Procedural Sedation - Pediatric Patients

Providence

This course provides an overview of procedural sedation for pediatric patients.

You will review information on each topic and then be presented with questions to test your understanding.

Course and Concepts

LEVELS OF SEDATION & CAPNOGRAPHY

Content - Levels of Sedation Defined

Levels of Sedation Defined Review

Content - Capnography: End Tidal CO_2 Monitoring During Sedation

Capnography: End Tidal CO_2 Monitoring During Sedation Review

PRE/INTRA/POST SEDATION CONSIDERATIONS

Pre/Intra/Post Sedation Considerations Overview

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Content - Intra-Procedure Sedation Considerations

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Post-Procedure Sedation Considerations Review

Pre/Intra/Post Procedure Sedation Considerations Review

PHARMACOLOGY

Content - Pharmacology

Pharmacology Review

SEDATION COMPLICATIONS & RESCUE FOR PEDIATRIC PATIENTS

Content - Sedation Complications & Rescue for Pediatric Patients

Sedation Complications & Rescue for Pediatric Patients Review

CONCLUSION

References

Conclusion

Course and Concepts

Course Format

You will review information on each topic and then be presented with questions to test your understanding.

All activities must be completed before moving on to the next section.

The key concepts in this course are:

- Identify and describe the indications for use and desired outcomes in procedural sedation.
- Describe the sedation continuum.
- Define capnography.
- List at least one benefit that capnography offers that pulse oximetry does not.
- Differentiate between normal and abnormal capnography wave forms.
- List at least two potential causes for a loss of wave form.
- Identify potential actions to take if a patient's $EtCO_2$ is rising.
- State the role of the RN during the procedural sedation process.
- Verbalize use of the ASA Classification Risk Assessment Tool.
- Relate the necessity of documented airway assessment by provider (Mallampati).
- Describe the pre-intra-post nursing management of the patient undergoing procedural sedation.
- Identify the equipment required for procedural sedation procedures.
- Interpret the Ramsay scale, the Aldrete scale, the State Behavioral Scale (SBS), and the Richmond Agitation-Sedation Scale (RASS).
- Name the drugs most commonly used in sedation.
- Identify the recommended doses and side effects of the drugs used in sedation.
- Relate the clinical considerations with the drugs used in sedation.
- List potential complications of procedural sedation.
- Identify first line emergency interventions required for the most commonly seen sedation complications.

CONTINUE

Content - Levels of Sedation Defined

Continuum of Sedation

Analgesia and sedation comprise a continuum.

It is not always possible to predict how an individual will respond.

The RN must be prepared to care for the patient if a deeper than intended level of sedation is attained.

Four Levels of Sedation

Before you peek at the answers below, can you name the four levels of sedation in order, beginning with the state of awake?

- American Society of Anesthesiologists

- American Society of Anesthesiologists

Minimal Sedation

- American Society of Anesthesiologists

Moderate/Dissociative Sedation

- American Society of Anesthesiologists

Deep Sedation

- American Society of Anesthesiologists

General Anesthesia

Review each of the question marks above before moving on.

Select each section below to review the definitions of each of the levels of sedation.

Minimal Sedation

- A drug-induced state in which patients respond normally to verbal commands
- Cognitive function and coordination may be impaired
- Respiratory and cardiovascular functions are unaffected
- Patient has normal eye movements, respiratory rate and effort, and has intact protective reflexes

Dissociative Sedation

- A trance-like cataleptic state in which the patient experiences profound analgesia and amnesia
- Airway protective reflexes, spontaneous respirations, and cardiopulmonary stability are all maintained
- Ketamine is the pharmacologic agent used for procedural sedation that produces this state

Moderate Sedation

- A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation
- No interventions are required to maintain patent airway or adequate respirations
- Cardiovascular functions and protective reflexes are usually maintained

Desired Outcomes:

- The primary objective/outcome is the reduction of the patient's anxiety and discomfort
- Produce amnesia
- Enhance patient's cooperation
- Maintain stable vital signs
- Allay fear and anxiety with minimal medication
- Rapid recovery from the procedure

Deep Sedation

- A drug-induced depression of consciousness during which patients cannot be easily aroused, but respond purposefully following repeated or painful stimulation
- Patients may need assistance in maintaining a patent airway and respirations may be inadequate
- Cardiovascular function is usually maintained
- Requires a Licensed Independent Practitioner (LIP) certified in deep sedation and a certified registered nurse (RN) to be present at the patient's bedside throughout administration of sedation

Desired Outcomes:

- The primary objective/outcome is a drug-induced decrease of consciousness which allows for comfort in an otherwise painful medical procedure
- The patient in deep sedation cannot be easily aroused, but can respond purposefully following repeated or painful stimulation

Anesthesia

- A drug-induced loss of consciousness during which patients are not arousable, even with painful stimulation
- Patent airway, adequate respirations, and cardiovascular functions may be impaired and often require assistance
- Requires an Anesthesiologist/Anesthesia LIP

Expand and review the content above before moving on.

Four Levels of Sedation - Defined

System	Minimal Sedation	Moderate/Dissociative Sedation	Deep Sedation	General Anesthesia

System	Minimal Sedation	Moderate/Dissociative Sedation	Deep Sedation	General Anesthesia
Response LOC	Normal response to verbal stimulation	Drowsy; purposeful response to verbal or tactile stimulation	Purposeful response following repeated or painful stimulation	Unarousable even with painful stimulus
Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
Spontaneous ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular function	Unaffected	Usually maintained	Usually maintained	May be impaired

CONTINUE

Levels of Sedation Defined Review

Multiple Choice:

The desired outcomes for moderate sedation include:

- ◯ Reduction of patient anxiety and discomfort with minimal medications
- ◯ Produce amnesia and maintain stable vital signs
- ◯ Enhance the patient's cooperation
- ◯ Rapid recovery from the procedure
- ◯ All of the above

SUBMIT

Multiple Choice:

During the procedure the patient is not easily aroused and no longer able to follow commands. Their respirations are depressed.

What is your assessment of the patient's status?

- ◯ The patient is at the moderate sedation level and is ready for the procedure to start
- ◯ The patient has moved to a deep sedation level

- ◯ The patient's sedation is at the anesthesia level

SUBMIT

Multiple Choice:

The primary purpose of using moderate sedation is to:

- ◯ Reduce the number of involuntary muscle spasms
- ◯ Support cardiovascular functions and depress consciousness
- ◯ Reduce chance of seizures in patients during an invasive procedure
- ◯ Decrease anxiety and discomfort during an invasive procedure

SUBMIT

Multiple Choice:

Which of the following is **not** a characteristic of moderate sedation?

- ◯ Patient is easily arousable
- ◯ Patient is unable to purposely respond to verbal stimuli
- ◯ Minimally depressed level of consciousness
- ◯ Protective airway reflexes are maintained

SUBMIT

Select all that apply:

RN responsibilities during a procedure requiring moderate sedation include:

- [ ] The administration of medication ordered by a qualified licensed independent Practitioner (LIP)
- [ ] Continuous monitoring of patient status, including vital signs and level of sedation
- [ ] Assisting the LIP with the procedure

SUBMIT

Multiple Choice:

Your patient assessment findings are the patient is in a drug induced depression of consciousness but can respond to verbal commands. The patient can maintain his airway and respirations and pulse oximetry readings are 93% with the protective reflexes intact.

Which level of sedation is the patient in?

- ◯ Minimal sedation
- ◯ Moderate sedation
- ◯ Deep sedation
- ◯ General anesthesia

SUBMIT

Multiple Choice:

Which of the following is ***not*** a goal of procedural/moderate sedation?

- ◯ Guard patient safety and welfare
- ◯ Maintain adequate sedation with minimal risk
- ◯ Allay patient fear and anxiety
- ◯ Produce an unconscious patient

SUBMIT

Multiple Choice:

Expected outcomes of moderate sedation may include all of the following ***except***?

- ◯ A calm, cooperative patient
- ◯ A sleepy but easily arousable patient
- ◯ A sleepy patient who requires a chin lift to maintain a patient airway
- ◯ Amnesia related to the procedure

SUBMIT

Multiple Choice:

Your patient is receiving moderate sedation for the closed reduction of a fracture of the right tibia. Halfway through the procedure the patient's heart rate increases to 140, respirations increase to 24, and he is moaning and crying out in pain. He can respond to verbal commands and his protective reflexes remain intact.

What level of sedation is the patient exhibiting?

- ◯ Minimal sedation
- ◯ Moderate sedation
- ◯ Deep sedation
- ◯ General anesthesia

SUBMIT

Complete the content above before moving on.

Content - Capnography: End Tidal CO_2 Monitoring During Sedation

Benefits of Capnography

Click or tap the box to the left of each statement to mark it as read. Review all to move on.

- [ ] Improved ventilation assessment
- [ ] Assessment of blood flow
- [ ] Protection from misplacement of tubes
- [ ] Monitoring of ventilation
- [ ] Avoidance of poor outcomes (e.g., oversedation during sedation)
- [ ] Avoiding unnecessary tests (e.g., ABGs)

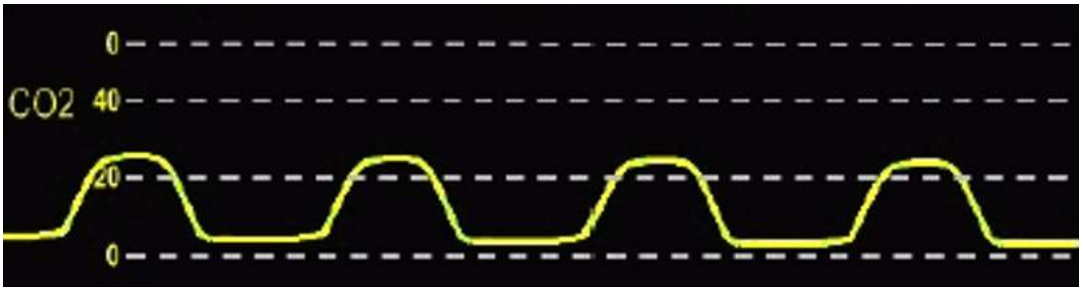
Complete the content above before moving on.

What is Capnography?

Capnography is the non-invasive measurement and numerical display of End-tidal CO_2 ($EtCO_2$), or the maximum expired CO_2 concentration during a respiratory cycle.

In an effective $EtCO_2$ tracing, note the rise and fall of expired CO_2 with each breath.

The normal range for $EtCO_2$ is 35-45 mm Hg



Waveform graphic courtesy of Covidien

Measuring Capnography

Exhaled carbon dioxide can be measured using various devices. The capnography equipment shown below are used to measure $EtCO_2$.

*These **examples** of capnography equipment **may not be representative of the equipment used at your ministry**.* **Be sure to familiarize yourself with the equipment you will be using.**

Oxygenation versus Ventilation

Pulse oximetry is used every day in the hospital setting, **but it is not enough to predict impending decline of a patient's pulmonary status!**

Case Study

Case Study

Let's review a patient scenario. You will want to consider what findings are expected and what findings are concerning to you. Think about whether important data is missing.

Let's get started!

Case Study - Peter

Peter, who is 11 years old, just had an EGD.

Case Study - Peter

	11:15	11:30	11:45
RR	15	16	16
SpO_2	98%	96%	98%
Oxygen	Room air	Room air	2L NC

The post procedure oxygenation status for Peter is shown above. Is there anything about this that concerns you?

When you're ready with your answer, go to the next slide.

Case Study - Peter

If you didn't have any concerns, you are correct! His values look fine.

