% of all trauma deaths, and a significant contributing factor in a further 25-50%. Whilst such casualties are also likely to have other

significant and possibly life-threatening injuries, it is essential that these injuries are identified as rapidly as possible, and life-saving procedures performed emergently to save the casualty's life. Less than 10% of blunt trauma and 15-30% of penetrating trauma requires operative intervention; up to 85% of thoracic trauma could be treated by Trauma Team members using techniques that are now well-established and taught on trauma courses such as Advanced Trauma Life Support and the European Trauma Course.

Traumatic pneumothorax and traumatic tension pneumothorax, as well as haemothorax, are potentially immediately life-threatening as a result of their effects on the lungs and cardiovascular system. Early recognition of these injuries, by clinical or radiological/sonographic means, could ensure immediate treatment and thus prevent further deterioration in the clinical course.

Tension pneumothorax is a result of a flap/valve-type injury to the pleura allowing air to leak into the pleural cavity but not escape out of it. As a result of the increasing intra-pleural pressure, the lung is compressed, eventually pushing the mediastinum to the contralateral side. Ventilatory compromise is therefore the initial concern, later compounded by cardiovascular collapse as the increasing intrathoracic pressures prevent diastolic filling, impairing stroke volume and cardiac output. This condition can occur both in spontaneously-ventilating patients as well as those receiving intermittent positive pressure ventilation, though the onset is often much more rapid and precipitous in the latter. In view of the frequently rapid deterioration in cardiorespiratory status, tension pneumothorax often requires a clinical diagnosis and immediate treatment, with no time for radiological confirmation (chest radiograph); sonographic confirmation might be possible if the equipment is immediately available. The immediate treatment of tension pneumothorax is finger thoracostomy, followed by open tube thoracostomy (chest drain insertion); whilst needle thoracocentesis was previously the technique of choice for immediate relief of tension pneumothorax, concerns over its failure and possible complication rate has resulted in guidance on its use only in cases when thoracostomy is not immediately possible (due to lack of equipment or expertise). The technical details behind these three procedures can be found in Appendix 1: Procedural Guidance.

Traumatic pneumothorax can be the result of trauma to either pleura, either as a result of a breach to the chest wall creating an open pneumothorax with air being sucked into the pleural cavity (e.g. penetrating injury) or secondary to damage to the visceral pleura and underlying lung with air escaping from the lung (e.g. following displaced rib fractures). In case of an open pneumothorax, a wound that is greater than half the diameter of the trachea results in air being sucked into the pleural cavity via the chest wound rather than into the lungs via the trachea with each respiratory effort, resulting in significant respiratory compromise. The immediate management consists of the application of a commercially available chest seal or an occlusive dressing. A chest drain will need to be placed immediately following this..

Traumatic haemothorax is an accumulation of blood in the pleural cavity, often as a result of a laceration to the intercostal or internal thoracic vessels. "Massive haemothorax" is diagnosed if >1500ml of blood is drained, or >200ml/hr for >2 hours. A haemothorax is often identified clinically, in the context of external signs of chest trauma associated with signs of an effusion, and confirmed radiologically or sonographically. Drainage of a haemothorax often requires a large-bore chest drain; evidence is limited with respect to the ideal drain size, and guidance often recommends inserting as large a drain as can fit in the intercostal space. Previous belief in the tamponade effect of a haemothorax has never been

evidenced, and thus any significant haemothorax should be drained with urgent involvement of a cardiothoracic surgeon if concerned about blood loss, whilst resuscitating with blood products..

Whilst tube thoracostomy is undoubtedly a life-saving procedure, it is also associated with significant risks. In 2008, the NPSA issued a rapid response report following reports of 12 deaths and 15 cases of serious harm relating to chest drain insertion between 2005 and 2008. The report made the following recommendations:

- Chest drains should only be inserted by staff with relevant competencies and adequate supervision
- As per the Trust Quality and Safety Bulletin 30 (30th November 2019) 'Undertaking 'clotting' prior to pleural procedures', if clinically time allows clotting should be checked beforehand, unless in the event of an emergency situation.
- Ultrasound guidance strongly advised when inserting a drain for fluid
- Clinical guidelines are followed and staff made aware of the risks
- Identify a lead for the training of all staff involved in chest drain insertion
- Written consent obtained from patients before the procedure, wherever possible
- Local incident data relating to chest drains reviewed
- Staff encouraged to report further incidents

Trauma teams in the MTC and TU should always be led by a senior Trauma Team leader ideally of Consultant level, and as such should always have the required expertise available during insertion. Adequate supervision would also imply close monitoring of the patient's vital signs. Local policy should be considered for anticoagulation, given the risk & benefit analysis applying to an emergency procedure.

