

COLLEGEWIDE COURSE OUTLINE OF RECORD

RESP 201, ADVANCED CONCEPTS IN CARDIOPULMONARY DIAGNOSTIC PROCEDURES

COURSE TITLE: Advanced Concepts in Cardiopulmonary Diagnostic Procedures

COURSE NUMBER: RESP 201

PREREQUISITES: RESP 104 Concepts in Adult Critical Care, RESP 105 Cardiopulmonary Pathophysiology

SCHOOL: Health Sciences

PROGRAM: Respiratory Therapy

CREDIT HOURS: 4

CONTACT HOURS: Lecture: 4

DATE OF LAST REVISION: Fall, 2019

EFFECTIVE DATE OF THIS REVISION: Spring, 2020

CATALOG DESCRIPTION: Presents in-depth approaches to advanced diagnostic procedures. Special emphasis is placed on techniques of patient evaluation, selection of equipment, how to perform various diagnostic procedures, cardiopulmonary monitoring during the procedure, interpreting test results and suggesting management of the patient. Information regarding quality control, quality assurance and calibration of equipment will also be discussed. Advanced techniques of patient assessment through pulmonary function testing and other selected assessment techniques will also be covered.

MAJOR COURSE LEARNING OBJECTIVES FROM 2020 NBRC MATRIX: Upon successful completion of this course the student will be expected to:

1. Evaluate data in the patient record
 - a. Physical exam to the cardiopulmonary system (heart tones)
 - b. Lines, drains, and airways (chest tube, vascular lines, artificial airways)
 - c. Laboratory results (CBC, electrolytes, coagulation studies, Sputum C&S, cardiac biomarkers)
 - d. PFT (spirometry, lung volumes, DLCO)
 - e. Imaging study results (chest radiography, CT scan, ultrasonography and/or echocardiography, PET scan, ventilation/perfusion scan)
 - f. Sleep study results (AHI)
 - g. Trends and monitoring
 - i. Fluid balance
 - ii. ICP monitoring (pathologies related to ICP)
 - iii. Pulmonary mechanics (compliance, resistance, work of breathing)
 - iv. Cardiac evaluation/monitoring results (ECG, hemodynamic parameters)
2. Perform clinical assessment to assess for level of consciousness and orientation, emotional state, and ability to cooperate(Glasgow, calculate CPP)
3. Perform procedures including review of indications, contraindications, and hazards to gather clinical information
 - a. Hemodynamic monitoring
 - i. $P_{Aa}O_2$, $C_{av}O_2$, Q_s/Q_t , CI, QT, PVR, SVR

- b. Pulmonary compliance and airway resistance
 - c. Overnight oximetry
 - d. CPAP/NPPV titration during sleep
 - e. Cardiopulmonary stress testing
 - f. Lung volumes and DLCO inside a PFT lab
 - g. Therapeutic bronchoscopy
4. Evaluate procedure results
 - a. 12 Lead ECG
 - b. Hemodynamic monitoring and calculations ($P_{Aa}O_2$, $C_{av}O_2$, Q_s/Q_t , CI, QT, PVR, SVR)
 - c. Pulmonary compliance and airway resistance
 - d. Overnight pulse oximetry
 - e. CPAP/NPPV titration during sleep
 - f. Cardiopulmonary stress test including metabolic study (e.g., O_2 consumption/ CO_2 production, RQ, Energy expenditure) results in a patient's record
 - g. Spirometry outside or inside a pulmonary function laboratory including bronchoprovocation
 - h. Lung volumes and DLCO inside a PFT lab
 5. Recommend diagnostic procedures
 - a. Laboratory tests (CBC, electrolytes, coagulation studies, sputum C&S, cardiac biomarkers)
 - b. Imaging studies
 - c. Diagnostic and therapeutic bronchoscopy
 - d. Bronchoalveolar lavage (BAL)
 - e. Pulmonary function testing including bronchoprovocation
 - f. ECG
 - g. Exhaled gas analysis (CO , and NO (FeNO))
 - h. Hemodynamic monitoring
 - i. Sleep studies
 - j. Thoracentesis
 6. Troubleshooting and quality control of devices to assemble/troubleshoot equipment
 - a. Blood analyzers (hemoximetry (co-oximetry), blood gas, point of care)
 - b. Testing equipment in pulmonary function laboratory
 - c. Pleural drainage
 - d. Noninvasive monitoring devices (pulse oximeter, capnometer, transcutaneous)
 - e. Bronchoscopes and light sources
 - f. Pressure transducers
 - g. Catheters (arterial, pulmonary artery)
 7. Perform quality control procedures
 - a. Blood analyzers
 - b. Gas analyzers
 - c. Pulmonary function equipment for testing
 - i. Spirometry results
 - ii. Lung volumes
 - iii. DLCO
 8. Ensure modifications are made to the respiratory care plan

