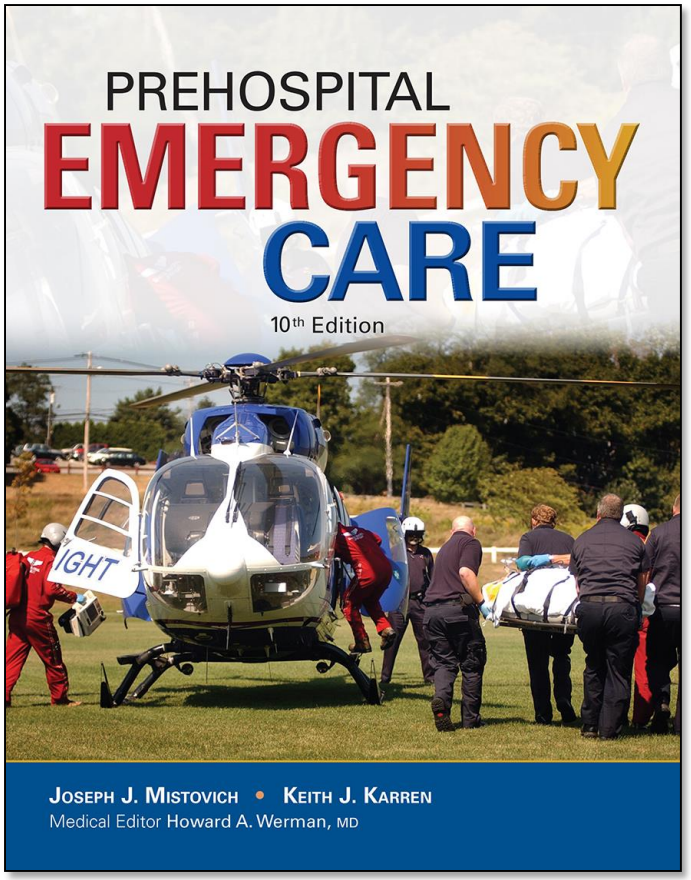
PREHOSPITAL EMERGENCY CARE

TENTH EDITION



CHAPTER 16

Part II
Respiratory Emergencies

Learning Readiness

- EMS Education Standards, text p. 445

Learning Readiness Objectives

- Please refer to page 445 of your text to view the objectives for this chapter.

Learning Readiness Key Terms

- Please refer to page 446 of your text to view the key terms for this chapter.

Setting the Stage

- Overview of Lesson Topics
  - Metered-Dose Inhalers and Small-Volume Nebulizers
  - Age-Related Variations: Pediatrics and Geriatrics
  - Assessment and Care

Case Study Introduction

EMTs Troy Steel and Oscar Herzog are caring for 5-year-old Sarah Gross, who has a history of asthma and began having difficulty breathing at daycare. Sarah is coughing, and the EMTs can hear wheezing without using a stethoscope. Sarah appears a bit pale, but is alert and cooperative. Sarah's teacher hands Oscar a metered-dose inhaler, telling him it belongs to Sarah.

Case Study

- What anatomical and physiological differences should the EMTs keep in mind when assessing a patient of Sarah's age?
- What information is needed before the EMTs consider administering medication by metered-dose inhaler?

Introduction

- Respiratory distress is frightening, and potentially life threatening.
- You must be able to recognize signs and symptoms of respiratory distress and provide immediate intervention.

Metered-Dose Inhalers and Small-Volume Nebulizers

- $Beta_2$ specific bronchodilators can be administered by MDIs or SVNs.
- Bronchodilators cause relaxation of the bronchial smooth muscle.

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Meter-dosed inhaler

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Small-volume nebulizer

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Metered-Dose Inhalers and Small-Volume Nebulizers

- Medications include:
  - Albuterol
  - Metaproterenol
  - Isoetharine
  - Bitolterol mesylate
  - Salmeterol xinafoate
  - Ipratropium
  - Levalbuterol
  - Pirbuterol

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Metered-Dose Inhalers and Small-Volume Nebulizers

- Indications
  - Patient is in respiratory distress
  - Patient has physician-prescribed medication
  - Approval from medical direction

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Metered-Dose Inhalers and Small-Volume Nebulizers

- Contraindications
  - Patient is not responsive enough to use the medication
  - The medication is not prescribed to the patient.
  - Medical direction has not given permission.
  - The patient has taken the maximum number of doses.

