MOHAWK VALLEY COMMUNITY COLLEGE, UTICA-ROME, NY

Respiratory Care

COURSE OUTLINE

1. COURSE DESCRIPTION:

**RC215 Principles of Respiratory Care 4** C-1, P-3 Cr-1

This is the fourth course in the curriculum sequence to study the theory and practice of respiratory care. This concentrated offering presents topics related to neonatal and pediatric respiratory care. Content areas include neonatal and pediatric diseases, pharmacology, airway management, mechanical ventilation, high-frequency oscillation, and extracorporeal membrane oxygenation (ECMO).

**Prerequisites:** RC233 Clinical Practicum 3, RC214 Acid Base Physiology, and BI209 Basic Pathophysiology

**Corequisites:** RC234 Clinical Practicum 4 or Program Coordinator consent. Minimum grade of “C” required.

1. STUDENT LEARNING OUTCOMES

**Upon completion of this course the student will be able to:**

1. Review and interpret existing data in the medical record including maternal history and data, perinatal history and data, APGAR scores, gestational age, L/S ratio and other studies of lung maturity.
2. Assess the neonate to determine gestational age, general appearance, APGAR score, peripheral edema, cyanosis, chest configuration, breathing pattern, asymmetrical chest movement, intercostal and/or sternal retractions, nasal flaring, capillary refill, presence of adventitious breath sounds.
3. Participate in the development of the respiratory care plan.
4. Appropriately recommend insertion of an umbilical monitoring line, chest tube(s), and/or transcutaneous O2/CO2 monitoring.
5. Interpret results of umbilical monitoring and recommend changes in the patient care plan as appropriate.
6. Set-up transcutaneous O2/CO2 monitors, troubleshoot problems as they occur, correctly evaluate results, and recommend changes in the patient care plan as appropriate.
7. Recommend, perform, and interpret results from arterial and capillary blood sampling.
8. Recommend the use of pharmacologic agents where appropriate (respiratory stimulants, antiviral agents (ribavirin), sedatives/analgesics/muscle relaxants, artificial surfactants, bronchodilators).
9. Describe indications, process, and hazards/complications of surfactant replacement therapy.
10. Discuss general indications for neonatal mechanical ventilation.
11. Discuss complications/hazards of mechanical ventilation.
12. Discuss various modes of ventilation used in the neonatal population and discuss indications, contraindications, and hazards for each (CPAP, IMV, SIMV, A/C, jet ventilation, high frequency oscillation, and inverse ratio ventilation).
13. Discuss the concept of compressed volume in the ventilator circuitry and explain its importance in neonatal ventilation.
14. Recommend changing the type of ventilator to be used on a neonatal patient as appropriate.
15. Discuss ventilator parameters/techniques used to treat IRDS, PPHN, BPD and other major neonatal problems/illnesses.
16. Recommend and perform weaning from mechanical ventilation.
17. Discuss indications, complications/hazards, and process of extracorporeal life support.
18. Discuss indications, hazards/complications of nitric oxide therapy in neonates.
19. Identify and discuss indications for neonatal intubation.
20. Gather equipment necessary for successful neonatal intubation.
21. Demonstrate neonatal intubation and securing of endotracheal tubes.
22. Discuss indications and hazards involved with airway maintenance techniques (suctioning).
23. Recommend extubation procedures and discuss associated hazards.
24. Classify neonatal mechanical ventilators according to how powered, triggering mechanisms, modes available, cycling variables, and expiratory phase variables.
25. Assemble, check for proper function, set controls/alarms appropriately, identify/correct malfunctions and perform quality control procedures for neonatal mechanical ventilators.
26. Initiate and adjust mechanical ventilation when settings are specified.
27. Given patient data, initiate and adjust mechanical ventilator settings when no settings are specified.
28. Given patient monitoring data (blood gas values, vital signs, hemodynamics, etc), recommend and institute appropriate modification in ventilator settings to address oxygenation and ventilation problems.
29. Initiate and adjust different combinations of ventilator modes and therapeutic PEEP.
30. Initiate and adjust mechanical ventilation based on a patient’s condition including patients with normal cardiopulmonary function, patients with decreased compliance (IRDS) and/or increased airway resistance (asthma, meconium aspiration).
31. Troubleshoot patient and/or ventilator problems/alarms.
