



Care of the Patient Receiving Sedation

Required Credentialing Education
(Self-Learning Packet)

Oversight Authority

The Department of Anesthesia is responsible for the recommendation and approval of the monitoring guidelines for patients how, in any setting, for any purposes or by any route receive:

- General, spina, or major regional anesthesia
- Sedation (with or without analgesia) where there is a reasonable possibility that the sedation/analgesia used may results in a loss of protective reflexes.

Who should complete this self-learning packet?

All credentialed non-anesthesia providers who request moderate (procedural) sedation and /or deep sedation privileges in an Allina Health hospital are required to complete the self-learning.

Why review this information?

A non-anesthesia provider (physician, dentist or advanced practice professional) must be privilege at the hospital in which they are practicing prior to performing a procedure under moderate sedation.

Note: All pediatric in-patients or pediatric patients with procedures that take place outside of the Emergency Department (ED) requiring moderate to deep sedation will be sedated and cared for by the Anesthesia department to assure that a consistent level of care is provided.

Objectives: Upon completion of the learning packet, the participant will be able to:

- Describe the continuum of sedation and distinguish between mild, moderate, deep sedation and general anesthesia.
- Describe and list the various medications used in sedation management, their indications, dosing and monitoring.
- Describe the elements of the patient pre-procedure assessment in a planned sedation procedure.
- Delineate the responsibilities of the provider in charge of the procedure in which sedation is being used.
- Describe the required patient monitoring throughout a procedure in which sedation is administered.
- Describe discharge criteria for the patient who receives sedation for a procedure.

Levels of Sedation

Depending on a variety of patient conditions, as well as, the type and amount of medication administered, many medications may result in a sedation of the patient along a continuum of altered level of consciousness.

There are four levels of sedation identified and it is important to be able to recognize the differences between the levels. This is for identification of the level of sedation intended for the patient, the actual patient response to the sedation medications, and recognition when the level of sedation is deeper than intended and how to rescue the patient.

In order to compare and contrast the levels of sedation, it is helpful to identify key parameters of each level of sedation. Not only is the patient responsiveness important, but the effect of the sedation on the airway, ability to breathe spontaneously, the effect on cardiac function and the potential for use of reversal agents.

Continuum and Levels of Sedation

	Minimal Sedation (Anxiolysis)	Moderate Sedation / Analgesia	Deep Sedation/ Analgesia	General anesthesia
Responsiveness	Normal response to verbal stimulation	<u>Purposeful</u> response to verbal or tactile stimulation (not just reflexive)	Cannot be easily aroused but responds purposefully following repeated or painful stimulation	Not arousable, even to painful stimulation
Airway	Unaffected	No intervention required	Intervention/ protection may be required	Total loss of airway protective reflexes
Spontaneous Respirations	Unaffected	Adequate	May be inadequate	Frequently inadequate, support required
Cardiovascular Function	Unaffected	Usually maintained	Usually maintained	May be impaired
Reversal Agents	Should have immediate access to reversal medications for all levels of sedation			

