CSE Examination Matrix

I. PATIENT DATA EVALUATION AND RECOMMENDATIONS

A. Review Data in the Patient Record

B. Collect and Evaluate Additional Pertinent Clinical Information

C. Recommend Procedures to Obtain Additional Data

II. EQUIPMENT MANIPULATION, INFECTION CONTROL, AND QUALITY CONTROL

A. Manipulate Equipment by Order or Protocol

B. Ensure Infection Control

C. Perform Quality Control Procedures

III. INITIATION AND MODIFICATION OF THERAPEUTIC PROCEDURES

A. Maintain Records and Communicate Information

B. Maintain a Patent Airway Including the Care of Artificial Airways

C. Remove Bronchopulmonary Secretions

D. Achieve Adequate Respiratory Support

E. Evaluate and Monitor Patient's Objective and Subjective Responses to Respiratory Care

F. INDEPENDENTLY MODIFY Therapeutic Procedures Based on the Patient's Response

G. RECOMMEND Modifications in the Respiratory Care Plan Based on the Patient's Response

H. Determine the Appropriateness of the Prescribed Respiratory Care Plan and Recommend Modifications When Indicated by Data

I. Initiate, Conduct, or Modify Respiratory Care Techniques in an Emergency Setting

J. Act as an Assistant to the Physician Performing Special Procedures

K. Initiate and Conduct Pulmonary Rehabilitation and Home Care

I. PATIENT DATA EVALUATION AND RECOMMENDATIONS

A. Review Data in the Patient Record

1. Patient history e.g.,
   - present illness
   - progress notes
   - admission notes
   - diagnoses
   - respiratory care orders
   - DNR status
   - medication history
   - patient education (previous)
2. Physical examination relative to the cardiopulmonary system e.g., vital signs, physical findings
3. Laboratory data e.g.,
   - CBC
   - culture and sensitivities
   - electrolytes
   - coagulation studies
4. Pulmonary function results
5. Blood gas results
6. Imaging studies e.g.,
   - radiograph
   - MRI
   - CT
7. Monitoring data
   a. fluid balance
   b. pulmonary mechanics e.g., maximum inspiratory pressure, vital capacity
   c. respiratory e.g.,
      - rate
      - I:E
      - tidal and minute volume
   d. pulmonary compliance, airways resistance, work of breathing
   e. noninvasive e.g.,
      - pulse oximetry
      - capnography
      - V_D / V_T
      - transcutaneous O_2 / CO_2
8. Cardiac monitoring
   a. ECG data results e.g., heart rate, rhythm
   b. hemodynamic monitoring results e.g.,
      - blood pressure
      - PA pressure
      - CVP
      - cardiac output / index
9. Maternal and perinatal / neonatal history and data
   - Apgar scores
   - L / S ratio
   - gestational age
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
   a. general appearance e.g.,
      - venous distention
      - diaphoresis
      - edema
      - clubbing
      - accessory muscle activity
      - cyanosis
      - chest wall movement
      - 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
   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, FEV_1
   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., $P(A\text{-}a)O_2$, V_D / V_T
   m. hemodynamic monitoring e.g., blood pressure, CVP
   n. lung mechanics e.g.,
      - plateau pressure
      - airways resistance
      - MIP
      - compliance
      - 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
10. Interpret procedure results including
    a. 12-lead ECG e.g.,
       - rate
       - artifacts
       - irregular rhythm

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, FEV_1
f. arterial sampling – percutaneous or line
g. arterialized capillary blood sampling
h. timed walk test e.g., 6-minute
i. oxygen titration with exercise
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l. cardiopulmonary calculations e.g., $P(A\text{-}a)O_2$, V_D / V_T
m. hemodynamic monitoring e.g., blood pressure, CVP
n. lung mechanics e.g., • plateau pressure • MIP • MEP
o. ventilator graphics e.g., pressure/volume loop
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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
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
   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, pulse-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 mechanical ventilation
    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
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 / O_2
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, transcutaneous
23. Metered dose inhalers (MDI) and MDI spacers
24. Dry powder inhalers
25. Bedside screening spirometers
26. CO, He, O_2 and specialty gas analyzers
27. Bronchoscopes

