Children's National Hospital
Division of Nursing & Patient Services

**Nursing Practice Guideline**

**Chapter**: Cardiovascular 13

**Date Effective:** 11/17
**Last Updated:** 12/22

# CICU Addendum: Chest Tube Removal

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## I. Introduction

**A.** Chest Tubes are frequently used to drain fluid in the pleural space post cardiac surgery

**B.** This guideline is to be used for nurses in the CICU only.

**C.** This guideline outlines the nursing procedure for removing chest tubes. For the general maintenance and care of chest tubes, please refer to the Nursing Practice Guideline on Chest Tube Management

## II. Definitions

**A.** The primary purpose of a chest tube is to evacuate air, fluid, or blood from the pleural space. Placement is confirmed by chest x-ray. The chest drainage system removes air or fluid from the pleural space and prevents the backflow of air and fluid into the pleural space. All connection points are banded to ensure that the system remains airtight.

**B.** The most common type of chest tube in the CICU is the JP drain attached to the drainage system.

## III. Procedure

**A.** Removal of a chest tube

**1.** Pre-Procedure Requirements for Nurses

~~i.~~ Nurses must attend an education session conducted by

Cardiovascular surgery team (held on PRN basis as need arises).

ii. Nurses must have competency completed (Appendix A).

iii. Competency will require three chest tube removal pulls. The first pull in the presence of a CV Surgery team member and next two can be performed with Education Team member or competent RN in this role. After completion of three pulls, the nurse is able to perform this task independently.

**B.** Supplies for Removal

1. Metal clamps, 1 per tube
2. Absorbent pad
3. Face mask with eye shields
4. Yellow gown
5. Adhesive remover
6. CHG or Alcohol wipes
7. 2x2 gauze
8. Petroleum gauze
9. Occlusive dressing
10. Suture removal kit
11. Gloves
12. Bedside emergency equipment: Ambu bag and mask, suction and oxygen source

**C.** Removal Procedure:

1. Verify the order has been placed by LIP prior to proceeding with CT removal.
2. Perform formal time-out in preparation for CT removal and document in Ad Hoc charting.
3. Explains to patient/family (if available) purpose of procedure, risks, and the process for removal of chest tubes.
4. Ensure appropriate pain medication is ordered and administered in an appropriate timeline. Continue to removal when it is the peak effect of the medication.
5. Follow Adult dosing guidelines for patients >50kg

| Medication | Dose | Peak Effect |
|---|---|---|
| Morphine | **Pediatric dosing**- 0.05-0.1 mg/kg/dose IV<br>**Adult dosing**- 1-2 mg/dose | 20 minutes |
| Oxycodone (if no IV access) | 0.05-.01 mg/kg/dose PO | 20-30 minutes |
| Hydromorphone | **Pediatric dosing**- 0.01mg/kg/dose IV<br>**Adult dosing**- 0.2-0.5mg IV | 20 minutes |
| Fentanyl (if Morphine not available) | **Pediatric dosing**- 0.5mcg/kg/dose<br>**Adult dosing**-25-50 mcg/dose | 20 minutes |

6. Wash hands and don clean gloves.
7. Ensure cardio-respiratory monitor is in place and alarms on.

8. Clamp all tubes with metal clamp.
9. Turn off suction.
10. Using adhesive remover, remove transparent dressing covering the site.
11. Clean site with chlorohexidine (scrub for 15 seconds) or alcohol pad (scrub for 30 seconds)
12. Unravel purse string sutures
13. Apply petroleum gauze and 2x2 gauze at entry site

14. If able, instruct patient to take in deep breath and hold the breath or exhale and hold it.
15. **If patient is intubated perform a respiratory hold with respiratory therapist**
16. Remove chest tube quickly at end of inspiration or exhalation.
17. Immediately cover the chest tube entry site with Vaseline gauze and/or 2x2.
18. Tighten purse-string suture to close the skin.
19. Replace Vaseline gauze and/or 2x2 if soiled.
20. Apply occlusive dressing.
21. Dispose of equipment.

**D.** Post Procedure:
1. Evaluate patient for changes in hemodynamics, specifically for respiratory distress.
2. Monitor removal site and dressing.
3. Closely monitor for pneumothorax.
4. Ensure that chest x-ray is ordered for 2-4 hours post removal.
5. Ensure LIP reviews post removal chest x-ray.
6. Document chest tube removal in a procedure note.

**IV.** Patient/Family Education

**A.** Review the functions of the chest tube and reasons why it is no longer necessary.

**B.** Discuss the procedure for removal with the family and answer any questions.

**C.** Inform family when chest tube is going to be removed.

**V.** Documentation

**A.** Chest tube removal is documented in a procedure note.

CERNER→Go to Documents→ Click Add→ Select Procedure note (drop down)→ Add Title of Note: Chest Tube Removal

**B.** Procedure notes should follow this template:
1. Body of Note
   - **a.** Date/ Time of procedure
   - **b.** Medication and time given
   - **c.** Type of distraction used: music, play, iPad, etc.
     i. If distraction was not used, explain why.
   - **d.** Procedure: Chest Tube removal

**e.** How the patient tolerated the procedure
i. Respiratory effort

**2.** Plan:
**a.** Monitor for bleeding and need for additional pain medication
**b.** If any complications were noted, explain follow-up interventions and reassessment plan.