Sedation Agents

Midazolam (Versed)			
Action	Adult Dose	Effects	Adverse Effects/Comments
<p><i>Benzodiazepine; induces CNS depression.</i></p>	<p>Intravenous: <i>usual initial dose 0.5-2 mg IV over 2 minutes. May repeat in 0.5-1 mg doses after 5 minutes. (Reduce dose in elderly).</i></p> <p>Oral (not routinely given to adults): <i>0.25-0.5 mg/kg up to a maximum dose of 20 mg. Higher doses, up to 1 mg/kg, may be required for uncooperative patients or procedures where intensity and duration of sedation are more critical.</i></p>	<p>Onset:</p> <p><i>IV: 1-5 minutes</i></p> <p><i>Oral: 20-30 minutes</i></p> <p>Peak Effect:</p> <p><i>IV: 5-15 minutes</i></p> <p>Duration:</p> <p><i>IV: 30-60 minutes, may persist up to 6 hours.</i></p>	<p>Reversal: <i>see flumazenil.</i></p> <p>Adverse effects: <i>variations in blood pressure and heart rate, impaired balance and gait, sedation, respiratory depression, and retrograde amnesia. Adverse effects may be potentiated by other medications (i.e. analgesics).</i></p> <p>Considerations: <i>use smaller doses in elderly and patients with decreased pulmonary or cardiovascular reserve. Patients with chronic benzodiazepine or alcohol use may require larger doses.</i></p>
Lorazepam (Ativan)			
Action	Adult Dose	Effects	Adverse Effects/Comments
<p><i>Benzodiazepine; induces CNS depression.</i></p>	<p><i>Usual initial dose 0.5-2 mg IV over 2 minutes. May repeat in 0.5-1 mg increments after 15 minutes. (Reduce dose in elderly).</i></p> <p><i>Must dilute IV dose.</i></p>	<p>Onset: <i>1-5 minutes</i></p> <p>Peak Effect: <i>15-20 minutes</i></p> <p>Duration: <i>4-8 hours, may persist up to 24 hours</i></p>	<p>Reversal: <i>see flumazenil.</i></p> <p>Adverse effects: <i>variations in blood pressure and heart rate, impaired balance and gait, sedation, respiratory depression, and retrograde amnesia. Adverse effects may be potentiated by other medications (i.e. analgesics).</i></p> <p>Considerations: <i>use smaller doses in elderly and patients with decreased pulmonary or cardiovascular reserve. Patients with chronic benzodiazepine or alcohol use may require larger doses.</i></p>

Diazepam (Valium)			
Action	Adult Dose	Effects	Adverse Effects/Comments
<i>Benzodiazepine; induces CNS depression.</i>	<p>Intravenous: 2-5 mg, administer no faster than 5 mg/min. May repeat with 1-2.5 mg after 5 minutes. (Reduce dose in elderly).</p> <p>Oral: 2-10 mg, may repeat dose after 30 minutes</p>	<p>Onset:</p> <p>IV: 1-5 minutes</p> <p>PO: 30-60 minutes</p> <p>Peak Effect:</p> <p>IV: 5 minutes</p> <p>Duration:</p> <p>IV: 1-6 hours</p> <p>PO: 6-12 hours</p>	<p>Reversal: see flumazenil.</p> <p>Adverse effects: variations in blood pressure and heart rate, impaired balance and gait, sedation, respiratory depression, and retrograde amnesia. Adverse effects may be potentiated by other medications (i.e. analgesics).</p> <p>Considerations: use smaller doses in elderly and patients with decreased pulmonary or cardiovascular reserve. Reduce dose by 50% in cirrhosis and avoid in severe/acute liver disease. Patients with chronic benzodiazepine or alcohol use may require larger doses.</p>

Anesthetic and Adjunct Anesthetic Agents

Propofol (Diprivan)			
Action	Adult Dose	Effects	Adverse Effects/Comments
Anesthetic agent, hypnotic	0.5 -1 mg/kg initial dose (usual initial dose 40-50 mg), followed by 0.5 mg/kg boluses every 5 minutes as needed to a maximum dose of 2.5 mg/kg. Give slow IV push to avoid hypotension. (Reduce dose in the elderly; 0.1-0.2 mg/kg).	<p>Onset: 30 seconds</p> <p>Peak Effect: 1-3 minutes</p> <p>Duration: 5-10 minutes</p>	<p>Reversal: none, discontinue medication</p> <p>Contraindications: propofol is contraindicated in any patient with allergy to egg or soy products</p> <p>Adverse effects: apnea, respiratory depression, pain on injection, hypotension, bradycardia, nerve excitation, seizures, nausea, vomiting, pancreatitis, and urine discoloration. Adverse effects may be</p>

			<p>potentiated by other medications (i.e. analgesics).</p> <p>Considerations: reduce dosage and titrate slowly in the elderly. Continuous infusion of propofol in non-intubated patients is considered <u>deep sedation</u>, without exception.</p>
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Etomidate (Amidate)