Following insertion of a chest drain, the drain position must be confirmed radiologically, not only to confirm the position of the tip, but also to ensure that all the drain holes are within the pleural cavity. If one or more chest drain holes are outside of the pleural cavity, the drain will need to be reinserted as otherwise air/fluid will leak into the chest wall tissue, and result in severe subcutaneous emphysema. The chest drain should not simply be pushed in but should be replaced all together so as not to increase the risk of infection. The same chest wall hole can be used following appropriate cleaning and draping of the site. Following satisfactory confirmation of drain position, the patient should be transferred to a clinical area that has the required medical and nursing expertise to care for the patient and the drain, as well as manage any possible complications until the time of drain removal.

Consent, Documentation and Checklist

These procedures are generally required as an emergency in critically unwell patients and cannot therefore be postponed. Written consent is often not possible in major trauma patients, though verbal consent is advisable if possible, and documented, including capacity of patient and urgency as per trust policy.

Documentation is currently on Paperlight Trauma Book, Lorenzo ED clinical note and ward based paper notes.

Before the procedure, the safety check list should ideally be followed. (Annexe)

Admission Responsibilities



As per Trauma Admission Rules Policy, there are frequent occasions when trauma patients have injuries involving more than one speciality, and the injuries in isolation would not necessarily require admission. There is benefit for the patients holistic care to be inpatient at HRI with access to a large MTC multidisciplinary team. This acute service is not as available at Castle Hill, and so, like at our trauma units, the Thoracic (and other CHH specialities) offer advice to patients admitted to the HRI site. As we see at trauma units, and as recognised by the Royal College of Surgeons, patients with chest trauma can be appropriately managed by a non Thoracic surgeon. Similarly, the responsibility for chest drain insertion does not solely belong to a thoracic surgeon, and is on the competency for acute surgical, orthopaedic surgery and anaesthetic trainees.

The "Trauma Admission Rules" policy, defines some scenarios where patients may be admitted to HRI specialities, with associated thoracic injuries.

Clearly, major thoracic injuries, complications of these and patients suitable for surgical rib fixation will require transfer to CHH, or attendance at HRI of the CHH based consultants.

Training, Compliance, Competency and Incident Reporting

Operator Training & compliance;

The operator for any pleural procedure should have been adequately trained.

Operators learning to undertake a pleural procedure must be adequately supervised and should record anonymised details of the procedure in their training portfolio.

Procedures must be appropriately documented in the medical notes, including;

- Indication
- Intervention conducted
- medication given
- recovery plan and observations required postprocedure (eg CXR)
- immediate complications

HUHT will appoint a lead for chest drain training and governance.

All members of the immediate trauma team should be training and competent for chest drain insertion and initial management. In addition, critical care / anaesthetic Doctor should also have competency for chest wall analgesia regional nerve blocks.

Training & competency is as follows for membership to the trauma team as on call Orthopaedic, general surgery & critical care;

1. Attendance at a trauma course (ATLS / ETC)
2. Attendance at a chest drain insertion course using cadaver or model, unless logbook demonstrating appropriate experience
3. Completion of competency documents (see annexe)

What this policy doesn't cover

- Other diagnostic or therapeutic pleural procedures
- Set up of specific chest drainage systems including suction
- Nurse training / governance
- Trauma admission rules – to guide decision making for admitting speciality.

Related Documents

Sternal Fracture Management
Trauma Admission rules
Blunt thoracic analgesia passport
Surgical Rib Fixation Guidance

References

Breathing problems and Thoracic trauma. In: Gwinnutt C, Driscoll P, Grunfeld M *et al.* eds. European Trauma Course Manual (Edition 3.0)

Thoracic Trauma. In: [Committee on Trauma, American College of Surgeons](#). ATLS: Advanced Trauma Life Student Course Manual (9th ed.). Chicago: American College of Surgeons. [ISBN](#) 13: 978-1-880696-02-6

National Patient Safety Agency 2008 *Rapid Response Report Risks of chest drain insertion*: London Available from www.nrls.npsa.nhs.uk

Zengerink I, Brink P, Laupland K *et al.* Needle thoracostomy in the treatment of a tension pneumothorax in trauma patients: what size needle? *J Trauma* 2008;**64**:111-114

[British Thoracic Society Clinical Statement on pleural procedures | Thorax \(bmj.com\)](#)

Appendices

Appendix 1 – Procedural Guidance

Finger Thoracostomy

Finger thoracostomy is the technique of choice for immediate relief of a tension pneumothorax, either confirmed clinically, or suspected in case of a patient *in extremis* or in traumatic cardiac arrest. The procedure is diagnostic as well as therapeutic.

