Procedural Sedation

1. Procedural sedation

1.1 Procedural Sedation

1.2 Not Just Anesthesiology!
1.3 Sedation Goals?

Sedation Goals?

- Patient safety
- Minimizing pain and anxiety associated with procedure
- Minimizing patient motion during the procedure
- Maximizing the success of a procedure
- Recovery to presedation state as quickly as possible

1.4 Sedation is a Continuum

Sedation is a Continuum

- Anxiolysis
- Moderate Sedation (conscious sedation)
- Deep Sedation
- General Anesthesia

1.5 Besides anesthesiologists, which physicians can provide procedural sedation?

(Multiple Choice, 10 points, unlimited attempts permitted)
1. Besides anesthesiologists, which physicians can provide procedural sedation?

- Surgeons
- Emergency Medicine
- Pulmonologists
- Gynecologists
- All of the above can provide some form of sedation

**Correct Choice**

<table>
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<tr>
<td>Emergency Medicine</td>
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<td>Pulmonologists</td>
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**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.
Correct (Slide Layer)

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   - Emerg
   - Pulm
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Incorrect (Slide Layer)

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   - Surgeons
   - Emerg
   - Pulm
   - Gyne
   - All of the above can provide some form of sedation

   Incorrect
   You did not select the correct response.
1.6 Which of the following is NOT a goal for sedation during a procedure?

(Multiple Choice, 10 points, unlimited attempts permitted)

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Alleviate anxiety</td>
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</tbody>
</table>
Provide a “quiet” surgical field

Make the procedure as pain free as possible

X Minimizing the use of monitors to expedite care

Returning the patient to presedation state as quickly as possible

Feedback when correct:
That's right! You selected the correct response.

Feedback when incorrect:
You did not select the correct response.

Correct (Slide Layer)
2. Which of the following is NOT a goal for sedation during a procedure?

- Alleviate anxiety
- Provide pain relief
- Make patient comfortable
- Minimize patient discomfort
- Returning the patient to pre-sedation state as quickly as possible

Incorrect (Slide Layer)

Try Again (Slide Layer)
1.7 Anxiolysis

Anxiolysis

- Patients respond normally to verbal commands
- Mild cognitive impairment
- No cardiopulmonary effects

1.8 Moderate Sedation

Moderate Sedation

- “Conscious Sedation”
- Patients respond to verbal or light tactile simulation
- Airway and ventilation remain competent
- Cardiovascular is usually unaffected
1.9 Deep Sedation

Deep Sedation

- Patients respond to repeated or painful stimulation
- Airway and ventilation often require intervention
- Cardiovascular system is usually unaffected

1.10 General Anesthesia

General Anesthesia

- Patients not arousable to painful stimulation
- Airway and ventilation often require intervention
- Cardiovascular system often impaired
- Often does not require intubation
1.11 Sedation Spectrum

1.12 The stages of sedation are clear and obvious

(Multiple Choice, 10 points, unlimited attempts permitted)

<table>
<thead>
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<th>Correct Choice</th>
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</thead>
<tbody>
<tr>
<td>True</td>
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</table>
Feedback when correct:
That's right! You selected the correct response.

Feedback when incorrect:
You did not select the correct response.

Correct (Slide Layer)

3. The stages of sedation are clear and obvious

- True
- False

Correct
That's right! You selected the correct response.

Continue
Incorrect (Slide Layer)

3. The stages of sedation are clear and obvious

- True
- False

Incorrect
You did not select the correct response.

Continue

Try Again (Slide Layer)

3. The stages of sedation are clear and obvious

- True
- False

Incorrect
That is incorrect. Please try again.

Try Again
1.13 Sedation Spectrum

Providers should anticipate inadvertent advancement or decline in sedation continuum:
- Sedation level is affected by the amount of stimulation from the procedure
- Decline in stimulation causes an increase in sedation independent of any additional sedative administration
- Therefore providers must be trained and capable of rescuing patients from the next level of sedation...
...And return safely to planned level of sedation

1.14 During Moderate Sedation, which is NOT true?

(Multiple Choice, 10 points, unlimited attempts permitted)

4. During Moderate Sedation, which is NOT true?

- Patient responds to verbal or tactile stimulation
- The patient’s airway remains competent
- The patient’s ventilation is stable
- The patient’s cardiovascular is often unstable
- The sedation can be referred as conscious sedation

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<td>X The patient’s cardiovascular is often unstable</td>
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**Feedback when incorrect:**

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**Correct (Slide Layer)**

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- The patient’s airway remains competent
- The patient’s ventilation is stable
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That's right! You selected the correct response.
1.15 Which of the following statements is true regarding Deep Sedation?

(Multiple Choice, 10 points, unlimited attempts permitted)
5. Which of the following statements is true regarding Deep Sedation?

- The patient responds to verbal or tactile simulation
- The airway and ventilation is always competent
- The cardiovascular system is always intact
- Does not require capnography
- None of the above are true

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That's right! You selected the correct response.

