Miami Dade College

Course Description

RET2503 | Respiratory Care Pathophysiology 2 | 3.00 credits

This is a foundation course on cardiopulmonary disease. The student will learn the pathogenesis, diagnosis, treatment and rehabilitation of the diseases included in the course. Prerequisite: RET 1484; Prerequisite: RET1484.

Course Competencies

Competency 1: The student will describe the language and techniques associated with chest radiography and other essential radiographic techniques used in the assessment of the patient with cardiopulmonary disease by:

1. Describing the fundamentals of radiography
2. Differentiating between the following standard positions and techniques of chest radiography:
    a. Posteroanterior radiograph
    b. Anteroposterior radiograph
    c. Lateral radiograph
    d. Lateral decubitus radiograph
3. Defining the following radiologic terms commonly used when inspecting the chest radiograph:
    a. Air cyst 2. Bleb 3.
    b. Bronchogram
    c. Bulla
    d. Cavity
    e. Consolidation
    f. Homogeneous density
    g. Honeycombing
    h. Infiltrate
    i. Interstitial
    j. Density
    k. Lesion
    l. Opacity
    m. Pleural
    n. Density
    o. Pulmonary mass
    p. Pulmonary nodule
    q. Radiodensity
    r. Radiolucency
    s. Translucent
4. Describing the three steps to evaluate the technical quality of the radiograph
5. Describing the sequence of examination and include:
    a. Mediastinum
    b. Trachea
    c. Heart
    d. Hilar region
    e. Lung parenchyma (tissue)
    f. Pleura
    g. Diaphragm
    h. Gastric air bubble
    i. Bony thorax
    j. Extra thoracic soft tissues
6. Describing the diagnostic values of the following radiologic techniques:
    a. Computed tomography (CT)
    b. Positron emission tomography (PET)

c. Positron emission tomography and computed tomography scan (PET/CT scan)
d. Magnetic resonance imaging (MRI)
e. Pulmonary angiography
f. Ventilation/ perfusion scan
g. Fluoroscopy
h. Bronchography

Competency 2: The student will describe a variety of general and specific tests to help identify the overall health status of the patient, with a primary emphasis on the examination of sputum samples to identify potential sources of infection and the levels of red and white blood cells and electrolytes in the blood by:

1. Describing the diagnostic values of the sputum examination and include common organisms associated with respiratory disorders:
    a. Gram-negative organisms (Klebsiella, Pseudomonas aeruginosa, Haemophilus influenzae, Legionella pneumophila)
    b. Gram-positive organisms (Streptococcus and Staphylococcus)
    c. Viral organisms (Mycoplasma pneumoniae and respiratory syncytial virus)
2. Discussing the diagnostic values of the following tests and procedures:
    a. Skin tests
    b. Endoscopic examinations (bronchoscopy and mediastinoscopy)
    c. Lung biopsy
    d. Video-assisted thoracoscopy (VATS)
    e. Thoracentesis
    f. Pleurodesis
3. Describing the following components of hematology:
    a. Complete blood count (CBC)
    b. Red blood cell (RBC) count (red blood cell indices and types of anemias)
    c. White blood cell count (WBC), and include granular leukocytes and nongranular leukocytes
    d. Describing the role of platelet and include:
    e. Causes of a platelet deficiency
    f. Clinical significance of a platelet deficiency
4. Identifying the following blood chemistry tests commonly monitored in respiratory care:
    a. Glucose
    b. Lactic dehydrogenase (LDH)
    c. Serum glutamic oxaloacetic transaminase (SGOT)
    d. Blood urea nitrogen (BUN) 5. Serum creatinine
5. Identifying the following electrolytes commonly monitored in respiratory care:
    a. Sodium (Na+)
    b. Potassium (K+)
    c. Chloride (Cl−)
    d. Calcium (Ca++)

Competency 3: The student will describe, and list anatomic alterations associated with a prevalent form of obstructive lung disease known as asthma with emphasis placed on the assessment and treatment of patients with this disease by:

