

# Course Competency

## RET 2264 ADVANCED MODALITIES AND MONITORING

### Course Description

This is an advanced course relating to critical care. Students will learn advanced techniques in invasive and non-invasive monitoring, electrocardiographic monitoring and interpretation, alternatives to conventional ventilation and advanced cardiovascular support systems. Prerequisite RET 2284; corequisite RET 2714. (2 hr. Lecture)

Course Competency	Learning Outcomes
<p><b>Competency 1:</b> The student will describe the requirements for and benefits of pulmonary rehabilitation for a patient with chronic pulmonary disease by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Critical thinking</li> <li>3. Information Literacy</li> <li>4. Cultural / Global Perspective</li> <li>5. Social Responsibility</li> <li>6. Ethical Issues</li> </ol>
<ol style="list-style-type: none"> <li>1. Defining pulmonary rehabilitation</li> <li>2. Listing the team members who constitute a pulmonary rehabilitation program</li> <li>3. Comparing intensive programs, maintenance programs, and perioperative programs</li> <li>4. Identifying candidates for a pulmonary rehabilitation program</li> <li>5. Describing the components of patient assessment in a comprehensive pulmonary rehabilitation program</li> <li>6. Describing the role of education in a pulmonary rehabilitation program</li> <li>7. Discussing the benefits of upper and lower extremity exercise training in a pulmonary rehabilitation program</li> <li>8. Explaining the guidelines used to prescribe an exercise training program</li> <li>9. Discussing the roles of the following in a pulmonary rehabilitation program: respiratory therapies, psychological therapies, physical therapy individualized</li> </ol>	

<p>instruction, nutrition counseling, and pharmacologic therapy</p>	
<p><b>Competency 2:</b> The student will describe the effects of nutrition on respiratory function and critical illness by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Information Literacy</li> </ol>
<ol style="list-style-type: none"> <li>1. Discussing the effects of nutritional status on the respiratory system</li> <li>2. Discussing the effects of nutritional status during critical illness</li> <li>3. Explaining the principle of nutritional assessment</li> <li>4. Comparing methods used to estimate nutritional needs</li> <li>5. Comparing approaches to nutritional support for patients with acute and chronic lung disease</li> <li>6. Discussing the role of indirect calorimetry in nutrition assessment</li> <li>7. Describing alternative methods to indirect calorimetry</li> <li>8. Describing nutrition therapies for acute and chronic lung disease</li> </ol>	
<p><b>Competency 3:</b> The student will describe and discuss the clinical importance of hemodynamic monitoring by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Information Literacy</li> <li>5. Computer / Technology Usage</li> </ol>
<ol style="list-style-type: none"> <li>1. Describing the factors that control blood pressure and the dynamics that affect them</li> <li>2. Identifying the equipment utilized for hemodynamic monitoring</li> <li>3. Describing the indications for continuous monitoring of arterial blood pressure</li> <li>4. Describing the pulmonary artery and central venous catheters and their function</li> <li>5. Describing the normal ranges of arterial blood pressure (systolic and diastolic),</li> </ol>	

<p>central venous blood pressure, pulmonary artery pressure, and pulmonary capillary wedge pressure, and the waveforms each produced during hemodynamic monitoring</p> <ol style="list-style-type: none"> <li>6. Describing how various cardiopulmonary diseases present in hemodynamic monitoring</li> <li>7. Calculating pulse pressure, mean arterial pressure, cardiac output, systemic vascular resistance, and pulmonary vascular resistance</li> <li>8. Describing the basic principles of Extracorporeal Membrane Oxygenation (ECMO)</li> </ol>	
<p><b>Competency 4:</b> The student will describe the purpose, equipment, and monitoring techniques involved in chest drainage systems by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Information Literacy</li> <li>5. Computer / Technology Usage</li> </ol>
<ol style="list-style-type: none"> <li>1. Discussing pathologies/disease processes requiring chest drainage systems</li> <li>2. Identifying the location/placement of chest tubes for the pathologies/disease processes</li> <li>3. Identifying and describing the components and operation of the three-bottle chest drainage system</li> <li>4. Identifying and describing the components and operation of the commercial chest drainage system (wet and dry)</li> <li>5. Discussing how a chest drainage system is assessed for proper function</li> <li>6. Discussing the procedures involved in transporting a patient with a chest tube, trouble-shooting accidental disconnection/removal, and termination of the chest tube</li> </ol>	
<p><b>Competency 5:</b> The student will describe various causes of Ventilator Induced Lung Injury (VILI) and the lung protective strategies used in mechanical ventilation to prevent it by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Information Literacy</li> </ol>

