



Module	Maine Emergency Medical Services Emergency Medical Technician (EMT) Scope of Practice Skills Practicum
Lab	Continuous Positive Airway Pressure Devices

Goals & Objectives

At the completion of this lab the student will be able to:

1. Identify and describe the components of a CPAP administration set
2. Explain and demonstrate the proper technique for application of the CPAP device to an adult patient, given CPAP equipment
3. Explain and demonstrate the proper technique for application of a small volume nebulizer (SVN) CPAP device to an adult patient, given CPAP equipment
4. Identify and demonstrate techniques for patient “coaching” and mitigating patient anxiety which may be associated with application of CPAP.
5. Identify and demonstrate techniques for troubleshooting CPAP devices for proper function and/or equipment failure.
6. Explain and demonstrate how to assess the patient for efficacy of CPAP treatment.
7. Discuss proper techniques for documenting the use of CPAP in a patient care report.

Reference Materials

Texts

American Academy of Orthopaedic Surgeons, Pollak, A.N., Elling, B., & Aehlert, B. (2021). *Nancy Caroline’s Emergency Care in the Streets, 12th Edition*, Burlington, MA: Jones & Bartlett Learning.

National Association of State EMS Officials. (2019) *National EMS Scope of Practice Model. (Report No. DOT HS 812-666)*.

Protocols & EMS Guidelines

- Maine EMS Pre-Hospital Care Protocols: <https://www.maine.gov/ems/sites/maine.gov.ems/files/inline-files/Final-2021-Protocol-ALL-compressed.pdf>
- NASEMSO Model EMS Clinical Guidelines: <https://nasemso.org/projects/model-ems-clinical-guidelines/>

Terminology

- Asthma
- Barotrauma
- Bronchoconstriction
- Bronchodilator
- Bronchospasm
- cm H₂O
- Combivent
- Congestive heart failure (CHF)



- Continuous positive airway pressure (CPAP)
- Drowning
- DuoNeb
- Gastric distention
- Hypotension
- Inflammation
- Inspiratory/Expiratory (I/E) ratio
- Ipratropium bromide
- Mucus
- Obstruction
- Obstructive sleep apnea
- Oxygenation
- Parasympathetic nervous system
- Perfusion
- Pneumonia
- Pneumothorax
- Positive-end-expiratory-pressure (PEEP)
- Pressure
- Pressure-relief valve
- Pulmonary edema
- Respiratory arrest
- Respiratory distress
- Respiratory failure
- Small volume nebulizer (SVN)
- Status asthmaticus
- Sympathetic nervous system
- Tidal volume
- Ventilation
- Volume

Equipment Needed

1. Airway trainer, adult
2. Continuous positive airway pressure (CPAP) device w/small volume nebulizer (SVN)
3. Simulated medication for use in small volume nebulizer (SVN)
4. Examination gloves (*Box of X-small, small, medium, large, x-large, and 2x large if available and/or needed*)
5. Flowmeter/pressure regulator
6. Goggles, safety glasses, and/or face shields (*1 unit/ student and instructor*)
7. Face masks
8. Handwashing sink and soap or hand sanitizer
9. Oxygen cylinder
10. Pulse oximeter
11. Stethoscope
12. Trash receptacle

Laboratory Skill Sheet(s)

1. CPAP, Adult

Laboratory Plan

1. **INSTRUCTOR NOTE: This procedure generates aerosolized droplets into the air. As a result of the current COVID-19 pandemic, there is a risk to EMS clinicians and others with the use of this procedure in patient care. PLEASE EMPHASIZE THE IMPORTANCE OF THE USE OF APPROPRIATE PPE when teaching this skill. Please use appropriate PPE and have students don appropriate PPE while practicing this skill, per current pandemic protocol.**
2. Have each student don gloves, face mask, and eye protection in accordance with standards (see above).
3. Student instruction should include the following:
 - a. Demonstration and discussion of different CPAP devices available to EMS
 - i. Low-pressure driven (used with liter flow attachment)
 - ii. High-pressure devices (used with 50 psi connector to wall outlet or regulator)



- iii. Equipment requirements, per MDPB (see MEMS Approved Equipment List)
 - iv. NOTE: all CPAP devices approved for use in Maine MUST have the ability to attach a nebulizer.
 - b. Demonstration (using whole-part-whole technique) of techniques for applying the CPAP device to an adult patient. This may vary with different sets/types of CPAP equipment. Demonstration should include:
 - i. CPAP device components
 1. Proper sizing and positioning of mask, including use of head straps
 - ii. CPAP device settings
 1. Titration of PEEP
 - iii. Oxygen system settings
 - iv. Addition of nebulizer and components, as needed for patient condition
 - c. Demonstration of various techniques to reduce or mitigate patient anxiety with use of CPAP, including:
 - i. Patient coaching techniques
 - ii. Requesting ALS response for medication anxiolysis (Blue 3 in 2021 Maine EMS protocols)
 - d. Demonstration and reinforcement of the need to perform various techniques of assessing equipment proper function and troubleshooting.
 - i. Assessing the mask fit and monitoring for proper fit and assessing for air leaks
 - e. Demonstration and reinforcement of the need to perform various techniques of patient assessment prior to application of CPAP, and for efficacy of CPAP treatment, or need for additional interventions, including improvement or deterioration of:
 - i. Patient anxiety level
 - ii. Breath sounds
 - iii. Patient respiratory effort
 1. Chest volume expansion
 2. Respiratory rate
 - iv. Patient affect or LOC
 - v. Vital signs, including pulse oximetry
 - vi. Pneumothorax
 - vii. Gastric distension
4. Under guided instruction (*with immediate corrections*), have the students practice:
 - a. Assembly of CPAP components and application of the CPAP device
 - b. Assembly and addition of medication nebulizer
 - c. Assessment/troubleshooting of equipment function
 - d. Patient re-assessment techniques for efficacy of treatment
5. Have the student demonstrate proper hand hygiene
 - a. In areas with no sinks, please utilize hand sanitizer
6. Discuss techniques of documenting in the PCR
 - a. Application of CPAP
 - b. Use of nebulizer and medication, as applicable
 - c. Patient reassessment



- d. Patient improvement/deterioration
 - e. Estimated total time on CPAP
7. Have the student reflect on their performance and discuss successes and opportunities for improvement.

Laboratory Exercises

1. Students should be provided time to practice skills CPAP application using a variety of CPAP device types, and with a skills evaluation form and an instructor sign-off.
2. The context in which these skills will be performed by the EMT is important. It should be emphasized by the instructor that these skills are not benign. The EMT must understand that improper application of this skill can have untoward effects for the patient, if attention is not paid to detail, and that ALS should be requested (if not enroute), and not be cancelled simply because these skills are now within the EMT scope of practice.
3. It is also important to emphasize that the EMT may be performing these skills independently, and possibly without an AEMT/Paramedic to rely on for patient reassessment and management.
4. Instructors should also consider incorporating use of the CPAP into patient scenario(s) for practical application and improved retention of knowledge.

Assessment of Objectives

Formative

1. Demonstration
2. Psychomotor skills practice
3. Peer review
4. Psychomotor skill scenarios
5. Complaint and injury scenarios

Summative

1. Summative affective assessment
2. Final complaint and injury scenarios

Credits

Maine EMS gratefully acknowledges the EMS programs of the Maine Community College System, for their collaboration and for allowing use of their program materials in the development of these EMT Scope of Practice Skills Practicum written lab and skills sheet materials: Southern Maine, Kennebec Valley, Eastern Maine, and Northern Maine Community Colleges.