Finger thoracostomy can be described as the first part of the chest drain procedure prior to insertion of the chest drain. It is intended as a rapid means of decompressing a tension pneumothorax that is resulting in significant respiratory and/or cardiovascular compromise. This procedure has now replaced needle thoracocentesis as the technique of choice as there is increasing evidence that needle thoracocentesis using a 4.5cm cannula can fail in up to 50% of patients. Using longer cannulae raised the possibility of increased vascular complication rates.



Indications for finger thoracostomy are:

- Suspected traumatic pneumothorax and:
 - Hypoxia
 - Severe hypotension
 - Peri-arrest/Cardiac arrest
 - Sudden deterioration in cardiorespiratory status following endotracheal intubation and positive pressure ventilation
 - Increasing ventilation pressures

Contraindications include:

- Simple pneumothorax
- Lack of expertise to perform the procedure (consider needle thoracocentesis instead)

Equipment:

- Povidone iodine/betadine or chlorhexidine (if immediately available)
- Scalpel
- Sterile gloves
- Personal protective equipment (especially in view of splash risk)
- Forceps (e.g. Spencer Wells)

Technique:

The technique is identical to the initial part of the open chest drain insertion technique, prior to insertion of the drain.

Identify the appropriate landmarks (Figure 1): between anterior axillary line (lateral border of pectoralis major) and mid-axillary line (imaginary line running between anterior and posterior axillary line (the latter being the anterior border of latissimus dorsi), in the fourth or fifth intercostal space. Consider local anaesthesia, systemic analgesia, with or without procedural sedation, especially if the patient is conscious. Verbal consent should be obtained if possible.

Following donning of personal protective equipment, including eye protection, surgical gown (ideally) and sterile gloves, clean the skin with povidone iodine/betadine or chlorhexidine.

Incise skin and subcutaneous tissue over the aforementioned landmark. Using a pair of forceps (e.g. Spencer Wells) dissect intercostal musculature bluntly but rapidly, avoiding the inferior border of the superior rib (and the associated neurovascular bundle). On reaching the pleura, “pop” through it using gentle force, stabilising the forceps with one or both hands. If forceps is not available, consider blunt dissection using own finger, though this is more difficult to achieve. Skin-to-pleura should not take longer than 60 seconds. After breaching the pleura, hold the forceps in place, and slide a finger on top so as to enter the pleural cavity and perform a “finger sweep”, confirming location in the pleural cavity.

If the patient is being mechanically ventilated (IPPV), a drain need not necessarily be inserted immediately if further resuscitation priorities are identified, and chest drain insertion can be delayed for a short time



period. If the patient is ventilated spontaneously, a chest drain is required immediately as the tension pneumothorax has been converted to an open pneumothorax.

Note that the thoracostomy can sometimes seal up again if a drain is not inserted immediately; in case of deterioration of clinical signs, the tract should be reopened by blunt finger or instrumental dissection.

In case of cardiac arrest, or deteriorating patient receiving positive pressure ventilation,, bilateral thoracostomies should be considered so as to diagnose and relieve any possible pneumothorax without any further delay.

Needle Thoracocentesis

Needle thoracocentesis was historically described as the technique of choice for immediate relief of tension pneumothorax, but is now only advisable if finger thoracostomy is not possible (due to lack of equipment or expertise).

Indications and contra-indications are similar to those for finger thoracostomy. This procedure has a significant failure risk, as mentioned earlier. Use of a standard 4.5cm cannula may result in failure to reach the pleural cavity or subsequent blockage of the cannula by blood and fat or by compression or kinking of the cannula.

Equipment:

- Alcohol wipe
- 14G or 16G cannula-over-needle

Technique:

Identify the anatomical landmarks: 5th intercostal space, anterior axillary line (first line) or 2nd intercostal space, mid-clavicular line (second line).

Don personal protective equipment, especially eye protection, and sterile gloves.

Wipe the insertion site with an alcohol wipe. Insert the cannula perpendicular to the skin, aiming for the upper border of the third rib. Avoid the inferior border of the rib above, and the associated neurovascular bundle.

Remove the needle leaving the cannula in situ. A hiss of air may or may not be heard. If no hiss of air is heard and/or the patient does not clinically improve, the procedure may be repeated in the alternative landmark whilst awaiting open thoracostomy and chest drain insertion. If a hiss of air is heard, and/or the patient's vital signs improve, proceed to insertion of a chest drain as soon as possible. If the expertise for chest drain insertion is not available it must be requested immediately, and prior to inter-hospital transfer (if this is being considered).