**Feedback when incorrect:**

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Correct (Slide Layer)

5. Which of the following statements is true regarding Deep Sedation?

- The patient responds to verbal or tactile simulation
- The action is to be repeated
- The clinician monitors the patient
- Does
- None of the above are true

Incorrect (Slide Layer)

5. Which of the following statements is true regarding Deep Sedation?

- The patient responds to verbal or tactile simulation
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1.16 Which is true about General Anesthesia?

(Multiple Choice, 10 points, unlimited attempts permitted)

<table>
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<tbody>
<tr>
<td>Patients are unarousable</td>
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<tr>
<td>Does not necessarily require airway support</td>
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<tr>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Can have cardiovascular perturbations</td>
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<tr>
<td>May be an unanticipated state during attempted deep sedation</td>
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</tbody>
</table>

X All of the above are true

**Feedback when correct:**
That's right! You selected the correct response.

**Feedback when incorrect:**
You did not select the correct response.

**Correct (Slide Layer)**

6. Which is true about General Anesthesia?
   - Patients are unarousable
   - Does not necessarily require airway support
   - Can have cardiovascular perturbations
   - May be an unanticipated state during attempted deep sedation
   - All of the above are true

Correct
That's right! You selected the correct response.

Continue
1.17 Regarding airway management and instrumentation during procedural sedation, which of the following statements are true?

(Multiple Choice, 10 points, unlimited attempts permitted)
7. Regarding airway management and instrumentation during procedural sedation, which of the following statements are true?

- May not be required in anxiolysis
- May not be required in moderate sedation
- May not be required in deep sedation
- May not be required in general anesthesia
- All of the above are true

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<thead>
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<tbody>
<tr>
<td>X</td>
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**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.
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- May
- May
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- May
- May

○ All of the above are true

Incorrect (Slide Layer)

7. Regarding airway management and instrumentation during procedural sedation, which of the following statements are true?

- May
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- May

○ All of the above are true
1.18 Commonly Used Drugs

Commonly Used Drugs

- Midazolam
- Fentanyl
- Morphine
- Dilaudid
- Ketamine
- Propofol
- Dexmedetomidine
1.19 2 Key Concepts

Two Key Concepts:

Safe & Successful:

1. Titration
2. Synergism

1.20 Titration

Titration

- Definition: the process of gradually adjusting the dose of a medication until optimal results are reached.
- Optimal results? safe, comfortable, immobile,...
- Sufficient time must elapse between doses of concomitant sedative medications to allow the effect of each dose to peak and be assessed before subsequent drug administration.
1.21 Synergism

**Definition:** drugs that work together so that the total effect is greater than the sum of the parts.

- Administration of drug A can reduce the amount of drug B in a different class that is needed to achieve the desired sedation.
- Drug synergism increases the likelihood of adverse events and side effects.
- Opioids, midazolam, propofol have prominent synergistic effects.

1.22 Which type of sedation drug is frequently used?

*(Multiple Choice, 10 points, unlimited attempts permitted)*

8. Which type of sedation drug is frequently used?
   - Benzodiazapines
   - Opioid
   - Propofol
   - Ketamine
   - All can be used if the Physician has appropriate privileges

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<td>Benzodiazapines</td>
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<tr>
<td>Opioid</td>
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<tr>
<td>Propofol</td>
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<tr>
<td><strong>X</strong></td>
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**Feedback when correct:**
That's right! You selected the correct response.

**Feedback when incorrect:**
You did not select the correct response.

**Correct (Slide Layer)**

8. Which type of sedation drug is frequently used?

- Benzodiazepines
- Opioid
- Propofol
- Ketamine
- All can be used if the Physician has appropriate privileges

Correct
That's right! You selected the correct response.

Continue
1.23 Regarding titration, which statement is most true?

(Multiple Choice, 10 points, unlimited attempts permitted)
9. Regarding titration, which statement is most true?

- You do not need a baseline or effect to adjust to
- You do not need to consider bolus verses infusion during adjustments
- You need to always start with a bolus
- You need to allow sufficient time in between doses or adjustments before additional changes
- All of the above are false

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**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.
Correct (Slide Layer)

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Incorrect (Slide Layer)

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1.24 What best describes synergism?

(Multiple Choice, 10 points, unlimited attempts permitted)

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Positive energy expediting a desired outcome

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<th>The total affect is greater than the sum of the parts</th>
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<tr>
<td>Zero sum game</td>
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<tr>
<td>Similar things minimizing adverse outcomes</td>
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**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.

**Correct (Slide Layer)**

20. What best describes synergism?

- Like begets like
- Positive energy expediting a desired outcome
- The total affect is greater than the sum of the parts
- Zero
- Similar things minimizing adverse outcomes

Correct

That's right! You selected the correct response.

Continue
Incorrect (Slide Layer)

20. What best describes synergism?
- Like begets like
- Positive combination
- The two parts are the same
- Zero
- Similar

Incorrect
You did not select the correct response.

