



National League
for Nursing

Chronic Obstructive Pulmonary Disease – Oxygen Therapy

Vincent Brody

Simulation in Nursing Education

Scenario Overview

Estimated Scenario time: 15 - 20 minutes

Guided Reflection time: 20 minutes

Target Groups: Nurses

Core Case

Brief Summary:

This case presents a patient with chronic obstructive pulmonary disease, who is in moderate to severe respiratory distress. The student will be expected to provide the standard of care related to patient safety and infection control, communicate appropriately, initiate a respiratory assessment, and provide appropriate interventions.

Learning Objectives:

- Identifies the primary nursing diagnosis
- Implements patient safety measures
- Evaluates patient assessment information including vital signs
- Implements therapeutic communication
- Implements direct communication with multidisciplinary team members
- Demonstrates effective teamwork
- Prioritizes and implements Physician Orders appropriately

Scenario Specific:

- Recalls indications, contraindications, and potential adverse effects of prescribed medication
- Implements the “5 rights” of medication administration
- Implements a focused respiratory assessment
- Recalls indications and contraindications for oxygen therapy
- Recognizes signs and symptoms of respiratory distress
- Implements correct treatment for respiratory distress in a timely manner



Equipment Checklist

Equipment

- Universal precautions equipment
- Stethoscope
- Blood pressure cuff
- SpO₂ monitor
- SpO₂ probe
- Thermometer
- ECG monitor
- ECG electrode cables
- Oxygen supply source
- Oxygen delivery devices (nasal cannula and/or mask)
- Respiratory nebulizer
- IV pump
- Tissues
- Disposal bag or trash can
- Emesis basin
- General supplies for administering medication

Medications and Fluids

- D5½ Normal Saline with KCL 20 meq 1000 mL infusing at 100 mL/hour
- Albuterol (Proventil) 2.5 mg in 2.5 mL normal saline via nebulization
- Methylprednisolone (Solu-Medrol) 125mg IV

Documentation Forms

- Patient Information Card
- Physician Orders
- Data Collection Form

Diagnostics available

- Chest X-ray pending

Preparation of Simulator

- Medical Unit
- Dress manikin in a patient gown
- Secure ID band with patient name, DOB and MR#
- Insert IV in right hand with D5½ Normal Saline with 20 meq KCL infusing at 100 mL/hour
- Place in hospital bed sitting hunched over
- Place crumpled tissues all over the bed and floor (may use water-soluble jelly to simulate copious amounts sputum)

Number of Participants

Student Roles:

- 1 primary nurse
- 1 secondary nurse
- 1 relative
- 1 observer

Instructor Roles:

- 1 physician or advanced practice nurse available if called
- 1 respiratory therapist if needed to deliver respiratory treatments per local policy



Correct Treatment

- Initial patient contact: wash hands, introduce self, identify patient
- Position/comfort patient
- Encourage pursed lip breathing
- Obtain vital signs including SpO₂
- Disposal of tissue with gloves
- Perform focused respiratory assessment
- Auscultate breath sounds
- Recognize low SpO₂
- Administer low-flow oxygen
- Calm and reassure patient
- Review physicians order
- Administer albuterol nebulizer treatment following the 5 rights
- Administer Solu-Medrol IV following the 5 rights
- Re-evaluate patient condition including vital signs
- Support patient/family education efforts
- Communicate therapeutically with patient

Nursing Diagnosis

Ineffective airway clearance related to smoking and chronic obstructive pulmonary disease

Defining characteristics:

- Fatigue
- Dyspnea
- Orthopnea
- Adventitious breath sounds
- Cough
- Sputum production
- Increased secretion

Activity Intolerance related to imbalance between oxygen supply/demand

Defining characteristics:

- Verbal report of fatigue
- Exertional discomfort or dyspnea

Impaired gas exchange related to alveolar-capillary membrane changes

Defining characteristics:

- Tachycardia
- Hypoxia
- Dyspnea
- Abnormal skin color (pale, dusky)
- Hypoxemia
- Abnormal rate, rhythm, depth of breathing

Noncompliance related to knowledge and motivational forces

Defining characteristics:

- Behavior indicative of failure to adhere
- Evidence of development of complications
- Evidence of exacerbation of symptoms



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VitalSim Scenarios

Debriefing/Guided Reflection Overview

Risk factors for chronic obstructive pulmonary disease (COPD):

- Exposure to tobacco smoke accounts for an estimated 80% to 90% of COPD cases.
- Passive smoking
- Occupational exposure
- Ambient air pollution
- Genetic abnormalities

Most common causes of COPD exacerbation are respiratory infection and air pollution. Smoking cessation is the single most effective intervention to prevent COPD or slow its progression. Nurses play a key role in promoting smoking cessation and educating patients about ways to be successful in quitting.