<ol style="list-style-type: none"> <li>1. Defining and discussing barotrauma, its causes and manifestations and how it is prevented</li> <li>2. Defining and discussing volutrauma, its causes and how it is prevented</li> <li>3. Defining and discussing atelectrauma, its causes and how it is prevented</li> <li>4. Defining and discussing biotrauma</li> <li>5. Defining and discussing oxygen toxicity</li> <li>6. Discussing various lung protective strategies used in mechanical ventilation</li> </ol>	
<p><b>Competency 6:</b> The student will describe interventions utilized in optimizing oxygenation of the mechanically ventilated patient by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Information Literacy</li> <li>5. Computer / Technology Usage</li> </ol>
<ol style="list-style-type: none"> <li>1. Discussing lung recruitment procedures, benefits, and hazards</li> <li>2. Discussing various types of PEEP titration methods used to improve oxygenation</li> <li>3. Discussing selective pulmonary vasodilation as a means of improving oxygenation</li> <li>4. Discussing prone positioning as a means of improving oxygenation</li> </ol>	
<p><b>Competency 7:</b> The student will describe application and advantages and disadvantages of various types of “Closed-Loop Ventilation” by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Information Literacy</li> <li>5. Computer / Technology Usage</li> </ol>
<ol style="list-style-type: none"> <li>1. Defining and discussing the application and advantages/disadvantages of Pressure Regulated Volume Controlled Ventilation (PRVC)</li> <li>2. Defining and discussing the application and advantages/disadvantages of Adaptive Pressure Ventilation (APV)</li> <li>3. Defining and discussing the application</li> </ol>	

<p>and advantages/disadvantages of Volume Support Ventilation (VSV)</p> <ol style="list-style-type: none"> <li>4. Defining and discussing the application and advantages/disadvantages of Volume-Assured Pressure Support (VAPS)</li> <li>5. Defining and discussing the application, management, and advantages/disadvantages of Airway Pressure Release Ventilation (APRV)</li> </ol>	
<p><b>Competency 8:</b> The student will describe the initiation and management of High-Frequency Oscillation Ventilation (HFOV) by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Information Literacy</li> </ol>
<ol style="list-style-type: none"> <li>1. Defining HFOV</li> <li>2. Discussing HFOV as a lung protective strategy</li> <li>3. Describing the various controls utilized on HFOV and their function</li> <li>4. Discussing the indication and exclusion criteria for HFOV</li> <li>5. Discussing the initial settings utilized for adult HFOV</li> <li>6. Discussing assessment of effectiveness when using HFOV</li> </ol>	
<p><b>Competency 9:</b> The student will describe the initiation and management of Airway Pressure Release Ventilation (APRV) by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Information Literacy</li> <li>5. Computer / Technology Usage</li> </ol>
<ol style="list-style-type: none"> <li>1. Defining APRV</li> <li>2. Discussing APRV as a lung protective strategy</li> <li>3. Describing the various controls utilized on APRV and their function</li> <li>4. Discussing the indication and exclusion criteria for APRV</li> <li>5. Discussing the initial settings utilized for adult APRV</li> </ol>	

6. Discussing assessment of effectiveness when using APRV	
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