RSPT 2131
NBRC Clinical Simulation Exam (CSE)
Overview

Who can take it?

- Eligibility
  - Must be 18 years of age
  - Must have CRT plus
    - be a graduate of a CoARC approved program or
    - have 4 yrs full-time experience + 62 sem hrs or
    - have 2 yrs full-time experience + BS degree

What is it?

- The CSE consists of 10 separate patient management problems
  - The clinical settings and patient situations are designed to simulate reality and be relevant to current practice
  - Time allowed: 4 hours

What is it?

- To ensure that each CSE is consistent in content, the 10 problems cannot be chosen at random
  - Such factors as problem length, patient type, disease process, degree of difficulty and content tested by individual problems must be considered

What’s on it?

- A typical CSE will include
  - 2 adult patients with COPD
  - 1-2 adult trauma patients
  - 1-2 adult cardiovascular disease patients
  - 1-2 adult neurological or neuromuscular disease patients
  - 1 pediatric patient
  - 1 neonatal patient
  - potentially 1 adult patient with other medical or surgical conditions

A closer look...

- 2 adult patients with COPD
  - Emphysema
  - Bronchiectasis
  - Bronchitis
  - Asthma
  - Status asthmaticus
  - Sleep apnea
A closer look…

• 1-2 adult trauma patients
  – Chest trauma/flail chest*
  – Hemo/pneumothorax*
  – Burns/smoke inhalation/CO poisoning*
  – Thoracic surgery
  – Head & neck trauma/surgery
  – ARDS
  – Spinal injury
  – Abdominal surgery - pre- & postop
  – Hypothermia

A closer look…

• 1-2 adult cardiovascular disease patients
  – CHF/pulmonary edema*
  – MI/chest pain*
  – Mitral stenosis/valve replacement
  – Pulmonary emboli
  – Cor pulmonale/shock
  – Coronary artery disease
  – Heart surgery - pre- & postop

A closer look…

• 1-2 adult neurological or neuromuscular disease patients
  – Myasthenia gravis*
  – Guillain-Barré syndrome
  – Poliomyelitis
  – Tetanus/botulism
  – Drug overdose
  – Stroke
  – Muscular dystrophy

A closer look…

• 1 pediatric patient
  – Croup/epiglottitis*
  – Cystic fibrosis*
  – Bronchiolitis
  – Allergic asthma
  – Toxic substance ingestion
  – Foreign body airway obstruction

A closer look…

• 1 neonatal patient
  – IRDS*
  – Meconium aspiration*
  – Infant apnea/CPR
  – Congenital heart disease
  – Delivery room care

A closer look…

• Potentially 1 adult patient with other medical or surgical conditions
  – CPR*
  – AIDS*
  – Exposure/hypothermia
  – Diabetic/renal failure
  – Pickwickian syndrome/obesity
  – Near-drowning
How does it work?
• CSEs use “branching logic”
  – Direction and progression of simulation problem is
determined by your choices
• Each problem has 3 sections
  – Scenario
  – Information gathering
  – Decision making

How does it work?
• Scenario
  – You are the day shift supervisor in a 500-bed hospital.
  At 2:30 pm, a male patient approximately 45 years old
  and weighing 180 lbs is admitted to the ED with a
  possible MI. The paramedics are performing CPR and
  ventilating the patient via bag/mask with an FIO$_2$ of 1.0.
The mask is found to have vomitus in it. Dr. Wang
  asks for your help in the initial assessment of this
  patient.

How does it work?
• Scenario
  – Identify the key points in the scenario
  – Mentally form possible causes and results
  – Keep an open mind

How does it work?
• Scenario
  – 500 bed hospital
  – 45 yom, 180 lbs
  – In ED
  – Possible MI
  – CPR in progress
  – Bag/mask ventilation
  – Vomitus in mask
  – Physician asks for initial assessment

How does it work?
• Information Gathering
  – You will be instructed to select as many as you
    consider appropriate
    • Read all options and select those you believe appropriate
    • All options are in the same time frame
  – Do not choose more than necessary
  – Some are useful, some irrelevant and some are
detrimental

Equipment and procedures readily available
82 kg
Time constraints?
Hypoxia?
Broken ribs?
Gastric insufflation?
Aspiration?
Nothing that will take a long time - nothing sophisticated
How does it work?

**Information Gathering**
- Some almost always result in positive results
  - vital signs
  - color
  - breath sounds, respiratory pattern
  - general appearance
  - sensorium
  - history of present illness

How does it work?