Try Again (Slide Layer)

20. What best describes synergism?
- Like begets like
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Incorrect
That is incorrect. Please try again.
1.25 Hypercapnic Respiratory Drive

Hypercapnic Respiratory Drive

- PaCO2 activates central chemoreceptors to stimulate respiration (primary respiratory drive)
- Opioids and BZDs significantly decrease the chemoreceptor sensitivity to PaCO2
- PaCO2 increases during sedation
- CO2 can become a sedative: CO2 narcosis

1.26 Hypercapnic Respiratory Drive
1.27 Hypoxic Respiratory Drive

Hypoxic Respiratory Drive

- Body can use O2 peripheral chemoreceptors instead of CO2 receptors to regulate respiration.
- Increases as the PaO₂ goes below 70mmHg
- Often leads to unconsciousness prior to stimulation to breathe
- Sedatives blunt the hypoxic drive
- Likely to experience respiratory arrest prior to stimulating respiration

1.28 Regarding the partial pressure of CO2 in the blood and the respiratory drive...

(Multiple Choice, 10 points, unlimited attempts permitted)

11. Regarding the partial pressure of CO2 in the blood and the respiratory drive...

- CO₂ is a secondary respiratory drive
- Is unaffected by Benzodiazepines and Opiates
- If the CO₂ is high enough, it can be a sedative
- PaCO₂ increases with hyperventilation
- Low PaCO₂ values can cause hyperventilation
Correct Choice

CO2 is a secondary respiratory drive

Is unaffected by Benzodiazapines and Opiates

X If the CO2 is high enough, it can be a sedative

PaCO2 increases with hyperventilation

Low PaCO2 values can cause hyperventilation

Feedback when correct:

That’s right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)
1.29 Which of the following is NOT true about the alveolar ventilation PaCO2 curve?

(Multiple Choice, 10 points, unlimited attempts permitted)
12. Which of the following is NOT true about the alveolar ventilation PaCO2 curve?

- Narcotics shift the curve to the Right
- Narcotics increase the impact of PaCO2 on alveolar ventilation
- General Anesthesia both lessens the impact and shifts the curve to the right
- Moderate sedation has no impact on CO2 and alveolar ventilation
- All of the above are true

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That's right! You selected the correct response.

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You did not select the correct response.
Correct (Slide Layer)

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- General anesthesia shifts the curve
- Moderate sedation has no impact on CO2 and alveolar ventilation
- All of the above are true
1.30 Regarding the hypoxic respiratory drive...

(Multiple Choice, 10 points, unlimited attempts permitted)

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<td>It is usually the primary respiratory drive</td>
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<td><strong>It’s effect begins with a PaO2 less than 90 mmHg</strong></td>
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<td>X</td>
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**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.

**Correct (Slide Layer)**
Incorrect (Slide Layer)

13. Regarding the hypoxic respiratory drive...
- It is usually the primary respiratory drive
- It’s effect begins with a PaO2 less than 90 mmHg
- It is a central chemosensitive receptor
- It is not a peripheral chemosensitive receptor
- Patient hyperventilation before hypoxemia

Incorrect
You did not select the correct response.

Try Again (Slide Layer)

13. Regarding the hypoxic respiratory drive...
- It is usually the primary respiratory drive
- It’s effect begins with a PaO2 less than 90 mmHg
- It is a central chemosensitive receptor
- It is not a peripheral chemosensitive receptor
- Patient hyperventilation before hypoxemia

Incorrect
That is incorrect. Please try again.
1.31 Reversal Drugs

Reversal Drugs

- Opioids = naloxone aka Narcan
- Benzodiazapines = flumazenil aka Romazicon
- Acute complete reversal of opioid-induced analgesia can result in pain, hypertension, tachycardia or pulmonary edema.
- Acute reversal of BZDs can cause seizures
- Ketamine, precedex, propofol = NO reversal available

1.32 High Risk Patients

High Risk Patients

- Geriatrics
- Pediatrics
- Obese
- Pregnant
- COPD
- CAD
- Drug Addiction
- Anomalous Airway
- Liver Disease
- Renal Disease
- Sleep Apnea

1.33 Which of the following statements is NOT true?

(Multiple Choice, 10 points, unlimited attempts permitted)
14. Which of the following statements is NOT true?

- Flumazenil can reverse Benzodiazepines
- Ketamine does not have a reversal agent
- Naloxone can reverse opiates
- Flumazenil can also reverse Propofol
- Dexmetomidine (precedex) does not have a reversal agent

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That's right! You selected the correct response.

**Feedback when incorrect:**
You did not select the correct response.
Correct (Slide Layer)

14. Which of the following statements is NOT true?
- Flumazenil can reverse Benzodiazepines
- Ketamine does not have a reversal agent
- Naloxone and Naltrexone are opioids
- Flumazenil does not reverse benzodiazepines
- Dexamethasone is an anti-inflammatory agent

That's right! You selected the correct response.

