CLINICAL GUIDELINE	
Needle Aspiration of the Chest	
Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

This document should be read in conjunction with this DISCLAIMER

Aim

Needle aspiration of the chest is performed as an emergency procedure to remove air from between the parietal and visceral pleura, while avoiding laceration to the lung or blood vessels, in an infant suspected of having an accumulation of air within the pleural space (pneumothorax).

This is an emergency procedure only.

Background

Pneumothorax can occur spontaneously in a well term infant or may be associated with resuscitation, meconium aspiration syndrome, respiratory distress syndrome and positive pressure ventilation. Signs of a pneumothorax may be subtle, and some infants may show no other signs except an increase in restlessness. A blood gas analysis, increasing transcutaneous CO2, persistent tachycardia, abrupt increase in respiratory rate may be the first indication that a pneumothorax has occurred.

As pneumothorax may complicate resuscitation following delivery, bilateral needle aspiration should be considered during a failed resuscitation and before ceasing resuscitative efforts.

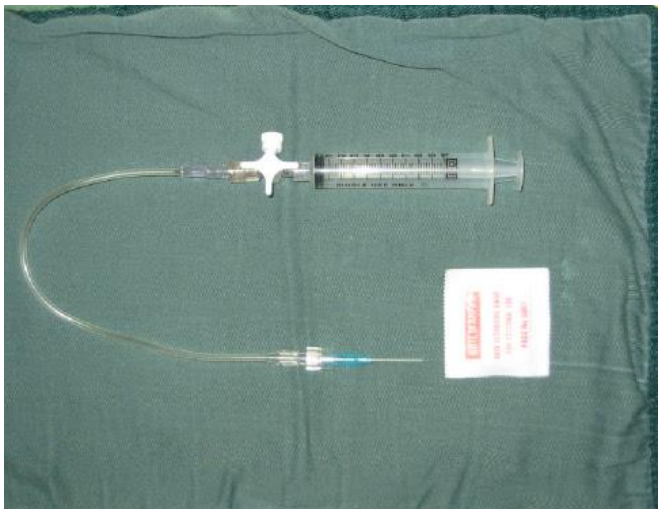
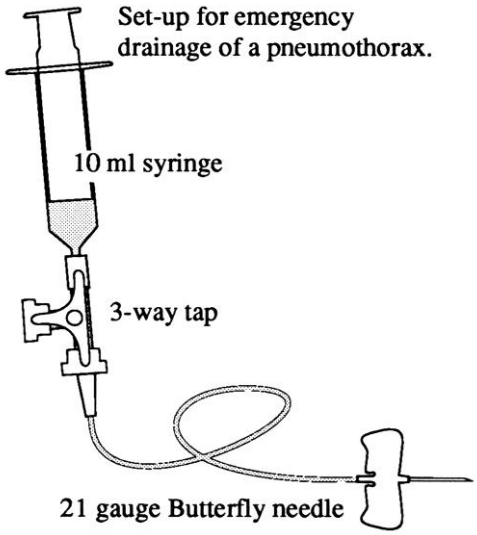
Air generally accumulates anteriorly and in the apex of the pleural space.

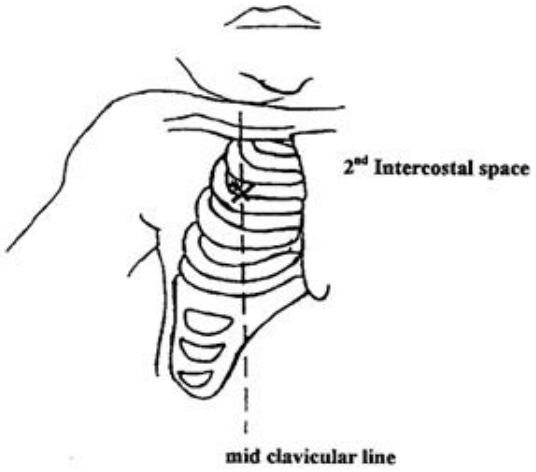
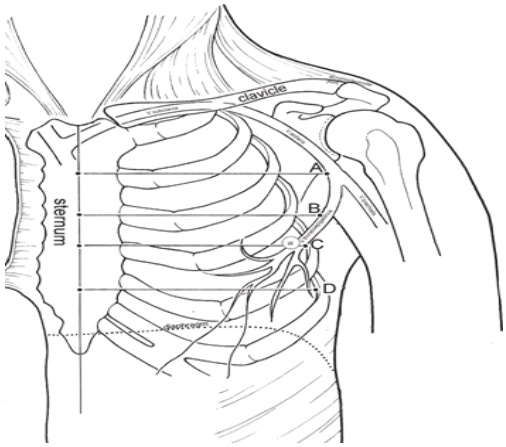
Equipment