Now, consider what $EtCO_2$ measurement can provide. Do you know what might be missing?

Go to the next slide when you think you know.

Case Study - Peter

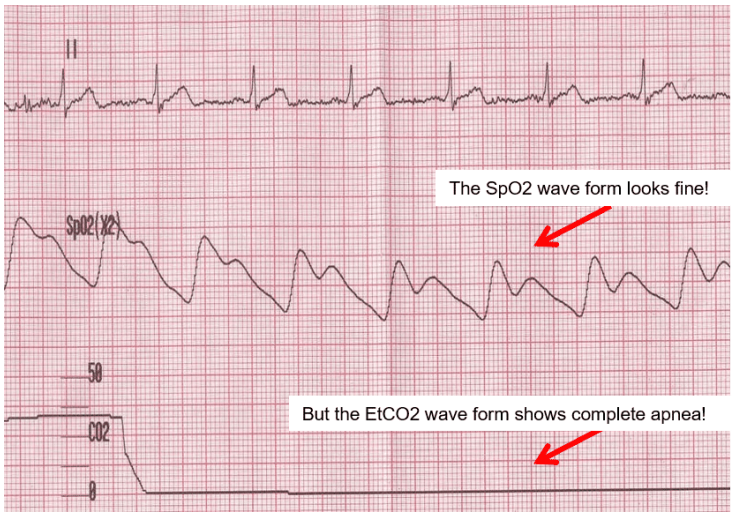
	11:15	11:30	11:45
RR	15	16	16
SpO_2	98%	96%	98%
Oxygen	Room Air	Room Air	2L NC
PaO_2	95	80	**90**
$PaCO_2$	39	54	**60**
pH	7.38	7.25	**7.23**

Note, the $PaCO_2$ is rising, which is causing a worsening pH.

- Pulse oximetry does not reveal dangerous changes in the pH!

So, even with good oxygenation you can have CO_2 retention, worsening patient condition, and poor outcomes.

Case Study - Peter



Oximetry versus Capnography

This wave form set demonstrates that $EtCO_2$ provides immediate indication of respiratory issues in an apneic episode.

Actions for abnormal EtCO2

Alert the LIP of the patient's status and your concern:

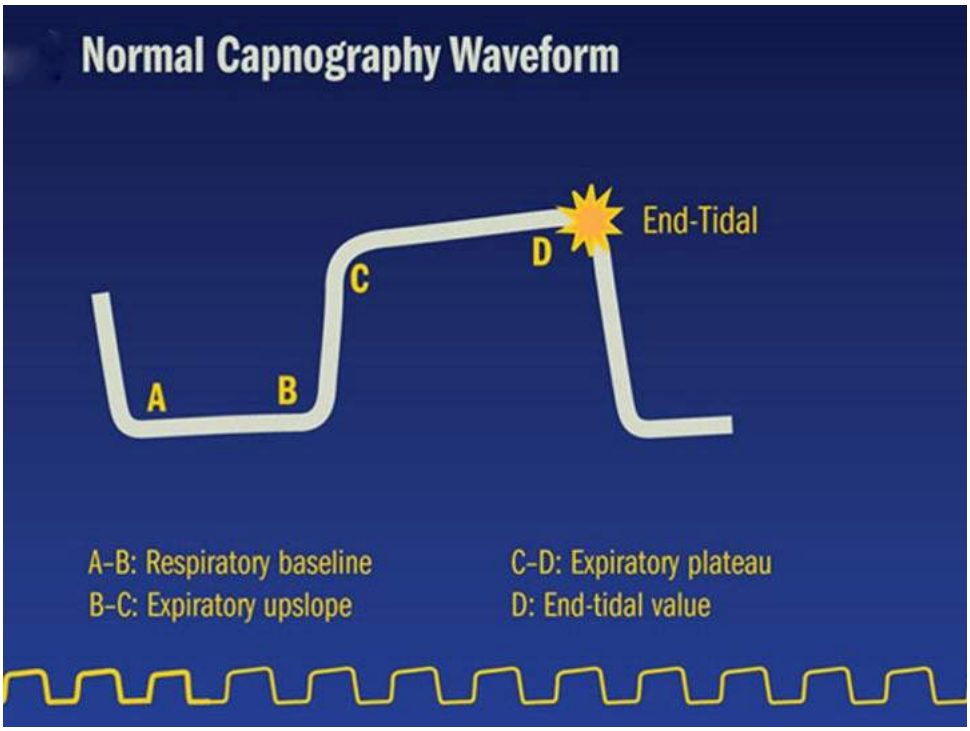
- If the $EtCO_2$ is high: Consider either inadequate ventilation (e.g., > 50 mmHg) or over sedation
- If the $EtCO_2$ is low, e.g., < 10 mmHg: Consider partial or complete airway obstruction or loss of cardiac output

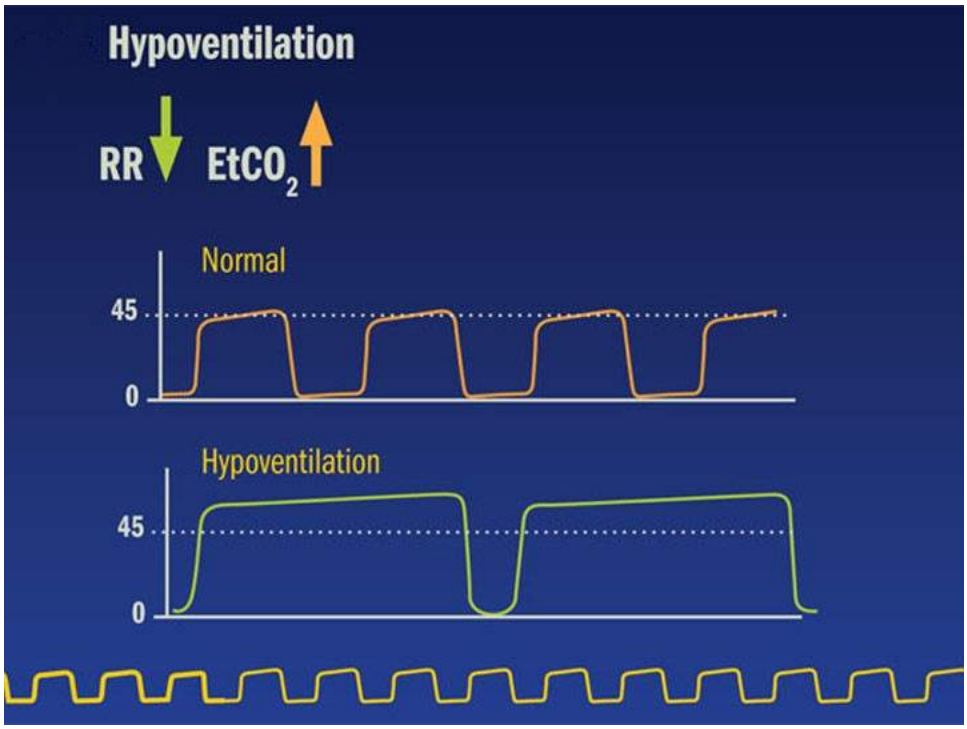
Interventions to consider include:

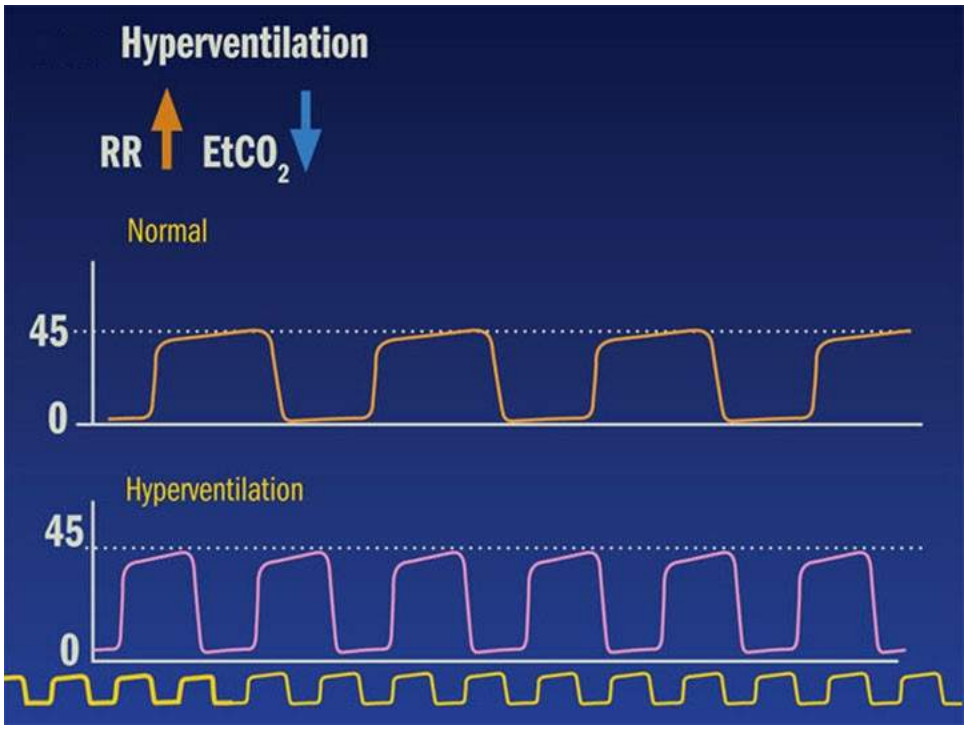
- Assess upper and lower airway patency and treat any obstruction or bronchospasm
- If concerned about decreased cardiac output, assess BP and pulse
- Treat per provider order

Review the case study above before moving on.

Capnography Wave Forms and Values







Waveform graphics courtesy of Covidien

CONTINUE

Determining Causes of Abnormal Wave Forms & Values

In the event of an abnormal wave form, check the equipment and the patient status

- Some abnormal wave forms can be due to poor connections, artifact, and misplaced cannulas rather than patient condition
- **Remember to check *both* equipment and patient!**

Abnormal wave forms may be seen during sedation. It is important to identify potential causes of these changes.

Select each section below to determine the causes of abnormal wave forms.

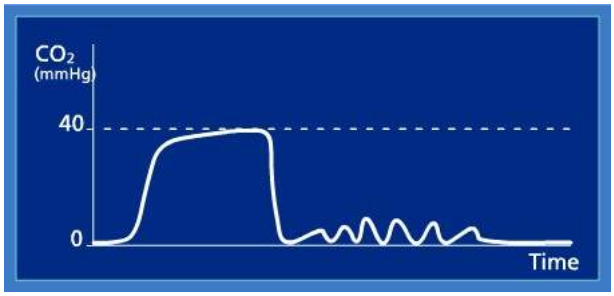
Abnormal Waveform - Loss of Waveform

Sudden loss of waveform and $EtCO_2$ to zero or near zero means no respiration is detected!