32. Perform routine monitoring of the mechanically ventilated neonate (completion of flowsheet).
33. Identify the difference between high frequency ventilation, high frequency jet ventilation and high frequency oscillation ventilation.
34. List indications, contraindications, and hazards for all types of high frequency ventilation/oscillation.
35. Demonstrate safe and effective neonatal transport.
36. Set-up, assure proper operation, identify problems, and troubleshoot transport neonatal ventilators.
37. Apnea Monitoring
38. Review and interpret existing information in the medical record.
39. Examine all patient data to determine the patient’s pathologic condition.
40. Perform a physical examination to assess the child to determine respiratory rate, rib cage/abdomen asynchrony, use of accessory muscles (retractions), respiratory sounds, breath sounds, presence of digital clubbing/cyanosis/chest pain.
41. Identify common signs and symptoms of pediatric respiratory disease.
42. Participate in the development of the respiratory care plan.
43. Appropriately recommended pediatric monitoring techniques.
44. Interpret results of ABG’s/pulse oximetry/transcutaneous O2 and CO2/impedance pneumography/hemodynamics and recommend changes in the patient care plan as appropriate.
45. Recommend the use of pharmacologic agents where appropriate (respiratory stimulants, antiviral agents (ribavirin), sedatives/analgesics/muscle relaxants, bronchodilators).
46. Discuss general indications for pediatric mechanical ventilation.
47. Discuss complications/hazards of mechanical ventilation.
48. Discuss the different types of pediatric mechanical ventilation (pressure vs. volume)
49. Discuss various modes of ventilation used in the pediatric population and discuss indications, contraindications, and hazards for each (CPAP, IMV, SIMV, A/C, PS, PCV and IRV).
50. Recommend changing the type of ventilator to be used on a pediatric patient as appropriate.
51. Discuss ventilator techniques used to treat major pediatric problems/illnesses.
52. Discuss factors related to pediatric ventilation including compressible volume, dead space and resistance, air leak and humidification.
53. Recommend and perform weaning from mechanical ventilation.
54. Describe the etiology, pathology, clinical presentation, management, and complications of the following cardiovascular disorders:
    1. Patent Ductus Arteriosus
    2. Tetralogy of Fallot
    3. Atrial septal defects
    4. Coarctation of the aorta
    5. Ventricular septal defects
    6. Hypoplastic left heart syndrome.
55. Describe cardiopulmonary resuscitation of the infant or child according to AHA.
56. Identify and discuss indications for pediatric intubation.
57. Gather equipment necessary for successful pediatric intubation.
58. Demonstrate pediatric intubation and securing of endotracheal tubes.
59. Discuss indications and hazards involved with airway maintenance techniques (suctioning).
60. Recommend extubation procedures and discuss associated hazards.
61. Classify pediatric mechanical ventilators according to how powered, triggering mechanisms, modes available, cycling variables, and expiratory phase variables (Newport Breeze, VIP).
62. Assemble, check for proper function, set controls/alarms appropriately, identify/correct malfunctions and perform quality control procedures for pediatric mechanical ventilators.
63. Initiate and adjust mechanical ventilation when settings are specified.
64. Given patient data, initiate and adjust mechanical ventilator settings when no settings are specified.
65. Given patient monitoring data (blood gas values, vital signs, hemodynamics, etc), recommend and institute appropriate modification in ventilator settings to address oxygenation and ventilation problems.
66. Initiate and adjust different combinations of ventilator modes and therapeutic PEEP.
67. Initiate and adjust mechanical ventilation based on a patient’s condition including patients with normal cardiopulmonary function, patients with decreased pulmonary compliance and/or increased airway resistance.
68. Troubleshoot patient and/or ventilator problems/alarms.
69. Perform routine monitoring of the mechanically ventilated child (completion of flowsheet).
70. Demonstrate safe and effective pediatric transport.
71. Set-up, ensure proper operation, identify problems, and troubleshoot transport.
72. MAJOR TOPICS:
73. The High-Risk Infant
74. Pediatric Respiratory Equipment
75. Neonatal and Pediatric Diseases
76. Managing the Critically Ill Infant
77. Life Support Systems and Adjuncts in The NICU and PICU
78. Neonatal Resuscitation Protocol
79. Pediatric Advanced Life Support