Chest drain insertion / tube thoracostomy

Insertion of a chest drain can be deemed to be definitive treatment of the majority of pneumothoraces and haemothoraces. In rare cases, further specialist treatment may be required if a massive haemothorax is diagnosed, or the pneumothorax persists indicating a bronchopleural fistula.

Indications for tube thoracostomy are:

- Drainage of traumatic pneumothorax
- Drainage of traumatic haemothorax

Contraindications include:

- Lack of expertise to perform the procedure (consider needle thoracocentesis instead)

Equipment:

- 1 CSSD pack for intercostal drainage (if available); alternatively, a suture pack
- Personal protective equipment: sterile gloves, surgical gown, face shield
- Sterile drapes
- Povidone Iodine/betadine or chlorhexidine
- Gauze
- Selection of syringes and needles
- Lignocaine 1% or 2%
- Scalpel
- 1 sterile drainage bottle
- Sterile water (if using a drainage bottle) for underwater seal
- Intercostal drain - size as requested, between 24F (isolated pneumothorax) and 36F (large haemothorax) depending on patient
- Sutures x2
- Sterile dressing
- Sharps container

Technique:

Following HUHT case reviews, for traumatic injuries requiring interpleural drainage, seldinger type drains are advised by Thoracic Surgery and MTC team to not be used, unless specific senior clinician decision. The advantage of smaller drain is outweighed by the increased risk of blockage requiring repeat procedure.

In conscious patients informed verbal consent is mandatory. In addition, studies have shown that the pain caused by insertion of a chest drain is severe, and therefore pre-medicating with strong analgesia is required, as well as considering procedural sedation. The Trauma Team Leader should ensure that all these procedures are being performed safely, with the appropriate level of expertise present at all times.

Identify the appropriate landmarks (Figure 1), as per finger thoracostomy. The procedure should be aseptic/sterile, and therefore skin preparation and draping is advisable, as well as full personal protective equipment.



Prior to starting the incision, infiltrate 2-3mg/kg of lignocaine into skin, subcutaneous tissue, intercostal muscle and pleura, aiming to anaesthetise a core of tissue through which the drain will be passed. This can be a very painful procedure and adequate time must be allowed for the anaesthetic to work.

Incise skin and subcutaneous tissue over the aforementioned landmark. Using a pair of forceps (e.g. Spencer Wells) dissect intercostal musculature bluntly but rapidly, avoiding the inferior border of the superior rib (and the associated neurovascular bundle). On reaching the pleura, “pop” through it using gentle force, stabilising the forceps with one or both hands. After breaching pleura, hold the forceps in place, and slide a finger on top so as to enter the pleural cavity and perform a cautious “finger sweep”, confirming location in the pleural cavity.

In cases where a finger thoracostomy has already been performed, either in the ED or pre-hospital then the same hole may be used for chest drain insertion after cleaning the site. Any time a chest drain is inserted through a thoracostomy that has not been performed under full aseptic conditions (not through the same incision), the patient should receive antibiotics to cover wound infection (such as co-amoxiclav if no contraindication).

Insert the chest drain using the forceps inserted through a chest drain hole as a guide. If possible direct the tip of the chest drain apically for pneumothorax and posteriorly for haemothorax, however this is not critical. It is essential to ensure that the chest drain is inserted sufficiently such that all the chest drain holes are within the pleural cavity. Ensure the chest drain is within the pleural cavity by confirming fogging of the drain, as well as swinging of the fluid meniscus within the tubing after connecting the drain to the water-filled drainage bottle.

The chest drain is then secured using a suture, and the rest of the incision closed using simple/mattress sutures (not a purse-string). Use of a transparent dressing allows the wound site to be inspected. An ‘omentum’ made from tape can be used to help prevent kinking or tension on the drain at the insertion site.

Following completion of the procedure, the position of the chest drain must be confirmed radiologically, ensuring that none of the drain holes are outside the pleural cavity.

Following satisfactory confirmation of drain position, the patient should be transferred to a clinical area that has the required medical and nursing expertise to care for the patient and the drain, as well as manage any possible complications until the time of drain removal.

The drain should never be clamped, unless under the direction of a senior physician. If the patient’s clinical condition deteriorates whilst the drain is clamped then it should be unclamped immediately. Furthermore, the chest drain bottle should be kept below the level of the patient to prevent air/water being sucked back into the chest.

Breathing with a chest drain in situ can be painful, and therefore the Team Leader must ensure that sufficient analgesia is prescribed for the initial admission and rib fracture passport commenced.