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Metered-Dose Inhalers and Small-Volume Nebulizers

- Side effects:
  - Tachycardia
  - Tremors
  - Nervousness
  - Dry mouth
  - Nausea, vomiting

TABLE 16-2 Signs of Improvement During the Administration of CPAP

- Reduction in the complaint of dyspnea
- Improved SpO_2 reading
- Stronger respiratory effort
- Patient becomes more alert

EMT SKILLS 16-2

Administering Medication by Metered-Dose Inhaler

Consult with medical direction for an order to administer the medication.

Check to make sure the medication is for the patient, that it is the proper one to administer, and that it has not reached its expiration date.

Shake the inhaler vigorously for at least 30 seconds.

Instruct the patient to inhale slowly and deeply for about 5 seconds. As the patient begins to inhale, depress the canister.

Remove the inhaler and instruct the patient to hold the breath for 10 seconds or for as long as is comfortable.

Instruct the patient to exhale slowly through pursed lips.

Replace the oxygen on the patient. Reassess the breathing status and vital signs.

EMT SKILLS 16-3

Administering a Metered-Dose Inhaler with a Spacer

Remove the spacer cap. Attach the spacer to the inhaler mouthpiece.

Depress the medication canister to fill the spacer with medication.

Instruct the patient to inhale slowly and deeply. The spacer may whistle if the patient is inhaling too quickly.