Possible causes:

- Kinked or displaced cannula (check equipment first!)
- Apnea

- Very shallow respirations
- Total airway obstruction

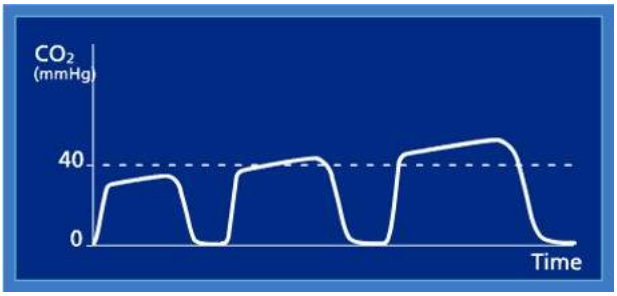


Abnormal Waveform – Increasing $EtCO_2$ Values

Gradual increase in $EtCO_2$ with normal waveform indicates CO_2 production, or decreasing systemic or pulmonary perfusion

Possible causes:

- Hypoventilation due to analgesia or sedation
- Sudden increase in delivery of CO_2 to pulmonary circulation

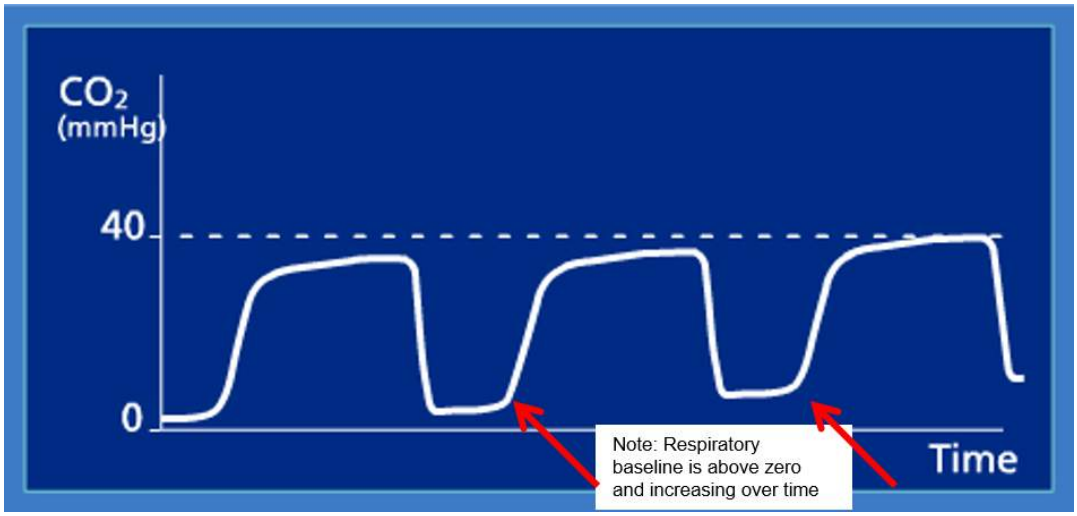


Abnormal Waveform – Rebreathing Exhaled CO_2

Rise in baseline CO_2 indicates rebreathing of CO_2

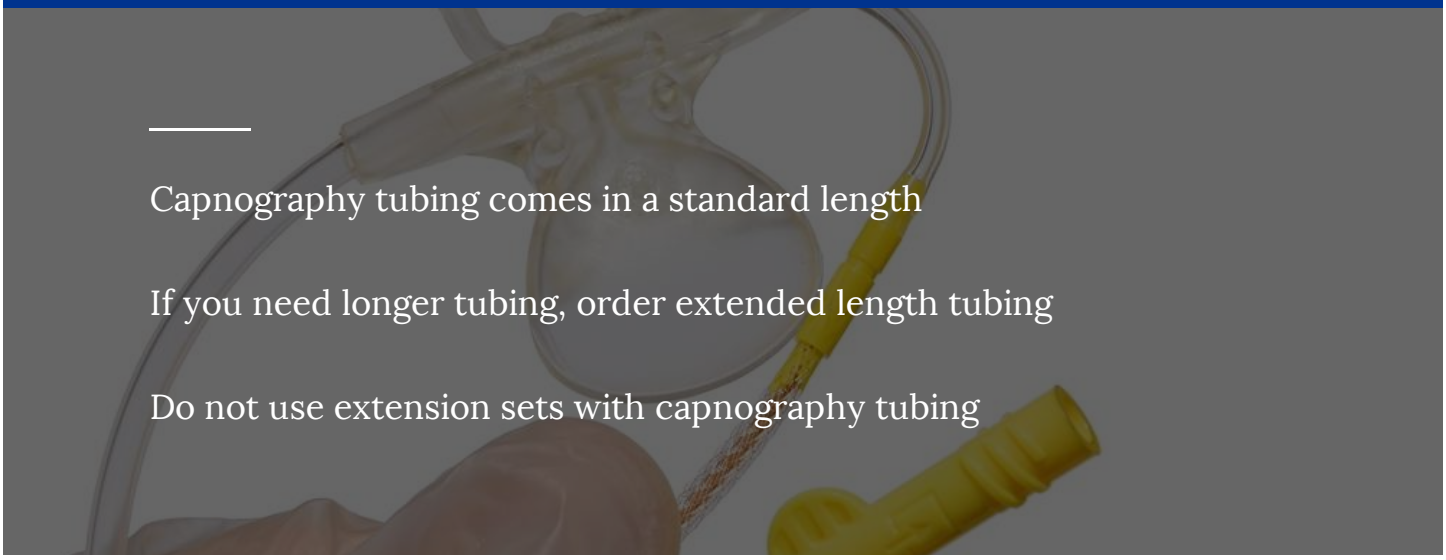
Possible causes:

- Poor head/neck alignment
- Draping at airway
- Insufficient flow to O_2 mask



Expand and review the content above before moving on.

Selecting the Correct Tubing



Capnography tubing comes designed for short term use or long term use. Review both uses by clicking or tapping on the flashcards below.

Short Term Use

Short term use tubing is only good for manufacturer recommended timeframe

- Typically used for monitoring during procedural sedation

Long Term Use

Long term use tubing has a filter for moisture control and can be used for longer durations

- This is the tubing to use if you anticipate the patient will need to be monitored after the procedure is complete

Complete the content above before moving on.

For more information on capnography or $ETCO_2$, click or tap the links below!

Capnography

Respiratory compromise

Capnography during sedation

CONTINUE

Capnography: End Tidal CO_2 Monitoring During Sedation Review

True or False:

The normal $EtCO_2$ range is 35–45 mmHg.

- ◯ True
- ◯ False

SUBMIT

True or False:

Ventilation can be monitored with Pulse Oximetry.

- ◯ True
- ◯ False

SUBMIT

True or False:

Common causes of increase in $EtCO_2$ include hypoventilation and over sedation.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

When monitoring a patient using capnography during procedural sedation, the RN will intervene in response the following changes:

- ◯ Decreased respiratory rate
- ◯ Increased $EtCO_2$ value
- ◯ Loss of capnography waveform
- ◯ All of the above

SUBMIT

Multiple Choice:

If observing significant changes from baseline $EtCO_2$ value, the RN will:

- ◯ Instruct patient to take a deep breath
- ◯ Ensure patient has an open airway

- ◯ Check the cannula and reposition, if necessary
- ◯ All of the above

SUBMIT

True or False:

An abnormal waveform can indicate equipment issues.

- ◯ True
- ◯ False

SUBMIT

True or False:

Pulse oximetry has limitations because there is a delay before oxygen saturation reflects hypoxia.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

When is the best time to begin $EtCO_2$ monitoring?

- ◯ After the first dose of sedating medication
- ◯ When the pulse oximeter cannot display a reading
- ◯ Before any sedating medications are administered
- ◯ Only if supplemental oxygen is provided

SUBMIT

True or False:

Capnography provides a numeric value for $EtCO_2$ as well as a graphic display of the concentration of exhaled carbon dioxide in each breath.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

Capnography should be utilized during procedural sedation:

- ◯ Only if supplemental oxygen is used
- ◯ To identify hypoventilation, apnea, or airway obstruction
- ◯ Instead of pulse oximetry
- ◯ If a patient needs to be intubated

SUBMIT

Multiple Choice:

Complete loss of the capnography waveform may result from:

- ◯ Hypoventilation
- ◯ Partial airway obstruction
- ◯ No detection of breath
- ◯ All of the above

SUBMIT

True or False:

Capnography provides caregivers with breath-to-breath information.

- ◯ True

False

SUBMIT

True or False:

Capnography ($EtCO_2$) refers to continuous noninvasive technique that measures exhaled carbon dioxide.

True

False

SUBMIT

Complete the content above before moving on.

Pre/Intra/Post Sedation Considerations Overview

Procedural Sedation

A continuum exists between minimal, moderate, deep sedation, and general anesthesia. One level of sedation can quickly change to a deeper level due to unique characteristics of drugs used, as well as physical status and drug sensitivities of individual patients.

The patient's age and pre-existing medical conditions may significantly alter dosing requirements needed to achieve a level of minimal or moderate sedation. Administration of sedating agents requires ongoing assessment and monitoring of the patient and ability to respond immediately to deviations from the norm.

> **Note: If moderate procedural sedation progresses to a deeper level of sedation than anticipated, appropriate measures are immediately taken to return patient to intended level of sedation. Sedation administrators must have skills to rescue the patient from a deeper level of sedation than intended for the procedure.**

Procedural Sedation Roles

The following caregivers must be present during procedural sedation.

Please note that this may vary by ministry and type of procedure (e.g., orthopedic LIP assist for orthopedic injuries).

RN | LIP | RT

Requires initial and annual competency verifying the following:

- **Evidence of current Advanced Cardiac Life Support (ACLS) certificate Pediatric Advanced Life Support (PALS) in ED.**
- **Familiarity with pharmacologic agents employed in moderate sedation; including administration, adverse reactions and possible interventions.**
- **Able to identify and recognize acceptable and unacceptable vital signs.**
- **Knowledge of documentation and monitoring standards, and nursing roles and responsibilities.**

RN | LIP | RT

Licensed Independent Practitioner (LIP)

RN | LIP | RT

Respiratory Therapist (RT)

Click or tap each tab above before moving on.

Desired Outcomes of Moderate Sedation

The desired outcome of moderate sedation is a patient who:

- [ ] Is sedate and cooperative
- [ ] Lacks awareness or recall of procedure (amnesia)
- [ ] Has reduced pain perception (analgesia)
- [ ] Has decreased anxiety (anxiolysis)
- [ ] Has modified behavior and/or movement to allow safe completion of the procedure
- [ ] Is returned to a state in which discharge from medical and/or dental supervision is safe

