GUIDELINE FOR THE MANAGEMENT OF TENSION PNEUMOTHORAX IN NEONATES

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Approved by:	Neonatal Guidelines Review Meeting	
Date of Approval:	11th November 2022	
Date of Review: **This is the most current version and should be used until a revised document is in place**	10th May 2026	

Key Amendments

Date	Amendment	Approved By
November 2022	Document approved for 3 years with no amendments	Dr Gregory/ Neonatal Guidelines Review Meeting
10th November 2025	Document extended for 6 months to allow time for review and update	Susan Smith

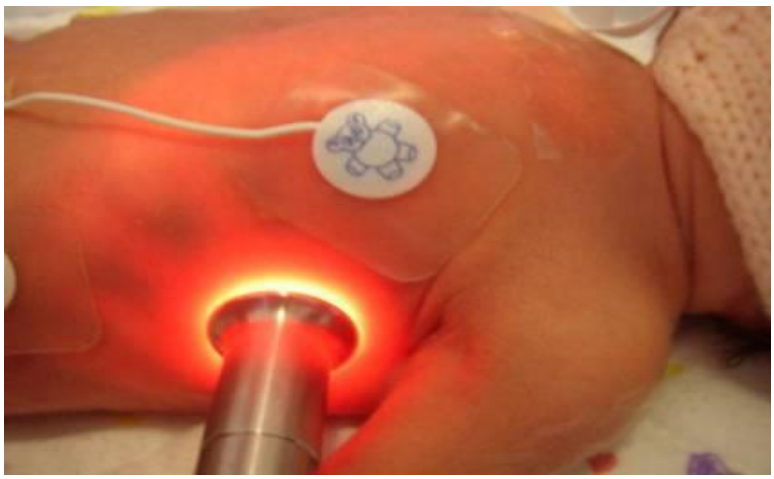
INTRODUCTION

Tension pneumothorax is a rare, potentially fatal condition primarily occuring in very sick, ventilated infants. Following the widespread use of surfactant therapy and changes in ventilation strategies to avoid volutrauma, occurrence of Pneumothorax has dropped but prevention is there fore essential. The continued use of antenatal steroids, early natural surfactants and ventilation regimes that avoid excessive minute volumes and tidal volumes are other preventative measures.

GUIDELINE

Signs of Tension Pneumothorax

- Sudden deterioration in the infant with worsening respiratory distress and rising oxygen requirements/falling oxygen saturation.
- Hyper-resonance with decreased air entry on affected side.
- Shift in position of cardiac impulse/heart sounds.
- Abdominal distension.
- Positive transillumination on affected side.



Treatment

If the baby is stable, and not deteriorating, arrange urgent chest X-ray to confirm diagnosis.

If situation is critical and transillumination positive, insert formal chest drain* on affected side.

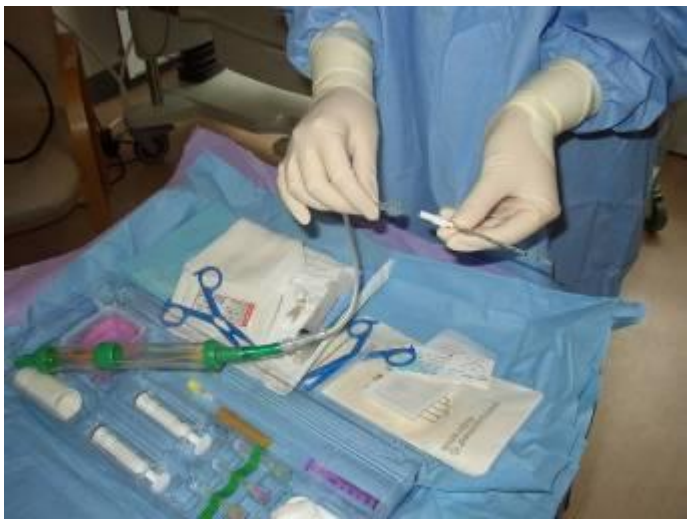
If situation critical and transillumination equivocal with a high index of suspicion perform needle aspiration with 21g butterfly needle, 10ml. syringe and 3 ways tap at 2nd intercostals space in the mid clavicle line.

We stock two types of chest drain at present until all staff are comfortable with the seldinger technique drains as these are the preferred type of drain on NNU.

**Technique for Formal Chest Drain Insertion- using Vygon "conventional" chest drainage*

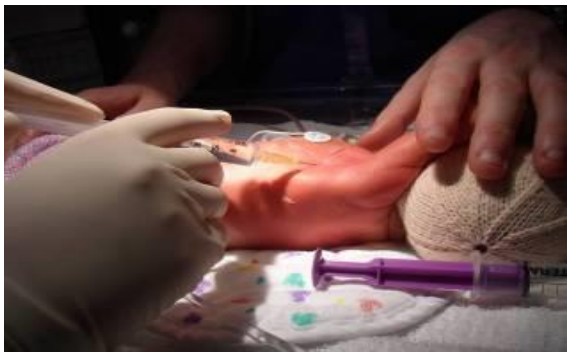
Equipment needed

- sterile dressing pack
- scalpel and straight surgical blade
- artery forceps
- suture (3.0 silk)
- intercostal drain (10 FG)
- connecting spigot and Heimlich valve – this comes with the chest drain in the same box



Procedure

1. Ensure adequate analgesia (Morphine IV ideally).
2. Position baby with affected side elevated and arm on affected side elevated.
3. Clean skin over mid axillary line and infiltrate 1% lignocaine at insertion site over 5th/6th intercostal space well away from breast bud.
4. Make small incision down to intercostal muscles using scalpel blade.
5. Use artery forceps for blunt dissection down to pleura.
6. Remove trochar from the chest drain.
7. Grasp tip of drain with artery forceps and insert through pleural sac, listening for gas leak - insert to depth of 2-3 cm.
8. Connect drain to Heimlich valve using appropriate connector.
9. Suture the drain in place and anchor with adhesive tape.
10. Perform chest X-ray to confirm position of tube and resolution of pneumothorax.