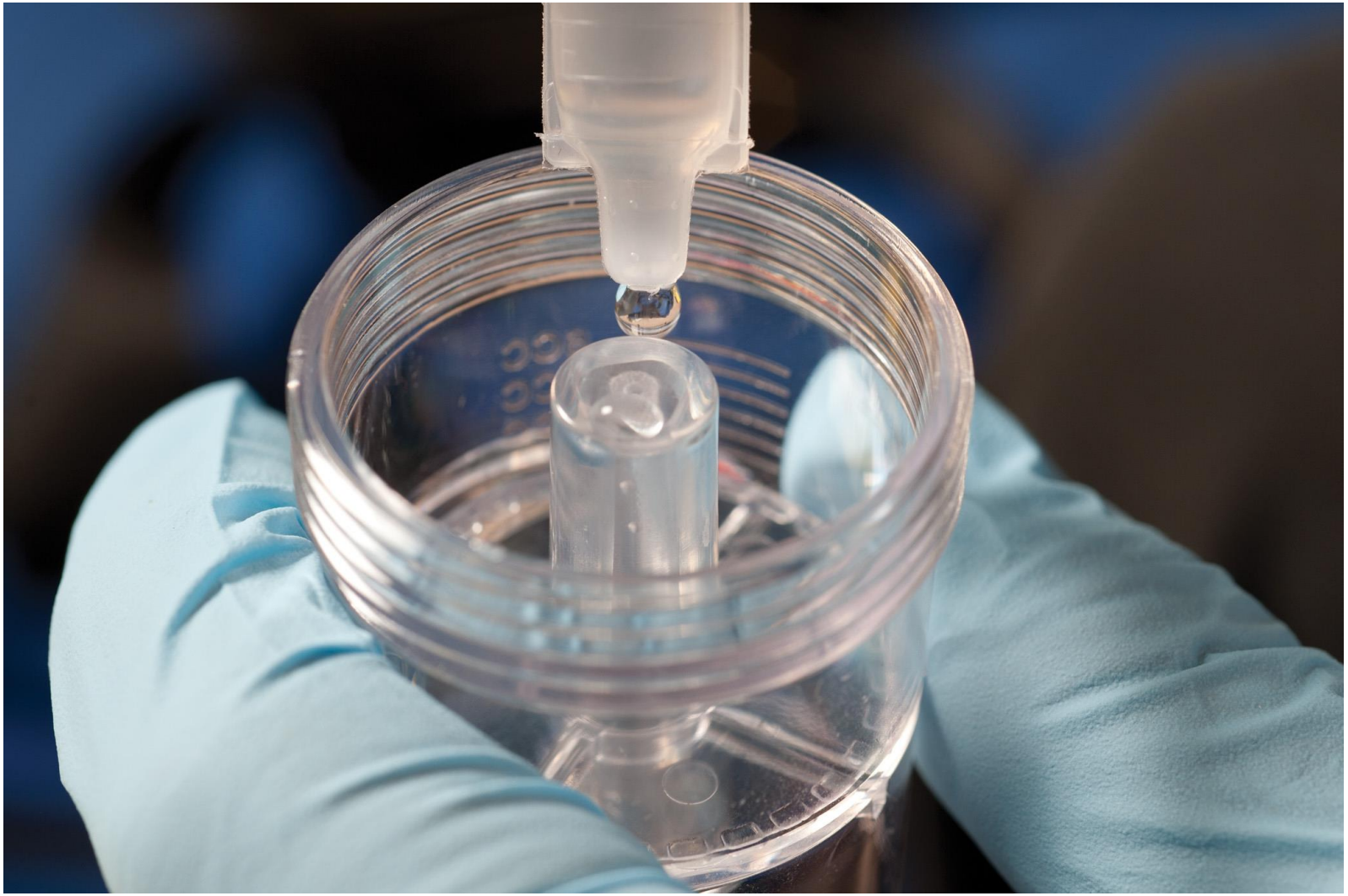
EMT SKILLS 16-4

Administering Nebulized Medications

Complete the primary assessment and assess the patient's pulse rate and breath sounds.

Select the correct medication and consult with medical direction for an order to administer the medication.

Add the medication to the nebulizer chamber.

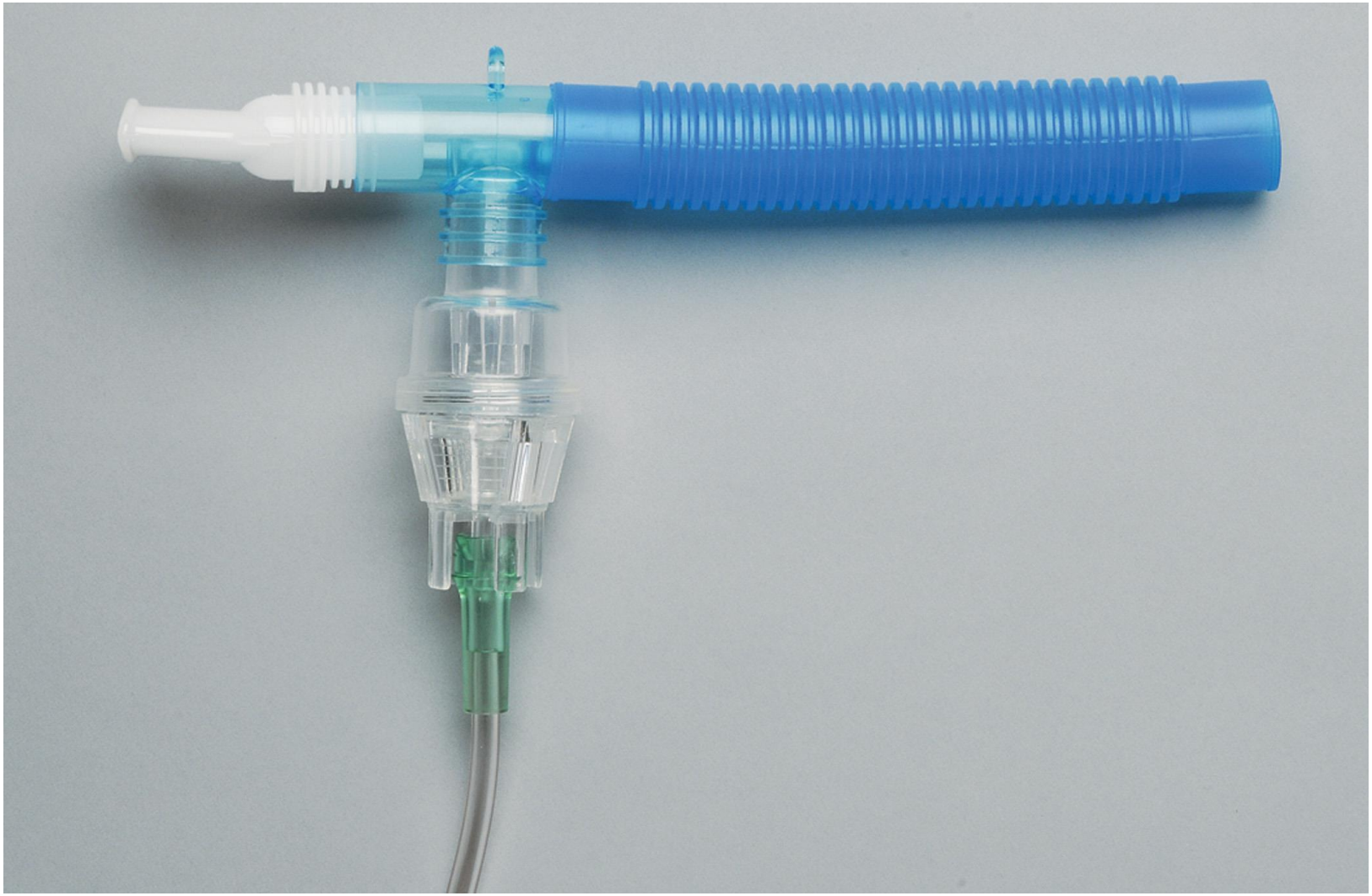


Assemble the nebulizer.

