



Module	Maine Emergency Medical Services Emergency Medical Technician (EMT) Scope of Practice Skills Practicum
Lab	Nebulized Medication Administration

Goals & Objectives

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

1. Identify and describe the equipment necessary for the administration of medications via the nebulization route.
2. Identify and describe the medications within the Maine EMS Emergency Medical Technician scope of practice that may be administered via nebulizer by an Emergency Medical Technician.
3. Demonstrate medication safety procedures for the patient by using the five (5) rights of medication administration and the medication cross check.
4. Demonstrate the proper technique of medication administration via the inhaled route using a small volume nebulizer (SVN) and continuous positive airway pressure (CPAP) with SVN.
5. Identify, explain, and demonstrate proper techniques for evaluation of a patient for efficacy and undesired effects from a medication administration.
6. Identify and demonstrate techniques for troubleshooting the nebulizer equipment for proper function and/or equipment failure.
7. Discuss proper techniques for documenting the administration of medication via nebulizer.

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://nasems.org/projects/model-ems-clinical-guidelines/>



Terminology

- Adverse reaction
- Albuterol sulfate
- Allergy
- Anaphylaxis
- Bullet
- Continuous positive airway pressure (CPAP)
- Contraindication
- Dose
- DuoNeb
- Epinephrine
- Hypersensitivity
- Indication
- Inhaled
- Ipratropium bromide
- Mechanism of action
- Pharmacodynamics
- Pharmacokinetics
- Route
- Side effect
- Small volume nebulizer (SVN)
- Vial
- Tidal Volume

Equipment Needed

1. Airway trainer, adult
2. Continuous positive airway pressure (CPAP) device w/small volume nebulizer (SVN)
3. Examination gloves (*Box of X-small, small, medium, large, x-large, and 2x large if available and/or needed*)
4. Flowmeter/pressure regulator
5. Goggles, safety glasses, and/or face shields (*1 unit/ student and instructor*)
6. Handwashing sink and soap or hand sanitizer
7. Stethoscope
8. Oxygen cylinder (multiple, E or Super D)
9. Simulated medication, ipratropium bromide/albuterol sulfate bullet
10. Small volume nebulizer set (SVN)
 - a. Hand-held
 - b. Mask
11. Trash receptacle

Laboratory Skill Sheet(s)

1. Inhaled, nebulizer
2. Inhaled, nebulizer, CPAP
3. Medication administration, DuoNeb, inhaled
4. Medication cross check
5. Rights of medication administration

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 APPROPRIATE PPE when teaching this skill. Please use appropriate PPE and have students don appropriate PPE (if available) while practicing this skill, per current pandemic protocol.**
2. Have each student don gloves and eye protection in accordance with standards (see above).



3. Student instruction should include the following:
 - a. Emphasis that good respiratory assessment and assessment skills prior to intervention and post-intervention are *imperative* to being able to assess for and recognize patient improvement or deterioration – this is a “hands-on” game.
 - b. Using the medication packaging and actual medication bullets, show the students how to identify
 - i. Medication name
 - ii. Medication concentration
 - iii. Expiration date
 - c. Have the students identify the applicable medications within the Maine EMS EMT scope of Practice (2021 *Maine EMS Prehospital Protocols*)
 - i. Albuterol sulfate
 - ii. Ipratropium bromide
 - iii. Oxygen
 - d. Discussion the five (5) rights of medication administration (*SEE SKILLS SHEET*)
 - e. Demonstration of how to perform a medication cross check (*SEE SKILLS SHEET*)
 - f. Demonstration of how to administer medication via small volume nebulizer (SVN) sets:
 - i. The following equipment should be demonstrated
 1. Hand-held administration set
 2. Mask-type administration set
 3. Administration with a continuous positive airway pressure (CPAP) device
 - ii. Reinforce that in the Maine EMS system, only the combination of Ipratropium bromide/albuterol sulfate may be used by the Emergency Medical Technician
 - iii. For each of the above administration sets, methods of troubleshooting both equipment and patient technique (i.e., hand-held), and variation of liter flow to the administration set to ensure effective administration of medication.
 - iv. Demonstrate, and reinforce the need to perform, various patient assessment techniques prior to treatment and for assessment of medication efficacy and/or need for additional administration after medication administration:
 1. Improvement/deterioration of
 - a. Patient skin color
 - b. Patient affect or LOC
 - c. Pulse oximetry
 - d. Breath sounds
 - e. Respiratory effort, including chest volume expansion and respiratory rate.
 - g. Demonstrate how to administer medication via a small volume nebulizer (SVN) with a continuous positive airway pressure (CPAP) device. This may be covered separately, with the CPAP skills session, done at this time, or both.
 - i. Reinforce that in the Maine EMS system, only the combination of Ipratropium bromide/albuterol sulfate may be used by the Emergency Medical Technician
 - ii. Reinforce that
 1. CPAP is NOT a replacement for bronchodilators



2. If using CPAP, bronchodilators MUST be use simultaneously with it (i.e., CPAP with albuterol/ipratropium via attached nebulizer). If you have reached this step, in patient care, you should have a paramedic enroute (including rendezvous with ALS) and/or been route to the hospital.
2. Under guided instruction (*with immediate corrections*), have the students practice the usage of the five (5) rights of medication administration and the medication cross check methods (consider use of skills sheets as a teaching aid) while doing the following nebulizer administrations:
 - a. Albuterol/ipratropium bromide (DuoNeb)
3. Review/reinforce procedures for proper documentation of:
 - a. Administration of medication via nebulizer
 - b. Re-assessment of patient for medication efficacy
 - c. Repeat administration of medication (if necessary)
 - d. Consult with OLMC (if necessary)
4. Have the student demonstrate proper hand hygiene and use of COVID precautions.
 - a. In areas with no sinks, please utilize hand sanitizer
5. Have the student reflect on their performance and discuss successes and opportunities for improvement including:
 - a. Location of medication and types of administration devices per their specific EMS Services
 - b. Replacement of used medications and administration devices.

Laboratory Exercises

1. Students should be provided time to practice medication administration skills using a both types of nebulizer sets, and with a verification 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 not be cancelled or requested (if not enroute) simply because these skills are now within the EMT scope of practice.
3. It is also important to emphasize, not only the protocols and scenarios during which the EMT will be performing these skills to assist the AEMT/Paramedic, but that the EMT will be performing these skills independently, and possibly without an AEMT/Paramedic to rely on for patient reassessment.
4. Instructors should also consider incorporating 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
1. Psychomotor skill scenarios

Summative

1. Summative affective assessment
2. Final psychomotor skills 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.