COMMISSION ON ACCREDITATION FOR RESPIRATORY CARE
COMBINED DETAILED CONTENT OUTLINE COMPARISON

NBRC Therapist CRT / Written RRT Examination Combined Detailed Content Outline Comparison with Proposed Curriculum (Program #)	List Course Number(s)
I. PATIENT DATA EVALUATION AND RECOMMENDATIONS	
A. Review Data in the Patient Record	
1. Patient history e.g., • present illness • admission notes • respiratory care orders • medication history • progress notes • diagnoses • DNR status • patient education (previous)	
2. Physical examination relative to the cardiopulmonary system e.g., vital signs, physical findings	
3. Laboratory data e.g., • CBC • electrolytes • coagulation studies • culture and sensitivities • sputum Gram stain	
4. Pulmonary function results	
5. Blood gas results	
6. Imaging studies e.g., • radiograph • CT • MRI	
7. Monitoring data	
a. fluid balance	
b. pulmonary mechanics e.g., maximum inspiratory pressure, vital capacity	
c. respiratory e.g., • rate • tidal and minute volume • I:E	
d. pulmonary compliance, airways resistance, work of breathing	
e. noninvasive e.g., • pulse oximetry • VD/VT • capnography • transcutaneous O2 / CO2	
8. Cardiac monitoring	
a. ECG data results e.g., heart rate, rhythm	
b. hemodynamic monitoring results e.g., • blood pressure • CVP • PA pressure • cardiac output / index	
9. Maternal and perinatal / neonatal history and data • APGAR scores • gestational age • L / S ratio	
10. Sleep study results e.g., diagnosis, treatment	
B. Collect and Evaluate Additional Pertinent Clinical Information	
1. Assess a patient's overall cardiopulmonary status by **inspection** to determine	

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a. general appearance e.g., • venous distention • edema • accessory muscle activity • chest wall movement •diaphoresis • clubbing • cyanosis • breathing pattern	
b. airway assessment e.g., macroglossia, neck range of motion	
c. cough, sputum amount and character	
d. Apgar score, gestational age, transillumination of chest	
2. Assess a patient's overall cardiopulmonary status by **palpation** to determine	
a. pulse, rhythm, force	
b. asymmetrical chest movements, tactile fremitus, crepitus, tenderness, secretions in the airway, and tracheal deviation	
3. Assess a patient's overall cardiopulmonary status by **percussion**	
4. Assess a patient's overall cardiopulmonary status by **auscultation** to determine presence of	
a. breath sounds	
b. heart sounds and rhythm	
c. blood pressure	
5. Interview a patient to determine	
a. level of consciousness and orientation, emotional state, and ability to cooperate	
b. level of pain	
c. presence of dyspnea, sputum production, and exercise tolerance	
d. nutritional status	
e. social history e.g., smoking, substance abuse	
f. advance directives e.g., DNR status	
6. Assess a patient’s learning needs	
7. Review a chest radiograph to determine	
a. quality of imaging e.g., patient positioning, exposure	

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b. position of endotracheal or tracheostomy tube	
c. presence of, or change in, cardiopulmonary abnormalities e.g., • pneumothorax • pleural fluid • consolidation • pulmonary edema	
d. position of indwelling tubes and catheters	
e. presence of foreign bodies	
f. position of or change in hemidiaphragms or mediastinum	
8. Review lateral neck radiographs e.g., epiglottitis, foreign body	
9. Perform procedures	
a. 12-lead ECG	
b. transcutaneous monitoring	
c. pulse oximetry and capnography	
d. tidal volume, minute volume, vital capacity, and peak flow measurements	
e. bedside spirometry e.g., FVC, FEV1	
f. arterial sampling – percutaneous or line	
g. arterialized capillary blood sampling	
h. timed walk test e.g., 6-minute	
i. oxygen titration with exercise	
j. blood gas / hemoximetry analysis	
k. exhaled nitric oxide	
l. cardiopulmonary calculations e.g., P(A-a)O2, VD / VT	
m. hemodynamic monitoring e.g., blood pressure, CVP	
n. lung mechanics e.g., • plateau pressure • MIP • MEP • airways resistance • compliance	
o. ventilator graphics e.g., pressure / volume loop	