B. Ensure Infection Control

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
   - transmission prevention
   - SARS
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, and 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
      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
   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
   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
   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 and record vital signs, monitor cardiac rhythm, and evaluate fluid balance – intake and output
7. Perform and interpret results of pulmonary function testing
   a. spirometry
   b. compliance and airways resistance
   c. lung volumes
   d. D_{Lco}
   e. exercise
   f. bronchoprovocation studies
8. Recommend blood tests e.g., hemoglobin, potassium
9. Monitor airway pressures, and adjust and check alarm systems
10. Measure F_IO_2 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 F_IO_2
      2) set up or change an O_2 blender
      3) set up an O_2 concentrator or liquid O_2 system
   e. specialty gas therapy e.g., He / O_2, 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
   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
      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. F_IO_2 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
   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. antiinflammatory 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

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 and 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
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
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

Neonatal/Pediatric Examination Matrix

Content Area	Cognitive Level: Recall	Application	Analysis	Number of Items
I. Critical Care	**6**	**35**	**34**	**75**
A. Evaluate Pertinent Information	0	6	6	12
B. Assess and Manage Airways	2	6	4	12
C. Administer and Monitor Specialty Gases	0	2	2	4
D. Manage Ventilation and Oxygenation	0	10	15	25
E. Prevent Ventilator Associated Pneumonia	1	1	1	3
F. Select, Assemble, and Troubleshoot Equipment	2	4	2	8
G. Assist or Perform Procedures	0	3	2	5
H. Deliver Pharmacologic Agents	0	2	1	3
I. Assist or Perform Resuscitation	1	1	1	3
II. General Care	**3**	**26**	**16**	**45**
A. Assess Patient Status and Changes in Status	0	7	5	12
B. Select, Assemble, and Troubleshoot Equipment	1	5	4	10
C. Anticipate Care Based on Laboratory Results and Nutritional Status	0	4	2	6
D. Anticipate Care Based on Imaging and Reports of Imaging	0	1	1	2
E. Anticipate Effects of Pharmacologic Agents	2	3	2	7
F. Manage End-of-Life Care	0	1	1	2
G. Prepare for Disasters	0	2	0	2
H. Interact with Members of an Interdisciplinary Team	0	1	1	2
I. Evaluate Patient and Family Understanding of Education	0	2	0	2
Totals	**9**	**61**	**50**	**120**

Each open cell shows an examination could include an item from the indicated cognitive level, which could interact with the ethics domain when the cell in the ***Ethics*** column is open.

Each shaded cell prevents an item from appearing on an examination.

	Ethics	Recall	Application	Analysis
I. CRITICAL CARE		**6**	**35**	**34**
A. Evaluate Pertinent Information		**0**	**6**	**6**
1. Maternal history				
2. Neonatal assessment e.g., • Apgar • fetal lung maturity indices				
3. Patient history				
4. Physical examination				
5. Laboratory e.g., • blood gas analyses • cultures • CBC				
6. Imaging e.g.,				
• chest radiograph • fluoroscopy • cardiac catheterization and angiography • MRI • CT • echocardiography				
7. Other diagnostic results e.g., • transillumination • oxygen challenge test				
B. Assess and Manage Airways		**2**	**6**	**4**
1. Establishment of an airway e.g., • bag-mask ventilation • oral/nasal airway placement				
2. Difficult airway recognition				
3. Performing or assisting standard intubation e.g., • equipment selection • CO_2 verification				
4. Performing or assisting advanced intubation techniques e.g., • cricoid pressure • specialty laryngoscopic visualization devices • tube changers				
5. Artificial airways				
a. laryngeal mask airway				
b. cuff management				
c. tracheostomy tubes				
d. airway clearance techniques e.g., • secretion removal				
C. Administer and Monitor Specialty Gases		**0**	**2**	**2**
1. Nitric oxide				
2. Helium-oxygen				
3. Other e.g., • isoflurane • subambient • carbon dioxide				
D. Manage Ventilation and Oxygenation		**0**	**10**	**15**
1. Selection of initial settings				
2. Conventional modes				
3. Alternative modes e.g., • volume-targeted • high frequency • airway pressure release ventilation • neurally adjusted ventilatory assist				
4. Noninvasive e.g., • CPAP • bilevel				
5. Adjunct techniques				
a. lung recruitment maneuvers				
b. prone patient positioning				
c. extracorporeal gas exchange e.g., • ECMO • CO_2 removal				
6. Monitoring				
a. measures of lung disease severity e.g., • OI • PaO_2 / F_IO_2 ratio				
b. airway pressures and volumes e.g., • mean airway pressure • minute ventilation				
c. gas exchange e.g., • S_PO_2 • $ETCO_2$				

