Western Technical College

10515174 Respiratory/Cardiac Physiology
Course Outcome Summary

Course Information

Description: Provides the student with an indepth knowledge of the structure and function of the respiratory and circulatory systems necessary to function as a competent Respiratory Therapist. Emphasis is placed on promotion of evidence-based practice using established clinical practice guidelines and published research for its relevance to patient care.

Career Cluster: Health Science

Instructional Level: Associate Degree Courses

Total Credits: 3

Textbooks


Success Abilities

1. Apply mathematical concepts.

2. Demonstrate ability to think critically.

3. Demonstrate ability to value self and work ethically with others in a diverse population.

4. Transfer social and natural science theories into practical applications.

5. Use effective communication skills.

6. Use technology effectively.

Course Competencies
1. **Analyze how components of the pulmonary system function in the body**

   **Assessment Strategies**
   1.1. by developing an analysis (format may be written, oral, graphic, or three-dimensional model)
   1.2. by answering questions about the concepts that support this competency (format may be oral, written, or graphic)

   **Learning Objectives**
   1.a. Describe the locations, structures and functions of the organs of the respiratory system.
   1.b. Describe the mechanics of breathing.
   1.c. Define respiratory air volumes and capacities.
   1.d. Explain the mechanism of respiratory control and factors that may influence it.
   1.e. Investigate components of the respiratory immune response

2. **Analyze control of breathing**

   **Assessment Strategies**
   2.1. by creating an oral, written or graphic representation of control of breathing.
   2.2. by answering questions about the concepts that support this competency (format may be oral, written, or graphic)

   **Learning Objectives**
   2.a. Identify the location of the structures that regulate breathing
   2.b. Describe how the peripheral and central chemo receptors differ in the way they regulate breathing
   2.c. Identify the effect of various reflexes on the respiratory pattern
   2.d. Describe how the regulation of breathing in individuals with hypercapnia differs from regulation of breathing in healthy individuals

3. **Apply principles of gas transport**

   **Assessment Strategies**
   3.1. by collecting, organizing and reporting data related to gas transport
   3.2. by answering questions about the concepts that support this competency (format may be oral, written, or graphic)

   **Learning Objectives**
   3.a. Diagram and label the oxy-hemoglobin dissociation curve and list factors that shift the curve
   3.b. Explain how oxygen and carbon dioxide are transported in the blood
   3.c. Give examples of factors affecting gas transport
   3.d. Calculate oxygen content of arterial and venous blood

4. **Apply principles of ventilatory mechanics**

   **Assessment Strategies**
   4.1. by preparing a written response to a case study
   4.2. by answering questions about the concepts that support this competency (format may be oral, written, or graphic)

   **Learning Objectives**
   4.a. Identify the forces that oppose gas movement into and out of the lungs including pulmonary compliance, elastance, and airways resistance
   4.b. Describe how the lung and chest wall affect pressure/volume relationships of ventilation
   4.c. Perform measurement of pulmonary mechanics including lung volumes, pressures and flows
   4.d. Investigate data related to respiratory monitoring such as rate, tidal volume, minute volume, and I:E ratio
   4.e. Compare lung volumes and capacities of patients with obstructive and restrictive patterns

5. **Analyze how components of the cardiovascular system function in the body**

   **Assessment Strategies**
   5.1. by developing an analysis (format may be written, oral, graphic, or three-dimensional model)
   5.2. by answering questions about the concepts that support this competency (format may be oral, written, or graphic)

   **Learning Objectives**
   5.a. Identify the names and locations of the major parts of the heart.
5.b. Explain the function(s) of each of the major parts of the heart.
5.c. Trace the pathway of the blood through the heart and lungs.
5.d. Compare the structures and functions of the major types of blood vessels.
5.e. Describe the mechanisms that aid in returning venous blood to the heart.

6. **Interpret blood gas data**

   **Assessment Strategies**
   6.1. by analyzing data (format may be oral or written)
   6.2. by answering questions about the concepts that support this competency (format may be oral, written, or graphic)

   **Learning Objectives**
   6.a. Interpret the oxygenation status
   6.b. Interpret the ventilation status
   6.c. Interpret the acid-base balance
   6.d. Identify primary and compensatory mechanisms
   6.e. Differentiate between acute and chronic acid-base disturbances
   6.f. Differentiate arterial and venous results

7. **Identify normal hemodynamic values of the cardiopulmonary system**

   **Assessment Strategies**
   7.1. by preparing a written response to a case study
   7.2. by answering questions about the concepts that support this competency (format may be oral, written, or graphic)

   **Learning Objectives**
   7.a. Define hemodynamic monitoring
   7.b. Calculate cardiac output when given heart rate and stroke volume
   7.c. Identify the factors that affect blood pressure
   7.d. Calculate systemic vascular resistance when given MAP, CVP, and cardiac output
   7.e. Calculate pulmonary vascular resistance when given PAP, PCWP and cardiac output

8. **Identify normal fluid and electrolyte balance values**

   **Assessment Strategies**
   8.1. by preparing a written response to a case study
   8.2. by answering questions about the concepts that support this competency (format may be oral, written, or graphic)

   **Learning Objectives**
   8.a. Identify clinical findings associate with excess of deficiencies in water, sodium, potassium, calcium, chloride, or bicarbonate
   8.b. Identify fluid compartments in the body and what their volumes are
   8.c. Describe how water loss and replacement occur
   8.d. Explain how the kidney and lung regulate pH
   8.e. Differentiate cations and anions
   8.f. Calculate the anion gap
   8.g. Relate electrolyte imbalances to alterations in cardiopulmonary status

9. **Recognize basic single lead rhythm strips**

   **Assessment Strategies**
   9.1. by preparing a written or oral response to a case study
   9.2. answering questions related to the learning objectives

   **Learning Objectives**
   9.a. Identify the components of an ECG
   9.b. Analyze rate and rhythm of a rhythm strip
   9.c. Recognize major dysrhythmias (i.e. asystole, bradycardia, tachycardia, PVC's, VT/VF)