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p. apnea monitoring	
q. overnight pulse oximetry	
r. tracheal tube cuff pressure and / or volume	
s. arterial line insertion	
t. stress testing e.g., ECG, pulse oximetry	
u. pulmonary function laboratory studies	
v. CPAP / BIPAP titration during sleep	
w. auto-PEEP detection	
10. Interpret procedure results including	
a. 12-lead ECG e.g., • rate • irregular rhythm • artifacts	
b. transcutaneous monitoring	
c. pulse oximetry and capnography	
d. tidal volume, minute volume, vital capacity, and peak flow measurements	
e. bedside spirometry e.g., FVC, FEV1	
f. arterial sampling - percutaneous or line	
g. arterialized capillary blood sampling	
h. timed walk test e.g., 6-minute	
i. oxygen titration with exercise	
j. blood gas / hemoximetry analysis	
k. exhaled nitric oxide	
l. cardiopulmonary calculations e.g., P(A-a)O2, VD / VT	
m. hemodynamic monitoring e.g., blood pressure, CVP	

NBRC Therapist CRT / Written RRT Examination Combined Detailed Content Outline Comparison with Proposed Curriculum (Program #)	List Course Number(s)
n. lung mechanics e.g., • plateau pressure • MIP • MEP	
o. ventilator graphics e.g., pressure/volume loop	
p. apnea monitoring	
q. overnight pulse oximetry	
r. tracheal tube cuff pressure and/or volume	
s. arterial line insertion	
t. stress testing e.g., ECG, pulse oximetry	
u. pulmonary function laboratory studies	
v. CPAP / BIPAP titration during sleep	
w. auto-PEEP detection	
C. Recommend Procedures to Obtain Additional Data	
1. Blood tests e.g., hemoglobin, potassium	
2. Radiographic and other imaging studies	
3. Diagnostic bronchoscopy e.g., evaluate hemoptysis, atelectasis	
4. Sputum Gram stain, culture and sensitivities e.g., pneumonia	
5. Bronchoalveolar lavage (BAL)	
6. Pulmonary function testing	
7. Lung mechanics e.g., compliance, airways resistance	
8. Blood gas analysis, pulse oximetry, and transcutaneous monitoring	
9. ECG	
10. Capnography	
11. Hemodynamic monitoring e.g., blood pressure, CVP	

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12. Insertion of monitoring catheters e.g., arterial	
13. Sleep studies	
14. Thoracentesis e.g., pleural effusion	
II. EQUIPMENT MANIPULATION, INFECTION CONTROL, AND QUALITY CONTROL	
A. Manipulate Equipment by Order or Protocol	
1. Oxygen administration devices	
a. low-flow devices e.g., nasal cannula	
b. high-flow devices e.g., air entrainment mask	
c. high-flow nasal cannula	
2. CPAP devices – mask, nasal, or bilevel	
3. Humidifiers	
4. Nebulizers	
5. Resuscitation devices e.g., manual resuscitator (bag-valve), mouth-to-valve mask resuscitator	
6. Ventilators	
a. pneumatic, electric, fluidic, and microprocessor	
b. noninvasive positive pressure	
c. high frequency	
7. Artificial airways	
a. oro- and nasopharyngeal airways	
b. endotracheal tubes	
c. tracheostomy tubes and devices	
d. speaking tubes and valves	

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e. intubation equipment	
f. laryngeal mask airway (LMA)	
g. esophageal-tracheal Combitube®	
8. Suctioning devices	
9. Gas delivery, metering, and clinical analyzing devices	
a. gas cylinders, regulators, reducing valves, connectors and flowmeters, and air/oxygen blenders	
b. oxygen conserving devices e.g., reservoir cannula, pulce-dose	
c. oxygen concentrators	
d. portable liquid oxygen systems	
e. portable oxygen concentrators	
f. air compressors	
10. Point-of-care analyzers e.g., blood gas, electrolytes	
11. Patient breathing circuits	
a. continuous	
b. IPPB	
c. CPAP and PEEP valve assemblies	
d. non-invasive ventilation	
12. Environmental devices	
a. incubators	
b. aerosol (mist) tents	
c. oxygen hoods	
13. Incentive breathing devices	