	Ethics	Recall	Application	Analysis
d. ventilator waveforms				
e. ventilator-patient interaction e.g.,				
• synchrony				
f. pulmonary mechanics e.g.,				
• compliance • V_D / V_T				
• resistance • MIP				
g. effects of mechanical ventilation on cardiac function				
7. Strategies				
a. liberation from mechanical ventilation e.g.,				
• protocols • spontaneous breathing trials				
b. prevention of ventilator induced lung injury				
c. lung-protective ventilation e.g.,				
• permissive hypercapnea				
8. Optimizing patient-ventilator interaction				
E. Prevent Ventilator Associated Pneumonia		**1**	**1**	**1**
1. Oral care				
2. Bed position				
3. Minimizing intubation time e.g.,				
• determining extubation readiness • noninvasive positive pressure ventilation				
4. Ventilator circuit care e.g.,				
• closed suction • heated wire				
F. Select, Assemble, and Troubleshoot Equipment		**2**	**4**	**2**
1. Oxygen administration devices e.g.,				
• high-flow nasal cannula • oxygen hood				
2. Aerosol delivery devices e.g.,				
• continuous medication nebulizers • in-line administration				
3. Nitric oxide delivery devices				
4. Transcutaneous monitoring systems				
5. Mechanical ventilators				
G. Assist or Perform Procedures		**0**	**3**	**2**
1. Inter- or Intra-hospital transport				
2. Intravascular catheter insertion e.g.,				
• through an umbilical or peripheral site				
3. Bronchoscopy and associated procedures e.g.,				
• lavage • brush				
• biopsies				
4. Intubation				
5. Extubation				
H. Deliver Pharmacologic Agents		**0**	**2**	**1**
1. Aerosolized agents e.g.,				
• antimicrobials • bronchodilators				
• mucolytics • anti-inflammatories				
• vasodilators				
2. Airway instillations e.g.,				
• surfactant replacement therapy • lidocaine				
I. Assist or Perform Resuscitation		**1**	**1**	**1**
1. Selection of appropriate equipment e.g.,				
• T-piece resuscitator • flow-inflating resuscitation bag				
2. Following the appropriate protocol e.g.,				
• NRP • PALS				
II. GENERAL CARE		**3**	**26**	**16**
A. Assess Patient Status and Changes in Status		**0**	**7**	**5**
1. Specific airway challenges e.g.,				
• acute upper airway obstruction • congenital anomalies				
2. Chest imaging e.g.,				
• radiograph • CT				
3. Indices of respiratory physiology and mechanics e.g.,				
• oxygenation • sleep study results				
• work of breathing				

	Ethics	Recall	Application	Analysis
4. Neurologic e.g.,				
• respiratory function • level of consciousness • apnea of prematurity				
5. Cardiovascular e.g.,				
• physical assessment • pulmonary hypertension				
• hemodynamics • congenital heart disease				
6. Recognition of respiratory failure mechanisms				
a. primary pulmonary and airway diseases e.g.,				
• atelectasis • asthma				
• pneumonia • croup				
b. other e.g.,				
• neuromuscular • flail chest • respiratory control				
7. Renal, metabolic, endocrine, and nutrition e.g.,				
• fluid status • acid-base balance				
• electrolytes • inborn errors of metabolism				
• nutrition/feeding • diabetic ketoacidosis				
8. Gastrointestinal e.g.,				
• congenital anomalies • feeding tube placement				
• abdominal distension • necrotizing enterocolitis				
9. Musculoskeletal e.g.,				
• spinal cord injury • scoliosis				
• myopathy • myelomeningocele				
B. Select, Assemble, and Troubleshoot Equipment		**1**	**5**	**4**
1. Airway clearance devices e.g.,				
• In-exsufflator • high frequency chest oscillation				
2. Oxygen administration devices e.g.,				
• high-flow nasal cannula • oxygen hood				
3. Aerosol delivery devices				
4. Mechanical ventilators e.g.,				
• home				
C. Anticipate Care Based on Laboratory Results and Nutritional Status		**0**	**4**	**2**
1. Hematologic e.g.,				
• CBC • Hgb electrophoresis				
2. Chemistry e.g.,				
• electrolytes • glucose • albumin				
3. Microbiology e.g.,				
• RSV swab • culture • Gram stain				
4. Blood gas analyses and hemoximetry (co-oximetry)				
5. Complications of feedings e.g.,				
• intolerance • malplacement of feeding tube • aspiration				
D. Anticipate Care Based on Imaging and Reports of Imaging		**0**	**1**	**1**
1. Radiographs				
2. Other e.g.,				
• CT • Ultrasound • MRI				
E. Anticipate Effects of Pharmacologic Agents		**2**	**3**	**2**
1. Sedatives, hypnotics, and analgesia				
2. Neuromuscular blocking agents e.g.,				
• succinylcholine • cisatracurium				
3. Reversal agents e.g.,				
• naloxone • flumazenil • neostigmine				
4. Vasoactive and inotropic agents				
5. Diuretics				
6. Aerosolized agents e.g.,				
• bronchodilators • anti-inflammatories				
• antimicrobials • mucolytics				
7. Drug interactions				