Action	Adult Dose	Effects	Adverse Effects/Comments
Anesthetic agent, short-acting hypnotic	0.1 mg/kg IV over 30-60 seconds. May repeat with 0.05 mg/kg every 3-5 minutes as needed for sedation	<p>Onset: <1 minute</p> <p>Peak Effect: 1 minute</p> <p>Duration: 3-5 minutes</p>	<p>Reversal: none, discontinue medication</p> <p>Adverse effects: pain on injection site, involuntary muscle movements, nausea, vomiting; minimal cardiovascular effects, rarely hypotension; respiratory depression (especially when used concomitantly with an opiate).</p> <p>Considerations: doses ≥ 0.3 mg/kg may confer anesthetic grade effect; use cautiously/consider lower doses in the elderly.</p>

Ketamine (Ketalar)

Action	Adult Dose	Effects	Adverse Effects/Comments
Anesthetic agent, non-competitive NMDA receptor antagonist with sedative properties, dissociative agent	1 to 2mg/kg IV over 1-2 minutes. May be followed by 0.25-0.5mg/kg IV every 5 to 10 minutes as needed for sedation	<p>Onset (IV): rapid—30 seconds</p> <p>Peak Effect (IV): 2-3 minutes</p> <p>Duration (IV): 5 to 10 minutes</p>	<p>Reversal: none. Discontinue medication</p> <p>Adverse effects: .Vivid dreams, psychiatric symptoms when coming out of anesthesia, hypertension, respiratory depression, increased muscle function, tachyarrhythmia</p> <p>Considerations: Risk of emergence reactions with use in patients > 10 years of age. Consider concomitant use of atropine to reduce secretions and midazolam to reduce emergence reactions. Use with caution in patients with tachyarrhythmias, congestive heart failure, hypertension, or with alcohol intoxication. Aspiration of stomach contents has been reported with use.</p>

Opioid Analgesic Agents

Fentanyl (Sublimaze)			
Action	Adult Dose	Effects	Adverse Effects/Comments
Opiate agonist, CNS depressant	25-100 mcg IV initial dose; may repeat with 12.5-50 mcg every 5-10 minutes.	Onset: 1-2 minutes Peak Effect: 3-5 minutes Duration: 30 - 60 minutes	Reversal: see naloxone Adverse effects: nausea, vomiting, dizziness, sedation, urinary retention, constipation; may cause chest wall rigidity, apnea and respiratory depression. Adverse effects may be potentiated by other medications (i.e. sedatives). Considerations: preferred opioid analgesic for procedures due to quick onset and short duration of action; consider reduced dose in elderly and in patients with decreased pulmonary or cardiovascular reserve.
Morphine sulfate			
Action	Adult Dose	Effects	Adverse Effects/Comments
Opiate agonist, CNS depressant	1-4 mg IV, not faster than 2 mg/min. May repeat with 0.5-2 mg every 10 minutes if needed (Reduce dose in elderly).	Onset: 1-5 minutes Peak Effect: 10-20 minutes Duration: 2-5 hours	Reversal: see naloxone Adverse effects: nausea, vomiting, dizziness, sedation, respiratory depression, urinary retention, constipation, hypotension, and itching (due to histamine release); active metabolites may accumulate with repeat doses in patients with renal dysfunction. Adverse effects may be potentiated by other medications (i.e. sedatives). Considerations: consider reduced dose in elderly and in patients with decreased pulmonary or cardiovascular reserve (decrease by ~50%). Slower onset and longer duration than fentanyl.