Incorrect (Slide Layer)

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- Flumazenil can reverse Benzodiazepines
- Ketamine does not have a reversal agent
- Naloxone and Naltrexone are opioids
- Flumazenil is not a benzodiazepine
- Dexamethasone is an anti-inflammatory agent

You did not select the correct response.

Continue
1.34 Which of the following patient type is NOT considered a high risk for sedation?

(Multiple Choice, 10 points, unlimited attempts permitted)
<table>
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<tr>
<th>Correct</th>
<th>Choice</th>
</tr>
</thead>
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<tr>
<td>X</td>
<td>Teenager</td>
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<td>Pregnant</td>
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<tr>
<td></td>
<td>Geriatric</td>
</tr>
<tr>
<td></td>
<td>Pediatric</td>
</tr>
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<td>Drug addict</td>
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</table>

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.

**Correct (Slide Layer)**
1.35 Which of the following is NOT considered a high risk patient for sedation?

(Multiple Choice, 10 points, unlimited attempts permitted)
16. Which of the following is NOT considered a high risk patient for sedation?

- CAD patient
- COPD patient
- High endurance athletes
- Liver diseased patient
- Renal diseased patient

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<td></td>
<td>CAD patient</td>
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- Liver
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Correct (Slide Layer)

Incorrect (Slide Layer)
Try Again (Slide Layer)

16. Which of the following is NOT considered a high risk patient for sedation?

- CAD patient
- COPD
- High
- Liver
- Renal diseased patient

That is incorrect. Please try again.

1.36 Monitoring needs

Monitoring needs

- Pulse oximetry
- Blood pressure
- Heart Rate (ECG)
- Respiratory monitoring device
- Capnometry
1.37 Pulse Oximetry

Pulse Oximetry

- Variably delay on Monitor reading vs. Patient
  - Depends on provider setting and probe location
  - 15s, 30s, 60s
- Measurement can be problematic with supplemental Oxygen
  - Saturation may be acceptable 90-100%
    But hides significant (A-a) gradient if high FiO2
    And hides increasing CO2 concentration
  - Hypercapnia can create narcosis

1.38 Supplemental oxygen

Supplemental Oxygen

- Alveolar Gas Equation
  - \( PAO2 = FiO2 \times (P_{atm} - PH2O) - PaCO2 \times RQ \)
  - \( PAO2 = \frac{Gas\ In \ - \ Gas\ Out}{RQ} \)
- Compounding Problems
  - Sedation dulls CO2 Respiratory drive
  - CO2 builds up in Lungs
  - CO2 limits amount of oxygen gas delivered to patient
  - High FiO2 prevents Hypoxic respiratory drive
  - CO2 narcosis readily ensues
1.39 Capnography

Capnography

- Measures and displays the partial pressure of CO2 in respiratory gases
- Attached to Nasal Cannula (Non-invasive)

ASA STANDARD of CARE:
- “During moderate or deep sedation the adequacy of ventilation shall be evaluated by continual observation of qualitative clinical signs and monitoring for the presence of exhaled carbon dioxide unless precluded or invalidated by the nature of the patient, procedure, or equipment.”

1.40 Capnography

Capnography

Normal Capnogram | Normal EtCO₂: 35 – 45 mmHg

The “normal” capnogram is a waveform which represents the varying CO₂ level throughout the breath cycle.

Waveform Characteristics:

- A-B: Baseline
- B-C: Expiratory Upright
- C-D: Expiratory Plateau
- D: End-Tidal Concentration
- E: Inspiration
1.41 Capnography

**Capnography**

- Unlike Pulse Oximetry:
  - Reveals adequacy of Ventilation
  - < 5 sec delay in machine vs. patient
- Be wary -- EtCO2 value is the lowest value PaCO2 might be...
  1. EtCO2 = End-tidal CO2
  2. PaCO2 usually at least 5mmhg higher than EtCO2
  3. Mixes with tracheal and environmental gas
  4. Dilutes CO2 concentration
  5. Need PaCO2 to obtain actual PaCO2 value

1.42 Monitoring Sedation

**Monitoring Sedation**

- Two Scales most frequently used:
  - Ramsay & RASS Scales
- Must be continuously documented by monitoring health care worker
- UF Health uses RASS Scale
1.43 RASS Sedation Scale

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<thead>
<tr>
<th>RASS Sedation Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>Alert &amp; calm</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Drowsy</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>Light sedation</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>Moderate sedation</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>Deep sedation</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>Unarousable</td>
</tr>
</tbody>
</table>

1.44 Ramsey Sedation Scale

<table>
<thead>
<tr>
<th>Ramsey Sedation Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awake</td>
</tr>
<tr>
<td>Levels:</td>
</tr>
<tr>
<td>1 Patient anxious or agitated or both</td>
</tr>
<tr>
<td>2 Patient cooperative, oriented and tranquil</td>
</tr>
<tr>
<td>3 Patient responds to commands only</td>
</tr>
<tr>
<td>Asleep</td>
</tr>
<tr>
<td>Levels:</td>
</tr>
<tr>
<td>4 A brisk response to a light glabellar tap</td>
</tr>
<tr>
<td>5 A sluggish response to a light glabellar tap</td>
</tr>
<tr>
<td>6 No response</td>
</tr>
</tbody>
</table>

1.45 Which of the following monitors is optional for moderate sedation?

(Multiple Choice, 10 points, unlimited attempts permitted)
17. Which of the following monitors is optional for moderate sedation?