	Ethics	Recall	Application	Analysis
8. Influence of co-morbid conditions e.g., • renal failure • hepatic failure				
F. Manage End-of-Life Care		0	1	1
1. Differentiation of the potential need for end-of-life care e.g., • palliative • hospice				
2. Withdrawal of life support				
3. Care of organ donors				
G. Prepare for Disasters		0	2	0
1. Procedures for patient movement and protection				
2. Triage procedures				
3. Equipment and supply management				
H. Interact with Members of an Interdisciplinary Team		0	1	1
1. Suggested modifications to the care plan based on the respiratory assessment				
2. Responses to proposed care plan modifications from other team members				
I. Evaluate Patient and Family Understanding of Education		0	2	0
1. Discharge and home e.g., • tracheostomy care • monitoring • CPR				
2. Equipment and procedure instruction				
3. Medication administration				
TOTALS	3*	9	61	50

* Each test form will include 3 items that engage thinking about ethics to select the best answer.
* Each of these 3 items also will
- include content from a task that shows an open cell under the ***Ethics*** column.
- be written to a cognitive level permitted for the task to which the item is linked.

Secondary Test Specifications

Item content also will be classified by the condition or disorder described for each patient.

	Item Counts Across the Examination		
	Target	Acceptable Range for Each Test Form	
Conditions or Disorders	**120**	**Minimum**	**Maximum**
General *No specific condition or disorder*	30	24	36
Asthma	10	8	12
Prematurity acute phase e.g., surfactant deficiency, apnea	10	8	12
Infectious diseases e.g., pneumonia, croup	10	8	12
Neonatal pulmonary e.g., meconium aspiration, pneumonia, PPHN	10	8	12
Chronic lung disease of prematurity	7	6	8
Bronchiolitis	7	6	8
Congenital heart diseases	4	3	5
Congenital defects that require surgical correction	4	3	5
Neuromuscular e.g., spinal muscle atrophy, muscular dystrophy	4	3	5
Shock	4	3	5
Trauma	4	3	5
Cystic fibrosis	4	3	5
Pediatric airway e.g., tracheomalacia, vocal cord paralysis, vascular ring	4	3	5
Neurologic e.g., seizures, brain tumors, hydrocephalus	3	2	4
Immunocompromised	2	2	2
Heart failure	2	2	2
Inhalation injuries	1	0	1
Total	**120**		

Each new test form will include two 20-item pretests (e.g., 1A, 1B, 2A, 2B) that will be released in sequence. The A set will be used for the first half of the test form cycle followed by the B set.

Sleep Disorders Examination Matrix

Content Area	Cognitive Level: Recall	Application	Analysis	Number of Items
I. Pre-testing	**6**	**10**	**3**	**19**
A. Identification and care of at-risk individuals	2	2	1	5
B. Study preparations	4	8	2	14
II. Sleep Disorders Testing	**10**	**19**	**19**	**48**
A. Signal maintenance during testing	2	5	2	9
B. Sleep-related disorders and therapeutic interventions	4	10	15	29
C. Documentation during testing	3	0	0	3
D. Study Conclusion	1	4	2	7
III. Study Analysis	**8**	**27**	**15**	**50**
A. Record review	1	1	0	2
B. Sleep Staging	2	12	0	14
C. Sleep event identification	2	5	14	21
D. Sleep event reporting	3	9	1	13
IV. Administrative Functions	**3**	**5**	**6**	**14**
A. Archiving data	1	2	0	3
B. Maintenance	1	1	2	4
C. Management	1	2	4	7
V. Treatment Plan	**5**	**9**	**15**	**29**
A. Development	1	3	5	9
B. Implementation	2	3	5	10
C. Evaluation	2	3	5	10
Totals	**32**	**70**	**58**	**160**

Open cells show an examination could include items from indicated cognitive levels. Shaded cells prevent appearance of items on examinations.