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14. Airway clearance devices	
a. percussors and vibrators	
b. high frequency chest wall oscillation	
c. positive expiratory pressure (PEP) devices	
d. vibratory PEP devices	
15. He / O2	
16. Manometers e.g., aneroid, digital, water	
17. Respirometers e.g., flow-sensing devices	
18. ECG monitors	
19. ECG machines (12-lead)	
20. Hemodynamic monitoring devices	
a. pressure transducers	
b. catheters e.g., arterial, pulmonary artery	
21. Vacuum systems e.g., pumps, collection bottles, regulators, pleural drainage devices	
22. Oximetry monitoring devices e.g., pulse oximeter, transutaneous	
23. Metered dose inhalers (MDI) and MDI spacers	
24. Dry powder inhalers	
25. Bedside screening spirometers	
26. CO, He, O2 and specialty gas analyzers	
27. Bronchoscopes	
B. Ensure Infection Control	

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1. Assure cleanliness of equipment by • selecting or determining appropriate agent and technique for disinfection and/or sterilization • performing procedures for disinfection and/or sterilization • monitoring effectiveness of sterilization procedures	
2. Assure proper handling of biohazardous materials	
3. Incorporate ventilator-associated pneumonia protocol	
4. Implement infectious disease protocols e.g., • avian flu • SARS • transmission prevention	
5. Adhere to infection control policies and procedures e.g., Standard Precautions	
C. Perform Quality Control Procedures For	
1. Blood gas analyzers, co-oximeters	
2. Gas analyzers	
3. Point-of-care analyzers	
4. Pulmonary function equipment	
5. Mechanical ventilators	
6. Gas metering devices e.g., flowmeter	
7. Noninvasive monitors e.g., transcutaneous	
8. Record and monitor QC data using accepted statistical methods	
III. INITIATION AND MODIFICATION OF THERAPEUTIC PROCEDURES	
A. Maintain Records and Communicate Information	
1. Record therapy and results using conventional terminology as required in the health care setting and/or by regulatory agencies	
a. specify therapy administered, date, time, frequency of therapy, medication, & ventilatory data	
b. note and interpret patient's response to therapy	
1) effects of therapy, adverse reactions, patient's subjective and objective response to therapy	
2) verify computations and note erroneous data	

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3) auscultatory findings, cough and sputum production and characteristics	
4) vital signs	
5) pulse oximetry, heart rhythm, capnography	
2. Communicate information	
a. regarding patient's clinical status to appropriate members of the health care team	
b. relevant to coordinating patient care and discharge planning	
3. Accept and verify patient care orders	
4. Apply computer technology to	
a. document patient management	
b. monitor workload assignments	
c. patient safety initiatives e.g., drug dispensing, order entry	
5. Communicate results of therapy and alter therapy by protocol(s)	
6. Explain planned therapy and goals to a patient in understandable terms to achieve optimal therapeutic outcome	
7. Educate a patient and family concerning smoking cessation and health management	
B. Maintain a Patent Airway Including the Care of Artificial Airways	
1. Properly position a patient	
2. Insert oro- and nasopharyngeal airways	
3. Perform endotracheal intubation	
4. Maintain position in the airway and appropriate cuff inflation of	
a. LMA	
b. esophageal-tracheal Combitube®	
c. endotracheal tube	