**Information Gathering - Scoring**
- **+3** Of general or critical importance in appropriate care of the patient and resolution of the problem
- **+2** Strongly facilitative of appropriate care...
- **+1** Mildly facilitative of appropriate care...
- **0** Optional and noncontributory
- **-1** Mildly detrimental...
- **-2** Seriously harmful...
- **-3** Gravely detrimental

How does it work?

<table>
<thead>
<tr>
<th>Heart rate</th>
<th>Breath sounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory rate</td>
<td>Temperature</td>
</tr>
<tr>
<td>CVP</td>
<td>EKG</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Ocular pressure</td>
</tr>
<tr>
<td>Complete PFT</td>
<td>Smoking history</td>
</tr>
<tr>
<td>Spontaneous V</td>
<td>Chest x-ray</td>
</tr>
<tr>
<td>ARDS</td>
<td>CBC</td>
</tr>
<tr>
<td>Sputum culture</td>
<td>Electrolytes</td>
</tr>
<tr>
<td>Color</td>
<td>Deep tendon reflex</td>
</tr>
</tbody>
</table>

How does it work?

**Decision Making**
- In most instances, you will be instructed to select only one option
  - Remember, this is not a multiple choice exam - all options may be correct
  - Evaluate each option critically, then choose the best answer based on information gathered
    - More than one answer may carry positive points, some more than others

How does it work?

**Decision Making**
- Intubate patient and place on FiO₂ 1.0
- Intubate patient and manually ventilate at FiO₂ 1.0
- Intubate patient and place on a pressure-limited ventilator
- Intubate patient and place on a volume-limited ventilator
- Intubate patient, manually ventilate at FiO₂ 1.0 and defibrillate

---

**How does it work?**

- **Information Gathering**
  - Some almost always result in positive results
    - vital signs
    - color
    - breath sounds, respiratory pattern
    - general appearance
    - sensorium
    - history of present illness

**How does it work?**

- **Information Gathering - Scoring**
  - **+3** Of general or critical importance in appropriate care of the patient and resolution of the problem
  - **+2** Strongly facilitative of appropriate care...
  - **+1** Mildly facilitative of appropriate care...
  - **0** Optional and noncontributory
  - **-1** Mildly detrimental...
  - **-2** Seriously harmful...
  - **-3** Gravely detrimental

**How does it work?**

<table>
<thead>
<tr>
<th>Heart rate</th>
<th>Breath sounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory rate</td>
<td>Temperature</td>
</tr>
<tr>
<td>CVP</td>
<td>EKG</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Ocular pressure</td>
</tr>
<tr>
<td>Complete PFT</td>
<td>Smoking history</td>
</tr>
<tr>
<td>Spontaneous V</td>
<td>Chest x-ray</td>
</tr>
<tr>
<td>ARDS</td>
<td>CBC</td>
</tr>
<tr>
<td>Sputum culture</td>
<td>Electrolytes</td>
</tr>
<tr>
<td>Color</td>
<td>Deep tendon reflex</td>
</tr>
</tbody>
</table>

**How does it work?**

- **Decision Making**
  - In most instances, you will be instructed to select only one option
    - Remember, this is not a multiple choice exam - all options may be correct
  - Evaluate each option critically, then choose the best answer based on information gathered
    - More than one answer may carry positive points, some more than others

**How does it work?**

- **Decision Making**
  - Intubate patient and place on FiO₂ 1.0
  - Intubate patient and manually ventilate at FiO₂ 1.0
  - Intubate patient and place on a pressure-limited ventilator
  - Intubate patient and place on a volume-limited ventilator
  - Intubate patient, manually ventilate at FiO₂ 1.0 and defibrillate
How does it work?
• Decision Making
  – After reading all the options, check the one you feel is best
  – The data you are given will indicate your next action by either:
    • directing you to go to the next section or
    • directing you to choose another option in the same section

How does it work?
• Decision Making
  – If you are directed to choose another option in the same section
    • It does not necessarily mean that the option you chose was incorrect, that you made a mistake or that you lost points - just like in real situations, the physician may disagree with your recommendation or decision, or equipment may not be available, etc.
    • continue to select the option you think is the most appropriate until you are directed to the next section

How does it work?
• Decision Making
  – Occasionally, in a DM section, you will be instructed to select as many options as you feel are indicated or necessary
  – Remember that all options are in the same time frame; after reading all options, select all that would be necessary in the situation, regardless of the data you obtain from uncovering responses

What does it test?
• Remember, the test is designed to assess your ability to
  – gather appropriate clinical data, including physical and laboratory
  – interpret data to establish criteria for Decision Making
  – solve the problem by identifying and analyzing the situation, and taking the appropriate steps toward its resolution
  – make clinical judgments or decisions about the appropriate management of the patient with regard to timing and necessity of therapy