- 10 mL Luer lock syringe
- 20 - gauge intravenous cannula, or 23 gauge butterfly needle
- 3-way tap
- 25 cm extension tubing
- 1% chlorhexidine/70% alcohol wipe

Procedure

*If credentialed, a lung ultrasound may be considered instead of diagnostic CXR (Raimondi et al 2016, Catarossi L et al 2016, Liu et al 2017). Ultrasound may be useful in rapid diagnosis and confirm position of needle corresponding to air leak.

Steps	Additional Information
1. Confirm pneumothorax by transillumination	May be difficult in term infants due to thick chest wall, CXR preferable
2. Position the infant supine and supported.	Consider the administer analgesia/local anaesthesia if time permits.
3. Attach 3-way tap to 10 mL luer lock syringe and turn the 3-way tap so that all ports are in the off position. Remove the caps from the 3-way tap.	
4. Attach a 25cm extension tube to the other end of the 3-way tap if a cannula is being used	
5. Add the butterfly needle extension to the 3-way tap when this system is used	
6. Using the alcohol wipe, swab the infant's skin in the area of the 2nd-3rd rib along the mid-clavicular line.	

Steps	Additional Information
7. Place a finger on the infant's 3rd rib. Guide the intravenous cannula, or butterfly needle, along the finger and insert it into the 2nd intercostal space, along the mid-clavicular line, at an angle of 90°. **Avoid the nipple area**	 An alternative site to drain is the 4th-5th intercostal space in the anterior axillary line. C and D below marks the 4th or 5th rib marks points respectively 
8. Once in position, remove the needle from the intravenous cannula and attach the extension tubing (with 3-way tap and syringe) to the cannula, or the 3-way tap & syringe, to the butterfly extension	
9. Turn the 3-way tap to aspirate air from the infant's chest into the syringe. Turn the 3-way tap to expel the air into the atmosphere. Measure the volume of expelled air.	Care must be taken while manipulating the 3-way tap to avoid accidental reinjection of air into the chest cavity.
10. Continue to aspirate until resistance is met. If a butterfly needle is used, it should be removed after the aspiration is completed	

Steps	Additional Information
11. Once the infant is stable perform transillumination/ CXR to confirm resolution of pneumothorax	In term infants, or those with a thick chest wall, transillumination may fail to detect pneumothorax. Assess infant, perform chest x-ray and consider the need for an intercostal catheter
12. The intravenous cannula used for needle aspiration may remain in situ and should not be removed until requested by a consultant	Chest x-ray is definitive diagnostic tool and may assist in deciding further intervention

References and related external legislation, policies, and guidelines

1. Eifinger F, Lenze M, Brisken K, Welzing L, Roth B, Koebke J. The anterior to midaxillary line between the 4th or 5th intercostal space (Buelau position) is safe for the use of thoracostomy tubes in preterm and term infants. Pediatric Anesthesia. 19(6):612-617, June 2009.
2. Weiner GM, Zaichkin J, Kattwinkel J, editors. textbook of Neonatal Resuscitation. 7th ed. Elk Grove Village, IL: American Academy of Pediatrics and American Heart Association;2016.
3. Bruschettini M, Romantsik O, Ramenghi LA, Zappettini S, O'Donnell CP, Calevo MG. Needle aspiration versus intercostal tube drainage for pneumothorax in the newborn. Cochrane Database Syst Rev. 2016 Jan 11;(1):CD011724

This document can be made available in alternative formats on request for a person with a disability.

File Path:			
Document Owner:	Neonatology		
Reviewer / Team:	Neonatal Coordinating Group		
Date First Issued:	June 2006	Last Reviewed:	14th February 2020
Amendment Dates:		Next Review Date:	14th February 2023
Approved by:	Neonatal Coordinating Group	Date:	25th February 2020
Endorsed by:	Neonatal Coordinating Group	Date:	25th February 2020
Standards Applicable:	NSQHS Standards:		
Printed or personally saved electronic copies of this document are considered uncontrolled			