CONTINUE

Pre-Procedure Sedation Considerations

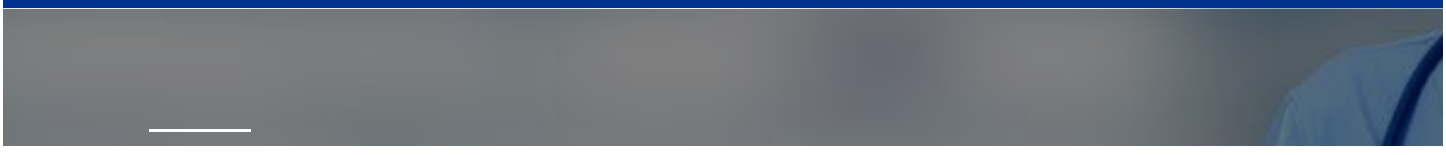
Roles and Responsibilities

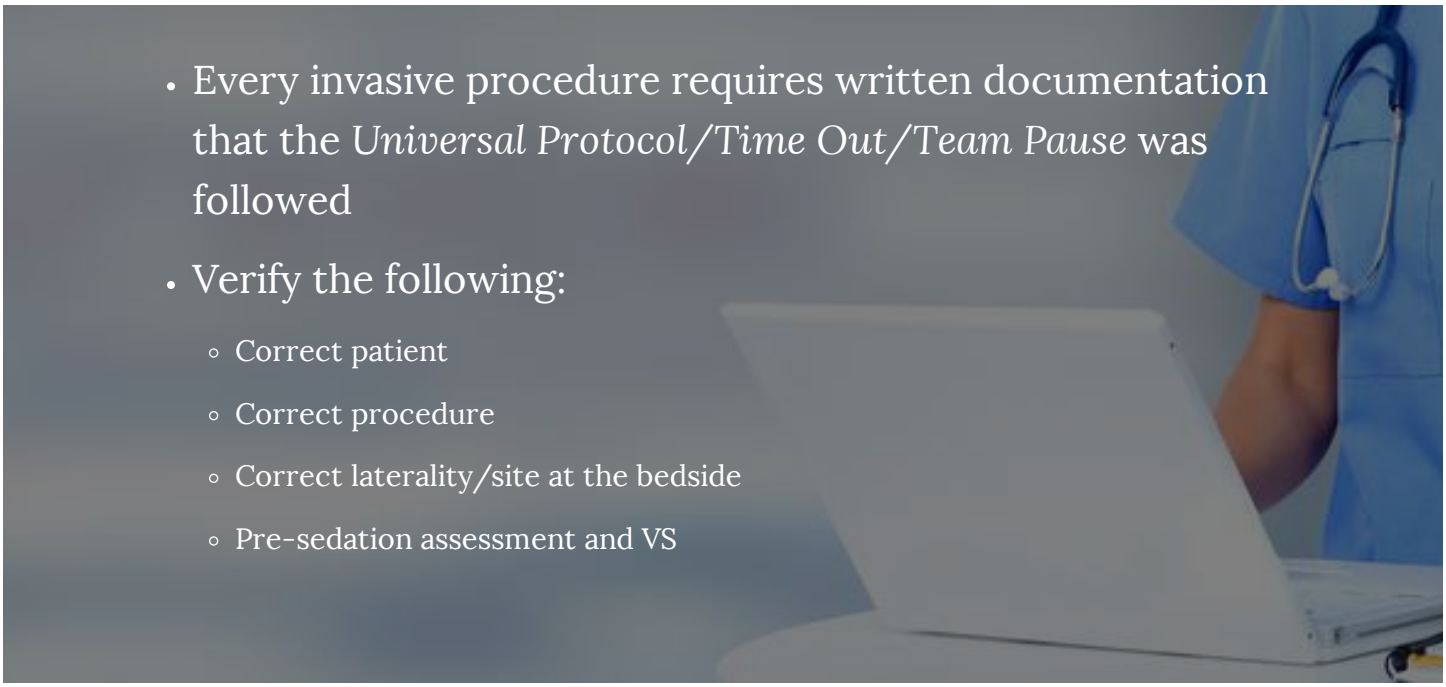
Pre-procedure

RN Responsibilities

- Verify ride contact info
- Add staff at bedside
- Baseline sedation score using ministry-specific sedation scale(s)
    - e.g., Ramsay, Aldrete, RASS, and/or SBS
- Temperature x1
- Baseline VS:
    - BP, HR, RR, $ETCO_2$, SPO_2, pain level
- Cardiac rhythm
- Confirm the LIP has completed the following:
    - Airway assessment (Mallampati classification)
    - American Society of Anesthesiologists (ASA) classification
    - Consents
- Universal Protocol/Team Pause/Time Out prior to procedure

Pre-Sedation Preparation - Universal Protocol/Time Out/ Team Pause





Sedation Team Responsibilities

Sedation team verifies the following required equipment is immediately available:

Suction –

Functioning suction and appropriately sized catheters

Oxygen –

Supplemental oxygen and appropriate delivery system (tubing, face mask, bag-valve mask, and nasal cannulas)

Airway –

Oral airways, nasopharyngeal and oropharyngeal airways, laryngeal mask airways, laryngoscopy blades, endotracheal tubes, and stylets

Pharmacy –

All the basic drugs needed to support life during an emergency

Reversal agents are at the bedside

Monitors

Pulse oximeter with appropriate sized probes, end-tidal carbon dioxide monitor, blood pressure cuffs, etc.

Equipment

Equipment to dispense medication (IV supplies), Broselow Cart with defibrillator and intubation supplies

Expand and review additional SOAPME details before moving on.

Sedation Risk Factor - Compromised Airway

COMPROMISED AIRWAY

Patients with anatomically compromised airways are at greater risk of respiratory complications

- The Mallampati assessment (performed by LIP) provides information regarding airway risk
  - Mallampati scores of 3 or 4 have higher risk for respiratory compromise

Image provided by UpToDate

CONTINUE

Sedation Risk Factor - Baseline Patient Condition

BASELINE PATIENT CONDITION

- The **American Society of Anesthesiologists (ASA) score** is a subjective assessment of the patient's overall health
- It is used to assess the fitness of patients before a procedure/surgery

Class I	Normal healthy patient
Class II	Patient with mild systemic disease
Class III	Patient with severe systemic disease
Class IV	Patient with severe systemic disease that is a constant threat to life
Class V	Moribund patient not expected to survive 24 hours.

Optimal ASA Class for Procedures with Sedation

- ASA scores 1 and 2 are the best predictors of a successful outcome for the patient
- ASA score of 3 or greater, special needs, anatomic airway abnormalities, or moderate to severe tonsillar hypertrophy present issues requiring additional and individual consideration.
    - The LIP is encouraged to consult with appropriate sub-specialist and/or an anesthesiologist prior to administration of sedation

CONTINUE

Sedation Risk Factor -
Other Complicating Conditions

PROCEED WITH CAUTION!

Patients presenting with the following conditions are known to have increased risks with sedation and are at the greatest risk of maintaining a patent airway or experiencing apnea during or following the sedation procedure.

Patients and their parents are instructed to refrain from pre-medicating for a procedure while at home or in route to the procedure.

1. Developmental disabilities
2. Younger than 6 years of age
3. Relevant diseases
4. Physical abnormalities (including genetic syndromes)
5. Neurological impairments
6. Obesity and/or a history of snoring or obstructive sleep apnea
7. History of seizures
8. History of prematurity

CONTINUE

Pre-Sedation Preparation - Sedation Plan

THIS IS IMPORTANT!

Click or tap the checkboxes to the left of each statement to mark them as read.

- [ ] Discuss sedation plan and target level of sedation (sedation score) with LIP
- [ ] The RN should consider potential risk factors that may increase the chance of complications associated with procedural sedation
- [ ] Communicate this information and any other concerns to the appropriate members of the healthcare team
- [ ] The LIP and RN must consider whether sedation and monitoring would be more appropriately managed by an anesthesiologist

Complete the content above before moving on.

Pre-Sedation Preparation - DNR/DNI Considerations

- DNR/DNI orders are not automatically rescinded during procedures
- The existing DNR/DNI status is to remain active unless the provider writes an order to initiate full code status during the procedure
    - However, pre-existing code status may not be appropriate for the procedural circumstances as techniques routinely undertaken in the course of sedation could be classified as resuscitation
- Every patient with DNR/DNI status, or their legal guardian, should have a conversation with the LIP regarding code status prior to the procedure

CONTINUE

Content - Intra-Procedure Sedation Considerations

Intra-Procedure Care & Documentation

Note: The monitored items listed below may change depending on ministry and/or procedure. Confirm with your preceptor and/or LIP.

Continuous monitoring means you must complete the following every 5 minutes during moderate or deep sedation (unless it interferes with procedure):

- Blood pressure
- Heart rate
- Respiratory rate
- SPO_2
- $ETCO_2$
- Pain level
- Sedation level (Ramsay, RASS, etc.)
- ECG

Medication

Medication administration is to be performed incrementally with adequate time between doses to assess full pharmacologic effects. This must be documented in in Epic.

The administration of each dose must be individualized based upon patient's condition and observed response to previous dose.

Note:

- Combinations of sedation and analgesic drugs may be administered but should be treated as individual components to achieve desired effects.
- IV sedative/analgesic drugs should be administered in small, incremental doses, or by titrating to desired endpoint allowing sufficient time to elapse between doses so peak effect of each dose can be assessed before subsequent drug administration.
- When drugs are administered by non-IV routes, allow sufficient time for absorption and peak effects of previous dose before supplementation is considered.

CONTINUE

Sedation Scales

Sedation scales are tools used to:

- Determine accurate and consistent drug titration
- Decrease the risk of excessive drug dosing
- Decrease the risk of over-sedation

Ramsay Sedation Scale

The Ramsay Score can be directly correlated to the ASA definitions of Levels of Sedation.

Ramsay Sedation Scale:

Clinical Status	Score
Patient awake, anxious, agitated, or restless	**1**
Patient awake, cooperative, orientated and tranquil	**2**
Patient drowsy, with response to commands	**3**
Patient asleep, brisk response to glabellar tap* or loud auditory stimulus	**4**
Patient asleep, sluggish response to stimulus	**5**
Patient has no response to firm nail-bed pressure or other noxious stimuli	**6**

Clinical Status	Score
*glabellar tap = tap on forehead between eyebrows	

Ramsay Sedation Scale correlation to ASA Levels of Sedation:

Score	Clinical Status	Level of Sedation Definition
1 2	**Patient awake, anxious, agitated, or restless** **Patient awake, cooperative, orientated and tranquil**	**Minimal Sedation:** A drug induced state during which patients respond normally to verbal commands. Cognitive function and coordination may be impaired, but respiratory and cardiovascular functions are unaffected.
3	**Patient asleep, responds to commands**	**Moderate Sedation:** A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain patent airway or adequate respirations. Cardiovascular functions and protective reflexes are usually maintained.
4	**Patient asleep, brisk response to glabellar tap or loud noise**	**Moderate <---------> Deep**
5	**Patient asleep, sluggish response to light glabellar tap*, tactile stimuli, or noise**	**Deep Sedation:** A drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. Patients may need assistance in maintaining a patent airway and respirations may be inadequate. Cardiovascular function is usually maintained.
6	**No response to light glabellar tap or laud noise**	**General Anesthesia:** A drug-induced loss of consciousness during which patients are not arousable even with painful stimulation. Patent airway, adequate respirations, cardiovascular functions may be impaired and often require assistance.

State Behavioral Scale (SBS)

A State Behavior assessment, especially in preverbal or nonverbal children is challenging. The SBS is a 6-point scale that describes state behavior on a scale of **-3 to +2**. Score the patient's response to voice then touch then noxious stimuli.

Score	Description	Definition
-3	**Unresponsive**	• No spontaneous respiratory effort • No cough or coughs with suctioning • No response to noxious stimuli

Score	Description	Definition
-2	**Responsive to noxious stimuli**	• Spontaneous yet supported breathing • Coughs with suctioning/repositioning • Responds to noxious stimuli
-1	**Responsive to gentle touch or voice**	• Spontaneous but ineffective non-supported breaths • Coughs with suctioning/repositioning • Responds to touch/voice
0	**Awake and able to calm**	• Spontaneous and effective breathing • Coughs when repositioned/occasional spontaneous cough • Responds to touch/no external stimulus is required to elicit response
+1	**Restless and difficult to calm**	• Spontaneous and effective breathing/having difficulty with ventilator • Occasional spontaneous cough • Responds to touch. No external stimulus is required to elicit response • Intermittently unsafe, increased movement (restless, squirming)
+2	**Agitated**	• May have difficulty breathing with ventilator • Coughing spontaneously • Unsafe (biting ETT, pulling at lines, cannot be left alone) • Unable to console

Richmond Agitation-Sedation Scale (RASS)

RASS is a 10-point scale, with:

- four levels of anxiety or agitation,
- one level denoting a calm and alert state, and
- five levels of sedation,

On one extreme of the RASS score, +4 represents a very combative, violent patient, who is considered dangerous to the staff. On the other extreme, -5 represents a patient who is unarousable, with no response to voice or physical stimulation.