Appendix 2 – Procedure Checklist

Appendix 2 – Pleural Procedures Checklist (Thoracoscopy, Chest Drain Insertion, Indwelling Pleural Catheter, Pleural Biopsy, Pleural Aspiration)

SIGN IN (To be read out loud)	SIGN OUT (To be read out loud)
<p>Before giving sedation or starting procedure</p> <p>Have all team members been introduced by name and role? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Has the patient confirmed his/her identity, site, procedure and consent? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Does the patient have a known allergy? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Operator: Has the operator confirmed the site, procedure and consent form? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Has the procedure site been marked as indicated on the consent form? <input type="checkbox"/> Yes <input type="checkbox"/> Not applicable</p> <p>Has essential imaging been reviewed? <input type="checkbox"/> Yes <input type="checkbox"/> Ultrasound guidance used <input type="checkbox"/> Not applicable</p> <p>Is essential imaging displayed? <input type="checkbox"/> Yes <input type="checkbox"/> Not applicable</p> <p>Is the required equipment available? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are there increased risks of ventilatory failure, airway difficulties or aspiration? <input type="checkbox"/> No <input type="checkbox"/> Yes, and appropriate action taken</p> <p>Have risk factors for bleeding and renal failure been considered? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are there any critical or unexpected steps you want the team to know about? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Registered Practitioner: Is monitoring equipment and medication (including sedation reversal agent) check complete? <input type="checkbox"/> Yes <input type="checkbox"/> Not applicable</p> <p>Has the sterility of the equipment been confirmed (by date or other method)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are there any equipment issues or concerns? <input type="checkbox"/> No <input type="checkbox"/> Yes</p> <p>Has antibiotic prophylaxis been given? <input type="checkbox"/> Yes <input type="checkbox"/> Not applicable</p>	<p>Before any member of the team leaves the procedure room</p> <p>Registered Practitioner verbally confirms with the team (tick to indicate YES):</p> <p><input type="checkbox"/> Has the name and site of the procedure been recorded?</p> <p><input type="checkbox"/> Have all needles, guidewires and catheters used been accounted for and documented on procedural record? (or not applicable)</p> <p><input type="checkbox"/> Have the specimens been labelled including patient name (or not applicable)?</p> <p><input type="checkbox"/> Have any equipment problems been identified that need to be addressed? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Have the instructions for post procedural care for this patient been agreed?</p> <p><input type="checkbox"/> Have VTE prophylaxis instructions been documented?</p> <p><input type="checkbox"/> Have all controlled drugs been accounted for?</p> <p>Registered practitioner confirms that the list has been read out.</p> <p>Name: _____</p> <p>Signature of Registered Practitioner _____</p> <hr/> <p style="text-align: center;">PATIENT DETAILS</p> <p>Procedure: _____</p> <p>Date: _____</p> <hr/> <p style="text-align: center;">PATIENT ID LABEL</p>

Appendix 3 - When & how to remove a drain

- Clamping trial?
- When to remove?
- How to remove?
- Follow up CXR

Appendix 4 – With the exception of the above, when to call Thoracics for advice?

- Drain output – parameters?
- Persistent Air leak / fistula
- Empyema
- Malposition



Injuries appropriate for surgical rib fixation (see separate policy)

Appendix 5 – Competency Statement

The insertion and management of an intrapleural chest drain

Appendix 1 Chest drain insertion competencies	CT1, CT2, or equivalent in core accident and emergency, anaesthetic, intensive care, medical, radiology, respiratory, and surgical training	Can perform chest drain insertion with supervision by an operator (level 2 or greater) who has recent experience of chest drain insertion.
Stage 1 competency	Accident and emergency, anaesthetic, intensive care, medical, radiology, respiratory, and surgical trainees	It is expected that doctors within this grade will have undertaken a number of chest drain insertions and have been directly supervised undertaking the procedure on at least 2 occasions in each year. Following such assessment they may carry out the procedure independently.
Stage 2 competency	ST3/equivalent and above	These doctors are experienced and independent operators and may undertake the observation and assessment of other operators carrying out the procedure.
Stage 3 Competency	Any senior medical personnel experienced at performing these procedures, preferably with experience in ultrasound assisted drain insertion.	

Appendix 6 – When to Consult Thoracic Surgery

- Increasing surgical emphysema
- Non Functioning drain
- Malposition on CXR – too far, not all holes in chest cavity, Kinked
- Thorocostomy wound leakage
- Drain bottle no longer swinging
- Persisting pneumothorax



Appendix 7 - DEFINITIONS / GLOSSARY (or included in the body of the document)

Please include details of the definitions used if not made clear in section 2 of the document.

