

Royal Hospital for Women (RHW)
BUSINESS RULE
COVER SHEET



Health
 South Eastern Sydney
 Local Health District

NAME OF DOCUMENT	Chest Drain – Insertion and Removal of Intercostal Catheter Using Safe-T-Centesis in Newborn Infants
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EXECUTIVE SPONSOR	S Bolisetty (Medical Co-Director Newborn Care Centre); S Wise (Nursing Co-Director Newborn Care Centre)
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SUMMARY	To guide the safe insertion of the Safe-T-Centesis intercostal catheter

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Chest Drain – Insertion and Removal of Intercostal Catheter Using Safe-T-Centesis in Newborn Infants

This Clinical Business Rule is developed to guide safe clinical practice in Newborn Care Centre (NCC) at The Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this Clinical Business Rule. Using this document outside the Royal Hospital for Women or its reproduction in whole or part, is subject to acknowledgement that it is the property of NCC and is valid and applicable for use at the time of publication. NCC is not responsible for consequences that may develop from the use of this document outside NCC.

1. BACKGROUND

Intercostal catheters are sometimes required in newborn infants to allow air or fluid to drain from the pleural space.

2. RESPONSIBILITIES

Medical and Nursing Staff

3. PROCEDURE

3.1 Equipment

Insertion

- Hat & mask
- Sterile gown and gloves (x2)
- Safe-T-Centesis™ 6.0Fr, 8.0Fr or 10.0Fr
- Needlefree Luer Activated Valve (x1)
- Dressing pack
- Sterile scissors (x1)
- Sterile gauze packets (x2)
- Sterile green drapes (x2)
- Sterile plastic drape (small)
- Sterile plastic drape (large)
- Large Tegaderm dressings (x2)
- Small steristrips (x2)
- Large steristrips (x1)
- 2 mL syringe and 25G needle
- Xylocaine 1% ampoule
- 0.5% Chlorhexidine foam swabstick x3
- Blue inco-pad
- Neutral detergent (for environmental cleaning)

Removal

- Hat & mask
- Sterile gloves
- Dressing pack
- Sterile plastic drape (large)
- Large Tegaderm dressing (x1)
- Small steristrips (x2)
- 0.5% Chlorhexidine foam swabstick x3



Picture 1



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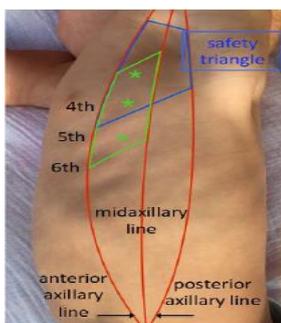
- Blue inco-pad

3.2 Clinical Practice

Procedure

1. Provide explanation to parent/s (may need to be discussed after procedure if performed emergently).
2. Check the following before starting procedure: 1) Informed consent; 2) Correct patient; 3) Correct procedure; 4) Correct site.
3. Check that suction and resuscitation equipment is available for emergency.
4. Perform hand hygiene.
5. Collect equipment.
6. Select appropriately sized Safe-T-Centesis™ catheter based on the infant's size and the protein content of any fluid being drained. There are three different sizes (6.0Fr, 8Fr or 10.0Fr).
7. Clean work surface with neutral detergent.
8. Insert a blue inco-pad under the infant.
9. Ensure infant is in the semi-lateral or lateral position with the arm above the head, exposing the insertion site.
10. Give oral sucrose prior to starting the procedure (and prior to administration of local anaesthetic).
11. Give a bolus dose of prescribed morphine infusion if in progress.
12. Identify landmarks and site for insertion of Safe-T-Centesis needle (Picture 2).

NOTE: Usually placed in the anterior or mid axillary line in line with the nipple (approximately in the 4th intercostal space)



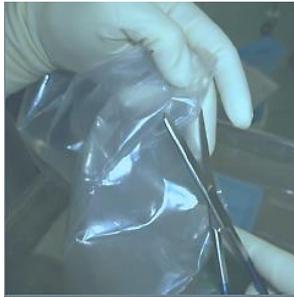
Picture 2



Picture 3

13. Don hat, goggles and mask.
14. Perform a surgical scrub for 2 minutes.
15. Dry hands with sterile paper towel.
16. Don sterile gown and sterile gloves (double-gloved).
17. Drape the cleaned procedure trolley with sterile plastic drape.
18. Assistant to open packets of equipment for proceduralist to assemble (Picture 3).
19. Cut a hole in the sterile plastic drape (Picture 4).
20. Assistant to assemble the water seal chest drain and connect tubing to suction (refer to nursing CBR "Chest Drain - set up"; Picture 5).

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Picture 4



Picture 5



Picture 6

21. Check and prepare local anaesthetic.
22. Remove the plastic tube from introducer (Picture 6).
23. Insert introducer into the silicone coated catheter via the white self-sealing valve (Pictures 7 & 8).



Picture 7



Picture 8

24. Push introducer into the white self-sealing valve to lock introducer to catheter (Pictures 9 & 10).
Do not twist the introducer.