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d. tracheostomy tube	
5. Assess tube placement	
6. Perform tracheostomy care	
7. Change tracheostomy tubes	
8. Maintain adequate humidification	
9. Perform extubation	
C. Remove Bronchopulmonary Secretions	
1. Perform	
a. postural drainage, percussion, or vibration	
b. nasotracheal suctioning	
c. oropharyngeal suctioning	
d. airway clearance using mechanical devices e.g., high frequency chest wall oscillation, vibratory PEP	
2. Suction artificial airways	
3. Administer aerosol therapy with prescribed drugs	
4. Instruct and encourage bronchopulmonary hygiene techniques	
D. Achieve Adequate Respiratory Support	
1. Instruct a patient in	
a. deep breathing and incentive spirometry techniques	
b. inspiratory muscle training techniques	
2. Initiate and adjust	
a. IPPB therapy	
b. continuous mechanical ventilation settings	

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c. noninvasive ventilation	
d. elevated baseline pressure e.g., CPAP, PEEP	
3. Select ventilator graphics e.g., waveforms, scales	
4. Initiate and select appropriate settings for high frequency ventilation	
5. Administer medications	
a. aerosolized	
b. dry powder preparations	
c. endotracheal instillation	
6. Administer oxygen	
7. Initiate and modify weaning procedures	
8. Position patient to minimize hypoxemia	
9. Prevent procedure-associated hypoxemia e.g., oxygenate before and after suctioning and equipment changes	
10. Apply disease-specific ventilator protocols (e.g. ARDS-Net protocol)	
E. Evaluate and Monitor Patient's Objective and Subjective Responses to Respiratory Care	
1. Recommend and review a chest radiograph	
2. Obtain a blood gas sample	
a. by puncture	
b. from an arterial or pulmonary artery catheter	
c. from arterialized capillary blood	
3. Perform	
a. transcutaneous monitoring	
b. pulse oximetry	

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c. blood gas and hemoximetry analyses	
d. capnography	
e. hemodynamic assessment	
4. Interpret results of	
a. blood gases	
b. hemoximetry e.g., carboxyhemoglobin	
c. hemodynamics	
d. pulse oximetry	
e. capnography	
5. Observe for	
a. changes in sputum characteristics	
b. signs of patient-ventilator dysynchrony	
6. Measure & record vital signs, monitor cardiac rhythm, & evaluate fluid balance - intake & output	
7. Perform and interpret results of pulmonary function testing	
a. spirometry	
b. compliance and airways resistance	
c. lung volumes	
d. DLCO	
e. exercise	
f. bronchoprovocation studies	
8. Recommend blood tests e.g., hemoglobin, potassium	
9. Monitor airway pressures, and adjust and check alarm systems	

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10. Measure FIO2 and/or oxygen flow	
11. Auscultate the chest and interpret changes in breath sounds	
F. Independently Modify Therapeutic Procedures Based On The Patient's Response	
1. Terminate treatment based on patient's response to therapy	
2. Modify treatment techniques	
a. IPPB	
b. incentive breathing devices	
c. aerosol therapy	
1) modify patient breathing patterns	
2) change type of equipment and change aerosol output	
3) change dilution of medication	
4) adjust temperature of the aerosol	
d. oxygen therapy	
1) change mode of administration, flow, and FIO2	
2) set up or change an O2 blender	
3) set up an O2 concentrator or liquid O2 system	
e. specialty gas therapy e.g., He / O2, NO	
1) change mode of administration	
2) adjust flow or gas concentration	
f. bronchial hygiene therapy	
1) alter patient position and duration of treatment and techniques	
2) coordinate sequence of therapies e.g., chest percussion, PEP, postural drainage	

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g. management of artificial airways	
1) reposition or change endotracheal or tracheostomy tube	
2) change type of humidification equipment	
3) initiate suctioning	
4) inflate and / or deflate the cuff	
5) perform tracheostomy care	
h. suctioning	
1) alter frequency and duration of suctioning	
2) change size and type of catheter	
3) alter negative pressure	
4) instill irrigating solutions	
i. mechanical ventilation	
1) improve patient synchrony	
2) enhance oxygenation	
3) improve alveolar ventilation	
4) adjust I : E settings	
5) modify ventilator techniques	
6) adjust noninvasive positive pressure ventilation	
7) monitor and adjust alarm settings	
8) adjust ventilator settings based on ventilator graphics	
9) change type of ventilator	
10) change patient breathing circuitry	