Reversal Agents

Naloxone (Narcan)			
Action	Adult Dose	Effects	Adverse Effects/Comments
Opiate antagonist	Adult: 0.08 mg IV over 15 seconds, as needed for respiratory rate < 8 per minute or unresponsiveness. Repeat dose as needed every 3 minutes until adequate ventilation and alertness (without pain and discomfort).	Onset: 2 minutes Peak Effect: 5-15 minutes Duration: 20-60 minutes	Reversal agent for opioid analgesics Adverse effects: nausea, vomiting, sweating, hypertension, tremors Considerations: consider using lower initial doses (0.04 mg) in patients who are opiate dependent to avoid analgesia reversal resulting in pain and cardiovascular changes. Naloxone has a shorter duration than many opiates; repeat doses may be necessary. Does not reverse the effects of benzodiazepines.
Flumazenil (Romazicon)			
Action	Adult Dose	Effects	Adverse Effects/Comments
Benzodiazepine antagonist	0.2 mg IV over 15 seconds. May repeat every 1 minute to a total dose of 1 mg. If re sedation occurs, may repeat 1 mg dosing sequence every 20 minutes to a maximum total dose of 3 mg.	Onset: 1-2 minutes Peak Effect: 6-10 minutes Duration: 30-60 minutes	Reversal agent for benzodiazepines Contraindications: do not use in patients given benzodiazepines for increased intracranial pressure or seizures; do not use in patients with suspected tricyclic antidepressant overdose Adverse effects: sweating, agitation, headache, nausea, vomiting, seizures, cardiac arrhythmias Considerations: Flumazenil has a shorter duration than many benzodiazepines; repeat doses may be necessary. Does not reverse the effects of opioid analgesics. Chronic benzodiazepine users may experience withdrawal symptoms, use with caution.

Sedation Precautions

Some of the common things physicians need to be aware of while using sedation includes:

- Failure to recognize hypoxemia
- Inadequate analgesia
- Inappropriate dosing with respect to individual variability
- Lack of appropriate back up support

Pre-Sedation Assessment

- **Pre-Sedation Assessment** includes current heart (should say heart, not heat), lung and airway status (Mallampati score); history of reaction or problems with anesthesia/sedation; NPO status; sedation plan based on assessment and ASA Classification.
- Prior to the procedure, the patient shall have a **responsible adult identified as available to accompany them upon discharge** from hospital and to be present with the patient for at least 24 hours following discharge. Satisfactory arrangements must be made before the patient is sedated.
- **Immediately prior** to the administration of sedation, the patient is reassessed for appropriateness of planned sedation with documentation of assessment results.

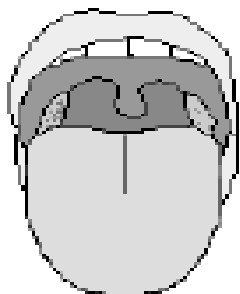
ASA Physical Status Classifications

American Society of Anesthesiologists (ASA) is used by anesthesia providers to assess a patient's fitness prior to surgery

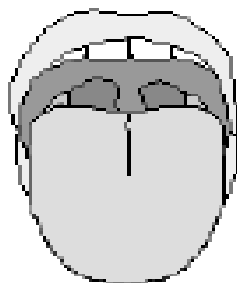
- ASA 1 – Normal healthy patient
- ASA 2 – Patient with mild systemic disease
- ASA 3 – Patient with severe systemic disease or multiple systemic diseases that limit activity but is not incapacitating.
- ASA 4 – Patient with incapacitating systemic disease that is a constant threat to life.
- ASA 5 – Moribund patient not expected to survive 24 hours with or without the procedure
- ASA 6 – A declared brain-dead patient whose organs are being removed for donor purposes

Mallampati

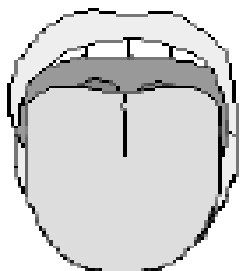
- A classification assigned by the clinician based upon assessing distance from the tongue base to the roof of the mouth and is used to predict the ease of endotracheal intubation.
- The classification assigned by the clinician may vary if the patient is in the supine position (instead of sitting). If the patients phonates, this falsely improves the view. If the patient arches his or her tongue, the uvula is falsely obscured.
- A class I view suggests ease of intubation and correlates with a laryngoscopic view grade I 99 to 100% of the time.
- Class IV view suggests a poor laryngoscopic view, grade III or IV 100% of the time. Beware of the intermediate classes which may result in all degrees of difficulty in laryngoscopic visualization.
- Class I = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.
- Class II = visualization of the soft palate, fauces and uvula.
- Class III = visualization of the soft palate and the base of the uvula.
- Class IV = soft palate is not visible at all.