- a. Recommendations for
 - i. Treatment of pneumothorax
 - ii. Adjustment of fluid balance
 - iii. Adjustment of electrolyte therapy
 - iv. Consultation from a physician specialist
 - v. Changes in patient position
 - vi. Mechanical and Noninvasive ventilation
- 9. Provide respiratory care in high risk situations in a cardiopulmonary emergency excluding CPR
- 10. Assist a physician/provider in performing procedures
 - a. Bronchoscopy
 - b. Specialized bronchoscopy (endobronchial ultrasound (EBUS), navigational bronchoscopy (ENB)) including biopsies
 - c. Thoracentesis
 - d. Chest tube insertion
 - e. Insertion of arterial or venous catheters
 - f. Moderate (conscious) sedation

COURSE CONTENT: Topical areas of study include –

Radiology (CT, V/Q, Pulmonary Angiogram, Ultrasound/Echocardiography)

Bronchoscopy

PFT

Quality Control, Quality Assurance (ABG, CO₂, CO, FeNo)

Cardiovascular studies (Heart sounds, Echocardiogram, Stress Tests, and EKG)

Hemodynamics (Arterial, Pulmonary Catheters, perform calculations, interpret results, troubleshoot)

Polysomnography (NPPV titration, pulse oximeter, medications)

Arterial/Central lines

Intracranial Pressure Monitoring

Laboratory Studies

Evaluations

HOW TO ACCESS THE IVY TECH COMMUNITY COLLEGE LIBRARY:

The Ivy Tech Library is available to students' on- and off-campus, offering full text journals and books and other resources essential for course assignments. Go to <http://www.ivytech.edu/library/> and choose the link for your campus.

ACADEMIC HONESTY STATEMENT:

The College is committed to academic integrity in all its practices. The faculty value intellectual integrity and a high standard of academic conduct. Activities that violate academic integrity undermine the quality and diminish the value of educational achievement.

Cheating on papers, tests or other academic works is a violation of College rules. No student shall engage in behavior that, in the judgment of the instructor of the class, may be construed as

cheating. This may include, but is not limited to, plagiarism or other forms of academic dishonesty such as the acquisition without permission of tests or other academic materials and/or distribution of these materials and other academic work. This includes students who aid and abet as well as those who attempt such behavior.

ATTENDANCE:

Students are expected to attend and participate regularly in class meetings, online learning activities and other activities assigned as a part of a course of instruction. Faculty are required to report student participation in compliance with institutional policies and federal financial aid guidelines. Faculty and staff shall be sensitive to students' religious beliefs and observances, including an expectation that instructors make reasonable arrangements when a student must miss an exam or other academic exercise due to their religious observance. When notified in advance, and when possible, faculty will make allowances for students to make up missed work.

COPYRIGHT STATEMENT:

Students shall adhere to the laws governing the use of copyrighted materials. They must insure that their activities comply with fair use and in no way infringe on the copyright or other proprietary rights of others and that the materials used and developed at Ivy Tech Community College contain nothing unlawful, unethical, or libelous and do not constitute any violation of any right of privacy.

ADA STATEMENT:

Ivy Tech Community College seeks to provide reasonable accommodations for qualified individuals with documented disabilities. If you need an accommodation because of a documented disability, please contact the Office of Disability Support Services.

If you will require assistance during an emergency evacuation, notify your instructor immediately. Look for evacuation procedures posted in your classroom.

TITLE IX STATEMENT:

Ivy Tech Community College is committed to providing all members of the College community with a learning and work environment free from sexual harassment and assault. Ivy Tech students have options for getting help if they have experienced sexual assault, relationship violence, sexual harassment or stalking. This information can be found at <https://www.ivytech.edu/prevent-sexual-violence/index.html>.

If students write or speak about having survived sexual violence, including rape, sexual assault, dating violence, domestic violence, or stalking, federal law and Ivy Tech policies require that instructors share this information with the Campus Title IX Coordinator. The Campus Title IX Coordinator will contact students to let them know about accommodations and support services at the College and in the community as well as options for holding accountable the person who

harmed them. When contacted, students are not required to speak with the Campus Title IX Coordinator.

If students do not want the Title IX Coordinator notified, instead of disclosing this information to their instructor, students can speak confidentially with certain individuals at the College or in the community. A list of these individuals can be found at <https://www.ivytech.edu/prevent-sexual-violence/index.html> under Confidential Employees and/or Community Resources.