

Shortness of Breath Management (Ambulatory) - CE

ALERT

Don appropriate personal protective equipment (PPE) based on the patient's signs and symptoms and indications for isolation precautions.

Take extra care with a patient whose airway patency cannot be maintained. These patients are not appropriate for the ambulatory care setting and must be managed in an emergency care setting.⁵

OVERVIEW

Shortness of breath, also known as dyspnea, is defined as a subjective feeling of difficulty breathing or breathlessness.⁵ Shortness of breath may be caused by many different conditions such as acute respiratory failure (ARF), chronic obstructive pulmonary disease (COPD), acute respiratory distress syndrome (ARDS), pulmonary embolism (PE), pneumonia, or asthma. This skill discusses shortness of breath as a whole and how to evaluate, monitor, and manage patients with shortness of breath in an ambulatory setting.

Shortness of breath may be diagnosed based on patient presentation along with a detailed history and physical. Symptoms the patient may present with, in addition to shortness of breath, include tachypnea, tachycardia, abnormal breath sounds, restlessness, decreased oxygen saturation, anxiety, chest pain, diaphoresis, pursed-lip breathing, increased work of breathing, use of accessory muscles, and cough. A cough in conjunction with shortness of breath may be considered normal if it occurs as a lung defense mechanism.⁵ Some patients may even present with difficulty speaking in full sentences. This symptom is more common in patients suffering from asthma.⁵

A detailed history needs to be collected during the patient evaluation. Social habits, travel history, and work atmosphere are important portions of the history for every patient presenting with shortness of breath. During the physical evaluation, baseline vital signs, such as respiratory rate or oxygen saturation, may be abnormal or decreased. Oxygen saturation levels are considered normal for any patient on room air at or above 95%.⁴ Lung sounds and skin condition should also be a key portion of the physical examination. Abnormal or adventitious lung sounds can help determine a diagnosis. Skin conditions such as cyanosis, a blue or gray discoloration of the skin, should be documented and reported to the clinical team leader promptly; however, cyanosis may be normal or baseline for patients with chronic lung disease. Cyanosis is easily recognized in the areas around the eyes, lips, and nail beds.

Causative factors for shortness of breath may be diagnosed in the ambulatory setting with diagnostic tools such as x-ray, ultrasonography, and laboratory blood specimen collection. Chest x-rays precede all other studies in determining the cause of the patient's shortness of breath.⁵ In many cases, chest x-rays can help guide a more accurate patient diagnosis, depending on the etiology of the shortness of breath. Ultrasonography of a lower limb may be ordered if a PE is suspected. Laboratory blood tests associated with patients experiencing shortness of breath depend on the patient's presentation and history and include the d-dimer; cardiac enzymes; prothrombin time (PT) and international normalized ratio (INR), if the patient is taking an antiplatelet medication; and complete blood count (CBC). Common risk factors for shortness of breath include tobacco inhalation (e.g., cigarettes, vaping), environmental pollution or occupational exposure, respiratory infection, allergic

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reaction, emotional stress, exercise, reflux esophagitis, inhaled irritants, and medications such as non-selective beta-blocking agents.⁵

The patient's respiratory and cardiovascular status should be evaluated when he or she is experiencing shortness of breath. The patient's quality, quantity, and effort of respiration should be noted.

- Eupnea: normal quiet respirations
- Bradypnea: abnormally slow rate of breathing
- Tachypnea: rapid rate of breathing
- Hyperpnea: increased depth and rate of breathing
- Apnea: complete or intermittent cessation of breathing
- Biot breathing: two or three alternating short or long breaths with periods of apnea
- Cheyne-Stokes: repeating patterns of increased breathing followed by more shallow breaths with apnea occurring
- Kussmaul breathing: deep and labored breathing

Cheyne-Stokes may be seen in sleeping individuals who have conditions such as central nervous system disease, heart failure, or sleep apnea.

In an ambulatory setting, noninvasive treatments to manage a patient experiencing shortness of breath include increasing oxygenation with an oxygen delivery device (e.g., nasal cannula, simple mask, partial nonrebreather mask). The goal of oxygen therapy is to keep the patient's arterial oxygen saturation above 90%;¹ however, depending on the patient's history of chronic lung disease, the patient's arterial oxygen saturation may be below 90%. If the patient's respiratory status deteriorates, the health care team member should anticipate the need for more aggressive measures, such as invasive treatments (e.g., intubation, mechanical ventilation). If invasive treatments are needed, then the patient needs to be stabilized and transferred to a higher level of care.