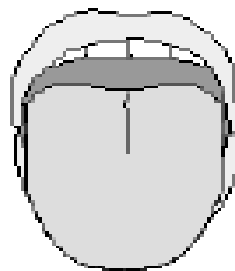
Class I



Class II



Class III



Class IV

Intra-Procedure Management and Monitoring

- All moderate sedation will be ordered and supervised by the provider privileged for the specific procedure.
- The ordering provider, the provider performing the procedure, an anesthesia provider, or qualified registered nurse under the supervision of a qualified provider, may administer sedation.
- The provider performing the procedure must be immediately accessible when sedation is administered.

Monitoring of the sedated patient is to be continuous throughout the procedure using the RASS and will be consistent with ASA (Am. Society of Anesthesiologist) and AANA (Am. Assoc. of Nurse Anesthetists) Practice Guidelines and will include at a minimum (but not limited to):

- Blood pressure, heart rate, respirations and oxygen saturation, and level of consciousness at least every 15 minutes during the procedure and at the conclusion of the procedure.
- Vital signs may be done more frequently if patient's condition warrants it.
- Pain level
- Patient's tolerance of the procedure and response to the medication, hypersensitivity and adverse drug reactions.

RASS: Richmond Agitation Sedation Scale

- RASS is a 10 point scale with four levels of agitation or anxiety, +1 to +4; one level to denote a calm and alert state, 0; and five levels of sedation, -1 to -5. The RASS is used to assess and document patients 1 year of age or greater:
 - During and acutely after moderate procedural sedation
 - During recovery from deep sedation or anesthesia
 - For patients receiving sedatives to monitor for/avoid excessive sedation

Score	Criteria: Behavior Measurement Score
+4	Combative
+3	Very agitated
+2	Agitated
+1	Restless
0	Alert and calm
-1	Drowsy
-2	Light sedation
-3	Moderate sedation
-4	Deep sedation
-5	Unarousable

Post-Sedation Monitoring and Assessment

- Post-sedation monitoring will be specific to the patient and the type of procedure done, but will include at a minimum:
 - Heart rate and oxygen saturation
 - Continually monitored via pulse oximetry
 - Blood pressure, respiratory rate, Modified Aldrete/PARSAP score
 - Beginning of recovery phase (termination of procedure)
 - At least every 15 minutes for 30 minutes after the last dose of sedative medication is given or for 2 hours after administration of a benzodiazepine or narcotic reversal agent
 - Just before discharge or transfer to next level of care
 - Pain
 - At least once and more often as indicated by condition of patient

Assessment	Criteria: Behavior or Vital Sign Measurement	Score
Activity	Able to move all extremities	2
	Able to move two (2) extremities	1
	Not able to control extremities	0
Circulation	BP +/- 20 points of PreOp	2
	BP +/- 21-50 points of PreOp	1
	BP +/- 51 points or more of PreOp	0
Respiration	Able to breathe deeply and cough	2
	Dyspnea or limited breathing	1
	Airway needs attention	0
Consciousness	Awake, responds to commands	2
	Arousable	1
	Not responsive	0
Oxygenation	SaO ₂ > 92% on room air	2
	Supplemental O ₂ required to maintain SaO ₂ > 90%	1
	SaO ₂ < 90% with supplemental O ₂	0

PARSAP- Post Anesthesia Recovery Score for ambulatory Patients

An assessment tool used to evaluate post-sedation patient during recovery

Assessment	Criteria: Behavior or Vital Sign Measurement	Score
Activity	Moves four (4) extremities on command/baseline	2
	Moves two (2) extremities voluntarily on command	1
	Unable to move extremities on command	0
Respiration	Able to breathe deeply	2
	Dyspnea, limited breathing, tachypnea	1
	Apneic or on mechanical ventilator	0
Circulation	BP +/- 20 points of PreOp	2
	BP +/- 21-50 points of PreOp	1
	BP +/- 51 points or more of PreOp	0
Consciousness	Fully awake	2
	Arousable on/by command	1
	Not responding	0
Oxygenation	Able to maintain O2 sat > 92% on room air	2
	Needs O2 to maintain O2 sat > 90%	1
	O2 sat < 90% with O2 supplement	0
Dressing	Dry and clean/no dressing	2
	Wet, but stationary and marked	1
	Growing area of wetness	0
Pain	Pain controlled or refusing pain medication	2
	Pain controlled by oral medication	1
	Pain requiring parenteral medication	0
Ambulation	Able to stand and walk/baseline	2
	Vertigo when erect	1
	Dizziness when supine	0
GI	Able to drink fluids or NPO	2
	Nauseated	1
	Nausea and vomiting	0
Urine Output	Has voided/not applicable	2
	Not voided, but comfortable	1
	Unable to void and uncomfortable	0