	Recall	Application	Analysis
I. PRE-TESTING	**6**	**10**	**3**
A. Identification and Care of At-Risk Individuals	**2**	**2**	**1**
1. Recognize signs and symptoms associated with sleep disorders as revealed by history, interview, or clinical assessment			
2. Identify special factors and co-morbid conditions affecting individuals with potential sleep disorders			
3. Interact with members of the health care team			
a. communicate findings			
b. recommend diagnostic studies			
c. recommend therapeutic intervention			
B. Study Preparations	**4**	**8**	**2**
1. Review			
a. a patient's history, current medications, questionnaire, and notes			
b. the physician's order for a sleep study			
2. Set up			
a. equipment to achieve the desired data collection			
b. special equipment as indicated			
3. Select the appropriate study procedure and corresponding montage e.g. • Polysomnography with or without PAP titration • Maintenance of Wakefulness Test • Multiple Sleep Latency Test			
4. Set high and low filters, and sensitivity settings			
5. Evaluate equipment calibrations to ensure accuracy and linearity of amplified signals e.g. • pneumotach • EMG • EEG			
6. Confirm adequate audiovisual signals			
7. Recommend modifications to the physician's order when necessary			

	Recall	Application	Analysis
8. Assess the patient's current clinical condition			
9. Explain testing procedures and potential interventions to the patient			
10. Determine the patient's expectations about the study			
11. Recognize special needs associated with a patient's			
a. age			
b. psychological status			
c. physical status			
d. culture			
e. language			
f. cognitive status			
12. Identify patient medications that may affect test results			
13. Document time and dose of medications taken prior to the study			
14. Obtain informed consent			
15. Apply electrodes and sensors at optimal locations to obtain data			
a. airflow			
b. snoring			
c. body position			
d. ECG			
e. respiratory effort			
f. EEG			
g. leg movements			
h. eye movements			
i. chin EMG			
j. SpO_2			
k. exhaled CO_2			
16. Verify the quality and interpretability of monitoring signals			
a. appropriate electrode impedances			
b. physiologic calibrations			
17. Document the quality and interpretability of monitoring signals			
II. SLEEP DISORDERS TESTING	**10**	**19**	**19**
A. Signal Maintenance During Testing	**2**	**5**	**2**
1. Recognize an inadequate signal from recording devices			
2. Correct inadequate signals as appropriate			
3. Recognize artifacts			
4. Correct artifacts as appropriate			
5. Document corrections to signals and artifacts			
B. Sleep-Related Disorders and Therapeutic Interventions	**4**	**10**	**15**
1. Recognize disorders during testing			
a. sleep e.g. • apnea • parasomnias • bruxism • limb movements			
b. cardiac			
c. neurological			
d. pulmonary			
e. gastroesophageal reflux			
2. Implement therapy			
a. positive airway pressure			
b. supplemental oxygen			
3. Monitor a patient's response to therapy			
4. Optimize therapy			
5. Coach a patient in cooperative behaviors while adjusting therapy			
6. Recommend modifications in therapy to the physician when no protocol applies			
7. Recognize medical emergencies e.g., • seizures • pneumothorax • life-threatening dysrhythmias • respiratory distress			
8. Implement interventions for a medical emergency			
9. Intervene when the testing environment becomes unsafe (e.g., combative patient or family member, fire)			
C. Documentation During Testing	**3**	**0**	**0**
1. Record			
a. lights out / on clock time			
b. reason for prolonged awakenings			

	Recall	Application	Analysis
c. staff interventions			
d. therapeutic interventions			
2. Document times associated with events e.g. • artifacts • ECG abnormalities • seizure activity • EEG abnormalities • parasomnias			
D. Study Conclusion	**1**	**4**	**2**
1. Evaluate post-study calibrations			
2. Remove electrodes and sensors			
3. Process nondisposable equipment			
4. Review post-study questionnaire			
5. Provide information to the patient on the post-study process			
6. Respond to questions from the patient			
7. Summarize study observations			
III. STUDY ANALYSIS	**8**	**27**	**15**
A. Record Review	**1**	**1**	**0**
1. Review pre- and post-study information e.g. • questionnaires • nocturnal oximetry reports • arterial blood gas analysis • history & physical • medications			
2. Review study observations			
B. Sleep Staging	**2**	**12**	**0**
1. Score sleep stages for adult patients			
2. Score sleep stages for pediatric patients			
C. Sleep Event Identification	**2**	**5**	**14**
1. Recognize			
a. sleep disordered breathing			
b. abnormal limb movements			
c. abnormal cardiac rhythm			
d. bruxism			
e. abnormal EEG waveforms (e.g., seizure, voltage changes)			
f. parasomnias			
g. REM behavior disorder			
h. arousals			
2. Recognize changes in			
a. body position			
b. SpO_2			
c. exhaled CO_2			
d. airflow			
3. Relate arousals to sleep events			
D. Sleep Event Reporting	**3**	**9**	**1**
1. Summarize observations about a patient's			
a. behaviors during testing (e.g., parasomnias, limb movements)			
b. tolerance of therapeutic interventions			
2. Summarize evidence of			
a. artifacts			
b. adverse events			
c. technical problems, errors, and actions taken to resolve them			
3. Document descriptive statistics for			
a. oxygen saturation			
b. sleep latency			
c. REM latency			
d. sleep efficiency			
e. total sleep time			
f. total time in bed			
g. total recording time			
h. sleep stage percentages			
i. wake after sleep onset			
4. Document descriptive statistics for MSLT and MWT			
a. mean sleep latency			
b. sleep onset REM periods			

