

Citation: Nguyen TTK, Nguyen NTC, Ho HT, Pham TQ, Nguyen T, Vo TM, et al. Nursing care for patients with open thoracostomy: Case series report and proposal for standardized care protocol. Arch Nurs Healthc. 2025;3(1):34-39.

Appendix 1: 10-item multiple-choice knowledge test

These items assess theoretical understanding and match the content of the training session (indications, risks, aseptic care, respiratory monitoring, and complication recognition).

1. Which of the following is a common indication for open thoracostomy?

- A. Mild pleural effusion
- B. Late-stage empyema with thick pus
- C. Uncomplicated pneumothorax
- D. Stable lung contusion

→ **Correct answer: B**

2. The primary purpose of open thoracostomy is to:

- A. Completely close the pleural space
- B. Allow continuous drainage and ventilation
- C. Increase intrapleural pressure
- D. Prevent all air leakage

→ **Correct answer: B**

3. Which principle is MOST important during dressing change?

- A. Keeping the wound tightly sealed
- B. Using clean technique only
- C. Maintaining aseptic (sterile) technique
- D. Avoiding removal of clots

→ **Correct answer: C**

4. The open thoracostomy opening must NOT be occluded because:

- A. It may increase patient pain
- B. It can cause tension pneumothorax
- C. It delays healing time
- D. It limits patient mobility

→ **Correct answer: B**

5. A sudden reduction or absence of air movement through the opening indicates:

- A. Normal recovery
- B. Effective drainage
- C. Possible obstruction of the opening
- D. Patient anxiety

→ **Correct answer: C**

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6. Which solution is recommended for cleansing the skin around the opening?

- A. Betadine 20%
- B. NaCl 0.9%
- C. NaCl 10%
- D. Hydrogen peroxide

→ **Correct answer: C**

7. When should vital signs and respiratory status be assessed?

- A. Only when the doctor requests
- B. Before care only
- C. After care only
- D. Before, during, and after care

→ **Correct answer: D**

8. Which sign suggests worsening infection around the wound?

- A. Warm, dry skin
- B. Reduced drainage
- C. Increasing redness or foul odor
- D. Improved oxygen saturation

→ **Correct answer: C**

9. Effective pain management helps improve:

- A. Patient appetite
- B. Cooperation and ventilation
- C. Blood pressure only
- D. Dressing durability

→ **Correct answer: B**

10. Which of the following is a key objective of nursing care in open thoracostomy?

- A. Achieving early wound closure
- B. Preventing ventilatory compromise and infection
- C. Minimizing the need for documentation
- D. Avoiding respiratory monitoring

→ **Correct answer: B**

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Appendix 2: 20-item checklist on open thoracostomy care

| No. | Assessment Item | Not Competent (0) | Competent (1) |
|---|--|-------------------|---------------|
| I. Preparation and Safety | | | |
| 1 | Performs hand hygiene according to protocol before the procedure | | |
| 2 | Prepares all required equipment: clean gloves, sterile gauze, minor procedure set, 10% NaCl, oxygen, monitor | | |
| 3 | Explains the procedure to the patient to ensure cooperation | | |
| 4 | Positions the patient in Fowler or semi-sitting position to facilitate breathing | | |
| II. Initial Assessment | | | |
| 5 | Assesses vital signs: pulse, blood pressure, SpO ₂ , respiratory rate, temperature | | |
| 6 | Evaluates dyspnea level and signs of pneumothorax | | |
| 7 | Inspects the open thoracostomy site for air leak, blood, or drainage characteristics | | |
| III. Wound Care – Ensuring Ventilation | | | |
| 8 | Ensures the opening is never occluded; maintains continuous ventilation | | |
| 9 | Cleans surrounding skin with 10% NaCl | | |
| 10 | Performs sterile dressing change using correct aseptic technique | | |
| 11 | Removes clots/pus/slough obstructing the opening using sterile instruments when necessary | | |
| 12 | Observes air movement through the opening during patient breathing | | |
| 13 | Records the amount and characteristics of blood/fluid drainage | | |

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| IV. Respiratory Monitoring | | | |
|--|--|--|--|
| 14 | Monitors SpO ₂ and respiratory rate | | |
| 15 | Assesses improvement/no improvement in dyspnea after care | | |
| 16 | Detects early signs of opening obstruction (absence of air movement) | | |
| V. Supportive Care and Prevention | | | |
| 17 | Administers analgesics as prescribed and reassesses pain | | |
| 18 | Instructs patient in deep breathing and effective coughing | | |
| 19 | Maintains hygiene; prevents clothing friction on the opening | | |
| VI. Documentation and Reporting | | | |
| 20 | Documents all findings: progression, opening status, and interventions performed | | |