



Western Technical College

10515181 Respiratory/Cardio Diagnostics

Course Outcome Summary

Course Information

Description	Advanced invasive and noninvasive diagnostic cardiopulmonary procedures including pulmonary function, hemodynamics and rescue medicine. 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	Human Services
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	72

Pre/Corequisites

Pre/Corequisite 10515113 Respiratory Life Support

Textbooks

Egan's Fundamentals of Respiratory Care. 12th Edition. Copyright 2021. Kacmarek, Robert M., James K. Stoller and Albert J. Heuer. Publisher: Elsevier Science. **ISBN-13**: 978-0-323-51112-4. Required.

Kettering – Therapist Multiple Choice Home Study Bookset and Audio. Publisher: Kettering Seminars. Required.

Kettering Classmate – Clinical Simulation Exam Preparation Licenses – 12 Month. Publisher: Kettering Seminars. Required.

Success Abilities

1. Refine Professionalism: Act Ethically
2. Refine Professionalism: Improve Critical Thinking
3. Refine Professionalism: Participate Collaboratively

Program Outcomes

1. Apply respiratory therapy concepts to patient care situations
2. Demonstrate technical proficiency required to fulfill the role of a Respiratory Therapist
3. Practice respiratory therapy according to established professional and ethical standards

Course Competencies

1. Evaluate data obtained from (invasive and noninvasive) hemodynamic monitoring

Assessment Strategies

- 1.1. by answering questions related to hemodynamic technology
- 1.2. during a skill demonstration or case study

Criteria

Your performance will be successful when:

- 1.1. you perform all relevant steps on the appropriate procedure checklist
- 1.2. you explain functional characteristics and principles of operation of hemodynamic monitoring equipment
- 1.3. you explain components of multi-lumen catheters
- 1.4. you identify common indications, hazards and complications related to technology
- 1.5. you recognize and explain normal waveforms and values related to hemodynamic monitoring
- 1.6. you recognize and explain abnormal waveforms and values related to hemodynamic monitoring
- 1.7. you relate hemodynamic data to common pathologies

Learning Objectives

- 1.a. Describe techniques for cardiovascular monitoring in critically ill patients
- 1.b. Interpret results of hemodynamic monitoring data and relate findings to common pathologies
- 1.c. Explain the components of multi-lumen monitoring catheters
- 1.d. Recognize normal and abnormal waveforms used to monitor hemodynamics

2. Interpret a complete pulmonary function test

Assessment Strategies

- 2.1. through an oral or written response to questions and/or scenarios

Criteria

Your performance will be successful when:

- 2.1. you interpret results of complete pulmonary function testing including spirometry, diffusion, lung volumes/capacities, MVV, 6-minute walk
- 2.2. you perform quality control procedures on pulmonary function equipment
- 2.3. you select the correct instruments/equipment
- 2.4. you verbalize an explanation of the process
- 2.5. your explanation presents sound reasoning as you describe the decisions you make throughout the process

Learning Objectives

- 2.a. List the three categories of pulmonary function tests
- 2.b. Describe the purpose and technique for the bronchial challenge test
- 2.c. Describe the purpose and techniques used to measure diffusion capacity
- 2.d. Interpret pulmonary function reports

3. Interpret data from invasive and noninvasive procedures to assess oxygenation and ventilation

Assessment Strategies

- 3.1. through a skill demonstration
- 3.2. by collecting analyzing and reporting data related to procedures to assess oxygenation and ventilation
- 3.3. by preparing a written or oral response

Criteria

Your performance will be successful when:

- 3.1. you demonstrate a thorough understanding of relevant aspects of the technology
- 3.2. you explain instrumentation of arterial lines and blood gas analyzers
- 3.3. identify common hazards and complications related to technology
- 3.4. you perform all relevant steps on the appropriate procedure checklist

