20
The Respiratory System

1. Define important words in this chapter
2. Explain the structure and function of the respiratory system
3. Discuss changes in the respiratory system due to aging
4. Discuss common disorders of the respiratory system
5. Describe oxygen delivery
6. Describe how to collect a sputum specimen
7. Describe the benefits of deep breathing exercises

Supplemental Tools
TRANSPARENCY 20-1 THE RESPIRATORY SYSTEM
HANDOUT 20-1 OXYGEN THERAPY USING A HUMIDIFICATION DEVICE
CHAPTER 20: EXAM

Assignments
TEXTBOOK READING, PP. 356-366
WORKBOOK EXERCISES, PP. 107-109

Overview of Teaching Strategies
This chapter focuses on the respiratory system. The structure and function of the respiratory system is described. Normal changes of aging are described so that students will be well-prepared to recognize abnormal changes that may signal a problem. Specific disorders of the respiratory system are addressed. Empathy for residents who have difficulty breathing is emphasized, along with the importance of taking all medication prescribed for respiratory illnesses.

1. Define important words in this chapter

Meeting the Learning Objective
TEXTBOOK PP. 356-357
WORKBOOK P. 107

Lecture
Pronounce and define each of the key terms listed in the Learning Objective on pages 356-357.

2. Explain the structure and function of the respiratory system

Meeting the Learning Objective
TEXTBOOK PP. 357-358
WORKBOOK P. 107

Lecture
Pronounce and define the following key terms:
- Trachea
- Bronchi
- Alveoli
- Lungs
- Inspiration
- Expiration
- Respiration

Display Transparency
20-1 THE RESPIRATORY SYSTEM

Review the following points about the respiratory system:
- The epiglottis shuts off the larynx during the swallowing process.
- The larynx enables humans to speak.
- Respiration, the body's taking in of oxygen and removing of carbon dioxide, involves inspiration (breathing in) and expiration (breathing out).

Review the functions of the respiratory system:
- Serves as an air filter, cleaning inhaled air
- Supplies oxygen to body cells
• Removes carbon dioxide from cells
• Produces the sounds associated with speech

3. Discuss changes in the respiratory system due to aging

Meeting the Learning Objective
Textbook p. 358
Workbook pp. 107-108

Lecture
Review normal changes of aging:
• Lung strength decreases.
• Alveoli become less elastic and decrease in number.
• Airways become stiff and less elastic.
• Lung capacity decreases.
• Rib cage changes and chest muscles become weaker.
• Cough reflex becomes less effective and cough becomes weaker.
• Oxygen in the blood decreases.
• Decreased lung capacity causes voice to weaken.

4. Discuss common disorders of the respiratory system

Meeting the Learning Objective
Textbook pp. 358-362
Workbook p. 108

Lecture
Pronounce and define the following key terms:
• Chronic obstructive pulmonary disease (COPD)
• Bronchitis
• Sputum
• Emphysema

Review the following points about COPD:
• Cause: obstruction of airways
• Includes chronic bronchitis and emphysema
• Chronic bronchitis occurs when lining of the bronchial tubes becomes inflamed, causing scarring.
• Symptoms of chronic bronchitis: excessive mucus production, long-lasting cough
• Treatment of chronic bronchitis: reducing triggers, quitting smoking, medications
• Symptoms of emphysema: shortness of breath, coughing, difficulty breathing
• Treatment for emphysema: providing comfort, relieving symptoms, quitting smoking, oxygen, medication, respiratory therapy

Review the general symptoms of COPD:
• Coughing or wheezing
• Dyspnea
• Shortness of breath
• Cyanosis
• Chest pain or tightness
• Confusion
• Weakness
• Weight loss or loss of appetite
• Fear and anxiety

Review care guidelines for COPD:
• Be supportive, calm, and empathetic.
• Use pillows to help residents sit up or lean forward.
• Be supportive of residents who are quitting smoking.
• Encourage healthy diet.
• Offer fluids.
• Encourage rest.
• Use proper infection prevention practices.
• Report signs of colds or flu immediately.
• Residents must take medication as ordered.
• Follow safety guidelines for oxygen therapy.
• Report fever, confusion or changes in mental state, refusal of medications, change in breathing patterns, change in color or consistency of mucus or sputum, chest pain, inability to sleep, anxiety or fear.