Score	Definition
+4	Combative, overtly combative or violent, immediate danger to staff.
+3	Very agitated, pulls on or removes tubes or catheters or is aggressive.
+2	Agitated, frequent non-purposeful movement or ventilator dyssynchrony.
+1	Restless, anxious or apprehensive but movements not aggressive or vigorous.
0	Alert and calm.
-1	Drowsy, but sustains more than 10 seconds awake, with eye opening in response to verbal command.
-2	Light sedation: Awakens briefly (less than 10 seconds) with eye contact to verbal command.
-3	Moderate sedation: Any movement, except eye contact, in response to command.
-4	Deep sedation: No response to voice, but any movement to physical stimulation.
-5	Unarousable: No response to voice or physical stimulation.

Source: "The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care unit patients." *Am J Respir Crit Care Med* 2002;166:1338–1344.

CONTINUE

Intra-Procedure Sedation Considerations Review

Multiple Choice:

You are taking care of a 13-year-old boy that is intubated for airway protection. While attempting to start an IV, your patient withdraws his hand from you and winces from the pain. You are able to calm him and start the IV. When you turn him on his side, he coughs and falls back asleep.

What is his SBS Score?

- ◯ -1
- ◯ -2
- ◯ 1

SUBMIT

Fill in the Blank:

You are in the middle of a procedure using moderate sedation, your patient is on her back. Her pulse oximetry measurement falls to 86% (her baseline was 92%), her $ETCO_2$ rises to 60 (from her baseline of 40), and she is making “crowing sounds."

What is the probable cause?

**Hint: type in your two word answer below.*

Type your answer here

SUBMIT

Select All That Apply:

Think about the patient in the question above. What should you do in this situation? Select the steps you should take from the list below.

- [ ] Open her airway by either repositioning her head, doing a head tilt/chin lift, jaw thrust, insert an oral/nasal airway, or ventilate with an ambu bag
- [ ] Provide supplemental oxygen and continue SaO_2 and $ETCO_2$ monitoring
- [ ] Anticipate the need for resuscitation and ensure you have emergency equipment at the bedside.

SUBMIT

Complete the content above before moving on.

Content - Post-Procedure Sedation Considerations

Post-procedural Monitoring

Who stays at the bedside?

During recovery, there is a minimum of:

- One qualified RN whose only responsibility is to constantly observe patients:
  - Vital signs
  - Airway patency
  - Adequacy of ventilation
  - Either administer medication or direct their administration

Post-Procedure Equipment

- [ ] Patent IV site with IV fluids
- [ ] Oxygen and O_2 delivery devices (flow meters, nasal cannulae, face mask)
- [ ] Pulse oximeter
- [ ] Blood pressure monitoring (use correct cuff size)
- [ ] Cardiac monitor
- [ ] Code cart/defibrillator immediately available (including one-way valve mask, airways, suction, ambu-bag, intubation equipment, emergency drugs)
- [ ] Drug antagonists nearby (Flumzaenil and Naloxone)

You should also consider monitoring $ETCO_2$ if you think the patient is at risk for post-procedure respiratory issues.

Post-Procedure Nursing Management

Continuous Monitoring

Once the procedure is complete and no further sedation has been given, continue to monitor and document until the patient achieves an Aldrete score of at least 8 (or the pre-procedure score if baseline is <8).

If score is less than 8 at the end of sedation phase, the monitoring nurse should contact the LIP and document the exception.

Monitor and Document

Monitor and document:

- Vital signs (BP, HR, RR, SpO_2, $ETCO_2$, pain level, sedation score) every 15 minutes (confirm frequency with your ministry) from administration of last dose of sedation mediation
- Aldrete score
- ECG

Additional Monitoring

After pharmacological reversal is completed, you must observe the patient to ensure that sedation and cardio-respiratory depression does not recur once the effect of the antagonist dissipates because duration of the medications administered for sedation may exceed the duration of the antagonist.

Aldrete Score

The Aldrete score evaluates recovery after sedation/anesthesia and patient readiness for discharge.

Level of Consciousness	• Fully awake or responds easily to verbal stimuli or pre-procedure baseline • Arousable on calling • Not responding ***must be at least 1 at end of monitoring**	**= 2** **= 1** **= 0**
Respirations	• Able to breathe and cough freely • Dyspnea or limited breathing • Apneic	**= 2** **= 1** **= 0**
Oxygen Saturation	• Maintains value ≥ 92% on room air • Requires supplemental O2 to maintain saturation at ≥ 90% • Saturation ≤ 90% with supplemental O2	**= 2** **= 1** **= 0**
Hemodynamic stability	• Blood pressure ± 20% baseline • Blood pressure ± 20-50% baseline • Blood pressure ± 50% baseline	**= 2** **= 1** **= 0**
Physical Activity	• Ability to move all extremities voluntarily or on command. • Moves 2 extremities voluntarily or on command • Moves 0 extremities voluntarily or on command	**= 2** **= 1** **= 0**

Discharge Criteria

Discharge Criteria

Patient may be discharged when:

- Cardiovascular function and airway patency are satisfactory and stable, vital signs are stable and similar to pre-procedure baseline measurements with no signs of respiratory distress
- Patient can:
  - Be easily aroused, and protective airway reflexes are intact
  - Talk (if age appropriate)
  - Sit up unaided (if developmentally appropriate)
    - If very young age, then patient should be back to pre-sedation level for that child

- State of hydration is adequate, has ingested and retained fluid
- No complications noted (e.g., no excessive bleeding from the wound, minimal nausea, vomiting, or dizziness)
- Pain is well tolerated
- Parents or guardians have received written instructions and prescriptions and demonstrate understanding of patient's post-procedural care needs, signs and symptoms of complications, reasons and how to contact the LIP, ensuring the parents or guardians can meet child's home care needs

Outpatient/Short Stay Discharge Criteria

Patient may be discharged from **facility** when:

- Provided written post-sedation/procedure instructions (signs and symptoms to monitor for, how to contact the care team prior to their follow-up appointment)
- Parent of guardian must be able to escort patient through post-discharge transportation (e.g., drive patient or travel with patient in taxi)
- Infants and toddlers in car seats require two adults present during transport so one may continuously observe the child during the drive
- Patients with anatomic airway problems, former preterm infants, underlying medical conditions (e.g., obstructive sleep apnea) should have a longer observation due to the increased risk to maintain a patent airway or experience apnea

Expand and review the content above before moving on.

Documentation Requirements

Document procedural sedation information:

- Pre-sedation assessment
- Patient education documented in Patient Education section in Epic
- Informed consent
- Current list of allergies and medications
- Time out/universal protocol/team pause (including pre-sedation assessment and VS)
- Documentation of vital signs, drugs, procedure details
- Post-sedation assessment
- Patient response to procedure/medications
- Discharge criteria met

Procedural Sedation Key Take-Aways

- [ ] Pre-procedure assessment must be completed by the LIP and include risk assessment, Mallampati, ASA score, and appropriate lab tests
- [ ] An informed consent must be obtained
- [ ] Monitoring of the patient during the sedation procedure is continuous

- When the RN is monitoring the patient, they may not leave the patient unattended or perform other tasks that would compromise patient monitoring including performance of the procedure itself

- [ ] Documentation of the sedation procedure will occur in a sedation narrator
- [ ] The RN must be familiar with the drugs used
- [ ] Use of reversal agents require additional monitoring post procedure
- [ ] Duration of monitoring:

  - From first dose of the sedating agent throughout the procedure.
  - Into the recovery phase until an Aldrete score of 8 is reached (or the pre-procedure score if baseline is <8).
  - Monitor continuously. Document a minimum of every 15 minutes or the frequency required by your ministry.
  - Document any deviations from baseline or expected results, and report to the LIP.

- [ ] If moderate sedation has progressed to deep sedation efforts need to be made to return the patient to the moderate sedation level
- [ ] The most common complications of procedural sedation are airway obstruction and over sedation
- [ ] Emergency equipment must be available at the bedside or within easy access during the procedure
- [ ] Post-procedure monitoring continues until discharge criteria are met
- [ ] Written discharge instructions will be provided
- [ ] The patient will be discharged to the care of a responsible adult

CONTINUE

Post-Procedure Sedation Considerations Review

Multiple Choice:

After his endoscopy, your patient is asleep, but arouses to voice (quickly falls back to sleep). He moves all extremities on command, his resp rate is 8, his BP is 110/60 (baseline was 158/88), and his SPO_2 is 93-94% on 2 liters O_2 (baseline was 98% on room air).

What is his Aldrete score?

- ◯ 5
- ◯ 6
- ◯ 7
- ◯ 8

SUBMIT

Multiple Choice:

After a chest tube insertion, your 16-year=old patient is awake and talking, is able to move all extremities, has a resp. rate of 12, his is BP 124/74 (baseline was 132/80), and his $Sa0_2$ is 96% on room air (baseline was 98%).

What is his Aldrete score?

- ◯ 7

- ◯ 8
- ◯ 9
- ◯ 10

SUBMIT

Complete the content above before moving on.

Pre/Intra/Post Procedure Sedation Considerations Review

True or False:

Pediatric Procedural sedation is a continuum that exists between minimal, moderate, deep sedation, but does not include general anesthesia.

- ◯ True
- ◯ False

SUBMIT

Select All That Apply:

Sedation scales are important because they:

- ☐ Determine the risk of under-sedation
- ☐ Determine the risk of over-sedation
- ☐ Determine accurate and consistent drug titration

SUBMIT

Multiple Choice:

SOAPME stands for:

- ◯ Suction, Oral, Airway, Pharmacy, Monitors, Equipment
- ◯ Supplemental Oxygen, Oral, Airway, People, Monitors, Equipment
- ◯ Suction, Oxygen, Airway, Pharmacy, Medications, Equipment
- ◯ Suction, Oxygen, Airway, Pharmacy, Monitors, Equipment

SUBMIT

Multiple Choice:

The Mallampati assessment identifies the following:

- ◯ Airway malformations
- ◯ Risk for respiratory compromise
- ◯ Risk for aspiration
- ◯ Seizure risk

SUBMIT

Fill in the Blank:

A Ramsay score of ____ indicates moderate sedation:

Type your answer here

SUBMIT

Multiple Choice:

During the post-procedure care, you should document vital signs (BP, P, RR, SpO_2) every _____.

- ◯ 5 minutes
- ◯ 8 minutes
- ◯ 10 minutes
- ◯ 15 minutes

SUBMIT

Complete the content above before moving on.

Content - Pharmacology

Nursing Management Topics

Pharmacological Considerations

Verify the sedation plan with the LIP:

- Moderate versus deep sedation?
- Is the LIP certified for the intended level of sedation?

Goals of Medication Administration

- A rapid and predictable onset of action following drug administration
- Minimal adverse respiratory and/or cardiovascular effects
- Allow for quick recovery
- Optimal patient satisfaction

Titrating Sedation Medications

- The administration of each dose of medication will be by the order of the LIP performing the procedure
- RN must be familiar with sedation medication, appropriate dosing, time to peak effect, and side effects
- Dosages and rates of administration must be individualized to patient response

Titrate each drug **individually** for desired effect:

- Use incremental doses
- Allow adequate time between doses to achieve peak pharmacologic effects
- Assess effectiveness of each dose before administering more medication

Consider your patient's response before administering the entirety of an ordered dose. It is acceptable to provide the ordered dose in incremental doses to assess effectiveness before administering the next portion.

