Pleural Decompression	6091-C
Effective 7/1/2023	**Expires** 6/30/2026
Low Frequency/High Risk: **Pleural Decompression**	Approval: Medical Director **John Beuerle, M.D.**	Signed
Applies To: **Paramedics**	Approval: EMS Director **Teresa Rios**	Signed

Performance Objective

Relieve intrathoracic pressure due to tension pneumothorax to improve cardiac output, ventilation and oxygenation.

Prior to Needle Pleural Decompression

Assess the patient:

1. Be suspicious of tension pneumothorax in the context of known or suspected torso trauma
2. Be suspicious of spontaneous tension pneumothorax
3. Be suspicious of tension pneumothorax during prolonged artificial ventilation

Recognize and differentiate the signs and symptoms of tension pneumothorax:

1. Hypotension
2. Pleural pain
3. Air hunger
4. Respiratory distress
5. Tachycardia
6. Neck vein distension
7. Tracheal deviation away from the side of the injury
8. Unilateral absence of breath sounds
9. Elevated hemithorax without respiratory movement
10. Cyanosis (late manifestation)

Treat hypoxemia and inadequate ventilation:

1. Position the patient as clinically indicated to meet physiologic requirements
2. Assist breathing as clinically indicated:
    a. Give only sufficient volume to cause chest rise
3. Use minimum titratable oxygen to reach 94% SpO_2

Recognize and correct confounding factors:

1. Occlusive dressing of open pneumothorax
2. Misplaced endotracheal tube

Confirm the indication for unilateral needle pleural decompression:

1. Signs and symptoms of tension pneumothorax with compromised cardiac output AND rapidly progressing respiratory distress unrelieved by less invasive means

Confirm the indication for bilateral needle pleural decompression:

1. Traumatic cardiac arrest with known / suspected chest trauma

Assemble equipment required for needle pleural decompression
Identify and aseptically mark the appropriate side(s), approach(es), and insertion site(s):

Left, right, or bilateral:

1. Anterior approach:
    a. Second intercostal space at the midclavicular line immediately above the third rib

Note: Inability to positively identify the insertion site is a contraindication to needle pleural decompression.

Prepare the insertion site:

1. Use aseptic technique
2. Swab the site with alcohol, povidone iodine, and/or ChloraPrep
3. Confirm use of the clinically indicated personal protective equipment (PPE)
4. Remove the Luer lock or slip tip fitting from the end of the IV needle-catheter set
    a. Alternatively attach a syringe partially filled with Normal Saline

Needle Pleural Decompression

Perform needle pleural decompression:

1. Firmly but carefully insert the IV Catheter at a 90° angle, just over the superior aspect of the rib, through the skin and pleura until air escapes or a distinct "give" is felt. The undersurface of the rib should be avoided to limit injury to the neurovascular bundle. Air should be freely aspirated, or a rush of bubbles will be in the partially filled syringe.
2. If air is released:
    a. Withdraw the needle while leaving the catheter in place
    b. Secure the catheter using bandages and tape
    c. Reassess signs and symptoms of tension pneumothorax
    d. Monitor patency of catheter
3. If air is not released:
    a. Reassess for placement in the pleural space and adjust as needed.
    b. Withdraw the needle-catheter set and dress the insertion site with an occlusive dressing
    c. Reassess for signs and symptoms of tension pneumothorax, hemothorax, or other conditions and treat appropriately
    d. Monitor for iatrogenic pneumothorax

Critical Success Targets

1. Improved cardiac output, including return of pulses, improved skin color, improved BP, improved level of consciousness
2. Chest rise and fall with each breath or ventilation
3. Sp02 of 94%
4. Improved ETC02

Equipment Requirements

1. Personal Protective Equipment
2. Respiratory Protection
3. Medical Exam Gloves
4. Barrier Garment
5. Stethoscope
6. Monitoring and resuscitation equipment
7. Alcohol, Povidone Iodine and/or ChloraPrep Swab
8. Syringe and Hypodermic needle
9. Normal Saline 0.9% - 10 mL Prefilled Syringe or Vial
10. Catheter(s) for Needle Pleural Decompression. Options include:
    a. 3.25-inch 14 g IV Catheter(s)
    b. 3.25-inch 16 g IV Catheter(s)
    c. 1.75-2-inch 18 g IV Catheter(s)
11. Portable Sharps Container
12. Gauze Sponge, Pad, Bandage, and/ or Dressing
13. Tape
14. Petrolatum Gauze Dressing
15. Biohazard Bag
16. Waste Bag