Pronounce and define the following key term:
• Asthma

Review the following points about asthma:
• Chronic, episodic disorder in which irritants, allergens, infections and cold air cause inflammation and swelling in the air passages in the lungs
• Can be worsened by exercise or stress
• Symptoms: heavy wheezing, coughing, tight feeling in chest
• Treatment: medication, avoidance of triggers, reducing stress levels
• Report: changes in vital signs, especially respiratory rate; wheezing, shortness of breath or dyspnea; cyanosis; chest pain or tightness; refusal to use inhaler

Pronounce and define the following key terms:
• Bronchiectasis
• Chest percussion

Review the following points about bronchiectasis:
• Condition in which the bronchi become permanently dilated
• Causes: infection of the airways, cystic fibrosis, presence of tumors, inhaling foreign material
• Symptoms: chronic coughing, shortness of breath, wheezing, weight loss, cyanosis, coughing up blood, respiratory infections, halitosis
• Treatment: postural drainage, chest percussion
• Report: fever, chest pain, change in mucus or phlegm production

Pronounce and define the following key term:
• Pneumonia

Review the following points about pneumonia:
• Inflammation of the lungs
• Causes: viral, bacterial, or fungal infection; chemical irritants
• Symptoms: high fever, chest pain, coughing, difficulty breathing, shortness of breath, chills, rapid pulse, thick secretions coughed up from the lungs
• Treatment: antibiotics and other medication, inhaler, special diet, increased fluid intake
• Report if resident is not taking medication.

Pronounce and define the following key terms:
• Tuberculosis
• Hemoptysis
• Multidrug-resistant TB (MDR-TB)

Review the following points about tuberculosis:
• Highly contagious lung disease
• Cause: bacterium that is carried on mucous droplets suspended in the air
• Can be spread by infected person coughing, breathing, sneezing, or laughing
• Symptoms: fatigue, loss of appetite, weight loss, slight fever and chills, night sweats, prolonged coughing, hemoptysis, chest pain, shortness of breath, dyspnea
• MDR-TB can develop when person with TB does not take all of his prescribed medication.

Review care guidelines for tuberculosis:
• Follow Standard Precautions and Airborne Precautions.
• Wear PPE.
• Be careful when handling sputum.
• Resident must take all of the medication prescribed.

5. Describe oxygen delivery

Meeting the Learning Objective
Textbook pp. 362-364
Workbook pp. 108-109

Lecture
Pronounce and define the following key term:
• Oxygen therapy

Review methods of oxygen delivery:
• Piped into room through wall outlet at facility
• Compressed oxygen in cylinders
• Liquid oxygen in special reservoirs
• Oxygen concentrators

Remind students that oxygen is a drug and cannot be applied or adjusted by nursing assistants.

Review care guidelines for residents using oxygen:
• Perform frequent skin care.
• Observe for redness, sores, bruising, or discomfort in ear, nose, mouth or chin area.
• Lubricate sensitive areas.
• Take vital signs as ordered.
• Check device for fit and comfort.
• Notify nurse if equipment does not seem to be working.
• Post “No Smoking” and “Oxygen in Use” signs.
• Know location of fire alarms and extinguishers.
• Add pillows, as needed, to improve breathing.
• Encourage activity.
• Provide emotional support.
• Report sores or crusts on nasal area, dry or red_dened areas on the skin, discomfort or pain, shortness of breath, changes in vital signs, cyanosis, and chest pain or tightness.

Distribute Optional Handout

20-1 OXYGEN THERAPY USING A HUMIDIFICATION DEVICE

If this procedure is taught at your facility, go over the information on the handout with students.

6. Describe how to collect a sputum specimen

Meeting the Learning Objective

Textbook pp. 364-365
Workbook p. 109

Lecture

Review the following points about collecting a sputum specimen:
• Sputum is mucus that comes from inside the respiratory system.
• Sputum may show evidence of cancer or bacteria.
• Some facilities do not allow nursing assistants to collect sputum specimens; always follow facility policy.
• Early morning is the best time to collect sputum.
• Resident should rinse mouth with water but not with mouthwash before specimen collection.