**VI.** References

Preze, E. (2011). Chest tube insertion and removal. In: K. Reuter-Rice & B. Bolick. (Eds.). *Pediatric Acute Care: A Guide for Interprofessional Practice* (p. 1268-1271). Burlington, MA: Jones & Bartlett Learning

Templin, D. (2008) Chest tube removal: Perform. In: Verger, J. T.& Lebet, R.M. (Eds). AACN Procedure Manual for Pediatric Acute and Critical Care. (p. 275-280). St. Louis, MO: Saunders/ Elsevier).

Verger J, Lebet R. AACN Procedure Manual for Pediatric Acute and Critical Care. St. Louis, 2008. Saunders Elsevier

**VII.** Reviewers
**A.** CICU Safe Practice Council
**B.** CICU Leadership Team
**C.** CICU Medical Unit Director
**D.** CV Surgery Team
**E.** Shared Nursing Leadership Quality & Safe Practice Council – Systems Level

**VIII.** Legal Statement

The nursing practice guidelines are intended to serve as a reference for the nurses in their practice. The compilation of information provided is drawn from relevant literature research from juried, reliable and respected sources. The guidelines are not intended to replace individual judgment but instead to inform decision making. The material is updated approximately every 12-24 months.

**IX.** Approval

_____ _____
Senior Vice President & Chief Nursing Officer Date

Original Date: 11/17
Revised Date(s):
11/20, 12/22

**X.** Appendix A: Competency for Chest Tube Removal

| **NAME:** | **CARDIAC INTENSIVE CARE UNIT (CICU)** |
|---|---|
| **EMPLOYEE ID:** | **DATE COMPLETE:** |

COMPETENCY VALIDATION CHECKLIST: Chest Tube Removal Competency
COMPETENCY STATEMENT: 3 Successful chest tube pulls must be demonstrated to validate competency.
**Validation Key**: VF = Verbal Feedback, OB = Observation, D = Discussion, RD = Return Demonstration

| Performance Criteria | Method of Validation | Validator Initials | | | Comments |
|---|---|---|---|---|---|
| **Prerequisite Knowledge:**<br>Explains indication(s) for placement & removal. | VF D | | | | |
| CICU RN must attend education session conducted by CV Surgical Team | VF D | | | | Date Attended: |
| Explains possible complications with chest tube removal | VF D | | | | |
| Explains rational to the patient/family purpose of procedure, risks & process of procedure | VF D | | | | |
| Perform formal time-out and chart in Ad Hoc | RD | | | | |
| Gathers necessary equipment:<br>• Metal clamps, 1 per tube<br>• Absorbent pad<br>• Face mask with eye shields<br>• Yellow gown<br>• Adhesive remover<br>• CHG or Alcohol wipes<br>• 2x2 gauze<br>• Petroleum gauze<br>• Occlusive dressing<br>• Suture removal kit<br>• Gloves<br>• Bedside emergency equipment: ambu bag and mask, suction, oxygen source | RD | | | | |
| ***Must successfully Return Demonstrate (RD) 3 chest tube removals to validate competency.*** | | #1 | #2 | #3 | |
| Demonstrate the following<br>**1.** Verify order placed by LIP prior to CT removal.<br>**2.** Verify removal is correct patient by using patient's ID band and performing a time-out.<br>**3.** Explains to the patient/family (if available) purpose of procedure, risks, and the process for removal of chest tubes.<br>**4.** Obtains pre-pain assessment using appropriate pain scale.<br>**5.** Ensure appropriate pain medication was ordered and administered in an appropriate timeline. Continue to removal when it is the peak effect of the medication.<br>**6.** Follow Adult dosing for patients >50KG | RD | | | | |

| Medication | Dose | Peak Effect |
|---|---|---|
| Morphine | **Pediatric dosing**- 0.05-0.1 mg/kg/dose IV<br>**Adult dosing**- 1-2 mg/dose | 20 minutes |
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6. Wash hands and don clean gloves.
7. Ensure cardio-respiratory monitor is in place and alarms are turned on.
8. Clamp all tubes.
9. Turn off suction.
10. Using adhesive remover, remove transparent dressing covering the site.
11. Clean site.
12. Tighten purse string sutures to close the skin.
13. Apply petroleum gauze and 2x2 gauze at entry site.
14. If able, instruct patient to take in deep breath and hold the breath or exhale and hold it.
15. Remove chest tube quickly at end of inspiration or exhalation.
16. Immediately cover the chest tube entry site with gauze.
17. Tie down purse-string suture.
18. Replace petroleum gauze and/or 2x2 if soiled.
19. Apply occlusive dressing.
20. Dispose of equipment.

***Post Chest Tube Removal***

- Evaluate patient for changes in hemodynamics, specifically for respiratory distress.
- Monitor removal site and dressing.
- Closely monitor for pneumothorax.
- Obtain post pain assessment using appropriate pain scale.
- Ensure that chest x-ray is ordered for 2-4 hours post removal.
- Ensure LIP reviews post removal chest x-ray.
- Document chest tube removal in a procedure note.

| | **Preceptor Name (Please Print)** | **Initials** | **Date** |
|---|---|---|---|
| #1 | | | |
| #2 | | | |
| #3 | | | |