Bergen Community College
Division of Health Professions
Department of Respiratory Therapy

RSP-220, **Fundamentals of Respiratory Critical Care**

Semester: Spring

Course and Section Number: RSP-220-001; Fundamentals of Respiratory Critical Care

Meeting Times and Locations:

Instructor:

Office Location:

Phone:

Departmental Secretary:

Office Hours:

Email Address:

Course Description

Lecture hours, laboratory hours, and credits: 3 lectures, 0 lab hours, 3 credits

Prerequisites: RSP-110, RSP-119, RSP-121; Co-requisites: RSP-210, RSP-222, RSP-225

Course Description: Respiratory Critical Care Fundamentals is a study of the respiratory therapist's role as a member of the critical care team. The course provides a continuation of knowledge and skills of respiratory care. Students will learn how to interpret arterial blood gas values and practice the arterial puncture/technique on a mannequin arm in the lab. The students will be introduced to critical care equipment, such as advanced artificial airways, machines that provide non-invasive ventilation and invasive ventilation. Procedures that involve assisting the physician for therapeutic and diagnostic purposes is another topic in this course.

Student Learning Objectives: As a result of meeting the requirements in this course:

Clinical Interpretation of Blood Gases and Sampling
Goal: The student will be able to sample blood from the radial arterial site and interpret the results obtained

1. Discuss the indications for obtaining an arterial blood gas sample.
2. Describe the procedure for obtaining an arterial sample from the radial, brachial, and femoral sites.
3. Discuss the hazards of arterial blood gas sampling.
4. Discuss safety precautions that are necessary when obtaining an arterial sample.
5. Discuss the procedure for analyzing an arterial sample, and the interpretation of the results from the arterial blood gas sample.
6. Describe the PCO2/pH/HCO3 relationship.
7. Interpret the results from the arterial sample according to acceptable medical standards.

7.1. Respiratory acidosis
7.2. Respiratory alkalosis
7.3. Metabolic acidosis
7.4. Metabolic alkalosis

8. Describe the potential common errors in the sampling, analysis, and interpretation of arterial blood gas assessments.

Airway Management

Goal: Review the concepts of airway management and utilization of advanced airway devices.

1. Describe how to perform endotracheal and nasotracheal suctioning.
2. Describe how to properly obtain sputum samples via artificial airways, and expectoration.
3. Describe and discuss the oropharyngeal airway, nasopharyngeal airway, and list the indications and contraindications for these devices.
4. Identify the need for and select an artificial airway:
   4.1. Endotracheal airway
   4.2. Nasotracheal airway
   4.3. Tracheal airways
5. Identify the complications and hazards of associated with insertion of artificial airways.
6. Describe how to perform orotracheal and nasotracheal intubation of an adult.
7. Discuss the significance of cuff pressure and demonstrate the procedure for obtaining cuff pressure.
8. Assess and confirm proper endotracheal tube placement.
9. Describe the rationale and the methods for performing a tracheotomy.
10. Identify the types of damage that artificial airways can cause
    10.1. Laryngeal lesions
    10.2. Tracheal lesions
    10.3. Tracheomalacia
    10.4. Tracheoesophageal fistula
11. Describe how to maintain and troubleshoot artificial airways properly.
12. Discuss assessing the patient and readiness for extubation.
13. Discuss when and how to decannulate a patient.
14. Describe how to use alternative airway devices:
    14.1. Laryngeal Mask Airway
    14.2. Double-Lumen Airway
    14.3. Surgical Emergency Airways
15. Describe the process for performing a bronchoscopy and the different types of tubes.
    15.1 Rigid Tube Bronchoscopy
    15.2 Flexible Fiberoptic Bronchoscopy
16. Describe how to perform capnometry and interpret capnography.
    16.1 Methods/Devices
    16.2 Interpretation
    16.3 Procedure
    16.4 Problem-Solving and Troubleshooting

Lung Expansion Therapy/Airway Clearance Therapy (ACT)

Goal: The student will be able to identify the indications for PEP therapy and Hyperinflation therapy.