Discharge or Transfer from Recovery

Transfer Criteria: Transfer to an inpatient unit or discharge area may occur when patient meets transfer criteria as outlined below:

- Modified Aldrete score is 8 or greater, OR
- Patient meets pre-procedure baseline, OR
- Per provider order

Discharge Criteria

- Discharge criteria for patients in ambulatory settings: (inpatients are discharged per provider order)
- PARSAP score of 18 or greater (2 consecutive scores required), OR
- When patient meets baseline (2 consecutive scores required), OR
- Per provider order

Post Discharge Instructions

The patient will receive the following discharge instructions after receiving anesthesia or sedation:

- You have received medicine (anesthesia, sedation or both) that made you sleepy. This will affect your ability to think clearly and make good decisions.
- For your safety, you will need a responsible adult to drive you home and to be present with you for 24 hours.
- For 24 hours:
 - Do not drive or use any machinery.
 - Do not make important decisions.
 - Do not drink alcohol. (It is also important to not drink alcohol as long as you are taking prescription pain medicine.)

What is Capnography?

Capnography or End tidal CO₂ monitoring is a noninvasive measurement of the partial pressure of carbon dioxide in exhaled breath

Why do we use end tidal CO₂ monitoring? A pulse oximetry will provide instant feedback about oxygenation. Capnography provides instant information about ventilation and can facilitate early detection of respiratory compromise.

It provides instant information about **ventilation** (how effectively CO₂ is being eliminated by the lungs); **perfusion** (how CO₂ is transported through the vascular system); and **metabolism** (how CO₂ is being produced at the cellular level) Both pulse oximetry and Capnography should be used together.

Remember capnography monitors ventilation and not oxygenation. Capnography can be thought of as the "ventilation vital sign" because it provides **breath-to-breath** feedback and displays a respiratory rate that is measured at the airway.

The clinician now has the ability to measure respiratory frequency and detect respiratory depression in non-intubated patients sooner than with traditional monitoring techniques, allowing safer titration of medications.

Capnography Wave Forms

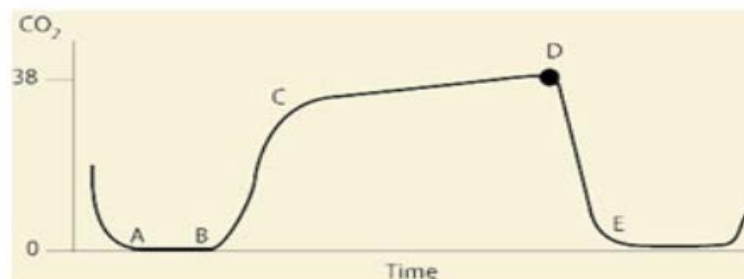
A normal capnogram shows alternating waveforms between inspiration and expiration. Upward deflections occur with exhalation, and downward deflections occur with inhalation. This is the opposite of respirograms, spiograms, and the flow-volume loop. The capnogram deviates from normal with physiologic or mechanical disruptions. Waveforms have the following characteristics (Figure 4):

Phase I: A zero baseline represents the completion of inspiration and the beginning of exhalation of CO₂-free gas from anatomic dead space. CO₂-free gas comes from the large airways, oropharynx, and nasopharynx (A-B).

Phase II: A rapid, sharp upstroke occurs as the gas from the intermediate airways containing a mixture of fresh gas and CO₂ begins to be exhaled from the lungs (B-C).

Phase III: A nearly flat alveolar plateau occurs as exhaled flow velocity slows and mixed gas is displaced by alveolar gas (C-D). Alveolar exhalation of CO₂ is nearing completion. The end point of the alveolar plateau most closely reflects the maximal concentration of exhaled CO₂ and the end of exhalation (D).