Remember: the risk of respiratory depression increases when multiple agents are used.

Review each tab above before moving on.

Medications Used for Procedural Sedation

The two main types of medications used for procedural sedation are Opioids/Synthetic Opioids and Benzodiazepines. Barbiturates can be used for sedation, but they are used infrequently.

Note: Combining drugs increases the risk of adverse effects in all age groups.

Drugs Commonly Used in Procedural Sedation

Medication	Pharmacology	Effect	Adverse Effect

Dexmedetomidine	• Dose:
	  ◦ IN: 1-2 mcg/kg
	  ◦ IV: 0.2-0.4 mcg/kg
	• Onset: 5-10 minutes
	• Duration: 30-70 minutes
	May only be used during a moderate or deep sedation if the LIP is immediately available to respond during administration or patient is already intubated and ventilated
		• Sedation
		• Analgesia
			• Bradycardia
			• Hypotension
			• Hypertension
			Note: Use with caution in hypovolemia or reduced cardiac function

Medication	Pharmacology	Effect	Adverse Effect

Fentanyl	**Note:** 100 times more potent than morphine. ADMINISTER SLOWLY!
	• Dose:
	  ◦ IN: 0.5-2 mcg/kg (max 100mcg/dose)
	  ◦ IV: 0.5-1 mcg/kg (max 50 mcg/dose)
	  ◦ IM: 1-2 mcg/kg (max 50 mcg/dose)
	• Onset: 5-10 minutes
	• Duration: 30-60 minutes
		Analgesia only (does not produce amnesia)	• Respiratory depression
			• Hypotension
			• **WARNING:** Rapid administration of Fentanyl can cause chest wall rigidity, which may be fatal
			
			Note: Can produce profound sedation when used in combination with benzodiazepines and other CNS depressants
			
			Avoid in patients with gastrointestinal obstruction

Midazolam (Versed)	• Dose:
	  ◦ IN: 0.2-0.5 mg/kg (max 10 mg/dose)
	  ◦ IV: 0.05-0.1 mg/kg (max 10 mg/dose)
	  ◦ IM: 0.05-0.15 mg/kg (max 10 mg/dose)
	• Onset: 1-3 minutes
	• Duration: 15-60 minutes
		Sedation	Respiratory depression, apnea, hypotension
			
			Provides sedation with no analgesia
			
			Avoid in patients with acute narrow-angle glaucoma
			
			Is associated with paradoxical reactions in pediatric patients such as aggressive behavior or hyperactivity

Etomidate	• Dose: ◦ IV: 0.2-0.4 mg/kg (max 50 mcg/dose) • Onset: .05-1 minute • Duration: 2-5 minutes	• General anesthesia • Sedation	• Myoclonus • Nausea • Vomiting *Not to be given to patients with adrenal insufficiency* *Reduces intracranial pressure* *Lowers seizure threshold*

Medication	Pharmacology	Effect	Adverse Effect

Ketamine	• Dose:
	  ◦ IN: 3-6 mg/kg
	  ◦ IV: 1-2 mg/kg
	  ◦ IM: 2-5 mg/kg
	• Onset: 1-2 minutes
	• Duration: 15-30 minutes
	May only be used during a moderate or deep sedation if the LIP is immediately available to respond during administration or patient is already intubated and ventilated
		• Anesthesia
		• Sedation
			• Hypotension
			• Dysphoria
			• Hypersalivation
			• Vomiting
			When given with Propofol, reduce initial dose
			Seizures and agitation should be treated with benzodiazepines
			Ketamine-induced dystonia can be treated with diphenhydramine
			Not to be given to patients with known or suspected psychosis

Abbreviations:

IN= intranasal

IV= intravenous

IM= intramuscular

Other Pharmacological Agents

- Anesthetic agents such as Propofol, Etomidate, and Ketamine may be used in planned deep sedation
- Planned deep sedation by non-anesthesia may be performed only by LIPs certified in deep sedation
- Ketamine may only administered by personnel trained in administration of anesthesia (unless there is a departmental protocol approved by the medical staff)

Reversal Agents

REMINDER: Not every medication has a reversal agent!

Test Yourself

Before you click or tap to flip each card below to reveal the corresponding reversal agent, test yourself to see if you can recall what they are. Review all cards before moving on.

Opioids - Fentanyl	**Reverse with nalaxone (Narcan)**

1 of 5

Benzodiazepines - Midazolam	**Reverse with flumazenil (Romazicon)**

2 of 5

Ketamine

No specific reversal agent (treat symptoms and provide supportive therapy)

Dexemedtomidine

No specific reversal agent (treat symptoms and provide supportive therapy)

Etomidate

No specific reversal agent (treat symptoms and provide supportive therapy)

Naloxone (Narcan)

- Duration is shorter than most opioids, so will likely need repeated doses (every 20-30 minutes)
- May titrate dose to reverse hypoventilation without reversing analgesic effect
- Dose:
  - IN: 2-4 mg
  - IV: 0.1 mg/kg (max 2 mg/dose)
  - IM: 0.1 mg/kg (max 2 mg/dose)
- Onset:
  - IN: 8-13 minutes
  - IV: 2 minutes
  - IM: 2-5 minutes
- Duration:
  - 30-120 minutes
    - ***IV route has the shortest duration**

Flumazenil

- Duration can be shorter than some benzodiazepines, so may need repeat doses
- Should be avoided in patients with seizure disorders or patients who take chronic benzodiazepines
- Dose:
  - IV: 0.01 mg/kg (max 0.2 mg/dose)
    - Maximum cumulative dose: 0.05 mg/kg or 1 mg (whichever is lower)
      - ***May repeat dose every 1 minute until total**

- Onset:
  - 1-2 minutes
- Duration:
  - 19-50 minutes

Complete the content above before moving on.

Treating Oversedation

If your patient progresses beyond the goal of therapy, supportive therapy should be provided.

- Consider reversal agent (per LIP order)
- Continue continuous monitoring every 10 minutes for at least 30 minutes (every 5 minutes for deep sedation) until adequate respiratory effort
  - May require 2 or more hours of additional monitoring
- Provide respiratory support
  - Examples include:
    - Increasing oxygen
    - Jaw thrust/chin lift
    - Oral airway
    - Ambu bag
    - Prepare for intubation, etc.

Watch for post-procedure sedation

Once the stimulation from the procedure is over, the patient may progress to a deeper level of sedation than assessed throughout the procedure.

Maintain intra-procedure level of monitoring until patient is at least a 3 on the Ramsey Sedation Score.

CONTINUE

Pharmacology Review

True or False:

Fentanyl should be given quickly in order to avoid chest wall rigidity.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

The reversal agent for Fentanyl is:

- ◯ Flumazenil
- ◯ Naloxone
- ◯ Morphine
- ◯ None available

SUBMIT

Multiple Choice:

Etomidate should be used with caution since it can:

- ◯ Increase clotting
- ◯ Decrease heart rate
- ◯ Lower seizure threshold

SUBMIT

Multiple Choice:

If a patient progresses beyond the goal of therapy, you should:

- ◯ Provide respiratory support
- ◯ Consider reversal agent
- ◯ Monitor patient every 10 minutes if in moderate sedation
- ◯ All of the above

SUBMIT

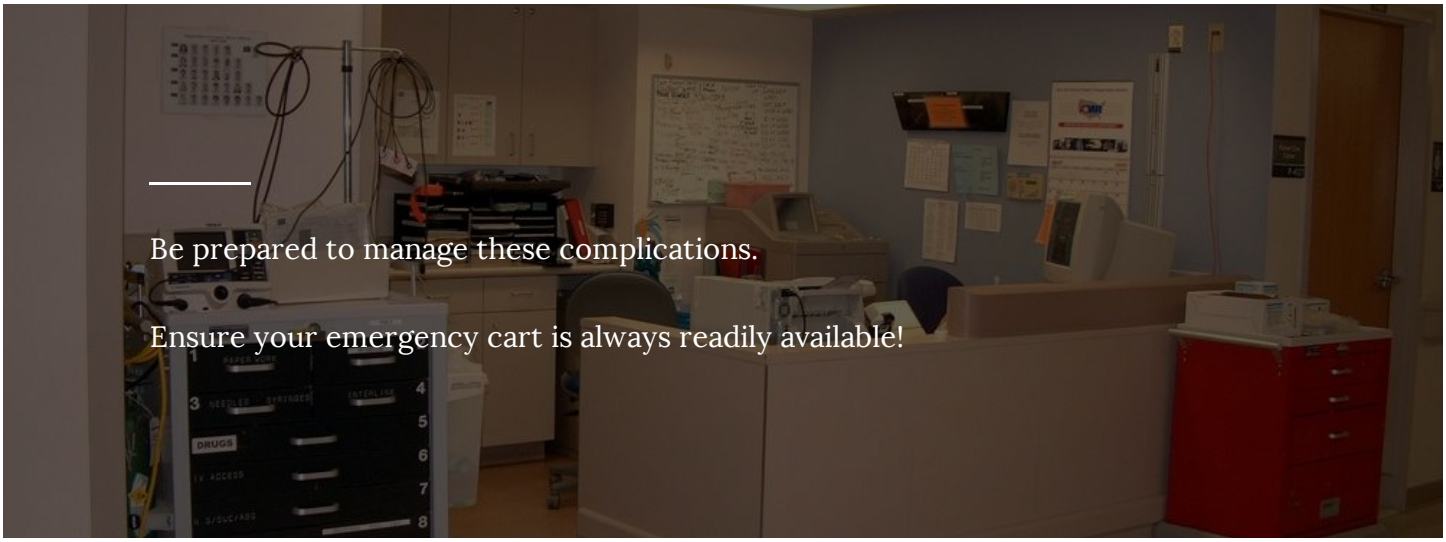
Complete the content above before moving on.

Content - Sedation Complications & Rescue for Pediatric Patients

Manage Complications of Sedation

Signs and symptoms of over sedation:

- [ ] Respiratory depression
- [ ] Airway compromise (most common sedation complication)
- [ ] Unresponsiveness
- [ ] Cardiovascular instability



Airway Management

- Airway obstruction is the most common complication in sedation
- Follow ACLS/PALS airway management guidelines
- Airway resuscitation equipment must be at the bedside or immediately available (Airways, Ambu Bag, Suction)
- Oxygen mask or nasal cannula must be immediately available

Airway Rescue Algorithm

Complete the content above before moving on.

Click or tap on the numbers below to review five ways to manage sedation complications. Review all to move on.


Management of Sedation Complications
1
2
3
4
5

Do NOT give more sedation medication

Initiate emergency airway management

Communicate patient status to LIP

Consult with LIP about further management of patient status including use of reversal agents

If reversal agents are used, ensure assessments are adequate to identify over-sedation recurrence once the effect of the antagonist dissipates (may require up to 2 hours of increased observation)

Review all five ways to manage sedation complications above before moving on.

Identifying Patients Transitioning to Deep Sedation

If the patient transitions to deep sedation, it is imperative that you initiate rescue procedures!

- The patient has transitioned to deep sedation if they cannot be easily aroused (even if they respond purposefully following repeated or painful stimuli)
    - These patients may have trouble breathing and often require assistance in maintaining a patent airway
- A score of 5 or 6 on Ramsay sedation score is indicative of transition to deep sedation
- In pediatric patients, a score of less than 0 on the State Behavior Scale indicates a transitions to deep sedation

Actions for When Sedation Progresses Deeper Than Planned

Let's take a look at the steps to take when a patient progresses deeper into sedation than anticipated.