What does it test?
• The problems are constructed to simulate a clinical situation as closely as possible; they are not designed to test whether you can arrive at a solution with a minimum number of choices - on the other hand, the fact that an option is offered does not necessarily imply that it would be included in optimal management of the patient described - to summarize: you should choose EVERY item you regard as pertinent and you should NOT choose any item that you regard as not contributory or inappropriate

Tips for taking it
• Information Gathering
  – respiratory rate, heart rate, BS, color and general appearance: order on all patients first - if no pulse, don’t pick further - Code
  – temperature: do not order on trauma patients
  – blood pressure: do not order on arrested patients
  – WBC or CBC: order if increased temperature
  – BUN, creatinine to assess renal function
  – blood glucose, total protein, cholesterol to assess nutritional status
**Tips for taking it**

**Information Gathering**
- Electrolytes: order if patient is in metabolic alkalosis or patient described as having any kind of muscle weakness, nausea, mental changes, lethargy, drowsiness and malaise
- Cardiac enzymes: order if suspected MI or blunt chest trauma
- Chest palpation: do not order on burn patients
- Chest trauma: first problem is usually oxygenation

**Tips for taking it**

**Information Gathering**
- Remember, with ABGs, you are at sea level
- If you don’t know what a test is - don’t select it
- Don’t ask “Why select this?” - ask “Why not?”
  - too much time?
  - too expensive?
  - any use?
  - invasive?

**Tips for taking it**

**Patient Management**
- Step 1 - always ask the Life Function questions
  - Is the patient ventilating? (PaCO₂, f, Vt, BS) - if not, treat it
  - Is the patient oxygenating? (PaO₂, SpO₂, PtcO₂, color, sensorium, HR) - if not, know the rules
    - Increase FiO₂ to .6 then add PEEP/CPAP
    - If patient is already above .6 FiO₂, then increase PEEP/CPAP
  - Does the patient have circulation? (HR & strength, CO) - if not, treat it
  - Is the patient perfusing? (BP, sensorium, urine output, hemodynamics) - if not, treat it

**Tips for taking it**

**General considerations**
- In emergencies - proceed right to therapy; do not do more testing; then assess response
- HR>100 - consider the patient hypoxic; RR>30 - patient is in respiratory failure
- EEC and EKG may be offered to try to confuse you into picking EEG -- READ CHOICES CAREFULLY
- Must have spontaneous breathing to use CPAP
- Never give acetylcysteine without a bronchodilator

**Tips for taking it**

**General considerations**
- Complete isolation for any staph infection
- Antibiotics: gram+ infections, use broad spectrum e.g. Erythromycin, Terramycin; gram- infections, use “mycins” e.g. Kanamycin, Gentamycin
- Choose cough suppressants if cyanosis occurs during coughing spells
- No heated aerosol if patient has fever

**Tips for taking it**

**General considerations**
- NEVER give the wrong therapy, no matter what anyone threatens you with!!
Tips for taking it

• Diseases/conditions
  – Pulmonary edema
    • true emergency - time is a factor, be aggressive, give 100% O\textsubscript{2} first
    • standard treatment after O\textsubscript{2} used to be IPPB with 100% O\textsubscript{2} and 50% ethyl alcohol
    • may eventually intubate and use mechanical ventilation

• Diseases/conditions
  – Code 99
    • NEVER leave patient
    • NEVER give IPPB
    • Do give 100% O\textsubscript{2} and manually ventilate
    • Know CPR sequencing
    • If patient goes on ventilator after HR is restored, use 100% O\textsubscript{2}

Tips for taking it

• Diseases/conditions
  – Epiglottitis
    • History will show child 2-8 yo with sudden onset of symptoms
      – fever
      – cough, hoarseness, sore throat
      – drooling
      – inspiratory stridor (supraglottic inflammation by H. influenza type B)
      – tachycardia, nasal flaring

• Diseases/conditions
  – Epiglottitis
    • True emergency - no ABGs, BP, CXRs, lab assessment - no further stimulation of child
    • Airway is priority - to OR to intubate with 1 size smaller ETT than normal, then to ICU
    • DO NOT visualize epiglottis without airway in place - if this is done, it is usually by physician - do not touch epiglottis

Tips for taking it

• Diseases/conditions
  – Epiglottitis
    • DO NOT give any kind of aerosol without airway in place
    • When airway is in place - humidified O\textsubscript{2}, antibiotics, CPT and suction
    • Extubate when air leak is heard around ETT (3-4 days), then racemic epi by SVN