Phase 0: A rapid downstroke occurs as patient begins the inspiration of gas that is essentially devoid of CO₂ (D-E).⁴



the
CO₂

Indications for ETCO₂ monitoring include the following:

- Verifying endotracheal tube placement
- Determining the adequacy of ventilation
- Evaluating the effectiveness of cardiopulmonary resuscitation (CPR)
- Monitoring during procedural sedation and analgesia
- Determining the patient's CO₂ waveform and ETCO₂ trends
- Providing a mechanism for early detection of changes in waveform pattern or ETCO₂ value that may accompany a sudden or gradual change in CO₂ production or elimination (*permissive hypercapnia, hyperthermia, hypoventilation, extubation, hyperventilation therapy*) or a reduction in circulation (*pulmonary blood flow*)

Capnography results are difficult to interpret in patients with ventilation-perfusion abnormalities with complex pathophysiology, such as pulmonary edema, myocardial infarction (MI), and chronic obstructive pulmonary disease (COPD).

Summary:

In this self-learning packet you learned to:

- **Describe the continuum of sedation and distinguish between mild, moderate, deep sedation and general anesthesia.**
 - **Describe and list the various medications used in sedation management, their indications, dosing and monitoring.**
 - **Describe the elements of the patient pre-procedure assessment in a planned sedation procedure.**
 - **Delineate the responsibilities of the provider in charge of the procedure in which sedation is being used.**
 - **Describe the required patient monitoring throughout a procedure in which sedation is administered.**
 - **Describe discharge criteria for the patient who receives sedation for a procedure.**
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Post Test

1. Under what level of sedation will a patient respond normally to verbal stimulation?
 - a. Minimal sedation
 - b. Moderate sedation
 - c. Deep sedation

2. Under what level of sedation might a patient have inadequate spontaneous respirations?
 - a. Minimal sedation
 - b. Moderate sedation
 - c. Deep sedation

3. What level of sedation does a patient no longer normally respond to verbal stimulation but does respond purposefully to verbal or tactile stimulation?
 - a. Minimal sedation
 - b. Moderate sedation
 - c. Deep sedation

4. What documentation is required prior to the administration of sedation for a procedure involving conscious sedation?
 - a. H & P
 - b. Pre-sedation evaluation
 - c. ASA Classification
 - d. Informed consent
 - e. All of the above

5. What ASA (American Society of Anesthesiologists) classification is a patient who has non-insulin dependant diabetes controlled by diet and oral hypoglycemics?
 - a. ASA I
 - b. ASA II
 - c. ASA IV
 - d. ASA V

6. What are the minimal monitoring requirements for conscious sedation?
 - a. O2 saturation
 - b. Heart rate
 - c. Respirations
 - d. Level of consciousness
 - e. All of the above

7. For moderate sedation, which individual cannot be responsible for monitoring the patient?
 - a. Physician doing the procedure
 - b. Nurse with minimal other responsibilities
 - c. Physician not doing the procedure
 - d. B & C

8. In order to be discharged a patient must have:
 - a. Stable vital signs as appropriate for procedure
 - b. Be awake and oriented as appropriate for age and baseline
 - c. Have unsupported adequate respirations
 - d. Parsap score 18 or greater or at pre-procedure baseline
 - e. All of the above

9. What benzodiazepines are commonly used for conscious sedation?
- Diazepam (Valium)
 - Midazolam (Versed)
 - Lorazepam (Ativan)
 - All of the above
10. What dosage range of Midazolam (Versed) should be administered initially for conscious sedation
- 1 – 2 mg
 - 5 – 10 mg
 - 3 – 4 mg
 - Dosage range is dependent on patient risk factors
 - A&D
11. What medication is used to reverse the effects of Midazolam (Versed)?
- Naloxone (Narcan)
 - Sublimaze (Fentanyl)
 - Lorazepam (Ativan)
 - Flumazenil (Romazicon)
12. What dose of Flumazenil should be used to begin to reverse a benzodiazepine overdose?
- 2 mg IV q minute
 - 0.2 mg IV q minute
 - 5 mg IV q minute
 - None of the above
13. What narcotics are commonly used for conscious sedation?
- Fentanyl
 - Meperidine
 - Morphine
 - All of the above
14. What dose of Fentanyl (Sublimaze) should be used initially for conscious sedation?
- 25 – 75 milligrams
 - 25 – 75 micrograms
 - 5 – 10 milligrams
 - Dosage range is dependent on patient risk factors
 - B&D
15. What medications are used to reverse the effects of narcotics used for conscious sedation?
- Flumazenil (Romazicon)
 - Naloxone (Narcan)
 - Hydromorphone (Dilaudid)
 - Oxycodone (OxyContin)