Oxygen delivery devices include nasal cannulas, simple face masks, and partial rebreather and nonrebreather face masks. A nasal cannula is the most common device used for oxygen administration.¹ A nasal cannula is a simple method that still gives the patient freedom to move, speak, and eat without being encumbered. A nasal cannula is ideal for patients requiring lower concentrations of oxygen ranging from 1 to 6 L.¹ A simple face mask is, ideally, used for patients that only need oxygen for short periods of time because it covers the patient's nose and mouth, limiting freedom and the ability to conduct daily tasks such as eating. A simple face mask allows for 6 to 12 L of oxygen to be administered.¹ A partial nonrebreather mask is ideal for short-term use as well but is intended for use with patients who require higher levels of oxygen concentrations, ranging from 10 to 15 L.¹ For both partial rebreather and nonrebreather face masks, an attached bag allows the patient improved inhalation of exhaled oxygen-rich air along with flowing oxygen. Depending on the cause of shortness of breath, pharmacologic agents (e.g., bronchodilators, steroids, antibiotics, pain medications) may be prescribed as part of the patient's treatments.⁵

EDUCATION

- Provide developmentally and culturally appropriate education based on the desire for knowledge, readiness to learn, and overall neurologic and psychosocial state.

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- Teach the patient the signs and symptoms of shortness of breath (e.g., breathlessness, coughing, restlessness, anxiety or increased work of breathing) and instruct him or her on when to seek additional care.
- Encourage the patient to decrease risk factors and triggering events by avoiding tobacco inhalation, inhaled irritants, and environmental allergens.
- Educate the patient on prescribed medications, such as bronchodilators, steroids, antibiotics, and pain medications.
- Explain to the patient that because ease of respiration is of the utmost importance, he or she should assume a position of comfort that facilitates breathing.
- Encourage questions and answer them as they arise.

PROCEDURE

1. Perform hand hygiene and don appropriate PPE based on the patient's signs and symptoms and indications for isolation precautions.
2. Introduce yourself to the patient.
3. Verify the correct patient using two identifiers.

Positioning a patient with shortness of breath must be performed immediately in a life-threatening situation. Verify the correct patient only if it does not delay the procedure.

4. Explain the procedure to the patient and ensure that he or she agrees to treatment.
5. Ensure that evaluation findings and laboratory results are communicated to the clinical team leader per the organization's practice.
6. Follow the organization's process for activating an emergency response if the patient is having difficulty speaking, is breathless, dizzy, or loses consciousness.
7. Obtain the patient's actual weight in kilograms. Stated, estimated, or historical weight should not be used.²
8. Obtain the patient's vital signs, including oxygen saturation.

Rational: Signs and symptoms of shortness of breath and hypoxia may include breathlessness, increased anxiety, pursed-lip breathing, increased work of breathing, or use of accessory muscles.

9. Obtain a detailed history from the patient. Ask the patient about these items that may be related to his or her shortness of breath:
 - a. How often do you smoke cigars, cigarettes, or vape?
 - b. What is your occupational history?
 - c. Have you had a chemical exposure?
 - d. What is your recent travel history?
 - e. Have you had a recent upper respiratory tract infection?
 - f. What medications are you taking?
 - g. Is the shortness of breath worse with exertion?
10. Evaluate the patient's cardiovascular status.
11. Evaluate the patient's respiratory status. Evaluate for dyspnea or hypoxia. Pay specific attention to the quality, quantity, and effort of respiration. Listen for abnormal lung sounds

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during auscultation such as the absence of breath sounds or rhonchi, wheezing, rales, or pleural rub.

12. Inspect the patient's skin for signs of cyanosis, a blue or gray discoloration of the skin.

13. Place the patient in a position of comfort.

a. High-Fowler position

i. Raise the head of the bed to an upright position.

ii. Consider using pillows on the bed to maintain the patient's position, or elevate the foot of the bed slightly while keeping the head of the bed elevated, if the patient can tolerate this position.

Rationale: These techniques help prevent the patient from sliding toward the foot of the bed.

Use pillows for only a limited time because of pressure created on the popliteal vessels. Observe for leg edema as indicated.

b. Orthopnea position (also known as the tripod position)

i. Seat the patient on the edge of the bed with his or her feet dangling, or seat the patient in the bed with an over-bed table placed across his or her lap and raised to a comfortable level.

ii. Pad the patient's arms by allowing them to rest on a pillow or blankets.

Rationale: This position helps patients with respiratory distress related to COPD. It also may help relieve dyspnea related to pulmonary edema.

14. Administer oxygen per the practitioner's orders.

a. Ensure that an appropriate-size face mask or nasal cannula is used for the patient.

Rationale: An improperly fitting mask may not provide adequate oxygen administration.

b. Ensure that the lowest fraction of inspired oxygen (F_{IO_2}) that produces adequate oxygenation is used.⁵

15. Obtain laboratory blood specimens (e.g., PT and INR if the patient is taking an antiplatelet medication, CBC) if ordered.