*Technique for Formal Chest Drain Insertion- using Cook "Seldinger technique" chest drainage

NB there is an opened set kept in NNU intensive care nursery for staff to use to familiarise themselves with the kit

Equipment needed

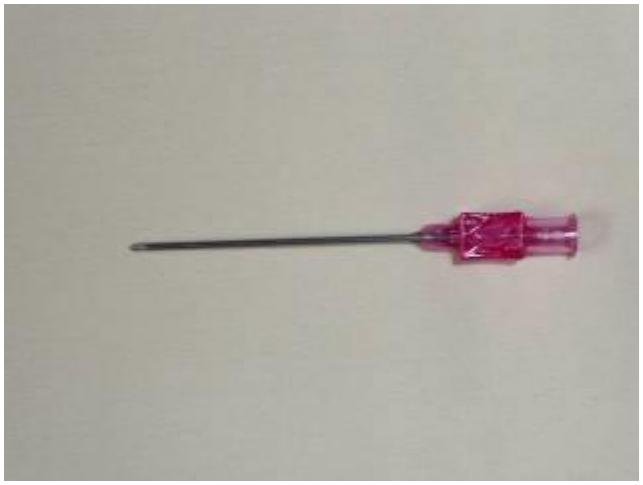
- sterile dressing pack
- scalpel and straight surgical blade
- suture (3.0 silk)
- intercostal drain (10 FG)
- connecting spigot and Heimlich valve – this comes in a separate packet to the chest drain


Chest Drain

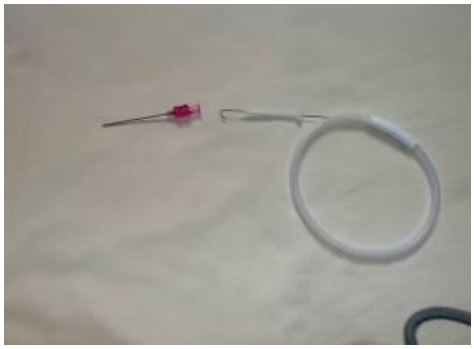

flutter valve

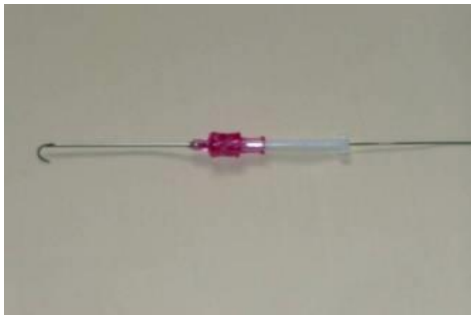
Procedure

1. Ensure adequate analgesia (Morphine IV ideally).
2. Position baby with affected side elevated and arm on affected side elevated.
3. Clean skin over mid axillary line and infiltrate 1% lignocaine at insertion site over 5th/6th intercostal space well away from breast bud.
4. Make small incision of a few mm in the skin using scalpel blade.
5. Pass the needle from the chest drain kit through the incision into the pleural cavity



6. Pass the guide wire down the needle and then withdraw the needle leaving the guide wire in situ

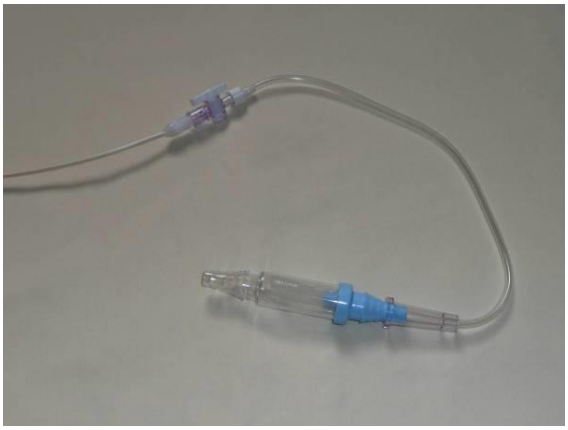




7. Pass the dilator over the guide wire and pass it down along the wire and through the chest wall so that the tip is within the pleural space. This dilates the track for easy passage of the drain. Now remove the dilator leaving the wire in situ.

8. Pass the chest drain over the wire and through the chest wall ensuring that all drainage holes are within the pleural space.
9. Remove the guide wire leaving the chest drain in situ
10. Connect drain to the Heimlich flutter valve use the blue set that is made by Cook medical

11. Secure drain using suture (not purse string) and clear adhesive dressing



MONITORING TOOL

How will monitoring be carried out? Individual case review

Who will monitor compliance with the guideline? Consultant staff

STANDARDS:

Item	%	Exceptions
Compliance with insertion technique of chest drains on all babies meeting criteria	100%	none

REFERENCES

Textbook of Neonatology Ed. Rennie + Roberton 3rd. Ed. pp. 517-521; 1381-1382.

CONTRIBUTION LIST

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