- ECG
- Mass Spectometry
- Pulse Oximetry
- Capnography
- Blood pressure monitor

Correct Choice

<table>
<thead>
<tr>
<th>Correct</th>
<th>Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ECG</td>
</tr>
<tr>
<td>X</td>
<td>Mass Spectometry</td>
</tr>
<tr>
<td></td>
<td>Pulse Oximetry</td>
</tr>
<tr>
<td></td>
<td>Capnography</td>
</tr>
<tr>
<td></td>
<td>Blood pressure monitor</td>
</tr>
</tbody>
</table>

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.
17. Which of the following monitors is optional for moderate sedation?

- ECG
- Mass
- Pulse
- Capn
- Blood

Correct (Slide Layer)

Incorrect (Slide Layer)
1.46 Which of the following is NOT true about Pulse Oximetry?

(Multiple Choice, 10 points, unlimited attempts permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be delayed from real time by 15 or more seconds</td>
</tr>
<tr>
<td>Can be affected by atrial fibrillation</td>
</tr>
<tr>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Can be affected by too much ambient light</td>
</tr>
<tr>
<td>X  Is good at monitoring hypoventilation</td>
</tr>
<tr>
<td>Can not tell you about the (A-a) gradient if on a high FiO2</td>
</tr>
</tbody>
</table>

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.

**Correct (Slide Layer)**

![Image of a question slide](image-url)
1.47 Supplemental oxygen can be dangerous in procedural sedation because...

(Multiple Choice, 10 points, unlimited attempts permitted)
19. **Supplemental oxygen can be dangerous in procedural sedation because...**

- Promotes fires
- Limits the time to detect hypoventilation
- Allows CO2 narcosis to develop
- Limits the effectiveness of the hypoxic respiratory drive while sedated
- All of the above are true

<table>
<thead>
<tr>
<th>Correct</th>
<th>Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Promotes fires</td>
</tr>
<tr>
<td></td>
<td>Limits the time to detect hypoventilation</td>
</tr>
<tr>
<td></td>
<td>Allows CO2 narcosis to develop</td>
</tr>
<tr>
<td></td>
<td>Limits the effectiveness of the hypoxic respiratory drive</td>
</tr>
<tr>
<td>X</td>
<td>All of the above are true</td>
</tr>
</tbody>
</table>

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.
19. **Supplemental oxygen can be dangerous in procedural sedation because...**

- Promotes fires
- Limits...  

**Correct**

That's right! You selected the correct response.

**Incorrect**

You did not select the correct response.

- All of the above are true
1.48 Which is NOT true about capnography?

(Multiple Choice, 10 points, unlimited attempts permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-invasive capability</td>
</tr>
</tbody>
</table>
X  
EtCO2 measures the maximum PaCO2 value in vivo

Reveals ventilator pattern in real time

Reveals apnea sooner then pulse oximetry

All the above are true

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.

**Correct (Slide Layer)**

20. Which is NOT true about capnography?

- Non-invasive capability
- EtCO2 measures the maximum PaCO2 value in vivo
- Reveals ventilator pattern in real time
- Reveals apnea sooner than pulse oximetry
- All the above are true

Correct

That's right! You selected the correct response.

Continue
1.49 Regarding sedation scales...

(Multiple Choice, 10 points, unlimited attempts permitted)
21. Regarding sedation scales...

- The Ramsey scale is a frequently used system
- The RASS scale is a frequently used system
- Needs to be frequently monitored, evaluated, and documented during procedural sedation
- Has objective and subjective components
- All of the above are true

<table>
<thead>
<tr>
<th>Correct</th>
<th>Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Ramsey scale is a frequently used system</td>
</tr>
<tr>
<td></td>
<td>The RASS scale is a frequently used system</td>
</tr>
<tr>
<td></td>
<td>Needs to be frequently monitored, evaluated, and documented during procedural sedation</td>
</tr>
<tr>
<td></td>
<td>Has objective and subjective components</td>
</tr>
<tr>
<td>X</td>
<td>All of the above are true</td>
</tr>
</tbody>
</table>

Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.
21. Regarding sedation scales...

- The Ramsey scale is a frequently used system
- The RASS scale is a frequently used system
- Need to keep sedation documented
- Has got
- All of the above

Correct (Slide Layer)

Incorrect (Slide Layer)
21. Regarding sedation scales...
- The Ramsey scale is a frequently used system
- The RASS scale is a frequently used system
- Need for sedation is documented
- Has one
- All of the above

That is incorrect. Please try again.