	Recall	Application	Analysis
5. Document the frequency of			
a. obstructive, central, and mixed apneas			
b. hypopneas			
c. arousals			
d. periodic limb movements			
e. snoring			
f. Respiratory Effort Related Arousals (RERAs)			
g. Cheyne-Stokes respirations			
h. sleep-related hypoventilation			
i. periodic breathing			
6. Document indices for			
a. apneas			
b. hypopneas			
c. apneas / hypopneas (AHI)			
d. arousals			
e. periodic limb movements			
7. Summarize results of the			
a. Multiple Sleep Latency Test			
b. Maintenance of Wakefulness Test			
8. Document excessive			
a. spindles			
b. beta activity			
c. alpha activity			
9. Document abnormalities in			
a. EEG activity (e.g., alpha-delta, alpha intrusion)			
b. REM (e.g., density, latency)			
c. ECG activity			
10. Generate a written report including objective and subjective information			
11. Confirm the written report is a valid reflection of the study			
IV. ADMINISTRATIVE FUNCTIONS	**3**	**5**	**6**
A. Archiving Data	**1**	**2**	**0**
1. Ensure adequate data archiving space			
2. Ensure information from each patient is stored			
a. in such a manner as to maintain data integrity			
b. according to government and industry standards			
c. in compliance with HIPAA regulations			
B. Maintenance	**1**	**1**	**2**
1. Correct problems with data acquisition and recording equipment			
2. Perform			
a. biomedical equipment quality control			
b. routine equipment processing			
3. Ensure preventative maintenance			
4. Maintain supply inventory			
C. Management	**1**	**2**	**4**
1. Implement policies and procedures that address			
a. accurate data processing			
b. patient safety			
c. staff safety			
d. infection control			
e. response to an emergency			
f. patient confidentiality			
g. staff educational requirements			
h. current practice standards			
2. Implement quality improvement programs that address			
a. inter-scorer reliability			
b. implementation of a physician's order			
c. compliance with protocols			
d. patient and physician satisfaction			

	Recall	Application	Analysis
V. TREATMENT PLAN	**5**	**9**	**15**
A. Development	**1**	**3**	**5**
1. Assess			
a. educational needs of the patient or caregiver			
b. a patient's barriers to optimal therapy			
2. Select equipment and interface to ensure maximum			
a. compliance (e.g., comfort)			
b. efficacy			
3. Communicate details of assessment to the physician / healthcare provider			
4. Assist in the development of an individualized treatment plan (e.g., behavior modifications, comorbid condition management)			
B. Implementation	**2**	**3**	**5**
1. Assist in the generation of the prescription			
2. Provide			
a. sleep disorder-specific education to the patient or caregiver			
b. therapy-specific education to the patient or caregiver e.g. • oxygen • oral appliance • positive airway pressure • behavioral changes			
3. Coordinate equipment delivery and setup			
4. Verify completion of equipment setup			
5. Adjust equipment settings to comply with the prescription			
6. Verify patient's comprehension of treatment plan			
7. Document educational assessments and interventions			
C. Evaluation	**2**	**3**	**5**
1. Ensure optimal compliance with the treatment plan			
2. Reassess the treatment plan			
3. Recommend revisions to the treatment plan as necessary			
4. Document evaluation of outcomes			
5. Communicate treatment plan outcomes to the physician / healthcare provider			
TOTALS	**32**	**70**	**58**

Adult Critical Care Specialist (ACCS)

