

**Course Objectives/Course Outline**  
**Spokane Community College**

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**Course Title: Advanced Pulmonary Diagnostics**

**Prefix and Course Number: RT 403**

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**Course Learning Outcomes:**

**By the end of this course, a student should be able to:**

- Describe the purpose of cardiopulmonary exercise testing
- Describe the body's physiologic adaptation to exercise
- Describe the equipment used in cardiopulmonary exercise testing
- Given the results of a cardiopulmonary exercise test, evaluate if the limitation is cardiac, pulmonary, cardiopulmonary or deconditioning
- Apply the use of indirect calorimetry in the ICU and for weight management
- Differentiate between a PSG and home sleep study
- Describe the various pathologies that may be identified by performing a sleep study
- Describe the treatment of obstructive sleep apnea
- Describe the indications for maximal inspiratory/expiratory pressure measurements and how to perform them
- Evaluate when airway resistance measurement may be better than spirometry in the diagnosis of reactive airway disease
- List the indications for bronchial provocation challenge testing and the different methods that may be used
- Discuss the indications for bronchoscopy
- Differentiate between a flexible, videoscope, endobronchial ultrasound (EBUS) and Superdimension bronchoscopy
- Describe the indications for rigid bronchoscopy
- Discuss the hazards of bronchoscopy

**Course Outline:**

- I. Cardiopulmonary Exercise (CPX) Testing
  - A. Physiologic adaptation to exercise
  - B. Exercise instrumentation
  - C. Indications for CPX testing
  - D. Hazards of CPX testing
  - E. Interpretation of CPX testing results
- II. Indirect calorimetry
  - A. Theory of substrate utilization
  - B. Equipment
  - C. Test performance requirements
- III. Sleep diagnostics
  - A. Prevalence of sleep disorders in society
  - B. Economic significance of sleep disorders
  - C. Theory of sleep
  - D. Polysomnographic sleep monitoring
  - E. Pathologies leading to sleep disorders

- F. Treatment of sleep disorders
- IV. Respiratory mechanics measurements
  - A. Indications
  - B. MIP/MEP
  - C. Reproducibility criteria
- V. Airway resistance measurement
  - A. Theory of spirometry versus airway resistance
  - B. Plethysmography theory
  - C. ATS standards
- VI. Bronchial provocation
  - A. Methacholine challenge
  - B. Histamine challenge
  - C. Exercise challenge
  - D. Eupneic ventilation challenge
  - E. Cold air challenge
- V. Bronchoscopy
  - A. Indications
  - B. Videobronchoscopy
  - C. Extra-bronchial ultrasound (EBUS)
  - D. CT superdimensional
  - E. Hazards of bronchoscopy