1. Describing the role of the following organizations in the management of asthma:
    a. National Asthma Education and Prevention Program (NAEPP)
    b. Global Initiative for Asthma (GINA)
    c. Listing the anatomic alterations of the lungs associated with asthma
2. Describing the epidemiology and risk factors associated with asthma, including:
    a. Extrinsic asthma
    b. Intrinsic asthma
    c. Describing the challenges associated with the diagnosis of asthma, and include the tests used to diagnosis and monitor asthma

    d. Differentiating the classifications of asthma severity
    e. Describing the cardiopulmonary clinical manifestations associated with asthma
    f. Describing the general management of asthma
3. Describe the definition, assessment, and treatment for chronic obstructive pulmonary disease and focus on chronic bronchitis and emphysema and the anatomical differences between the two forms of COPD.
4. Describing the American Thoracic Society (ATS) guidelines for chronic obstructive pulmonary disease (COPD), chronic bronchitis, and emphysema
5. Discussing the Global Initiative for Chronic Obstructive Lung Disease (GOLD) definition of COPD
6. Listing the epidemiology and risk factors associated with COPD
7. Describing the Global Initiative for Chronic Obstructive Lung Disease (GOLD) global strategy for diagnosing COPD
8. Describing the key indicators for considering a COPD diagnosis
    a. Dyspnea
    b. Chronic cough
    c. Chronic sputum production
    d. History of exposure to risk factors
    e. Describing the three main pulmonary function study measurements used to confirm the clinical suspicion of COPD: 11. FVC 12. FEV1.
    f. FEV1/FVC ratio 14. Differentiating among the following four stages of COPD as outlined by GOLD:
    g. Stage I: Mild COPD
    h. Stage II: Moderate COPD
    i. Stage III: Severe COPD
    j. Stage IV: Very severe COPD
9. Discuss additional diagnostic studies for patients identified as having either Stage II, Stage III, or Stage IV COPD 20.
    a. Bronchodilator reversibility testing
    b. Chest x-ray 22. Arterial blood gas measurement
    c. Alpha-1 antitrypsin deficiency screening
    d. Listing the anatomic alterations of the lungs caused by both chronic bronchitis and emphysema
10. List the cardiopulmonary clinical manifestations caused by the anatomic alterations and pathophysiologic mechanisms associated with chronic bronchitis and emphysema
11. Identifying the key differences between chronic bronchitis and emphysema—the “pink puffer” and the “blue bloater”
12. Describing the Global Initiative for Chronic Obstructive Lung Disease (GOLD) global strategy for the management and prevention of chronic obstructive pulmonary diseases
13. Describing additional treatment considerations for emphysema, including:
    a. Alpha1 antitrypsin replacement therapy
    b. Lung volume reduction surgery
    c. Lung transplantation

Competency 4: The student will describe the pathologic abnormalities associated with cystic fibrosis as well as the typical clinical findings and treatment modalities used to treat patients with CF by:

1. Listing the anatomic alterations of the lungs associated with cystic fibrosis
2. Describing the causes and classifications of cystic fibrosis
3. Listing the cardiopulmonary clinical manifestations associated with cystic fibrosis
4. Describing the general management of cystic fibrosis

Competency 5: The student will describe changes in the lung that occur with pneumonia as well as the clinical findings and treatment by:

1. Listing the anatomic alterations of the lungs associated with pneumonia
2. Describing the causes and classifications of pneumonia
3. Listing the cardiopulmonary clinical manifestations associated with pneumonia
4. Describing the general management of pneumonia

Competency 6: The student will describe the pathology, clinical findings, and treatment associated with pulmonary tuberculosis by:

1. Listing the anatomic alterations of the lungs associated with tuberculosis
2. Describing the causes of tuberculosis
3. Listing the cardiopulmonary clinical manifestations associated with tuberculosis
4. Describing the general management of tuberculosis

Competency 7: The student will describe the pathological change, clinical signs, and the treatments associated with pulmonary edema by:

1. Listing the anatomic alterations of the lungs associated with pulmonary edema
2. Describing the causes of pulmonary edema
3. Listing the cardiopulmonary clinical manifestations associated with pulmonary edema
4. Describing the general management of pulmonary edema

Competency 8: The student will describe the findings associated with general management, and respiratory care often provided to treat patients with the diagnosis of pulmonary embolism by:

1. Listing the anatomic alterations of the lungs associated with pulmonary embolism
2. Describing the causes of pulmonary embolism
3. Listing the cardiopulmonary clinical manifestations associated with pulmonary embolism
4. Describing the general management of pulmonary embolism

Competency 9: The student will describe the anatomical defects in the lung and chest wall, the assessment, and treatment associated with flail chest by:

1. Listing the anatomic alterations of the lungs associated with a flail chest
2. Describing the causes of a flail chest
3. Listing the cardiopulmonary clinical manifestations associated with a flail chest
4. Describing the general management of a flail chest

Competency 10: The student will describe the anatomical defects, causes, clinical findings, and treatment associated with a pneumothorax by:

1. Listing the anatomic alterations of the lungs associated with a pneumothorax
2. Describing the causes of a pneumothorax
3. Listing the cardiopulmonary clinical manifestations associated with a pneumothorax
4. Describing the general management of a pneumothorax