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11) alter mechanical dead space	
12) initiate procedures for weaning	
G. Recommend Modifications In The Respiratory Care Plan Based On The Patient's Response	
1. Recommend	
a. institution of bronchopulmonary hygiene procedures	
b. treatment of pneumothorax	
c. sedation and/or use of muscle relaxant(s)	
d. adjustment of fluid balance	
e. adjustment of electrolyte therapy	
f. insertion or change of artificial airway	
g. weaning from mechanical ventilation	
h. extubation	
i. discontinuing treatment based on patient response	
2. Recommend changes in	
a. patient position	
b. inhaled drug dosage or concentration	
c. FIO2 and oxygen flow	
3. Recommend changes in mechanical ventilation to	
a. improve patient synchrony	
b. enhance oxygenation	
c. improve alveolar ventilation	
d. adjust I : E settings	

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e. modify ventilator techniques	
f. adjust noninvasive positive pressure ventilation	
g. monitor and adjust alarm settings	
h. adjust ventilator settings based on ventilator graphics	
i. change type of ventilator	
j. change patient breathing circuitry	
k. alter mechanical dead space	
l. reduce auto-PEEP	
m. reduce plateau pressure	
4. Recommend pharmacologic interventions including use of	
a. bronchodilators	
b. anti-inflammatory drugs e.g., leukotriene modifiers, cromolyn sodium, corticosteroids	
c. mucolytics and proteolytics e.g., acetylcysteine, hypertonic saline, RhDNAse	
d. cardiovascular drugs e.g., ACLS protocol agents	
e. antimicrobials e.g., antibiotics	
f. sedatives	
g. analgesics	
h. paralytic agents	
i. diuretics	
j. surfactants	
k. vaccines e.g., pneumovax, influenza	
H. Determine the Appropriateness of the Prescribed Respiratory Care Plan and Recommend Modifications When Indicated by Data	

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1. Analyze available information to determine the pathophysiological state	
2. Review	
a. planned therapy to establish therapeutic plan	
b. interdisciplinary patient and family plan	
3. Determine appropriateness of prescribed therapy & goals for identified pathophysiological state	
4. Recommend changes in therapeutic plan when indicated	
5. Perform respiratory care quality assurance	
6. Develop	
a. quality improvement program	
b. respiratory care protocols	
7. Monitor outcomes of	
a. quality improvement programs	
b. respiratory care protocols	
8. Apply respiratory care protocols	
9. Conduct health management education	
I. Initiate, Conduct, or Modify Respiratory Care Techniques in an Emergency Setting	
1. Treat cardiopulmonary emergencies according to	
a. BCLS	
b. ACLS	
c. Pediatric Advanced Life Support (PALS)	
d. Neonatal Resuscitation Program (NRP)	
2. Treat a tension pneumothorax	

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3. Participate in	
a. land / air patient transport	
b. intra-hospital patient transport	
c. disaster management	
d. medical emergency team (MET) e.g., rapid response team	
J. Act as an Assistant to the Physician Performing Special Procedures	
1. Intubation	
2. Bronchoscopy	
3. Thoracentesis	
4. Tracheostomy	
5. Chest tube insertion	
6. Insertion of venous or arterial catheters	
7. Moderate (conscious) sedation	
8. Cardioversion	
9. Ultrasound	
K. Initiate and Conduct Pulmonary Rehabilitation and Home Care	
1. Monitor and maintain home respiratory care equipment	
2. Initiate and adjust apnea monitors	
3. Explain planned therapy and goals to a patient in understandable terms to achieve optimal therapeutic outcome	
4. Educate a patient and family in health management	
5. Interact with a case manager	
6. Counsel a patient and family concerning smoking cessation	

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7. Instruct patient and family to assure safety and infection control	
8. Modify respiratory care procedures for use in home	
9. Initiate treatment for sleep disorders e.g., CPAP	