Because hypoxemia stimulates respiration in the patient with severe COPD, increasing the oxygen flow to a high rate may greatly raise the patient's blood oxygen level and may suppress the respiratory drive, causing increased retention of carbon dioxide and CO₂ narcosis. The nurse should closely monitor the patient's respiratory response to oxygen administration via physical assessment, pulse oximetry, and arterial blood gases.

Pharmacological therapies include bronchodilators with metered-dose inhalers (both short-acting and long-acting). Corticosteroids may be added for severe COPD and exacerbations. Postural drainage along with chest physiotherapy assists with secretion management. The patient may require oxygen therapy at home. Patients should be encouraged to receive yearly influenza vaccine and the pneumococcal vaccine every 5 to 7 years as preventative measures.



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Report to Students

Time: 11:00 a.m.

Vincent Brody is a 67-year-old male admitted directly from Physician Office for exacerbation of chronic obstructive pulmonary disease (COPD). He has been assisted into a patient gown and in the hospital bed. He is hunched forward in apparent respiratory distress. His wife is very attentive at his side. Physician Orders have been obtained.

Clinical signs immediately visible:

- Alert and responsive
- Using accessory muscles of shoulder and neck to breathe
- Clubbed fingers
- Barrel chest

Additional Information, Medical History

Patient data:	Male – Age 67 years. Weight 154 pounds (70 kg). Height 68 inches (1.72 meters)
DOB:	6/28/XX
MR#:	PCS62800
Prior medical history:	Patient has a 50 year history of smoking 2 packs a day. He has continued to smoke despite health care provider's recommendations to quit. During the last year he has had two exacerbations
Recent medical history:	Patient has complained of increasing fatigue with activity and inability to sleep well at night. Has also had increased sputum production and cough

	Monitor Settings (Instructor)	Patient/Manikin (Actions)	Student Interventions (Events)	Cue/Prompt
5 minutes	<p>Initial state: awRR: 28 HR: 90 BP: 142/84 SpO₂: 80% Temp: 100.2 F</p>	<p>Auscultation sounds: Breath sounds with wheezes bilaterally</p> <p>Vocal sounds: “Could I get some more Tissues, I am coughing up a lot of mucous”</p> <p>Coughing</p>	<p>Wash hands Introduce self Identify patient</p> <p>Position patient upright for comfort and ease of breathing Encourage to pursed lip breathing Obtain vital signs with SpO₂ level</p> <p>Provides appropriate disposal of tissues with gloves</p>	<p>Role member providing cue: family member</p> <p>Cue: If student fails to provide appropriate disposal of tissues, family member will request a trash bin be placed by the bed</p>
5 to 10 minutes	<p>When Low-flow oxygen Press Event:  Low-flow O₂</p> <p>awRR: < to 24 BP: > to 146/90 SpO₂: > to 93% Over 5 minutes</p> <p>When High-flow oxygen Press Event:  High-flow O₂</p> <p>SpO₂ > to 98% awRR: < to 10</p>	<p>Vocal sounds: Continues to cough</p>	<p>Focused respiratory assessment Auscultate breath sounds Recognize low SpO₂ Apply low-flow oxygen</p>	<p>Role member providing cue: Family member</p> <p>Cue: If student provides high-flow oxygen, family member will be quick to point out that it is not helping and that he is getting worse!</p> <p>Instructor cue: When low-flow oxygen SpO₂: > to 93% over 5 minutes When High-flow oxygen SpO₂: > 98%</p>
10 to 20 minutes	<p>When Albuterol is given Press Event:  Albuterol</p> <p>awRR: < to 20 HR: > to 100 BP: < to 136/80 SpO₂: > to 95%</p>	<p>Breath sounds with coarse crackles bilaterally</p>	<p>Review physicians order Give Albuterol nebulizer treatment Give Solu-Medrol IV</p>	<p>Role member providing cue: Family member</p> <p>Cue: If student does not initiate health promotion teaching, family member will ask nurse to tell Vincent that he needs to quit smoking and take better care of himself</p>