Coach the patient to inhale the nebulized medication from the mouthpiece.

Reassess the patient's pulse rate and breath sounds.

Nebulized medications may be administered through a mouthpiece . . .



. . . or through a face mask.

Click on the medication that is NOT a beta$_2$ agonist used in the emergency treatment of patients with respiratory conditions.

A. Albuterol

B. Levalbuterol

C. Advair Diskus

D. Metaproterenol

Case Study

Troy asks the teacher for the original packaging for the MDI to confirm the medication belongs to Sarah, and also confirms that Sarah has not already received any of the medication. Because of Sarah's age, protocol requires Troy to contact medical direction for an order, which he does. After hearing the report on Sarah's condition, the physician orders the use of the MDI.

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Case Study

- What are the steps Troy will use in administering the MDI?
- What will Troy look for to determine the effect of the medication?

Age-Related Variations

- Pediatric patients
  - Respiratory failure is the most common cause of respiratory arrest and cardiac arrest.
  - Common causes are upper airway obstruction and lower airway diseases.

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Age-Related Variations

- Signs of respiratory distress in pediatric patients
  - Use of accessory muscles
  - Retractions
  - Tachypnea
  - Tachycardia
  - Nasal flaring

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Age-Related Variations

- Signs of respiratory distress in pediatric patients
  - Prolonged exhalation
  - Coughing
  - Cyanosis of extremities
  - Anxiety

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Age-Related Variations

- Signs of respiratory failure in pediatric patients
  - Altered mental status
  - Bradycardia
  - Hypotension
  - Slow, fast, or irregular breathing
  - Loss of muscle tone

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Age-Related Variations

- Signs of respiratory failure in pediatric patients
  - Diminished or absent breath sounds
  - Head bobbing
  - Grunting
  - Seesaw breathing
  - Decreased response to pain
  - Inadequate tidal volume

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Age-Related Variations

- Special considerations in emergency medical care in pediatric patients
  - Allow the child to assume a position of comfort.
  - Do not remove the child from his caregiver.

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Age-Related Variations

- Special considerations in emergency medical care in pediatric patients
  - Apply oxygen by nonrebreather mask.
  - Remove the child from the parent if respiratory failure occurs in order to establish an airway and provide ventilations.

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If the child does not tolerate the mask, have the parent hold the mask near the child's face.

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Age-Related Variations

- Keep in mind the following possibilities:
  - Upper airway obstruction from foreign body or disease
  - Croup

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Age-Related Variations

- Geriatric patients
  - Respiratory distress has many causes in geriatric patients.
  - Respiratory function may already be diminished.
  - Can progress rapidly from respiratory distress to respiratory failure

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Age-Related Variations

- Signs of respiratory distress in geriatric patients
  - Accessory muscle use
  - Retractions
  - Tachypnea
  - Tachycardia
  - Nasal flaring

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Age-Related Variations

- Signs of respiratory distress in geriatric patients
  - Prolonged exhalation
  - Coughing
  - Cyanosis
  - Anxiety
  - Inability to speak in full sentences

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Age-Related Variations

- Signs of respiratory failure in geriatric patients
  - Altered mental status
  - Vital sign changes
  - Fast, slow, or irregular breathing
  - Cyanosis
  - Loss of muscle tone

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Age-Related Variations

- Signs of respiratory failure in geriatric patients
  - Diminished or absent breath sounds
  - Decreased response to pain
  - Inadequate tidal volume
  - Retractions

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Age-Related Variations

- Special considerations in emergency care in geriatric patients
  - Prompt intervention and transport are critical.
  - Place the patient in a position of comfort.
  - Apply oxygen by nonrebreather.
  - If breathing becomes inadequate, intervene immediately.

Guidelines for Assessment and Care

- Scene size-up
  - Look for clues to the condition.

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Guidelines for Assessment and Care

- Primary assessment
  - Form a general impression.
  - Assess mental status.
  - Assess airway.
  - Assess breathing.
  - Assess circulation.

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Guidelines for Assessment and Care

- General impression
  - Patient's position
  - Facial expression
  - Speech
  - Signs of altered mental status
  - Use of accessory muscles

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Guidelines for Assessment and Care

- General impression
  - Cyanosis
  - Diaphoresis
  - Pallor
  - Nasal flaring
  - Pursed lips

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A patient in respiratory distress is commonly found in a "tripod" position.