Adult Critical Care Specialty Examination Matrix

Content Area	Recall	Application	Analysis	Number of Items
	Cognitive Level			
I. RESPIRATORY CRITICAL CARE	**5**	**18**	**35**	**58**
A. Manage Airways	1	3	6	10
B. Administer Specialty Gases	0	2	2	4
C. Manage Ventilation	4	12	24	40
D. Deliver Pharmacologic Agents	0	1	3	4
II. GENERAL CRITICAL CARE	**7**	**27**	**58**	**92**
A. Assess Patient Status and Changes in Status	0	5	22	27
B. Anticipate Care Based on Laboratory Results	1	3	6	10
C. Anticipate Care Based on Imaging and Reports of Imaging	1	2	4	7
D. Anticipate Effects of Pharmacologic Agents	1	3	7	11
E. Anticipate Care Based on Nutritional Status	1	2	1	4
F. Prevent Ventilator Associated Pneumonia	2	2	3	7
G. Recognize and Manage Patients with Infections and Sepsis	0	3	4	7
H. Manage End-of-Life Care	0	1	3	4
I. Prepare for Disasters	1	1	1	3
J. Interact with Members of an Interdisciplinary Team	0	1	2	3
K. Perform Procedures	0	1	1	2
L. Troubleshoot Systems	0	3	4	7
Totals	**12**	**45**	**93**	**150**

Each open cell shows an examination could include an item from the indicated cognitive level, which could interact with the ethics domain when the cell in the ***Ethics*** column is open.

Each shaded cell prevents an item from appearing on an examination.

	Ethics	Recall	Application	Analysis
I. RESPIRATORY CRITICAL CARE		**5**	**18**	**35**
A. Manage Airways		**1**	**3**	**6**
1. Airway clearance techniques				
2. Difficult airway recognition and techniques				
3. Advanced techniques during intubation e.g.,				
• cricoid pressure • specialty visualization devices • tube changers				
4. Artificial airways				
a. exchanging endotracheal tubes				
b. specialty tracheostomy tubes				
B. Administer Specialty Gases		**0**	**2**	**2**
1. Nitric oxide				
2. Helium-oxygen				
C. Manage Ventilation		**4**	**12**	**24**
1. Initial settings				
2. Advanced modes e.g.,				
• techniques to enhance ventilation • techniques to enhance synchrony • techniques to enhance oxygenation				
3. Noninvasive				
4. Waveform analyses				
5. Rescue techniques				
a. recruitment maneuvers				
b. inhaled vasodilators e.g.,				
• nitric oxide • prostacyclin				
c. high frequency ventilation				
d. prone patient positioning				

	Ethics	Recall	Application	Analysis
6. Strategies				
a. liberation (weaning) from mechanical ventilation e.g., • protocols				
b. prevention of lung injury from mechanical ventilation				
c. management of ALI and ARDS				
d. treatment of patients with traumatic injuries e.g., • chest • burns • cervical spine • head • long bone fractures • abdomen				
7. Differential / independent lung ventilation				
8. Intrahospital transport of unstable and high-risk patients				
9. Optimizing patient-ventilator interaction				
D. Deliver Pharmacologic Agents		**0**	**1**	**3**
1. Aerosolized agents other than bronchodilators e.g., • narcotics • vasodilators • antimicrobials				
2. Airway instillations other than for ACLS e.g., • epinephrine • cold saline • lidocaine • topical thrombin				
II. GENERAL CRITICAL CARE		**7**	**27**	**58**
A. Assess Patient Status and Changes in Status		**0**	**5**	**22**
1. Difficult airway issues e.g., • patency • protection • Mallampatti classification • thyromental distance				
2. Chest imaging e.g., • radiograph • ultrasound • CT • MRI • PET • $\dot{V}/\dot{Q}$				
3. Indices of respiratory physiology and mechanics e.g., • oxygenation • carbon dioxide clearance • work of breathing				
4. Neurologic e.g., • EEG • level of consciousness • respiratory function • brain death criteria • neuromuscular function • seizures • stroke				
5. Cardiovascular e.g., • physical assessment • coronary artery disease • diagnostic testing • pulmonary hypertension • arrhythmias • systemic hypertension • CHF				
6. Hemodynamics e.g., • pre-load • contractility • after-load • rate control				
7. Differentiation among types of shock e.g., • anaphylactic • hypovolemic • cardiogenic • neurogenic • septic				
8. Recognition of respiratory failure mechanisms				
a. acute lung injury and ARDS				
b. aspiration				
c. atelectasis				
d. drug induced				
e. hypoventilation syndromes				
f. neuromuscular				
g. obstructive lung disease				
h. pneumonia				
i. post-operative				
j. pulmonary contusion				
k. pulmonary edema e.g., • cardiogenic • noncardiogenic				