Instructor Resource Materials

1. Advanced Trauma Life Support, 9th Edition

2. Prehospital Trauma Life Support 8th Edition
3. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

Pleural Decompression

Successful (y/n)	Performance Steps	Additional Information
	Use standard, contact, and droplet precautions	Personal protective equipment includes multiple-use eye protection, respiratory protection, barrier garment, and medical exam gloves
	Assess the patient	• Be suspicious of tension pneumothorax in the context of known or suspected torso trauma • Be suspicious of spontaneous tension pneumothorax
	Recognize and differentiate the signs and symptoms of tension pneumothorax *	• Pleural pain • Air hunger • Respiratory distress • Tachycardia • Hypotension • Tracheal deviation away from the side of the injury (late manifestation) • Unilateral absence of breath sounds • Elevated hemithorax without respiratory movement • Neck vein distension • Cyanosis (late manifestation)
	Treat hypoxemia and inadequate ventilation *	• Position the patient as clinically indicated to meet physiologic requirements • Assist breathing as clinically indicated: o Give only sufficient volume to cause chest rise • Use minimum titratable oxygen to reach 94% SpO2
	Recognize and correct confounding factors *	• Tension pneumothorax due to occlusive dressing of open pneumothorax • Misplaced endotracheal tube

	Confirm the indication for needle pleural decompression *	• Unilateral:
		  o Signs and symptoms of tension pneumothorax with rapidly progressing respiratory distress unrelieved by less invasive means with s/s compromised cardiac output
		• Bilateral:
		  o Traumatic cardiac arrest with known / suspected chest trauma

	Assemble equipment required for needle pleural decompression	• Personal Protective Equipment • Respiratory Protection • Medical Exam Gloves • Barrier Garment • Stethoscope • Monitoring and resuscitation equipment • Alcohol, Povidone Iodine and/or ChloraPrep Swab • Syringe and Hypodermic needle • Normal Saline 0.9% - 10 mL Prefilled Syringe or Vial • 3.25-inch 14 g IV Catheter(s) for Needle Pleural Decompression o 3.25-inch 16 g IV Catheter(s) for Needle Pleural Decompression • 1.75 – 2-inch 18 g IV Catheter(s) for Needle Pleural Decompression

		• Portable Sharps Container • Gauze Sponge, Pad, Bandage, and/ or Dressing • Tape • Petrolatum Gauze Dressing • Biohazard Bag • Waste Bag

	Identify and aseptically mark the appropriate side(s), approach(es), and insertion site(s) *	• Left, right or bilateral
		  ○ The side(s) requiring needle chest decompression
		• Anterior approach:
		  ○ Second intercostal space at the midclavicular line immediately above the third rib
		  ○
		•
		The inability to positively identify the insertion site is a contraindication to needle chest decompression.

	Prepare the insertion site *	• Use aseptic technique • Swab the site with alcohol, povidone iodine, and/or ChloraPrep • Confirm use of the clinically indicated personal protective equipment (PPE) • Remove the Luer lock or slip tip fitting from the end of the IV needle-catheter set ○ Alternatively, attach a syringe partially filled with Normal Saline

	Perform Needle Pleural Decompression *	• Firmly but carefully insert the IV Catheter at a 90° angle, just over the superior aspect of the rib, through the skin and pleura until air escapes or a distinct "give" is felt. The undersurface of the rib should be avoided to limit injury to the neurovascular bundle. Air should be freely aspirated, or a rush of bubbles will be in the partially filled syringe.
		• If air is released:
		  ○ Withdraw the needle while leaving the catheter in place
		  ○ Secure the catheter using bandages and tape
		  ○ Reassess signs and symptoms of tension pneumothorax
		  ○ Monitor patency of catheter
		• If air is not released, the catheter is not in the pleural space:
		  ○ Withdraw the needle-catheter set and dress the insertion site with an occlusive dressing
		  ○ Reassess signs and symptoms of tension pneumothorax
		  ○ Monitor for iatrogenic pneumothorax

Critical Failure Criteria

- **Failure to use standard, contact, and droplet precautions**
- **Failure to recognize and differentiate the signs and symptoms of tension pneumothorax**
- **Failure to treat hypoxemia and inadequate ventilation**
- **Failure to recognize and correct confounding factors**
- **Failure to confirm the indication for needle pleural decompression**
- **Failure to identify and aseptically mark the appropriate side(s), approach(es), and insertion site(s)**
- **Failure to prepare the insertion site**
- **Failure to perform clinically indicated needle pleural decompression**
- **Failure to reassess and monitor**
- **Any procedure that would have harmed the patient**