1.50 Airway Obstruction

Airway Obstruction

- Sedation relaxes airway muscles and **often** leads to airway obstruction

- **High risk groups:**
  - Obese
  - Sleep apnea
  - Large necks
  - Large tongues
  - Large tonsils
  - Small chin
  - Nasal obstruction

- **Treatment:**
  - Chin-lift
  - Jaw-thrust
  - Oral airway
  - Nasal airway
  - Intubation
1.51 Chin-lift

- First maneuver to help airway obstruction
- Lifting the tongue from the back of the throat

1.52 Jaw-Thrust

- Index and middle fingers pull the mandible upwards while their thumbs push down on the chin to open the mouth
- Particularly useful in the patient in whom cervical spine injury is a concern
1.53 Oral and Nasal Airway

1.54 CPAP

1.55 One of the most common adverse events while sedating a patient is...

(Multiple Choice, 10 points, unlimited attempts permitted)
22. **One of the most common adverse events while sedating a patient is...**

- Aspiration
- Airway Obstruction
- Cardiac arrest
- Pressure point injury
- Corneal abrasion

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspiration</td>
</tr>
<tr>
<td>Airway Obstruction</td>
</tr>
<tr>
<td>Cardiac arrest</td>
</tr>
<tr>
<td>Pressure point injury</td>
</tr>
<tr>
<td>Corneal abrasion</td>
</tr>
</tbody>
</table>

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.
Correct (Slide Layer)

22. One of the most common adverse events while sedating a patient is...

- Aspiration
- Airway
- Cardiac
- Pressure
- Corneal abrasion

Incorrect (Slide Layer)

22. One of the most common adverse events while sedating a patient is...

- Aspiration
- Airway
- Cardiac
- Pressure
- Corneal abrasion
Which population is at risk for airway obstruction?

(Multiple Choice, 10 points, unlimited attempts permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbidly obese</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Micrognathic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonsillar hypertrophy</td>
</tr>
<tr>
<td>Large circumference necks</td>
</tr>
</tbody>
</table>

X All of the above

**Feedback when correct:**
That's right! You selected the correct response.

**Feedback when incorrect:**
You did not select the correct response.

**Correct (Slide Layer)**

23. Which population is at risk for airway obstruction?

- Morbidly obese
- Micrognathic
- Tonsillar hypertrophy
- Large circumference necks
- All of the above

Correct
That's right! You selected the correct response.

Continue
1.57 Which of the following is typically the first maneuver for airway obstruction?

(Multiple Choice, 10 points, unlimited attempts permitted)
24. Which of the following is typically the first maneuver for airway obstruction?

- Oral airway
- Nasal airway
- Chin-lift
- Jaw-thrust
- CPAP

Correct Choice

<table>
<thead>
<tr>
<th>Correct</th>
<th>Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oral airway</td>
</tr>
<tr>
<td></td>
<td>Nasal airway</td>
</tr>
<tr>
<td>X</td>
<td>Chin-lift</td>
</tr>
<tr>
<td></td>
<td>Jaw-thrust</td>
</tr>
<tr>
<td></td>
<td>CPAP</td>
</tr>
</tbody>
</table>

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.
24. Which of the following is typically the first maneuver for airway obstruction?

- Oral airway
- Nasal airway
- Chin-lift
- Jaw-thrust
- CPAP

Correct (Slide Layer)

Incorrect (Slide Layer)
24. Which of the following is typically the first maneuver for airway obstruction?

- Oral airway
- Nasal airway
- Chin lift
- Jaw thrust
- CPAP

Try Again (Slide Layer)

1.58 Procedural Sedation

Procedural Sedation

- Checklist prior to commencing sedation
- Many things to accomplish
- Next 2 slides show all prerequisites
1.59 Sedation Protocol I

Sedation Protocol I

- Credentialed for Procedure by Hospital
- Pre-procedure focused H&P
- Plan formulated / patient appropriate
- Capable of rescue from unanticipated depth
- Risk / Benefits / Options / Consent

1.60 Sedation Protocol II

Sedation Protocol II

- Pre-procedure vitals & NPO verified
- No other uninterruptable tasks
- Record of vitals, drugs, oximetry
- Monitored recovery
- Discharge by protocol or provider
- Quality Assurance
1.61 Untitled Slide

Thank you for completing the content portion of this module. Next you must complete a 12 question quiz and score a minimum of an 80% to pass.

Please click Next to continue.

1.62 Which of the following is NOT true?

(Multiple Choice, 10 points, 1 attempt permitted)

1. Which of the following is NOT true?

- A chin-lift is an easy maneuver to do for episodic airway obstruction
- Jaw-thrust has been used during cervical instability
- There is a universal size for oral and nasal airway
- CPAP patients should use their own machines during procedural sedation
- They are all true

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A chin-lift is an easy maneuver to do for episodic airway obstruction</td>
</tr>
</tbody>
</table>
Jaw-thrust has been used during cervical instability

X There is a universal size for oral and nasal airway

CPAP patients should use their own machines during procedural sedation

They are all true

Feedback when correct:
That's right! You selected the correct response.