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Guidelines for Assessment and Care

- Mental status
  - Look for restlessness, agitation, confusion, unresponsiveness.

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Guidelines for Assessment and Care

- Assess the airway for obstruction.

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Guidelines for Assessment and Care

- Assess breathing.
  - Rates outside these ranges are of concern for inadequate breathing:
    - Adults
      - 8 to 24
    - Children
      - 15 to 30
    - Infants
      - 25 to 50

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Guidelines for Assessment and Care

- Assess breathing.
  - Assess tidal volume.

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Guidelines for Assessment and Care

- Inadequate breathing
  - Provide positive pressure ventilation.
- Adequate breathing
  - Administer oxygen.

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Guidelines for Assessment and Care

- Assess circulation.
  - Inspect the skin and mucous membranes.
  - Assess the heart rate.

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Guidelines for Assessment and Care

- Establish priority.
  - A patient with difficulty breathing is a priority patient.
  - Consider ALS backup and expeditious transport.

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Guidelines for Assessment and Care

- Secondary assessment
  - History
    - Evaluate the chief complaint.
    - Allergies
    - Medications
    - History of respiratory or cardiac problems
    - Hospitalizations for chronic conditions

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TABLE 16-3 Signs of Deterioration During the Administration of CPAP

- Increasing respiratory rate
- Lethargy
- Patient is becoming more exhausted and fatigued
- Speechlessness
- Abdomen moves inward with inhalation and outward with exhalation
- Decreasing SpO_2 reading

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TABLE 16-4 MDI Administration Dos and Don'ts

When administering a metered-dose inhaler, follow these tips:

Do

Instruct the patient to breathe in slowly and deeply.

Be sure the patient is breathing in through his mouth.

Shake the canister for at least 30 seconds before removing the cap.

Depress the canister as the patient begins to inhale.

Coach the patient to hold his breath as long as possible.

Use a spacer device if available and the patient is used to it.

Don't

Allow the patient to breathe in too quickly.

Allow the patient to breathe in through his nose.

Administer the medication before shaking the canister.

Depress the canister before the patient begins to inhale.

Forget to coach the patient to hold his breath as long as possible.

The patient may experience a variety of side effects from the medication. The most common are an increased heart rate, tremors, and nervousness. More detailed information about bronchodilators and other side effects are listed in Figure 16-11.

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Guidelines for Assessment and Care

- Secondary assessment
  - Physical exam
    - Look for cyanosis.
    - Check for JVD, tracheal deviation, and retractions.
    - Auscultate the lungs.
    - Check vital signs and pulse oximetry.
    - Look for signs of difficulty breathing.
    - Evaluate the level of difficulty breathing.

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Guidelines for Assessment and Care

- Emergency medical care for inadequate breathing
  - Establish an open airway.
  - Begin positive pressure ventilation.
  - Transport expeditiously.

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Guidelines for Assessment and Care

- Emergency medical care for adequate breathing
  - Administer oxygen.
  - Assess baseline vital signs.
  - Determine if the patient has an MDI.

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Guidelines for Assessment and Care

- Emergency medical care for adequate breathing
  - Complete the secondary assessment.
  - Place the patient in a position of comfort.
  - Consider CPAP for severe respiratory distress.

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Guidelines for Assessment and Care

- Reassessment
  - Look for improvement or worsening in respiratory distress or respiratory failure.
  - Assess the mental status and airway.
  - Provide positive pressure ventilation, if needed.

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Guidelines for Assessment and Care

- Reassessment
  - Monitor respiratory rate and tidal volume.
  - Closely monitor the SpO_2.
  - Monitor the heart rate.

Case Study Conclusion

Troy coaches Sarah through two inhalations from the MDI. En route to the hospital, Troy reassesses Sarah, and finds that her wheezing has nearly resolved, with only faint, scattered expiratory wheezes heard on auscultation.

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Case Study Conclusion

Sarah's respiratory rate has decreased from 24 to 20 per minute, her SpO_2 has remained steady at 98%, and her heart rate has increased from 88 to 96.

Lesson Summary

Some patients with histories of respiratory conditions have metered-dose inhalers or small-volume nebulizers to deliver beta$_2$ agonists, which act as bronchodilators.

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Lesson Summary

- Infants, children, and geriatric patients may present differently than adults with respiratory problems, and the EMT must be prepared to intervene promptly.
- Reassessment is a critical step in the management of patients with respiratory emergencies.