Rationale: Laboratory tests for shortness of breath include d-dimer and cardiac enzymes.

16. In the presence of the patient, label the specimen per the organization's practice.³

17. Place the labeled specimen in a biohazard bag and transport it to the laboratory immediately per the organization's practice.

18. Administer medications per the practitioner's orders.

19. Reevaluate the patient's oxygenation status.

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Rationale: Reevaluating the patient's oxygen status determines whether the level of oxygenation is appropriate or if the plan of treatment needs to be adjusted.

20. Observe the patient for continued improvements in oxygenation and reduction of signs and symptoms of shortness of breath. If the patient's respiratory status deteriorates, anticipate the need for more aggressive measures.
21. Ensure that oropharyngeal suction and emergency airway equipment are readily available.
22. Monitor the patient for adverse and allergic reactions to the medication. Recognize and immediately treat respiratory distress and circulatory collapse, which are signs of a severe anaphylactic reaction. Follow the organization's practice for emergency response.
23. Discard supplies, remove PPE, and perform hand hygiene.
24. Document the procedure in the patient's record.

EXPECTED OUTCOMES

- Oxygenation improves.
- Patient's respiratory status improves or returns to his or her baseline.
- Patient tolerates the face mask or nasal cannula without difficulty.
- Partial or nonrebreather face mask fits the patient properly.
- Patient's breathing patterns and respiratory rate are normal for his or her age.
- Patient's anxiety is decreased.

UNEXPECTED OUTCOMES

- Patient experiences hyperoxia, leading to impaired gas exchange, pulmonary edema, or vasoconstriction with possible extension of a myocardial infarction.
- Partial or nonrebreather face mask is uncomfortable or does not fit properly.
- Patient's respiratory status does not improve or worsens.
- Patient does not tolerate the face mask or nasal cannula.
- Patient's breathing patterns and respiratory rate continue to be abnormal for his or her age.
- Patient's anxiety is increased.

DOCUMENTATION

- Patient's response to procedure
- Unexpected outcomes and related interventions
- Education
- Evaluation findings communicated to the clinical team leader per the organization's practice
- Amount of oxygen administered and per oxygen delivery device
- Laboratory specimens collected
- Position that offers patient the most relief from shortness of breath
- Evaluations of the patient's respiratory status, including quality, quantity and effort of respiration; abnormal lung sounds during auscultation
- Transport to a higher level of care (if applicable)
- Evaluation for the patient's cardiovascular status
- Evaluation of the patient's skin
- Patient's vital signs, including oxygen saturation
- Patient's weight in kilograms per the organization's practice

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- Patient's response to the medication, including any adverse reactions

PEDIATRIC CONSIDERATIONS

- A family member should be allowed to hold their child and participate in the history and physical for their child's comfort and to encourage their child's participation.
- An appropriate-size mask should be used for pediatric patients who cannot tolerate a nasal cannula or if higher levels of oxygen delivery are required. The mask should be large enough to cover the nose and mouth.
- If age-appropriate, pediatric patients should be encouraged to assist in the placement of the mask.

REFERENCES

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2. Institute for Safe Medication Practices (ISMP). (2020). 2020-2021 Targeted medication safety best practices for hospitals. Retrieved April 13, 2020, from https://www.ismp.org/sites/default/files/attachments/2020-02/2020-2021%20TMSBP-%20FINAL_1.pdf (Level VII)
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5. Storzer, D.N. (2018). Chapter 2: Pulmonary system. In T.M. Hartjes (Ed.), *AACN core curriculum for high acuity, progressive, and critical care nursing* (7th ed., pp. 34-141). St. Louis: Elsevier.

ADDITIONAL READINGS

Clinical Overview. (2019). Acute respiratory distress syndrome in adults. Retrieved April 13, 2020, from <https://www.clinicalkey.com>

Elsevier Skills Levels of Evidence

- Level I - Systematic review of all relevant randomized controlled trials
- Level II - At least one well-designed randomized controlled trial
- Level III - Well-designed controlled trials without randomization
- Level IV - Well-designed case-controlled or cohort studies
- Level V - Descriptive or qualitative studies
- Level VI - Single descriptive or qualitative study
- Level VII - Authority opinion or expert committee reports

Supplies

- Gloves and PPE, as indicated
- Nasal cannula
- Simple face mask

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- Partial nonrebreather mask
- Pulse oximeter and sensor
- Laboratory blood specimen supplies and equipment
- Bed with adjustable head and foot
- Pillows (optional)
- Over-bed table (for orthopnea position)
- Oropharyngeal suction setup
- Emergency airway equipment
- Vital signs equipment (e.g., stethoscope, watch, thermometer, noninvasive BP machine, blood pressure cuff)

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