1. Describe the various causes and factors associated with atelectasis.
2. Identify which patients need lung expansion therapy.
3. Identify the different types of lung expansion therapy
   3.1 Incentive Spirometer
   3.2 Noninvasive ventilation
   3.3 Intermittent Positive Airway Pressure Breathing
   3.4 Positive Airway Pressure Therapy
4. Describe how lung expansion therapy works

5. List the indications, hazards, and complications associated with the various modes of lung expansion therapy.
6. Describe the primary responsibilities of the respiratory therapist in planning, implementing, and evaluating lung expansion therapy.
7. State the clinical indications for airway clearance therapy.
8. Describe the technique and potential benefit of each of the following:
   - 8.1 Chest Physical Therapy
   - 8.2 Directed Coughing and Related Expulsion Techniques
   - 8.3 Mechanical Insufflation-Exsulflation
   - 8.4 Positive Airway Pressure Adjuncts
   - 8.5 High-Frequency Chest Wall Oscillation
   - 8.6 High-Frequency Positive Airway Pressure Devices
   - 8.7 Intrapulmonary Percussive Ventilation (MetaNeb)
9. Evaluate a patient's response to airway clearance therapy.
10. Modify airway clearance therapies on the basis of patient response.

Assisting the Physician

Goal: The student will be able to describe the responsibilities of working with physician performing specific tasks.

1. Identify the indications for thoracentesis.
2. Explain the procedure for performing and assisting the physician during thoracentesis
3. Describe the use for ultrasound.
4. Identify the indications and contraindications for chest tube placement.
5. List the medications used for moderate sedation.
6. Explain the procedure for administration of sedative medications and reversal agent.

Non-Invasive Positive Pressure Ventilation (NIV or NIPPV)

Goal: Understand the function and operation of negative pressure and non-invasive positive pressure ventilators. Define the selection criteria and exclusion criteria for patients to receive NIV.

1. List the goals and benefits of noninvasive positive pressure ventilation (NIPPV).
2. Describe the principles of operation of negative pressure ventilators
3. Discuss indications for NIPPV.
4. Discuss the types of mechanical ventilators and ventilation modes used to provide NIPPV.
5. Establish the initial setting for non-invasive ventilation.
6. Identify the types of patient interfaces available for NIPPV; selecting an appropriate interface for the patient.
7. Discuss the role of the respiratory therapist during the initial application of NIV.
8. Discuss the ongoing management of the patient on a noninvasive ventilator in the acute care setting.
9. Identify potential complications associated with NIPPV.

Invasive Positive Pressure Mechanical Ventilation

Goal: Understand the criteria for initiating invasive ventilation.

1. Discuss the goals of ventilatory support.
2. Describe how to choose an appropriate ventilator to begin ventilatory support.
3. Explain how to choose an appropriate mode of ventilation given a patient's specific condition and ventilatory requirements.
   - 3.1 Patients with normal lungs
   - 3.2 Patients with restrictive disorders
   - 3.3 Patients with obstructive disorders

   Modes:
   - 3.4. Assist control – pressure control
   - 3.5 Assist control – volume control
   - 3.6 Pressure Regulated Volume Control
   - 3.7 Synchronized intermittent mechanical ventilation

4. Identify appropriate initial ventilator settings based on patient assessment.
5. Discuss the assessment process on a patient who is on mechanical ventilation.
6. Discuss how to adjust ventilatory support based on oxygenation and ventilation status.
7. Discuss how to adjust the ventilator on the basis of the patient's response.
8. Discuss the importance of ventilator alarms and how to adjust the alarm parameters.
9. Discuss respiratory care ventilator flow sheets for documentation of patient assessment, ventilator settings, alarms, and patient progress/weaning.

Course Content

This course will be delivered in a formal lecture with student discussions, workbook exercises, patient case-studies, and time in the center for simulation. The course content comprises of critical care aspects of the utilization of respiratory care equipment, machines, and patient care modalities. There will be dedicated laboratory and simulation center sessions for practice using respiratory care equipment and performing student competencies.

Special Features of the Course (if any)

MoodleRooms is used to enhance student interaction. The center for simulation is used to enhance student and patient interaction applying critical thinking skills and critical care patient scenarios. The laboratory sessions are used to practice setting up and using respiratory care equipment, and for performing student competencies.

Course Texts and/or Other Study Materials

Egan's Fundamentals of Respiratory Care, 11th Ed., Kacmarek, ISBN- 978-0-323-34136-3
Egan's Fundamentals of Respiratory Care Workbook,11th Ed., and Elsevier Evolve online.

Research, Writing, and/or Examination Requirement(s)

Examinations:
The course will consist of (5) multiple choice computerized examinations, and (4) in-class multiple choice quizzes consisting of ten to fifteen questions. The computerized exams are typically fifty questions given timed for an hour, and in class quizzes are typically timed for ten minutes.