Learning Objectives

- 3.a. Differentiate invasive and non-invasive methods of assessing oxygenation and ventilation
- 3.b. Explain the technology associated with oximeters, arterial lines, transcutaneous and blood gas analyzers
- 3.c. State how to obtain, process, and analyze arterial, capillary, and mixed venous blood gas samples
- 3.d. List the potential advantages and disadvantages of point of care testing
- 3.e. Explain the technology associated with monitoring of transcutaneous, arterial, mixed venous, and exhaled carbon dioxide.
- 3.f. Identify common hazards and complications related to this technology
- 3.g. Differentiate mainstream and side stream capnography
- 3.h. Interpret capnograms and relate findings to respiratory pathology

4. Describe quality assurance and calibration of respiratory therapy equipment

Assessment Strategies

- 4.1. by responding to situations and scenarios (format may be oral, written, or graphic)

Criteria

Your performance will be successful when:

- 4.1. you calibrate the equipment including, but not limited to analyzers and point of care
- 4.2. you run appropriate controls
- 4.3. you record and monitor QC data using accepted statistical methods
- 4.4. you verify computations and note erroneous data

5. Interpret common abnormal ECG rhythm strips

Assessment Strategies

- 5.1. by preparing a written or oral response to a case study
- 5.2. answering questions related to the learning objectives

Criteria

Your performance will be successful when:

- 5.1. you recognize major dysrhythmias
- 5.2. you relate ECG findings to common pathologies
- 5.3. you recommend therapeutic/pharmacologic intervention based on major dysrhythmias
- 5.4. you demonstrate competence in rescue intervention according to ACLS guidelines
- 5.5. case study response demonstrates a thorough understanding of relevant aspects of the case
- 5.6. case study response includes an explanation of why the decision was selected
- 5.7. case study response is supported by relevant evidence

Learning Objectives

- 5.a. Describe the electrophysiology of cardiac cells
- 5.b. Identify correct placement of precordial and limb electrodes
- 5.c. State the general direction of the electrical vector of the normal heart
- 5.d. Identify leads I, II, III, avR, avL, avF, and the six precordial leads
- 5.e. Recognize cardiac dysrhythmias
- 5.f. Relate abnormal EKG findings to common pathologies
- 5.g. Recommend rescue interventions according to ACLS guidelines

6. Perform screening spirometry

Assessment Strategies

- 6.1. through a skill demonstration
- 6.2. with a role-play partner, peer
- 6.3. by answering questions related to the learning objectives

Criteria

Your performance will be successful when:

- 6.1. you select the correct instruments/equipment
- 6.2. you calibrate the spirometer
- 6.3. you perform all critical steps in the right order
- 6.4. you follow safety procedures
- 6.5. you verbalize an explanation of the process as you perform it
- 6.6. you interpret results of spirometry/flow volume loop

Learning Objectives

- 6.a. Demonstrate how to calibrate and perform all critical steps of spirometry testing
- 6.b. List and describe the four lung volumes and four lung capacities measured with pulmonary function testing
- 6.c. Describe patterns associated with obstructive and restrictive lung disease

7. Explain therapist's role in assisting the physician during special procedures (thoracentesis, bronchoscopy, cardioversion, chest tube insertion, arterial and venous catheter insertion and stress testing)

Assessment Strategies

- 7.1. through an oral or written response to questions and/or scenarios

Criteria

Your performance will be successful when:

- 7.1. you identify the appropriate equipment necessary to assist physician with bronchoscopy thoracentesis and cardioversion
- 7.2. you explain monitoring procedures related to IV conscious sedation
- 7.3. you explain potential complications and appropriate interventions

Learning Objectives

- 7.a. Describe how to assist a physician in setting up and performing bronchoscopy
- 7.b. Describe how to assist a physician in setting up and performing thoracentesis
- 7.c. Describe indications and the procedure for performing synchronized cardioversion
- 7.d. Explain the purpose of, and monitoring procedures for, IV conscious sedation