Miami Dade College

Course Competency

RET 2414L Pulmonary Studies Laboratory

Course Description

Laboratory for RET 2414. Simulated clinical settings of diagnostic techniques used to evaluate pulmonary functions. Laboratory fee. (2 hr. lab)

Course Competency	Learning Outcomes
Competency 1: The student will identify indications for Pulmonary Function Testing by:	1. Communication 2. Numbers / Data 3. Critical thinking 4. Information Literacy 5. Computer / Technology Usage
1. Categorizing pulmonary function test 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. Communication 2. Numbers / Data 3. Critical thinking 4. Information Literacy 5. Computer / Technology Usage
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 performing 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. Communication 2. Numbers / Data 3. Critical thinking 4. Information Literacy 5. Computer / Technology Usage
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. Communication 2. Numbers / Data 3. Critical thinking 4. Information Literacy 5. Computer / Technology Usage
1. Identifying the various components of the circuit used to performing 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. Communication 2. Numbers / Data 3. Critical thinking 4. Information Literacy 5. Computer / Technology Usage
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. Communication 2. Numbers / Data 3. Critical thinking 4. Information Literacy 5. Computer / Technology Usage
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 demonstrating the assessment of acid-base status 4. Interpreting PO2 and oxygen saturation to demonstrating 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 problems	

associated with the use of capnographs and how to troubleshoot them	
Competency 7: The student will be able to identify outcomes related to cardiopulmonary Exercise Testing by:	1. Communication 2. Numbers / Data 3. Critical thinking 4. Information Literacy 5. Computer / Technology Usage
1. Identifing indications related to cardiopulmonary exercise testing 2. Selecting appropriate protocol related to cardiopulmonary exercise testing 3. Evaluating the outcomes related to cardiopulmonary exercise testing	

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