

# COLLEGEWIDE COURSE OUTLINE OF RECORD

## RESP 202, PEDIATRIC AND NEONATAL ADVANCED CRITICAL CARE

COURSE TITLE: Pediatric and Neonatal Advanced Critical Care

COURSE NUMBER: RESP 202

PREREQUISITES: RESP 104 Concepts in Adult Critical Care and Program Chair Approval

SCHOOL: Health Sciences

PROGRAM: Respiratory Therapy

CREDIT HOURS: 3

CONTACT HOURS: Lecture: 2      Lab: 2

DATE OF LAST REVISION: Fall, 2020

EFFECTIVE DATE OF THIS REVISION: Spring, 2021

**CATALOG DESCRIPTION:** Presents advanced techniques of mechanical ventilation of neonatal and pediatric patients; includes fetal development and assessment; neonatal and pediatric assessment, equipment, procedures and therapeutic techniques, introduces related aspects of the neonatal intensive care unit environment. Selected neonatal and pediatric diseases and advanced modes of ventilation will be discussed.

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

1. Describe fetal development
2. Identifies maternal high risk factors associated with birth process
3. Discuss neonatal effects of medications delivered to the mother during pregnancy (suppression of labor, promotion of fetal lung maturity, maternal drug dependency)
4. Understands the transitional phase from utero to birth process, include how gas exchange occurs in utero and after birth
5. Evaluate data in the patient record
  - a. Laboratory results (bilirubin and glucose)
  - b. Blood Gas Analysis and/or hemoximetry (CO-oximetry) results (ABG, CBG)
  - c. Maternal and perinatal/neonatal history (Apgar, gestational age, L/S ratio)
  - d. Trends in
    - i. fluid balance
    - ii. compliance, resistance and work of breathing
    - iii. non-invasive (pulse oximetry, capnography, transcutaneous)
6. Perform a clinical assessment by inspection to include:
  - a. General appearance
  - b. Status of a neonate (APGAR, gestational age)
7. Perform a clinical assessment by reviewing a chest radiograph to assess:
  - a. Quality of imaging (patient positioning, penetration, lung inflation)
  - b. Presence and position of airways, lines and drains
  - c. Presence of foreign body
  - d. Cardiopulmonary abnormalities (pneumothorax, pleural effusion, consolidation, pulmonary edema, pulmonary artery size)

8. Perform procedures to gather clinical information:
  - a. Noninvasive monitoring (pulse oximetry, capnography, transcutaneous)
  - b. Blood gas sample collection (ABG, CBG)
  - c. Cardiopulmonary calculations (PA-aO<sub>2</sub>, V<sub>d</sub>/V<sub>t</sub>, P/F, OI)
  - d. Apnea monitoring
9. Evaluates procedures results:
  - a. Noninvasive monitoring (pulse oximetry, capnography, transcutaneous)
  - b. Blood gas analysis and/or hemoximetry (co-oximetry) (ABG, CBG)
  - c. Cardiopulmonary calculations (PA-aO<sub>2</sub>, V<sub>d</sub>/V<sub>t</sub>, P/F, OI)
  - d. Apnea monitoring
10. Recommend diagnostic procedures:
  - a. Imaging studies
  - b. Noninvasive monitoring (pulse oximetry, capnography, transcutaneous, transillumination)
  - c. Hemodynamic monitoring (UAL)
11. Assemble and troubleshoot equipment:
  - a. Medical gas delivery devices and interfaces (mask, cannula, heated high-flow cannula, flow meters, blender, gas analyzer (O<sub>2</sub>, NO))
  - b. CPAP/NPPV with patient interfaces
  - c. Resuscitation devices (self-inflating resuscitator, flow-inflating resuscitator, Neo-tee)
  - d. Mechanical ventilators
  - e. Patient breathing circuits
  - f. Heliox delivery device
  - g. Noninvasive monitoring devices (pulse oximeter, capnometer, transcutaneous)
  - h. Hemodynamic catheters (UAL)
12. Perform quality control procedures on noninvasive monitors (including TCM)
13. Support oxygenation and ventilation by initiating and modification of
  - a. Initiating and adjusting mechanical ventilation
    - i. Continuous mechanical ventilation
    - ii. Noninvasive ventilation
    - iii. High-frequency ventilation
    - iv. Ventilator alarms
    - v. ECMO
    - vi. PEEP
  - b. Recognizing and correcting patient-ventilator dyssynchrony
  - c. Utilizing ventilator graphics
  - d. Liberating patient from mechanical ventilation
14. Administer specialty gases (heliox, inhaled NO, Nitrogen)
15. Ensure modifications are made to the respiratory care plan
  - a. Treatment termination (life threatening adverse event)
  - b. Starting treatment based on patient response
  - c. Treatment of pneumothorax
  - d. Adjustment of fluid balance
  - e. Liberating from mechanical ventilation
  - f. Discontinuing treatment based on patient response

- g. Make recommendations for changes to mechanical ventilation
  - h. Make recommendations for pharmacological interventions (inhaled pulmonary vasodilators)
16. Utilize evidence-based or clinical practice guidelines in:
    - a. Classification of disease severity
    - b. Recommendations for changes in a therapeutic care plan when indicated
    - c. Application of guidelines to include: NAEP, NRP/PALS, STABLE
  17. Provides respiratory care in a high risk situation cardiopulmonary emergencies, excluding CPR
  18. Assist a physician/provider in performing procedures
    - a. Withdrawal of life support
  19. Demonstrates Knowledge Concepts of Mechanical Ventilation:
    - a. Review basic modes of ventilation from RESP 104 (CMV-PC, IMV-PC, Spontaneous)
    - b. Describe selected advanced techniques of mechanical ventilation of the neonatal, pediatric patients. (e.g. NAVA, PAV, APRV, PRVC)
  20. Use objectives #5-19 to discuss each of the following pathologies:
    - a. Pediatric(Croup, Epiglottitis, RSV/Bronchiolitis, Foreign Body obstruction, Kyphoscoliosis, Poisoning/toxic ingestion)
    - b. Neonatal (Delivery room care, Apnea of prematurity, Meconium aspiration, Congenital Diaphragmatic Hernia, Cardiac Anomalies, Persistent Pulmonary Hypertension, Bronchopulmonary Dysplasia, Transient Tachypnea Newborn, Pulmonary Interstitial Emphysema)
    - c. Diffuse Alveolar Disease (IRDS)

COURSE CONTENT: Topical areas of study include –

Fetal development

Assessment and basic care of the neonatal and pediatric patients

Selected neonatal and pediatric disease listed in Objective #20

Mechanical ventilation concepts, effects

Ventilator Graphics

Modes for ventilation for neonate, pediatric

PALS / NRP

S.T.A.B.L.E

Evaluations

Procedures:

1. Newborn Assessment/Resuscitation (Basic Airway Care - Bulb Suctioning)
2. Pediatric Assessment
3. Oxyhood setup
4. CPAP
5. Pediatric and Neonatal Mechanical Ventilation Initiation
6. Pediatric and Neonatal Mechanical Ventilation Rounds
7. Pediatric and Neonatal Mechanical Ventilation Circuit change
8. Neonatal inline suctioning

Total Procedures: 8

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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.

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

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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.