Miami Dade College

Course Description

RET2414L | Pulmonary Studies Laboratory | 1.00 credits

Laboratory for RET 2414. Simulated clinical settings of diagnostic techniques used to evaluate pulmonary functions.

Course Competencies

Competency 1: The student will identify indications for Pulmonary Function Testing by:

1. Categorizing pulmonary function tests according to specific purposes
2. Listing indications for spirometry, lung volumes, and diffusing capacity
3. Listing one obstructive and one restrictive pulmonary disorder
4. Relating pulmonary history to indication for performing pulmonary function tests
5. Identifying three indications for exercise testing
6. Naming at least two diseases in which air trapping may occur

Competency 2: The student will perform and interpret spirometry and spirometry-related tests by:

1. Demonstrating the calibration of a spirometer using a 3 Liter syringe
2. Demonstrating the use of a hand-held spirometer to measure FVC, FEV1, FEV1/FVC
3. Determining whether spirometry is acceptable and repeatable
4. Identifying airway obstruction using forced vital capacity (FVC) and forced expiratory volume (FEV1)
5. Differentiating between obstruction and restriction as causes of reduced vital capacity
6. Determining whether there is a significant response to bronchodilators
7. Selecting the appropriate FVC and FEV1 for reporting from a series of spirometry maneuvers
8. Identifying at least two pathophysiologic conditions in which maximal inspiratory or expiratory pressures might be abnormal
9. Demonstrating the use of a respiratory monometer to perform MIP/MEP and interpreting results
10. Recognizing abnormal values for airway resistance and specific conductance
11. Performing Peak Flow measurements

Competency 3: The student will interpret Lung Volume Testing by:

1. Identifying the various components of the various circuits/testing equipment that are used for lung volume/gas distribution testing
2. Stating how different types of gas analyzers are used in the pulmonary function laboratory, problems encountered with their use, and how they are calibrated
3. Describing the basic components of the body plethysmograph and the instruments used to calibrate it
4. Describing the measurement of lung volume gas dilution/ washout methods
5. Explaining two advantages of measuring lung volumes using the body plethysmograph
6. Calculating residual volume and total lung capacity from FRC and the subdivisions of VC
7. Identifying a restricted disease process from measured lung volumes
8. Describing the correct technique for measuring thoracic gas volumes
9. Identifying air trapping and hyperinflation using measured lung volumes

Competency 4: The student will interpret Diffusing Capacity Measurements by:

1. Identifying the various components of the circuit used to perform DLCOsb
2. Stating how different types of gas analyzers are used in the DLCOsb circuit, problems encountered with their use, and how they are calibrated
3. Identifying the steps for performing the single-breath DLCO test
4. Listing at least two criteria for an acceptable single-breath DLCO test
5. Describing why DLCO is often reduced in emphysema
6. Describing at least two non-pulmonary causes for a reduced DLCO

7. Explaining the significance of a reduced DL/VA

Competency 5: The student will interpret ventilation and ventilatory control tests by:

1. Identifying the various components of the circuit/testing equipment that are used for ventilation and ventilation control testing
2. Describing the measurement of tidal volume and minute ventilation
3. Identifying at least two causes of decreased minute ventilation
4. Calculating the VD/VT ratio using PaCO2 and PETCO2
5. Listing at least two causes for an increased VD/VT ratio
6. Explaining the function of a variable CO2 scrubber in a circuit for measuring ventilatory response to hypoxia
7. Identifying the normal ventilatory response to carbon dioxide

Competency 6: The student will demonstrate and evaluate the interpreting of blood gases and related tests by:

1. Identifying the various components of a blood gas analyzer and other testing equipment used for blood gas analysis, capnography, and pulse oximetry
2. Explaining the common causes of blood gas electrode problems
3. Describing how pH and PCO2 are used to demonstrate the assessment of acid-base status
4. Interpreting PO2 and oxygen saturation to demonstrate the assessment of oxygenation
5. Describing and performing the appropriate procedure for obtaining an arterial blood gas specimen
6. Describing how QC is to be performed on blood gas analyzers and interpreting Levy- Jennings QC graphs for In-Control, Out- of-Control, Trending, Random Error
7. Describing at least two limitations of pulse oximetry
8. Describing some of the common issues associated with the use of capnography and how to troubleshoot them

Competency 7: The student will be able to identify outcomes related to cardiopulmonary Exercise Testing by:

1. Identifying indications related to cardiopulmonary exercise testing
2. Selecting appropriate protocol related to cardiopulmonary exercise testing
3. Evaluating the outcomes related to cardiopulmonary exercise testing

Learning Outcomes:

1. Communication
2. Computer / Technology Usage
3. Critical Thinking
4. Information Literacy
5. Numbers / Data