	Ethics	Recall	Application	Analysis
l. pulmonary embolism				
m. restrictive lung disease				
n. sleep apnea				
o. transfusion-related lung injury				
p. upper airway obstruction				
9. Renal function e.g.,				
• fluid status • acid-base balance				
10. Metabolic e.g.,				
• respiratory quotient • acid-base balance				
• nutrition/feeding • endocrine disorders				
11. Gastrointestinal e.g.,				
• abdominal distension • ileus				
• feeding tube placement • GI bleeding / endoscopy				
12. Coagulation e.g.,				
• indices • risk for deep vein thrombosis				
• platelet count				
13. Musculoskeletal e.g.,				
• spinal cord injury • rhabdomyolysis				
• ICU myopathy				
B. Anticipate Care Based on Laboratory Results		**1**	**3**	**6**
1. CBC				
2. Cardiac markers e.g.,				
• troponin • BNP				
3. Electrolytes, magnesium, calcium, and phosphate				
4. Acid-base status and lactate level				
5. Coagulation studies				
6. Culture and sensitivities e.g.,				
• blood • sputum				
• stool • urine				
7. Sputum Gram stain				
8. Hemoximetry (co-oximetry) e.g.,				
• carboxyhemoglobin • methemoglobin				
9. BUN and creatinine				
10. Fluid analyses e.g.,				
• pleural • CSF				
• urine • peritoneal				
C. Anticipate Care Based on Imaging and Reports of Imaging		**1**	**2**	**4**
1. Plain radiographs e.g.,				
• chest • abdominal				
• spine				
2. CT e.g.,				
• brain • abdomen				
• chest				
3. MRI				
4. Ultrasound e.g.,				
• pleural • echocardiography				
• vascular				
5. Nuclear scans e.g.,				
• $\dot{V}/\dot{Q}$ lung • cerebral blood flow				
6. Angiography e.g.,				
• pulmonary • bronchial				
• coronary • gastrointestinal				
D. Anticipate Effects of Pharmacologic Agents		**1**	**3**	**7**
1. Sedatives / hypnotics				
2. Analgesia e.g.,				
• regional • systemic				
3. Neuromuscular blocking agents e.g.,				
• vecuronium • cisatracurium				
• succinylcholine				

	Ethics	Recall	Application	Analysis
4. Reversal agents e.g., • naloxone • neostigmine • flumazenil • edrophonium				
5. Vasoactive and inotropic agents				
6. Drugs that induce methemoglobinemia e.g., • lidocaine • nitroprusside • dapsone • benzocaine (Hurricaine) spray • nitric oxide				
7. Prophylaxis for				
a. deep vein thrombosis				
b. stress ulcers				
c. delirium				
8. Diuretics				
9. Drug interactions				
10. Influence of co-morbid conditions				
E. Anticipate Care Based on Nutritional Status		1	2	1
1. Complications of malnutrition e.g., • protein wasting • respiratory muscle catabolism • hypoglycemia				
2. Complications of feedings e.g., • aspiration • malplacement of feeding tube • TPN line infection				
3. Route of feeding e.g., • enteral • parenteral				
4. Morbid obesity				
5. Metabolic study e.g., • caloric requirements • over-fed • exhaled gas analysis • under-fed				
F. Prevent Ventilator Associated Pneumonia		2	2	3
1. Oral care				
2. Bed position				
3. Minimizing intubation time e.g., • aggressive weaning protocols • noninvasive positive pressure ventilation				
4. Ventilator circuit care e.g., • keeping closed • heated wire/HME • optimal position • aerosol medication delivery • closed suction				
5. Using specialty airways e.g., • silver coated • subglottic suction endotracheal tube • polyurethane cuff				
G. Recognize and Manage Patients with Infections and Sepsis		0	3	4
1. Recognition of clinical and laboratory signs consistent with infections and sepsis e.g., • pneumonia • catheter-associated				
2. Management of patients with infections and sepsis e.g., • pneumonia • catheter-associated				
3. Prevention measures e.g., • hand hygiene • catheter care • skin integrity				
H. Manage End-of-Life Care		0	1	3
1. Differentiation of the potential need for end-of-life care e.g., • palliative • hospice				
2. Determination of brain death				
3. Withdrawal of life support				
4. Care of organ donors				
I. Prepare for Disasters		1	1	1
1. Procedures for patient movement and protection				
2. Triage procedures				
3. Equipment and supply management				