Appropriate measures need to be taken to return patient to planned sedation level.

1

Notify team involved with the procedure of patient's status.

"The patient's sedation is increasing and has transitioned to a deeper sedation level than planned. We need to address sedation level before proceeding."

2

Assess patient's airway.

If respirations are impaired, prepare rescue procedures:

1. Manually open airway (jaw thrust).
2. Consider insertion of oral or nasal airway.
3. Assist with ventilations (bag/valve mask).
4. Prepare for intubation: consider calling for anesthesia or code blue as appropriate to situation.
5. Suction airway PRN.

4

Be aware that the progression towards deep sedation varies from person to person.

5

Be alert to accumulation of secretions in the airway as aspiration is the most common cause of death in procedural sedation.

6

If deep sedation has occurred, measures to return to the planned level of sedation need to be instituted.

Monitor patient for signs of decreased respiratory status and airway compromise.

Follow airway rescue algorithm as needed.

8

Administer reversal agents per LIP orders.

Document patient status every 5 minutes, including:

- BP
- Pulse
- Respirations
- $ETCO_2$
- Pulse oximetry
- Sedation level
- ECG pattern

Remember!

Only LIPs certified in endotracheal intubation may perform airway intubation.

Complete the content above before moving on.

Reversal Agents

Remember, the half-life of reversal agents can be shorter than sedative medications - close and continued monitoring is essential.

- If a reversal agent is used, the patient must be observed and monitored long enough to ensure that sedation and cardio-respiratory depression does not recur once the effect of the antagonist dissipates.
- May require observation and monitoring at least 2 hours after last dose of a reversal agent.

Complications: Allergic Reactions

Allergic Reactions

Although they are rare, allergic reactions to medications do occur. Be sure to note allergies and symptoms at the pre-procedure assessment.

The following are the most common signs of an allergic reaction:

- Generalized flush with tingling

- Pruritus
- Tachycardia
- Urticaria
- Angioedema
- Inspiratory stridor
- Wheezing
- Sudden hypotension
- Cardiac arrhythmias
- Loss of consciousness
- Seizures

Responding to an Allergic Reaction

1. Stop procedure
2. Administer appropriate drugs to counteract the allergic response as ordered:
    a. Epinephrine
    b. Benadryl
    c. Hydrocortisone, etc.
3. Monitor blood pressure
4. Support cardiovascular system with emergency medications/fluids
5. Keep airway patent
6. Anticipate possible endotracheal intubation
7. Consider calling RRT

CONTINUE

Sedation Complications & Rescue for Pediatric Patients Review

Multiple Choice:

Your patient has progressed to unplanned deep sedation during the procedure. He does not have spontaneous respirations, the SpO_2 has dropped to 65% on 6 L of O_2, and the $ETCO_2$ waveform is flat. The LIP decides to stop the procedure to intubate the patient.

What should you do?

- ◯ As your ACLS/PALS certification is current, you intubate the patient
- ◯ Call for assistance (anesthesia or code) and support the airway until an LIP trained in pediatric intubation arrives
- ◯ Call an RRT
- ◯ Transfer the patient to the critical care unit immediately, then intubate

SUBMIT

Multiple Choice:

Your patient has received 4 mg of morphine sulfate IV. You notice during your procedural assessment that hives are forming. He is now having difficulty breathing with high pitched crowing on inspiration with stridor. His blood pressure has dropped from 140/78 to 80/40. You alert the LIP of the suspected allergic reaction.

Which of the following interventions would you **NOT** perform?

- ◯ Stop the procedure

- ◯ Administer medications to reverse the allergic reaction per LIP order
- ◯ Intubate the patient immediately
- ◯ Call RRT
- ◯ Support the airway

SUBMIT

Select All That Apply:

Your patient's baseline vital signs are HR 78, RR 16, B/P 132/78, O_2 saturation 96%, and $ETCO_2$ 35 mmHg on room air. 15 minutes into the procedure, you obtain the following vital signs: HR 65, RR 10, B/P 120/70, O_2 saturation 94%, $ETCO_2$ 47 mmHg.

Which parameter(s) is/are of concern and bears closer observation?

- ☐ RR of 10
- ☐ $ETCO_2$ of 47
- ☐ HR of 65
- ☐ B/P of 120/70
- ☐ O_2 saturation of 94%

SUBMIT

Multiple Choice:

What would be the first line intervention if airway obstruction is suspected?

- ◯ Administer the appropriate reversal agent
- ◯ Continue pulse oximetry monitoring
- ◯ Intubate the patient immediately
- ◯ Reposition the airway using techniques for opening the airway

SUBMIT

True or False:

The most common cause of death in procedural sedation is respiratory depression.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

Your patient has received large doses of midazolam (Versed) and fentanyl for painful debridement of a wound. 20 minutes into the procedure, the patient begins to have sonorous respirations. You perform a chin lift and reassess the patient's status. The patient does not respond to verbal, tactile, or painful stimuli.

Which level of sedation describes the patient's current status?

- ◯ Minimal sedation
- ◯ Moderate sedation
- ◯ Deep sedation
- ◯ General anesthesia

SUBMIT

Multiple Choice:

Your patient has received a total of 10 mg of IV morphine sulfate for procedural sedation. She is restless and agitated. Her respirations are 10 and shallow.

What may be the cause?

- ◯ The patient is responding to the painful procedure and needs more medication
- ◯ The patient is showing early signs of an allergic response to the morphine sulfate
- ◯ The patient may be showing signs of hypoxemia and further assessment is needed
- ◯ The patient is having an opposite effect with the use of morphine sulfate and a different drug should be administered

SUBMIT

Select All That Apply:

Which of the following would indicate that your patient has drifted into deep sedation?

- [ ] Vital signs are stable, but oxygen saturation has decreased slightly
- [ ] Respirations have decreased to 10/minute, oxygen saturation remains at 99%, and $ETCO_2$ is 3mm Hg above baseline
- [ ] Patient attempts to open eyes only after pain stimulus (e.g., sternal rub)
- [ ] A chin lift is required to maintain a patent airway and $ETCO_2$ has risen 10 mm Hg above baseline

SUBMIT

Complete the content above before moving on.

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CONTINUE

Conclusion

Thank you for completing the Procedural Sedation - Pediatric Patients course!

If you have any unit-specific questions, please contact your nursing unit manager or preceptor.

Exit

Click to exit the course.

EXIT

Procedural Sedation - Adult Patients

Providence

This course provides an overview of procedural sedation for adult patients.

You will review information on each topic and then be presented with questions to test your understanding.

Course and Concepts

LEVELS OF SEDATION & CAPNOGRAPHY

Content - Levels of Sedation Defined

Levels of Sedation Defined Review

Content - Capnography: End Tidal CO_2 Monitoring During Sedation

Capnography: End Tidal CO_2 Monitoring During Sedation Review

PRE/INTRA/POST SEDATION CONSIDERATIONS

Pre-Procedure Sedation Considerations

Content - Intra-Procedure Sedation Considerations

Intra-Procedure Sedation Considerations Review

Content - Post-Procedure Sedation Considerations

Post-Procedure Sedation Considerations Review

PHARMACOLOGY

Content - Pharmacology

Pharmacology Review

SEDATION COMPLICATIONS & RESCUE FOR ADULT PATIENTS

Content - Sedation Complications & Rescue for Adult Patients

Sedation Complications & Rescue for Adult Patients Review

CONCLUSION

Conclusion

Course and Concepts

Course Format

You will review information on each topic and then be presented with questions to test your understanding.

All activities must be completed before moving on to the next section.

The key concepts in this course are:

- Identify and describe the indications for use and desired outcomes in procedural sedation.
- Describe the sedation continuum.
- Define capnography.
- List at least one benefit that capnography offers that pulse oximetry does not.
- Differentiate between normal and abnormal capnography wave forms.
- List at least two potential causes for a loss of wave form.
- Identify potential actions to take if a patient's $EtCO_2$ is rising.
- Name the drugs most commonly used in sedation.
- Explain the clinical considerations with the drugs used in sedation.
- Identify the recommended doses and side effects of the drugs used in sedation.
- List considerations needed in drug administration in the geriatric populations.
- State the role of the RN during the procedural sedation process.
- Verbalize use of the ASA Classification Risk Assessment Tool.
- Relate the necessity of documented airway assessment by the Licensed Independent Practitioner [LIP] (Mallampati).
- Describe the pre-intra-post nursing management of the patient undergoing procedural sedation.
- Identify the equipment required for procedural sedation procedures.
- State when to use the Ramsay and Aldrete scales.
- List potential complications of procedural sedation.

- Identify first line emergency interventions required for the most commonly seen sedation complications.

CONTINUE

Content - Levels of Sedation Defined

Continuum of Sedation

Analgesia and sedation comprise a continuum.

It is not always possible to predict how an individual will respond.

The RN must be prepared to care for the patient if a deeper than intended level of sedation is attained.

Four Levels of Sedation

Before you peek at the answers below, can you name the four levels of sedation in order, beginning with the state of awake?

- American Society of Anesthesiologists

- American Society of Anesthesiologists

Minimal Sedation

- American Society of Anesthesiologists

Moderate/Dissociative Sedation

- American Society of Anesthesiologists

Deep Sedation

- American Society of Anesthesiologists

General Anesthesia

Review each of the question marks above before moving on.

Select each section below to review the definitions of each of the four levels of sedation.

Minimal Sedation

- A drug-induced state in which patients respond normally to verbal commands
- Cognitive function and coordination may be impaired
- Respiratory and cardiovascular functions are unaffected
- Patient has normal eye movements, respiratory rate and effort, and intact protective reflexes

Dissociative Sedation

- A trance-like cataleptic state in which the patient experiences profound analgesia and amnesia
- Airway protective reflexes, spontaneous respirations, and cardiopulmonary stability are all maintained

- Ketamine is the pharmacologic agent used for procedural sedation that produces this state

Moderate Sedation

- A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation
- No interventions are required to maintain patent airway or adequate respirations
- Cardiovascular functions and protective reflexes are usually maintained

Desired Outcomes:

- Primary objective/outcome: reduce the patient's anxiety and discomfort
- Produce amnesia
- Enhance patient's cooperation
- Maintain stable vital signs
- Allay fear and anxiety with minimal medication
- Rapid recovery from the procedure

Deep Sedation

- A drug-induced depression of consciousness during which patients cannot be easily aroused, but respond purposefully following repeated or painful stimulation
- Patients may need assistance in maintaining a patent airway and respirations may be inadequate
- Cardiovascular function is usually maintained

Desired Outcomes:

- Primary objective/outcome: drug-induced decrease of consciousness that allows for comfort in an otherwise painful medical procedure
- Patient cannot be easily aroused but can respond purposefully following repeated or painful stimulation

Anesthesia

- A drug-induced loss of consciousness during which patients are not arousable, even with painful stimulation
- Patent airway, adequate respirations, cardiovascular functions may be impaired and often require assistance
- Requires an Anesthesiologist/anesthesia provider

Expand and review the content above before moving on.