Picture 9



Picture 10

25. Remove the yellow cap and replace with a red IV bung on the port of the 3-way tap of the side-line of the extension line (Picture 11).
26. Turn the tap toward the infant to close the catheter (Picture 11).
27. Check the tip of introducer is visible at the catheter tip (Picture 12).
28. Insert pressure on the introducer (on sterile dressing tray) to check the introducer retracts and the red marker at the white self-sealing valve is visible (Picture 13).

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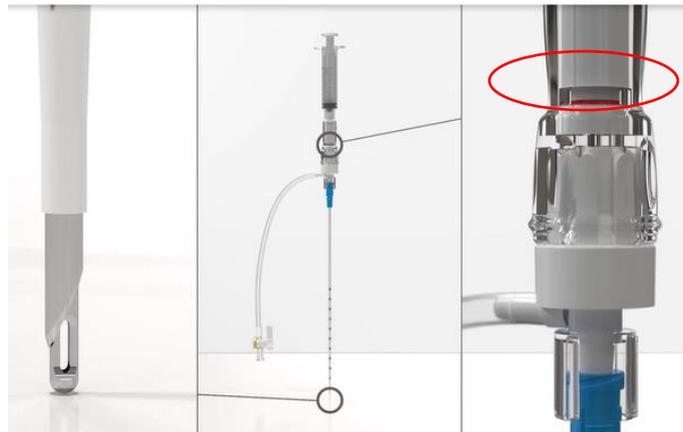
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Picture 11

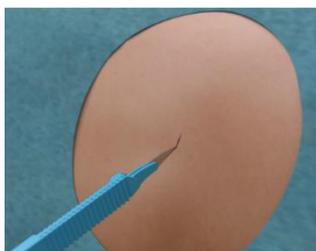


Picture 12



Picture 13

29. Clean insertion site with antiseptic solution. Repeat.
30. Apply sterile plastic drape and then sterile green drapes on infant.
31. Remove top pair of gloves.
32. Administer local anaesthetic.
33. Use the scalpel blade to make a small incision (0.2-0.3cm) on the nominated insertion site (Picture 14).
34. Hold the catheter firmly and insert it into the selected intercostal space with a 90 degree angle (Picture 15). Support catheter near the skin without touching the “key-part” of the catheter with the non-dominant hand.



Picture 14



Picture 15

35. Enter the incision site with firm pressure applied to the catheter.
36. Advance the catheter anteriorly into the pleural space. A “pop” can sometimes be felt as the catheter enters the pleural space.

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37. Observe for the red flash indicator in the catheter as it moves through the intercostal tissue in “sharp mode” (Picture 16). Indicator will return back to white (blunt mode) when it is in the pleural space (Picture 17).



Picture 16



Picture 17

38. Stabilise the introducer and slide the catheter off the introducer and forward into the infant’s chest wall (Picture 18).
39. Withdraw the introducer.
40. Ensure that the catheter is about 4-8 cm at the skin (depending on the size of the infant). The holes in the catheter are between 1.5 cm and the 3 cm marking (Picture 19).

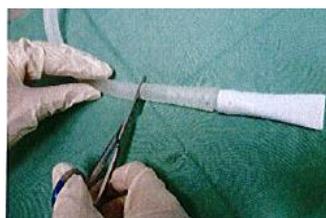


Picture 18

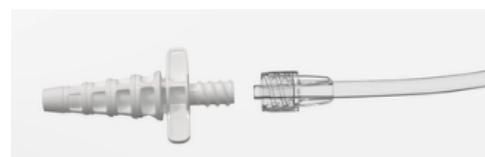


Picture 19

41. Attach the extension line to the 3-way tap (Picture 20).
42. Turn the tap toward the red bung.
43. Attach the white adaptor from the Safe-T Centesis pack to the extension line (Picture 21). The white adaptor can block if the fluid draining is proteinaceous. A Foley catheter adaptor can be used in place of the white adaptor if this is an issue.
44. Cut the end of tubing of the Atrium drainage system (Picture 22).
45. Connect the white adaptor to the end of the Atrium tubing (Picture 23).



Picture 20



Picture 21

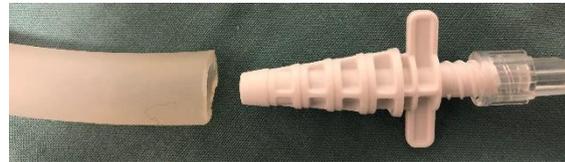


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Picture 22

Picture 23

46. Open the 3-way tap to the chest-drain.
47. Observe for intermittent bubbling and oscillation in the Atrium drainage system.
48. Clean the skin around the insertion site and allow to dry.
49. Secure the catheter with sterile surgical steristrips at the entry site to the skin.
50. Apply steristrips in a cross-over method as illustrated (Picture 24).
51. Perform a chest x-ray to check catheter position before dressing application.
52. Confirm catheter position with a senior medical officer.
53. Apply 2 tegaderms on opposite sides of the catheter to sandwich the catheter (Picture 25).
54. Ensure the dressing seals the insertion site.
55. Reinforce the edges of the tegaderm with large surgical steristrips (Picture 26).



