DATE OF LAST REVIEW: 02/2013

CIP CODE: 51.0812, 51.0908

SEMESTER: Departmental Syllabus

COURSE TITLE: Technical Intervention III

COURSE NUMBER: RSCR0274

CREDIT HOURS: 2

INSTRUCTOR: Departmental Syllabus

OFFICE LOCATION: Departmental Syllabus

OFFICE HOURS: Departmental Syllabus

TELEPHONE: Departmental Syllabus

PREREQUISITES: Admission to the Respiratory Therapy Program, Program Sequence

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckccbookstore.com/, for the required texts for your particular class

COURSE DESCRIPTION: Students learn mechanical ventilation principles, effects, and modes. Initiation of mechanical ventilation, monitoring in mechanical ventilation, and management of mechanical ventilation are emphasized.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, problem based learning, cases, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, learning experiences, and performances outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

I. Principles of Mechanical Ventilation
   A. airway resistance
   B. lung compliance
   C. dead space ventilation
   D. ventilatory failure
   E. oxygenation failure

II. Effects of Positive Pressure Ventilation
   A. pulmonary effects
   B. cardiovascular effects
C. hemodynamic considerations
D. renal effects
E. neurological effects
F. hepatic effects

III. Operation Modes of Mechanical Ventilation
   A. negative pressure
   B. positive pressure
   C. spontaneous
   D. positive end expiratory pressure
   E. continuous positive airway pressure
   F. bi-level positive airway pressure
   G. controlled mandatory ventilation
   H. assist control
   I. intermittent mandatory ventilation
   J. synchronized intermittent mandatory ventilation
   K. pressure support
   L. volume ventilation
   M. pressure control ventilation
   N. new and emerging modes of ventilation

IV. Initiation of Mechanical Ventilation
   A. indications
   B. initial mode
   C. initial respiratory rate
   D. initial tidal volume
   E. initial FiO2
   F. initial PEEP
   G. initial I:E ratio
   H. initial flow pattern
   I. alarm settings

V. Ventilator Alarms
   A. pressure
   B. volume
   C. FiO2
   D. temperature
   E. wall pressure in psi

VI. Managing Ventilator Controls
   A. tidal volume
   B. minute volume
   C. frequency
   D. flow rate
   E. FiO2
   F. pressure limit
   G. sensitivity/triggers
   H. volume limits
   I. positive end expiratory pressure
   J. continuous positive airway pressure
   K. pressure support
   L. SIMV
M. inspiratory time
N. pause time
O. inspiratory rise time

VII. Airway Humidification
   A. heat moisture exchanger
   B. cascade
   C. concha
   D. wick
   E. passover
   F. hot plate
   G. heated wire

VIII. Patient Monitoring on Mechanical Ventilation
   A. vital signs
   B. chest inspection
   C. chest auscultation
   D. fluid balance
   E. arterial blood gases
   F. oxygen saturation
   G. end-tidal carbon dioxide
   H. transcutaneous blood gas monitoring
   I. hemodynamic monitoring
   J. ventilator waveforms

IX. Patient Management on Mechanical Ventilation
   A. improve oxygenation
   B. improve ventilation
   C. improve acid-base balance
   D. barbiturates
   E. promoting pulmonary hygiene
   F. frequency of bronchodilators
   G. frequency of metered dose inhalers
   H. frequency of suction
   I. suction devices
   J. chest physiotherapy
   K. rotating bed

X. Weaning Patients From Mechanical Ventilation
   A. weaning criteria
   B. weaning indices
   C. weaning procedures
   D. weaning monitoring

EXPECTED LEARNER OUTCOMES:
A. The student will be able to differentiate positive pressure breathing equipment.
B. The student will be able to make ventilator setting recommendations.
C. The student will be able to evaluate data to manage mechanically ventilated patients.
D. The student will recommend care for the mechanically ventilated patient.
E. The student will recommend care for patients with breathing related sleep disorders.
F. The student will recommend special procedures for critical care patients.
COURSE COMPETENCIES:
Upon successful completion of this course:

The student will be able to differentiate positive pressure breathing equipment.
1. The student will be able to classify adult ventilators by type.
2. The student will be able to identify the ventilator components.
3. The student will be able to describe non-invasive PPV devices.
4. The student will be able to describe invasive PPV devices.