Feedback when incorrect:
You did not select the correct response.

Correct (Slide Layer)
1.63 While preparing for procedural sedation, what must be verified:

(Multiple Choice, 10 points, 1 attempt permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A timely H &amp; P has been provided</td>
</tr>
<tr>
<td>The patient is NPO for the appropriate time</td>
</tr>
<tr>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>ASA classification documented</td>
</tr>
<tr>
<td>An appropriate consent is filled out</td>
</tr>
</tbody>
</table>

X All must be completed

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.

**Correct (Slide Layer)**

2. While preparing for procedural sedation, what must be verified:

- A timely H & P has been provided
- The patient is NPO for the appropriate time
- ASA classification documented
- An appropriate consent is filled out
- All must be completed

Correct

That's right! You selected the correct response.

Continue
1.64 Which of the following is a goal for sedation during a procedure?

(Multiple Choice, 10 points, 1 attempt permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alleviate anxiety</td>
<td></td>
</tr>
</tbody>
</table>
Provide a “quiet” surgical field

Make the procedure as pain free as possible

Returning the patients to presedation state as quickly as possible

X All of the above are goals

Feedback when correct:
That's right! You selected the correct response.

Feedback when incorrect:
You did not select the correct response.

Correct (Slide Layer)
1.65 During Moderate Sedation, which is true?

(Multiple Choice, 10 points, 1 attempt permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient does not respond to verbal or tactile stimulation</td>
<td></td>
</tr>
</tbody>
</table>
The patient’s airway requires intervention
The patient’s ventilation is unstable
The patient’s cardiovascular is usually unstable

X The sedation has been referred as conscious sedation

**Feedback when correct:**
That's right! You selected the correct response.

**Feedback when incorrect:**
You did not select the correct response.

**Correct (Slide Layer)**

4. During Moderate Sedation, which is true?

- Patient does not respond to verbal or tactile stimulation
- The patient is unable to protect their own airway
- The patient is unable to cough
- The patient is unable to protect their own airway
- The sedation has been referred as conscious sedation

Correct
That's right! You selected the correct response.

Continue
1.66 **Which of the following statements are true regarding deep sedation?**

*(Multiple Choice, 10 points, 1 attempt permitted)*

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>The patient responds to repeated verbal or noxious simulation</td>
</tr>
</tbody>
</table>
The airway and ventilation can be competent

The cardiovascular system is often intact

Does require capnography

X All of the above are true

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.

**Correct (Slide Layer)**

5. Which of the following statements are true regarding deep sedation?

- The patient responds to repeated verbal or noxious stimuli
- The airway and ventilation are competent
- The cardiovascular system is often intact
- Does require capnography
- All of the above are true

Correct

That's right! You selected the correct response.

Continue
1.67 Regarding General Anesthesia...

(Multiple Choice, 10 points, 1 attempt permitted)

Correct Choice

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients are unarousable</td>
</tr>
</tbody>
</table>
Does not necessarily require airway support

Can have cardiovascular perturbations

May be an unanticipated state while attempted deep sedation

X All of the above are true

Feedback when correct:
That's right! You selected the correct response.

Feedback when incorrect:
You did not select the correct response.

Correct (Slide Layer)

6. Regarding General Anesthesia...

- Patients are unarousable
- Does not necessarily require airway support
- Can have cardiovascular perturbations
- May be an unanticipated state while attempted deep sedation
- All of the above are true

That's right! You selected the correct response.

Continue
1.68 Regarding titration, which is the true?

(Multiple Choice, 10 points, 1 attempt permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>You need a baseline or effect to adjust to</td>
<td></td>
</tr>
<tr>
<td>You need to consider bolus versus infusion during adjustments</td>
<td></td>
</tr>
<tr>
<td>You can start with a bolus</td>
<td></td>
</tr>
<tr>
<td>You need to allow sufficient time in between doses or adjustments before additional changes</td>
<td></td>
</tr>
</tbody>
</table>

X All of the above are true

**Feedback when correct:**

That's right! You selected the correct response.

**Feedback when incorrect:**

You did not select the correct response.

**Correct (Slide Layer)**

7. Regarding titration, which is the true?

- You need a baseline or effect to adjust to
- You need a specific effect before adjusting
- You need a specific effect before adjusting the next dose
- All of the above are true

Correct

That's right! You selected the correct response.
1.69 Which best describes synergism?

(Multiple Choice, 10 points, 1 attempt permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like begets like</td>
</tr>
</tbody>
</table>
### Positive energy expediting a desired outcome

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>The total affect is greater than the sum of the parts</td>
</tr>
<tr>
<td></td>
<td>Zero sum game</td>
</tr>
<tr>
<td></td>
<td>Similar things minimizing adverse outcomes</td>
</tr>
</tbody>
</table>

**Feedback when correct:**
That's right! You selected the correct response.

**Feedback when incorrect:**
You did not select the correct response.

**Correct (Slide Layer)**

8. **Which best describes synergism?**
   - Like begets like
   - Positive energy expediting a desired outcome
   - The total affect is greater than the sum of the parts
   - Zero sum game
   - Similar things minimizing adverse outcomes
   - Correct
     - That's right! You selected the correct response.