Demonstration

Demonstrate the procedure: Collecting a sputum specimen. Include all of the numbered steps in your demonstration.

Have the students return the demonstration. Procedure checklists are located at the end of the Student Workbook.

7. Describe the benefits of deep breathing exercises

Meeting the Learning Objective

Textbook p. 365-366
Workbook p. 109

Lecture

Review the following points about deep breathing exercises:
• Help expand the lungs, clear them of mucus, and prevent infections
• The care plan may include using an incentive spirometer.
• Usually a goal volume is set and attempted for a minimum of three seconds.
• Do not assist with these exercises if you have not been trained to do so.
• Do not share incentive spirometers between residents.
• Make sure you and the resident wash hands prior to using the spirometer. Don gloves before assisting with this procedure.
• Encourage, but do not force, the resident to use the incentive spirometer.

Demonstration

Demonstrate the procedure: Assisting with deep breathing and coughing exercises. Include all of the numbered steps in your demonstration.

Have the students return the demonstration. Procedure checklists are located at the end of the Student Workbook.

Chapter Review

Exam

Distribute Chapter 20: Exam
(Appendix C, pp. 329)

Allow students enough time to finish the test. See Appendix D for answers to the chapter exams.

Answers to Chapter Review in Textbook

1. The epiglottis acts like a lid, shutting off the larynx during the swallowing process.
2. Speak
3. Respiration
4. Answers include: serves as an air filter, cleaning inhaled air; supplies oxygen to body cells; removes carbon dioxide from cells; and produces the sounds associated with speech
5. Answers include: Lung strength decreases. Alveoli become less elastic and decrease in number. Airways become stiff and less elastic. Lung capacity decreases. Rib cage changes and chest muscles become weaker. Cough reflex becomes less effective and cough becomes weaker. Oxygen in the blood decreases. Decreased lung capacity causes voice to weaken.

6. COPD causes difficulty breathing. Residents may be constantly fearful about not being able to breathe.

7. Answers include: Be supportive, calm, and empathetic. Use pillows to help residents sit up or lean forward. Be supportive of residents who are quitting smoking. Encourage healthy diet. Offer fluids. Encourage rest. Use proper infection prevention practices. Report signs of colds or flu immediately. Residents must take medication as ordered. Follow safety guidelines for oxygen therapy. Report fever, confusion, or changes in mental state, refusal of medications, change in breathing patterns, change in color or consistency of mucus or sputum, chest pain, inability to sleep, anxiety or fear.

8. Answers include: helping residents avoid triggers that cause asthma attacks and talking with and listening to residents may help decrease stress levels

9. People with weaker immune systems, such as young children and the elderly, are at a higher risk of developing pneumonia.

10. People can be exposed to TB when they spend time with a person who is infected with TB. The infected person can spread the disease by coughing, breathing, singing, sneezing, or laughing.

11. Someone with TB infection carries the disease but does not show symptoms and cannot infect others. A person with TB disease shows symptoms of the disease and can spread TB to others.

12. Answers include: fatigue; loss of appetite; weight loss; slight fever and chills; night sweats; prolonged coughing; hemoptysis; chest pain; shortness of breath; or dyspnea

13. When the full course of proper medication is not taken, bacteria that is resistant to medication remains in the body. This means that this bacteria is less likely to be killed by medication used to treat TB. The disease then becomes more difficult to cure.

14. Answers include: Perform frequent skin care. Observe for redness, sores, bruising, or discomfort in ear, nose, mouth, or chin area. Lubricate sensitive areas. Take vital signs as ordered. Check device for fit and comfort. Notify nurse if equipment does not seem to be working. Post “No Smoking” and “Oxygen in Use” signs. Know location of fire alarms and extinguishers. Add pillows as needed to improve breathing. Encourage activity. Provide emotional support. Report sores or crusts on nasal area, dry or reddened areas on the skin, discomfort or pain, shortness of breath, changes in vital signs, cyanosis, and chest pain or tightness.

15. Answers include: sores or crusts on nasal area; dry or reddened areas on the skin; discomfort or pain; shortness of breath; changes in vital signs; cyanosis; or chest pain or tightness

16. Early morning

17. Residents who are paralyzed or who have had abdominal surgery