16. What dose should be used to initially reverse the effects of narcotics?
- 1 mg of Midazolam (Versed) IV
 - 0.8 mg IV Naloxone (Narcan)
 - 1 mg of Hydromorphone (Dilaudid) IV
 - 0.2 mg IV Flumazenil (Romazicon)
17. The possible side effects of using Naloxone (Narcan) can be hypertension, tachycardia and pulmonary edema due to the reversal of analgesia and the patient abruptly experiencing pain.
- true
 - false
18. The possible side effects of using Flumazenil (Romazicon) can be seizures if the patient was on a sedative for seizure control as well as for moderate sedation.
- true
 - false
19. After successful reversal of narcotics or benzodiazepines with Naloxone (Narcan) or Flumazenil (Romazicon), there is no danger of re-sedation.
- true
 - false
20. The administration of deep sedation requires one person whose sole responsibility is to constantly observe the patient's VS, airway patency and adequacy of respirations
- true
 - false
21. The goal of the pre-procedure assessment is to identify patients at increased risk for complications. Patients who may need further assessment by a physician include the following EXCEPT:
- patients with sleep apnea
 - patients who > 30% over their ideal body weight
 - patients with allergies to penicillin and sulfa drugs
 - patients with a throat defect
 - patients who abuse alcohol
22. Agitation can be one of the complications a patient experiences while receiving moderate sedation. But, agitation can have three different etiologies. If your patient is exhibiting agitation, which of the etiologies should you assess for FIRST because it is the most life threatening?
- agitation as a result of hypoxemia
 - agitation as a result of paradoxical reaction to a medication
 - agitation as a result of under-sedation

23. when a patient receiving moderate sedation becomes unresponsive to loud verbal or painful stimulation, treatment should be:
- A,B,Cs; titrate reversal medications
 - 200cc bolus of isotonic IV fluid; vasopressors
 - oxygen administration, starting with cannula, then to mask
 - 0.2 mg IV Flumazenil (Romazicon)
24. Other complications of moderate sedation include the following EXCEPT:
- Paradoxical reactions
 - Aspiration
 - Airway obstruction
 - Under sedation
25. When a patient receiving moderate sedation shows decreasing O2 saturation secondary to an obstructed airway, the initial intervention should be:
- Increasing flow in O2 cannula
 - Chin lift/jaw thrust maneuver
 - Administration of 0.4 mg IV Naloxone (Narcan)
 - 200 joules synchronized cardioversion
26. You are administering moderate sedation to your patient and are monitoring ETCO2, via a side-stream nasal cannula. You are concerned that your patient may be experiencing hypoventilation. Hypoventilation with shallow breathing results in a low "amplitude" or dampened waveform.
- True
 - False
27. What is the earliest sign of apnea (or airway obstruction) on the Capnograph?
- The absence of a waveform or a flat line
 - A Low ETCO2 with a normal waveform

Answers

- | | | | |
|----|---|----|---|
| 1 | a | 16 | b |
| 2 | c | 17 | a |
| 3 | b | 18 | a |
| 4 | e | 19 | b |
| 5 | b | 20 | a |
| 6 | e | 21 | c |
| 7 | a | 22 | a |
| 8 | e | 23 | a |
| 9 | b | 24 | d |
| 10 | e | 25 | b |
| 11 | d | 26 | a |
| 12 | b | 27 | a |
| 13 | a | | |
| 14 | e | | |
| 15 | b | | |