The student will be able to make ventilator setting recommendations.
5. The student will be able to identify indications for mechanical ventilation.
6. The student will be able to recommend appropriate ventilator mode and techniques.
7. The student will be able to recommend appropriate F_{i}O_{2}, PEEP.
8. The student will be able to select triggers.
9. The student will be able to recommend appropriate tidal volume, mechanical deadspace.
10. The student will be able to recommend appropriate frequency.
11. The student will be able to recommend appropriate I:E ratio.
12. The student will be able to recommend appropriate flow rates.
13. The student will be able to recommend appropriate inspiratory flow waveform.
14. The student will be able to recommend alarm settings.

The student will be able to evaluate data to manage mechanically ventilated patients.
15. The student will evaluate and recommend pulmonary compliance, airways resistance, work of breathing.
16. The student will be able to evaluate optimal PEEP.
17. The student will be able to detect and correct auto-PEEP.
18. The student will be able to evaluate and make recommendations from lung mechanics e.g., MIP, MEP.
19. The student will be able to calculate weaning indices.
20. The student will be able to evaluate and make recommendations from ventilator waveforms, loops, P_{PLAT}, PIP.
21. The student will be able to evaluate pulmonary vascular resistance.
22. The student will be able to evaluate systemic vascular resistance and blood pressure.
23. The student will be able to evaluate cardiac output and cardiac index.
24. The student will be able to evaluate stroke volume.
25. The student will be able to evaluate right atrial pressure, CVP.
26. The student will be able to evaluate pulmonary artery pressure, PAP.
27. The student will be able to evaluate pulmonary capillary wedge pressure, PCWP.
28. The student will be able to evaluate and make recommendations from E_{t}CO_{2}, transcutaneous O_{2}/CO_{2}, V_{D}/V_{T}, pulse oximetry.

The student will recommend care for the mechanically ventilated patient.
29. The student will be able to recommend artificial airway care.
30. The student will be able to recommend pulmonary hygiene.
31. The student will be able to make recommendations to improve pulmonary vascular resistance.
32. The student will be able to make recommendations to improve systemic vascular resistance.
33. The student will be able to make recommendations to improve oxygenation.
34. The student will be able to make recommendations to improve ventilation.
35. The student will be able to make recommendations to improve acid-base balance.
36. The student will be able to make recommendations to maintain infection control.
37. The student will be able to make recommendations for responding to ventilator alarms.
38. The student will be able to recommend changes to ventilator settings to respond to patient acuity.
39. The student will be able to recommend strategies to wean the patient from the ventilator.

_The student will recommend care for patients with sleep related breathing disorders._
40. The student will be able to assess for macroglossia, neck range of motion, neck circumference.
41. The student will be able to recommend a polysomnogram.
42. The student will be able to evaluate apneas and hypopneas on a polysomnogram.
43. The student will be able to recommend interventions for sleep related breathing disorders.

_The student will recommend and evaluate special procedures for critical care patients._
44. The student will be able to recommend and evaluate intubation, tracheostomy, bronchoscopy.
45. The student will be able to recommend and evaluate thoracentesis, needle decompression, chest tubes.
46. The student will be able to recommend and evaluate lung protective strategies e.g., permissive hypercapnia, reduced $P_{PLAT}$.

**ASSESSMENT OF LEARNER OUTCOMES:**
Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

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<th>Grading Scale</th>
<th>100-93</th>
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A grade of “C” or better is needed to meet respiratory therapy program requirements.

**SPECIAL NOTES:**
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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