---

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1.70 Regarding the partial pressure of CO2 in the blood and the respiratory drive...

(Multiple Choice, 10 points, 1 attempt permitted)
<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 is a primary respiratory driver</td>
</tr>
<tr>
<td>X Is affected by Benzodiazapines and Opiates</td>
</tr>
<tr>
<td>If the CO2 is high enough, it can be a sedative</td>
</tr>
<tr>
<td>PaCO2 decreases with hyperventilation</td>
</tr>
<tr>
<td>All of the above are true</td>
</tr>
</tbody>
</table>

**Feedback when correct:**
That's right! You selected the correct response.

**Feedback when incorrect:**
You did not select the correct response.
1.71 Which of the following patient types is considered a high risk for sedation?

(Multiple Choice, 10 points, 1 attempt permitted)
Correct Choice

<table>
<thead>
<tr>
<th>Correct</th>
<th>Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drug Addict</td>
</tr>
<tr>
<td></td>
<td>Pregnant</td>
</tr>
<tr>
<td></td>
<td>Geriatric</td>
</tr>
<tr>
<td></td>
<td>Pediatric</td>
</tr>
<tr>
<td>X</td>
<td>All are high risk</td>
</tr>
</tbody>
</table>

Feedback when correct:
That’s right! You selected the correct response.

Feedback when incorrect:
You did not select the correct response.

Correct (Slide Layer)

10. Which of the following patient types is considered a high risk for sedation?

- Drug Addict
- Pregnant
- Geriatric
- Pediatric
- All are high risk

That’s right! You selected the correct response.
1.72 Which statement is true about capnography?

(Multiple Choice, 10 points, 1 attempt permitted)

<table>
<thead>
<tr>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only has invasive capability</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Feedback when correct:**
That's right! You selected the correct response.

**Feedback when incorrect:**
You did not select the correct response.

**Correct (Slide Layer)**

11. Which statement is true about capnography?

- [ ] Only has invasive capability
- [ ] EtCO2 Measures the minimum PaCO2 value in vivo
- [ ] Reveals ventilator pattern in 15s lag time
- [ ] Reveals apnea later than pulse oximetry
- [ ] All the above are true

Correct

That's right! You selected the correct response.

Continue
1.73 Which of the following monitors is optional for moderate sedation?

(Multiple Choice, 10 points, 1 attempt permitted)

<table>
<thead>
<tr>
<th>Correct</th>
<th>Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ECG</td>
</tr>
<tr>
<td>Blood pressure monitor</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>--</td>
</tr>
<tr>
<td>Pulse Oximetry</td>
<td></td>
</tr>
<tr>
<td>Capnography</td>
<td>X</td>
</tr>
</tbody>
</table>

Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

You did not select the correct response.

Correct (Slide Layer)
12. Which of the following monitors is optional for moderate sedation?

- ECG
- Blood pressure
- Pulse oximeter
- Capnometry
- All are required

Incorrect (Slide Layer)

1.74 Untitled Slide

1.75 Results Slide

(Results Slide, 0 points, 1 attempt permitted)
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.62 Which of the following is NOT true?</td>
<td></td>
</tr>
<tr>
<td>1.63 While preparing for procedural sedation, what must be verified:</td>
<td></td>
</tr>
<tr>
<td>1.64 Which of the following is a goal for sedation during a procedure?</td>
<td></td>
</tr>
<tr>
<td>1.65 During Moderate Sedation, which is true?</td>
<td></td>
</tr>
<tr>
<td>1.66 Which of the following statements are true regarding deep sedation?</td>
<td></td>
</tr>
<tr>
<td>1.67 Regarding General Anesthesia...</td>
<td></td>
</tr>
<tr>
<td>1.68 Regarding titration, which is the true?</td>
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</tr>
<tr>
<td>1.69 Which best describes synergism?</td>
<td></td>
</tr>
<tr>
<td>1.70 Regarding the partial pressure of CO2 in the blood and the respiratory drive...</td>
<td></td>
</tr>
<tr>
<td>1.71 Which of the following patient types is considered a high risk for sedation?</td>
<td></td>
</tr>
<tr>
<td>1.72 Which statement is true about capnography?</td>
<td></td>
</tr>
</tbody>
</table>
1.73 Which of the following monitors is optional for moderate sedation?

Result slide properties

Passing Score 80%

Success (Slide Layer)

Results

Your Score: 80%

Passing Score: 80%

Result:

Congratulations, you passed.

Retry Quiz Exit Module
Results

Your Score: 60%
(Passes: 70 points)

Passing Score: 80%
(Passes: 100 points)

Result:

✗ You did not pass.

Retry Quiz  Exit Module