Competency 11: The student will describe pleural problems that cause unique clinical manifestations and need specific treatment by:

1. Listing the anatomic alterations of the lungs associated with pleural diseases 1. Describing the causes of pleural diseases
2. Listing the cardiopulmonary clinical manifestations associated with pleural diseases 3. Describing the general management of pleural diseases

Competency 12: The student will describe the key issues related to kyphoscoliosis to include pathology, causes, clinical findings, and treatment associated with this medical problem by:

1. Listing the anatomic alterations of the lungs associated with kyphoscoliosis
2. Describing the causes of kyphoscoliosis
3. Listing the cardiopulmonary clinical manifestations associated with kyphoscoliosis
4. Describing the general management of kyphoscoliosis

Competency 13: The student will describe the pathologic changes in the lung, causes, clinical findings, and treatment associated with chronic interstitial lung disease by:

1. Listing the anatomic alterations of the lungs associated with chronic interstitial lung disease

2. Describing the causes of chronic interstitial lung disease
3. Listing the cardiopulmonary clinical manifestations associated with chronic interstitial lung disease
4. Describing the general management of chronic interstitial lung disease

Competency 14: The student will describe the pathological changes in the lung, causes, clinical findings, and treatment for lung cancer by:

1. Listing the anatomic alterations of the lungs associated with cancer of the lung
2. Describing the causes of cancer of the lung
3. Listing the cardiopulmonary clinical manifestations associated with cancer of the lung
4. Describing the general management of cancer of the lung

Competency 15: The student will describe the pathological changes, causes, clinical findings, and treatment of ARDS by:

1. Listing the anatomic alterations of the lungs associated with acute respiratory distress syndrome
2. Describing the causes of acute respiratory distress syndrome
3. Listing the cardiopulmonary clinical manifestations associated with acute respiratory distress syndrome
4. Describing the general management of acute respiratory distress syndrome

Competency 16: The student will describe the pathologic changes, causes, clinical findings, and treatment for Guillain-Barré syndrome by:

1. Listing the anatomic alterations of the lungs associated with Guillain-Barré syndrome
2. Describing the causes of Guillain-Barré syndrome
3. Listing the cardiopulmonary clinical manifestations associated with Guillain- Barré syndrome
4. Describing the general management of Guillain-Barré syndrome

Competency 17: The student will describe the pathology, causes, and treatment of myasthenia gravis by:

1. Listing the anatomic alterations of the lungs associated with myasthenia gravis
2. Describing the causes of myasthenia gravis
3. Listing the cardiopulmonary clinical manifestations associated with myasthenia gravis
4. Describing the general management of myasthenia gravis

Competency 18: The student will describe clinical findings and treatment for obstructive and central sleep apnea by:

1. Listing the anatomic alterations of the lungs associated with sleep apnea
2. Describing the meaning of the apnea-hypopnea index and oxygen desaturation index
3. Describing the general management of sleep apnea
4. Describing the causes of sleep apnea
5. Describing how a sleep study is performing
6. Listing the cardiopulmonary clinical manifestations associated with sleep apnea

Competency 19: The student will describe two potential causes, clinical findings, and treatment of upper airway narrowing due to infection in croup and epiglottitis by:

1. Listing the anatomic alterations of the lungs associated with croup syndrome
2. Describing the causes of croup syndrome
3. Listing the cardiopulmonary clinical manifestations associated with croup syndrome
4. Describing the general management of croup syndrome

Competency 20: The student will describe the pathological changes in the lung, causes, clinical findings, and treatment of near drowning, smoke inhalation, and postoperative atelectasis by:

1. Listing the anatomic alterations of the lungs associated with near-drowning
2. Describing the causes of near drowning
3. Listing the cardiopulmonary clinical manifestations associated with near drowning
4. Describing the general management of near drowning

5. Listing the anatomic alterations of the lungs associated with smoke inhalation and thermal injuries
6. Describing the causes of smoke inhalation and thermal injuries
7. Listing the cardiopulmonary clinical manifestations associated with smoke inhalation and thermal injuries
8. Describing the general management of smoke inhalation and thermal injuries
9. Listing the anatomic alterations of the lungs associated with postoperative atelectasis
10. Describing the causes of postoperative atelectasis
11. Listing the cardiopulmonary clinical manifestations associated with postoperative atelectasis
12. Describing the general management of postoperative atelectasis

Learning Outcomes:

1. Communication
2. Numbers / Data
3. Critical Thinking
4. Information Literacy