Picture 24



Picture 25



Picture 26

56. Place a rectangle of comfeel onto the skin a centimetre from the edge of the dressing.
57. Anchor the catheter to the comfeel.
58. Remove and dispose all used equipment correctly.
59. Remove sterile gown and gloves.
60. Perform hand hygiene.
61. Document procedure in eRIC and NICUS database.

Removal

NOTE: Chest drains can be removed by the medical or nursing team. The medical team should be present at the time of removal. If nursing team encounters any difficulty with removal, the procedure should be paused and the medical team should remove the catheter.

1. Consult with medical staff whether a CXR is required to confirm lung re-expansion prior to removal of chest tube.
2. Document in eRIC that a plan has been made to remove the chest drain.
3. Check that the chest drain tubing has been clamped for at least 6 hours prior to removal.
4. Explain the procedure to parent/s if present.

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5. Ensure suction and resuscitation equipment is available for an emergency.
6. Perform hand hygiene.
7. Collect equipment.
8. Clean work surface trolley with neutral detergent.
9. Position infant in a semi-lateral position with the chest drain side upward.
10. Insert a blue inco-pad under infant.
11. Perform hand hygiene, dry with sterile paper towels and don sterile gloves.
12. Request an assistant.
13. Drape work surface with sterile plastic drape.
14. Assistant to open packets of equipment for proceduralist.
15. Request for analgesia to be administered to the infant prior to the procedure eg. oral sucrose or increase morphine infusion dose.
16. Clean the Tegaderm dressing and catheter with antiseptic swabstick. Repeat.
17. Peel the edges of the tegaderm dressing towards the catheter.
18. Remove the dressing.
19. Clean around the insertion site area and 2cm of the tubing with the antiseptic swabsticks. Repeat.
20. Remove the steristrips.
21. Cover the insertion site with a piece of gauze and remove the catheter in a single motion.

NOTE:

If infant is ventilated: Attempt to time catheter removal with ventilator inspiration.

If the infant is not ventilated: Attempt to time catheter removal with early expiration phase.

22. Apply gentle pressure with a piece of sterile gauze.
23. Check the site is clean and dry before sealing the insertion site with Tegaderm. Steristrips may be used to secure the edges of the skin if the catheter site is wide.
24. Document removal of chest drain in eRIC and NICUS database.
25. Discard all equipment and clean work surface area.
26. Perform hand hygiene.

3.3 Abbreviations

NCC	Newborn Care Centre	CXR	Chest X-ray
IV	Intravenous		

3.4 References

1. Bruschetti M, Romantsik O, Zappettini S, et al. Needle aspiration versus intercostal tube drainage for pneumothorax in the newborn. Cochrane Database of Systematic Reviews 2019;2:CD011724.
2. Safe-T-Centesis drainage device overview (instructional video) – <https://www.bd.com/en-ca/company/video-gallery?video=5246158301001>
3. Strutt J, Kharbanda A. Pediatric chest tubes and pigtales: an evidence-based approach to the management of pleural space diseases. *Pediatr Emerg Med Pract.* 2015;12:1-24.
4. Chan YH, Yu EL, Kwok HC, et al. Clamping of chest drain before removal in spontaneous pneumothorax. *J Cardiothorac Surg.* 2021;16:24.
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4. RELATED BUSINESS RULES AND POLICY DOCUMENTS

- RHW NCC Nursing CBR - Chest Drain - set up
- RHW NCC Medical CBR - Antisepsis in the Newborn Care Centre

5. CULTURAL SUPPORT

- When clinical risks are identified for an Aboriginal family, they may require additional supports. This may include Aboriginal health professionals such as Aboriginal liaison officers, health workers or other culturally specific services.
- For a Culturally and Linguistically Diverse CALD family, notify the nominated cross-cultural health worker during Monday to Friday business hours.
- If the family is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017_044-Interpreters Standard Procedures for Working with Health Care Interpreters.

6. IMPLEMENTATION PLAN

This Clinical Business Rule will be distributed to all medical, nursing and midwifery staff via @health email. The Clinical Business Rule will be discussed at ward meetings, education and patient quality and safety meetings. Education will occur through in-services, open forum and local ward implementation strategies to address changes to practice. The staff are asked to respond to an email or sign an audit sheet in their clinical area to acknowledge they have read and understood the Clinical Business Rule. The Clinical Business Rule will be uploaded to the Clinical Business Rule tab on the intranet and staff are informed how to access.

7. RISK RATING

- Low

8. NATIONAL STANDARDS

- Standard 1 Clinical Governance
- Standard 3 Preventing and Controlling Healthcare Associated Infections
- Standard 5 Comprehensive Care

9. REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
Mar 2021	1	KB lindrea (CNC); Approved by NCC LOPs Committee
Oct 2021	2	Revised and approved by NCC LOPs Committee
17 Aug 2023	3	Revised and approved by NCC CBR Committee
September 2023	4	Endorsed by RHW Safety Quality Committee



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