



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
Pre/Corequisite	Respiratory Disease
Pre/Corequisite	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.

Comprehensive Respiratory Therapist's Exam Review – w/ Access. 7th Edition. Copyright 2020. Sills, James R. Publisher: Elsevier Science. **ISBN-13**: 978-0-323-55367-4. Required.

Success Abilities

1. Cultivate Passion: Expand a Growth-Mindset
2. Cultivate Passion: Increase Self-Awareness
3. Live Responsibly: Develop Resilience
4. Live Responsibly: Foster Accountability
5. Refine Professionalism: Act Ethically

6. Refine Professionalism: Improve Critical Thinking

Program Outcomes

1. Apply respiratory therapy concepts to patient care situations.
2. Demonstrate technical proficiency required to fulfill the role of a Respiratory Therapist.

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