2014/2015 Self-Directed Courses

Ethical and Legal Issues in Clinical Practice: Medical Devices (1 hr)
Learning objectives:
- Explain the functions of standards of care in guiding ethical and legal decision-making in clinical practice.
- Recognize the functions of agencies that regulate medical devices.
- Distinguish among specific causes and contributing factors of adverse events involving medical devices.
- Develop strategies for preventing adverse events involving medical devices.
- Discuss the responsibilities of respiratory care personnel pertaining to adverse events involving medical devices.
- Examine the ethical implications of examples of medical device adverse events.

Hemodynamic Monitoring (1 hr)
- Explain the rationale for selection of noninvasive hemodynamic monitoring techniques.
- Explain the theory and application of the following noninvasive hemodynamic monitoring techniques:
  - Impedance cardiography
  - Echocardiography
  - Partial CO2 rebreathing
- Interpret data gathered by noninvasive monitoring techniques.
- Explain the rationale for selection of invasive hemodynamic monitoring techniques.
- Explain the theory and application of the following invasive hemodynamic monitoring techniques:
  - Systemic arterial pressures
  - Central venous pressures
  - Pulmonary arterial pressures
  - Cardiac output
- Interpret data gathered by invasive monitoring techniques.
- Diagnose complications of invasive monitoring techniques.
- Explain the management of complications of invasive monitoring techniques.

Hypobaric and Hyperbaric Conditions (1 hr)
- Apply the gas laws to hyperbaric and hypobaric conditions
- Explain the effects of high altitude on human physiology.
- Discriminate between the following high altitude illnesses:
  - Acute mountain sickness (AMS)
High altitude cerebral edema (HACE)
High altitude pulmonary edema (HAPE)
Chronic mountain sickness (CMS)

- Explain the pathophysiology of high altitude illnesses.
- Describe the signs and symptoms of high altitude illnesses.
- Recommend preventative measures for high altitude illnesses.
- Recommend management strategies for high altitude illnesses.
- Explain the pathophysiology of decompression sickness (DCS) and arterial gas embolism (AGE).
- Describe the signs and symptoms of DCS and AGE.
- Recommend preventative measures for DCS and AGE.
- Recommend management strategies for DCS and AGE.
- Explain the rationale and effects for hyperbaric oxygen therapy (HBOT)
- State the indications and complications for HBOT.
- Describe general procedures and devices applied to HBOT.
- Explain technical points pertaining to HBOT and respiratory therapeutics.
- Describe the risks to caregivers associated with administration of HBOT.

**Neuromuscular Conditions (2 hrs)**
- Explain the etiology, pathophysiology, manifestations, diagnosis and general management for the following conditions:
  - myasthenia gravis
  - Guillain-Barre syndrome
  - amyotrophic lateral sclerosis
  - muscular dystrophy
  - spinal muscle atrophy
  - critical illness polyneuropathy and myopathy
- Assess weakness of ventilatory apparatus through physical assessment, lung volume measurement, blood gases, inspiratory and expiratory pressures and sleep studies.
- Apply non-ventilatory techniques to management of neuromuscular conditions.
- Apply mechanical ventilation to neuromuscular conditions.

**Prevention of Ventilator-Associated Pneumonia (1 hr)**
- Explain the importance of ventilator-associated pneumonia (VAP)
- Describe the epidemiology of VAP.
- Identify the risk factors for VAP.
- Outline the pathogenesis of VAP.
- Recommend diagnostic techniques for VAP.
- Recommend preventative measures for VAP.
- Recommend strategies for management of VAP.
**Pulmonary Rehabilitation Part 1 (1.5 hrs)**
- Explain the goals and benefits of pulmonary rehabilitation.
- Select patients for pulmonary rehabilitation.
- Assess patients for pulmonary rehabilitation.
- Develop patient education for pulmonary rehabilitation.
- Recommend strategies for management of dyspnea.
- Implement strategies for management of dyspnea.

**Pulmonary Rehabilitation Part 2 (2 hrs)**
- Integrate the following interventions into a pulmonary rehabilitation (PR).
  - Pharmacologic agents
  - Supplemental oxygen therapy
  - Ventilatory muscle training
  - General exercise training
- Outline PR for patients with conditions other than obstructive disease.
- Assess outcomes for pulmonary rehabilitation patients.
- Explain the implications of special issues associated with PR; such as:
  - Patient adherence,
  - Ethical issues and
  - Social support.

**Respiratory Care Emergency Preparedness for Mass Casualty Events (2 hrs)**
- Identify infections capable of causing mass casualties and describe their etiologies, manifestations, diagnosis, management and prevention.
- Apply strategies and devices to prevent communication of infections to caregivers, patients and the environment.
- Identify chemical agents capable of causing mass casualties and describe their likely sources, effects, manifestations and management of chemically contaminated patients.
- Identify the sources of mass casualty radiation events and describe the effects, manifestations and management of radiation injuries.
- Identify sources of blast injuries and describe the types of injuries, their manifestations and their management.
- Describe major types of natural disasters, their associated types of injuries, their manifestations and management.
- Discuss problems associated with healthcare delivery in natural disasters, including those associated with transportation and destruction of physical facilities.
Distinguish among conventional, contingency, crisis modes within a healthcare facility with respect to space, staffing, equipment and supplies.

Describe preparations and response strategies for mass casualty situations with respect to respiratory care equipment and supplies, including oxygen and mechanical ventilators.

**Respiratory Management of the Neonate (1.5 hrs)**

- State the indications for supplemental oxygen therapy applied to neonates.
- Explain the complications of supplemental oxygen therapy applied to neonates.
- Select devices and settings for supplemental oxygen therapy applied to neonates.
- Apply subambient oxygen therapy to neonates.
- Select medications and devices for aerosol delivery to neonates.
- Describe the rationale and goals for environmental therapy for neonates.
- Apply environmental devices to neonates.
- Explain the goals and strategies of developmental care for neonates.
- Select artificial airways for neonates.
- Explain special considerations pertaining to intubation of neonates.
- Explain the role of chest physiotherapy for neonates, as determined by research findings.
- Explain the physiologic and adverse effects of continuous positive airway pressure (CPAP) for neonates.
- Identify the indications and contraindications of CPAP for neonates.
- Select CPAP generators and interfaces for neonates.
- Explain special considerations and technical issues for continuous mechanical ventilation (CMV) applied to neonates.
- Compare CMV modes applied to neonates.
- Outline procedures and ventilator control settings for application of CMV to neonates.
- Implement liberation from CMV for neonates.