Attendance Policy

Attendance and punctuality at all class sessions is required and will be factored into the student's overall final grade. Attendance for classroom lecture and lab will be factored into the total grade for the course. For every absence from classroom lecture or lab, 1 point will be deducted from the total grade for the course. If the student is late by 10 minutes for a lecture or lab, 0.5 points will be deducted from the total grade.

Late Work/Assignments

Late work and make-up examinations will be penalized with a grade being no greater than 78%. Late work must be submitted as soon as possible. 10% will be deducted from total grade for every day assignment is not turned in.
Make-up examinations will be completed during the last week of the semester, or at the discretion of the professor.

Grading Policy

Grade Determinations:

Exams (5)	**90%**
Quizzes (4)	**10%**

A	Student must show superior work, excel in knowledge of academic material and contribute positively to class discussions.	93 - 100
B+	Student exceeds acceptable standards in classroom work and in practical exercises.	88 - 92.9
B	Student must show above average work and standard of achievement. in classwork and laboratory skills.	83 – 87.9
C+	Student must meet and attain the standard of achievement with reasonable theoretical knowledge and academic material.	78 – 82.9
F	Student fails to meet acceptable standards in classroom.	<78 performance
N	Incomplete. Failure to submit all reports will in an incomplete (N) grade.	

Class Participation

This area strongly considers class attendance and punctuality; especially when student's grades are in jeopardy of failing.

Quality questions and comments relating to class discussions, assigned readings and reflection of relevant professional and personal experiences is valued.

**Class disruptions such as; use of cell phones, and other electronic devices not intentioned for classroom research or note taking, will result in dismissal from class for the day.

Departmental Policy Statements

1. Acceptable quality of work and mature behavior is expected from every student at all times. Students are regarded as professionals and are expected to conduct themselves accordingly.
2. High standards of professional performance demand that students maintain good academic progress throughout their course of study in the program.
3. Students demonstrating chronic tardiness or absenteeism will be placed on academic warning or probation. The student may be subjected to termination from the program.
4. Absence from a class during a scheduled exam will be subject to the policy of the instructor for that specific course (please refer to the **Absenteeism Policy**). If the student is going to miss a scheduled exam, it is expected that the student will contact the instructor ahead of time by e-mail or phone to the department office.
5. All students are required to adhere to the policies and procedures of the school as outlined in the college catalogue.
6. Cell phones are not to be used during this class.

7. During scheduled exams, cell phones and electronic/smart watches must be left at the proctors table, or in the student's personal bag at the front of the classroom. No personal belongings are permitted with the student during an examination.
8. Student's must be in clinical uniform at all times when in the Health Professions Building and any Respiratory Care functions at the college.
9. Students must wear full uniform and lab coat when in the laboratory and simulation center. Proper shoes must also be worn with uniform, especially in the lab.
10. Additional department policies are located in the **Student Policies and Procedures Manual.**

Student and Faculty Support Services

1. The program faculty maintain office hours for counseling and are available to provide tutorial assistance to students.
2. Students must make appointments in advance to meet with the respective instructors.
3. Students may also obtain assistance from the College Tutoring Center. Appointments must be made in advance through this center.
4. The College has a personal counseling center for those students who may need personal assistance. Appointments are made directly through this center.
5. Any problems, concerns, or questions should be directed to the course instructor or the student's advisor.
6. Statement on Civility
    a. Refer to the Standards of Conduct subsection found in the Student Judicial Affairs Policies and Procedures in the *Bergen Community College Student Code of Conduct.*
7. Academic Integrity
    a. Refer to the *Bergen Community College Student Code of Conduct*.
8. Other possible College, Divisional, and/or Departmental Policy Statements to be referenced
    a. Disability Services (Office of Specialized Services OSS)
    b. Sexual Harassment
    c. Social Media Policy and usage as a student of a Health Profession- please refer to the program's Policy and Procedure Manual.
    d. Acceptable use of Bergen Community College Technology- found in the *Student Code of Conduct.*
9. Student and Faculty Support Services
    a. Refer to the College Catalog for Academic and Student Support Services, ie., Center for Health, Wellness, and Personal Counseling; Office of Specialized Services; Tutoring Center, etc.
10. Bergen Community College Library
    a. The Sidney Silverman Library is committed to providing a quiet, welcoming, respectful atmosphere conducive to study and research in an environment that is comfortable, clean, and safe. The use of the library will be beneficial in providing resources on researching topic information, citation styles, finding current articles among many other media services available.