• Diseases/conditions
  – Croup
    • History will show child <2 yo, and a gradual onset of symptoms
    • Assessment will reveal inspiratory stridor, barking cough, hoarseness, tachypnea and tachycardia
    • Croup is a viral infection (parainfluenza) which causes subglottic inflammation
    • Differential diagnosis of croup and epiglottitis: steeple sign in croup lateral neck xray; epiglottitis patients nearly always drool
Tips for taking it

• Diseases/conditions
  – Croup - treatment
    • Cool mist with FIO\textsubscript{2} 30–40
    • Plenty of rest; maybe ICU
    • Racemic epi by SVN (do not awaken for Rx)
    • When child shows improvement - start CPT
    • Do not suction if airway is not in place
    • Do throat and blood cultures

• Diseases/conditions
  – Mechanical ventilation
    • Know when to commit to ventilator (by the numbers) and initial settings
    • Initial settings are by ideal body weight: male 70–80 kg; female 50–60 kg
    • Do not put patient with lung problems on pressure-cycled vent; this is ok on post-op and drug OD

• Diseases/conditions
  – Mechanical ventilation
    • If ANY problem arises with the ventilator - manually bag the patient
    • If manual ventilation proves difficult - suction; if suction catheter won’t pass - extubate
    • All ventilator changes should be based on patient condition and lab results (by the numbers)

• Diseases/conditions
  – Neuromuscular problems
    • Myasthenia gravis
      – upper body problems (dysphagia, blurred vision) that improve with rest
      – do Tensilon test (edrophonium) - if patient improves test is positive; if patient worsens, patient is in cholinergic crisis - give atropine and be prepared to insert airway, give O\textsubscript{2}, intubate/ventilate, suction, etc.
      – treat with Neostigmine (Prostigmin), Mestinon
      – admit patient, monitor (IC, \textit{V\textsubscript{1}}, \textit{V\textsubscript{2}}, \textit{VS} q4h) - go to mechanical ventilation if condition deteriorates
Tips for taking it
• Diseases/conditions
  – High risk deliveries
    • C-sections, pre-term, post-term, multiple births; mother over 30 yo, drug user, diabetic
    • Initial assessment - BS, weight, APGAR
    • HR<100 = code - begin CPR (start with airway!)
    • Temperature is critical
      When stable, do glucose on all infants - term = 30-50, pre-term = 20-30; do blood gases
    • Don’t mechanically ventilate if infant is ventilating OK - remember O2 rules

Tips for taking it
• Diseases/conditions
  – High risk deliveries
    • Start CPAP/PEEP at 2-3 cmH2O
    • Ventilate with pressure-cycled ventilator
      – 20-25 cmH2O if lungs are clear
      – 30 cmH2O if “ground glass” appearance
      – rate = 20 bpm (may need higher in pre-term, but start at 20)
      – start at same FIO2 and PEEP level as before ventilation
      – re-assess with blood gases

Tips for taking it
• Diseases/conditions
  – High risk deliveries
    • Consider transillumination if pneumothorax is suspected
    • Know pre-ductal vs. post-ductal sites
      – If ductus arteriosus is closed, PO2s will be the same

Tips for taking it
• Diseases/conditions
  – Status asthmaticus
    • Treatment
      – 100% O2
      – Sub-Q epi
        » no response - more epi in 20-30 min
        » no response - more epi (up to 3 injections)
        » no response - Pavulon and mechanical ventilation
      – Maintain 100% O2 until indications no longer exist

Tips for taking it
• Diseases/conditions
  – Status asthmaticus
    • History will show patient not improving with home meds
    • Assessment shows severe distress
    • Don’t just keep recommending bronchodilator treatments

Tips for taking it
• Diseases/conditions
  – True emergencies (time really matters)
    • Status asthmatics
    • Pulmonary edema
    • Epiglottitis
    • Burns/smoke inhalation/CO poisoning
    • Near-drowning
    • Code 99
    • Shock (maybe)
CSE

• Study List
  – In addition to the diseases (slides 6-12) and conditions listed here, study
    • Post-op evaluation
    • Critical care management
    • Mechanical ventilation
    • PFT evaluation
    • Infection control
    • Rehabilitation
    • Home care

Score reporting

• Score reporting
  – Each section of IG and DM is evaluated by content experts and their judgments are used in assigning scoring weights to each section
  – You will be provided with your score on each problem and the minimum passing level (MPL) and the maximum score (MAX) for each problem