Four Levels of Sedation - Defined

System	Minimal Sedation	Moderate/Dissociative Sedation	Deep Sedation	General Anesthesia
Response LOC	Normal response to verbal stimulation	Drowsy; purposeful response to verbal or tactile stimulation	Purposeful response following repeated or painful stimulation	Unarousable even with painful stimulus
Airway	Unaffected	Unarousable even with painful stimulus	Intervention may be required	Intervention often required
Spontaneous ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular function	Unaffected	Usually maintained	Usually maintained	May be impaired

CONTINUE

Levels of Sedation Defined Review

Select All That Apply:

RN responsibilities during a procedure requiring moderate sedation include:

- [ ] Assisting the Licensed Independent Practitioner (LIP) with the procedure
- [ ] Continuous monitoring of patient status, including vital signs and level of sedation
- [ ] The administration of medication ordered by a qualified LIP

SUBMIT

Multiple Choice:

The desired outcomes for moderate sedation include:

- ◯ Reduction of patient anxiety and discomfort with minimal medications
- ◯ Produce amnesia and maintain stable vital signs
- ◯ Enhance the patient's cooperation
- ◯ Rapid recovery from the procedure
- ◯ All of the above

SUBMIT

Multiple Choice:

Which of the following is **NOT** a goal of procedural (moderate) sedation?

- ◯ Guard patient safety and welfare
- ◯ Maintain adequate sedation with minimal risk
- ◯ Allay patient fear and anxiety
- ◯ Produce an unconscious patient

SUBMIT

True or False:

Deep sedation requires a LIP who is certified in deep sedation to be present during the procedure.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice Scenario:

Your patient assessment findings are the patient is in a drug induced depression of consciousness but can respond to verbal commands. The patient can maintain his airway and respirations and pulse oximetry readings are 93% with the protective reflexes intact.

Which level of sedation is the patient in?

- ◯ Minimal sedation
- ◯ Moderate sedation
- ◯ Deep sedation
- ◯ General anesthesia

SUBMIT

Multiple Choice Scenario:

Your patient is receiving moderate sedation for the closed reduction of a fracture of the right tibia. Halfway through the procedure the patient's heart rate increases to 140, respirations increase to 24, he is moaning and crying out in pain. He can respond to verbal commands and his protective reflexes remain intact.

What level of sedation is the patient exhibiting?

- ◯ Minimal sedation
- ◯ Moderate sedation
- ◯ Deep sedation

- ◯ General anesthesia

SUBMIT

Multiple Choice:

Which of the following is **NOT** a characteristic of moderate sedation?

- ◯ Patient is easily arousable
- ◯ Minimally depressed level of consciousness
- ◯ Patient is unable to purposely respond to verbal stimuli
- ◯ Protective airway reflexes are maintained

SUBMIT

Multiple Choice:

Expected outcomes of moderate sedation may include all of the following **except**:

- ◯ A calm, cooperative patient
- ◯ A sleepy but easily arousable patient
- ◯ A sleepy patient who requires a chin lift to maintain a patent airway
- ◯ Amnesia related to the procedure

SUBMIT

Multiple Choice:

The primary purpose for using moderate sedation is to:

- ◯ Reduce the number of involuntary muscle spasms
- ◯ Support cardiovascular functions and depress consciousness
- ◯ Decrease anxiety and discomfort during an invasive procedure
- ◯ Reduce chance of seizures in patients during an invasive procedure

SUBMIT

Complete the content above before moving on.

Content - Capnography: End Tidal CO_2 Monitoring During Sedation

Benefits of Capnography

Click or tap the box to the left of each statement to mark it as read. Review all to move on.

- [ ] Improved ventilation assessment
- [ ] Assessment of blood flow
- [ ] Protection from misplacement of tubes
- [ ] Ventilation monitoring
- [ ] Avoiding poor outcomes (e.g., oversedation during sedation)
- [ ] Avoiding unnecessary tests (e.g., ABGs)

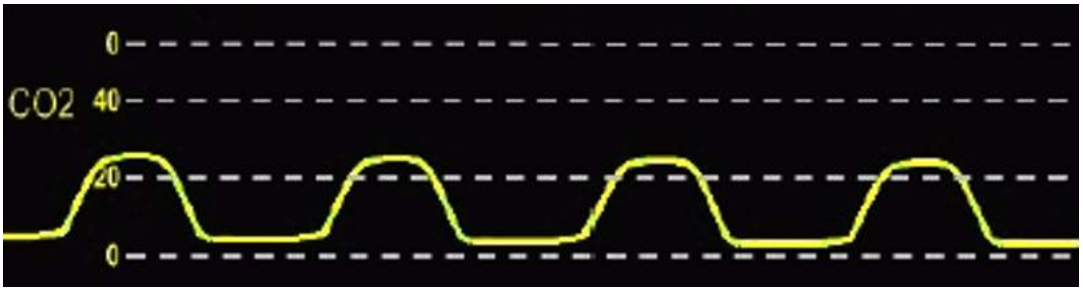
Complete the content above before moving on.

What is Capnography?

Capnography is the non-invasive measurement and numerical display of End-tidal CO_2 ($EtCO_2$), or the maximum expired CO_2 concentration during a respiratory cycle.

In an effective $EtCO_2$ tracing, note the rise and fall of expired CO_2 with each breath.

The normal range for $EtCO_2$ is 35-45 mm Hg



Waveform graphic courtesy of Covidien

Measuring Capnography

Exhaled carbon dioxide can be measured using various devices. The capnography equipment shown below are used to measure $EtCO_2$.

*These **examples** of capnography equipment **may not be representative of the equipment used at your ministry**.* **Be sure to familiarize yourself with the equipment you will be using.**

Oxygenation versus Ventilation

Pulse oximetry is used every day in the hospital setting, **but it is not enough to predict impending decline of a patient's pulmonary status!**

Case Study

Case Study

Let's review a patient scenario. You will want to consider what findings are expected and what findings are concerning to you. Think about whether important data is missing.

Click or tap the button below to get started!

Case Study - Mr. Wu

You are providing sedation and monitoring for Mr. Wu for a colonoscopy.

Mr. Wu is 78 with history of COPD and diabetes.

Prior to the procedure, you administer Versed 2 mg and Fentanyl 50 mcg IV.

Case Study - Mr. Wu

	11:15 Medication Administered	11:30 Mid-Procedure	11:45 Post-Procedure
RR	20	24	16
SpO_2	94%	94%	92%
$EtCO_2$	46	54	62

Monitoring Values

According to these values shown above, does Mr. Wu need any intervention? If you believe so, what would you do?

Click or tap the right arrow to the next screen when you are ready.

Case Study - Mr. Wu

If you said yes, you would be correct!

The procedure is over, yet Mr. Wu's CO_2 is still rising, his respiratory rate is decreasing, and his PaO_2 is dropping.

There are actually four interventions to consider. Can you name them all?

Jump to the last slide to see if you did!

Case Study - Mr. Wu

Interventions to consider:

- Stimulate him
- Insert an oral airway
- Neck/jaw positioning
- Watch for the need of drug reversal

Actions for abnormal $EtCO_2$

Alert the LIP of the patient's status and your concern:

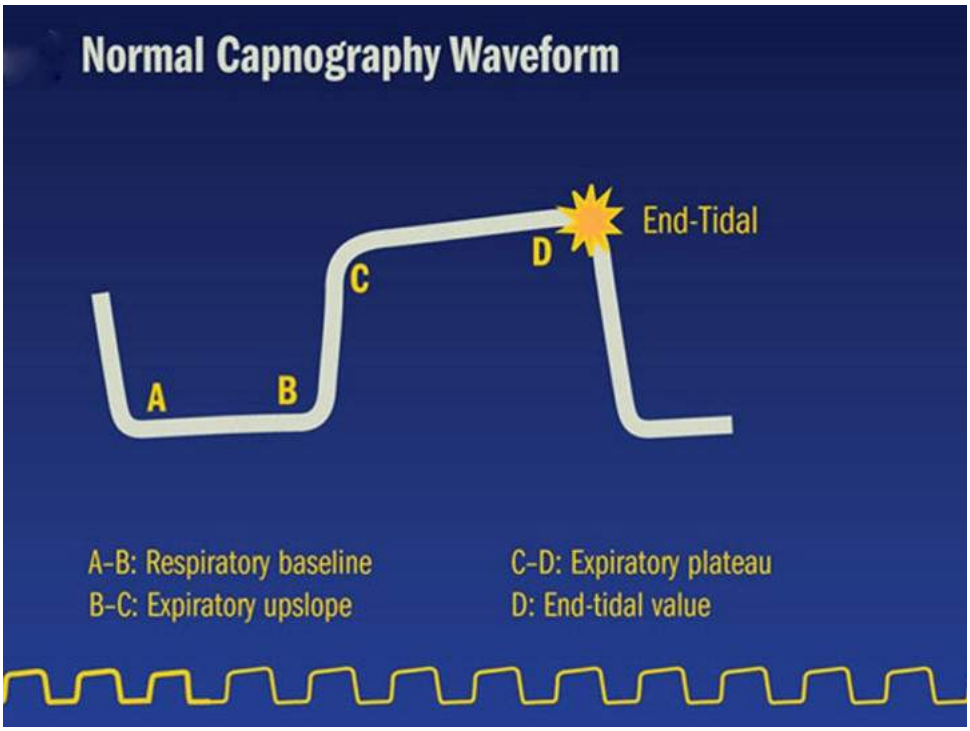
- If the $EtCO_2$ is high (e.g., > 50 mmHg), consider either inadequate ventilation or oversedation
- If the $EtCO_2$ is low (e.g., < 10 mmHg), consider partial or complete airway obstruction or loss of cardiac output

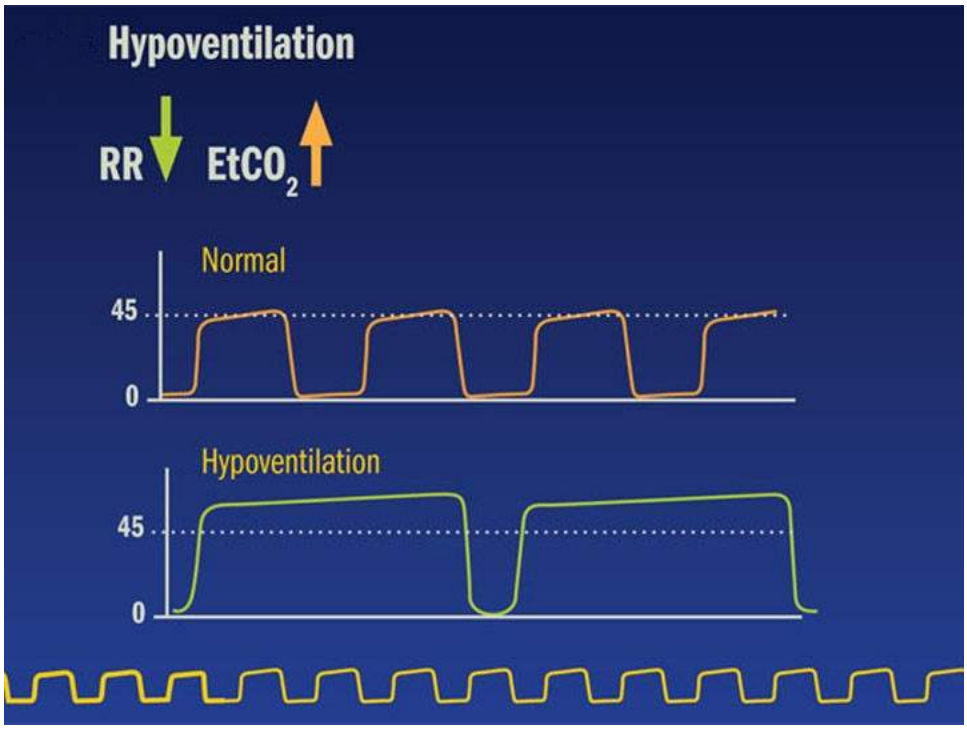
Interventions to consider include:

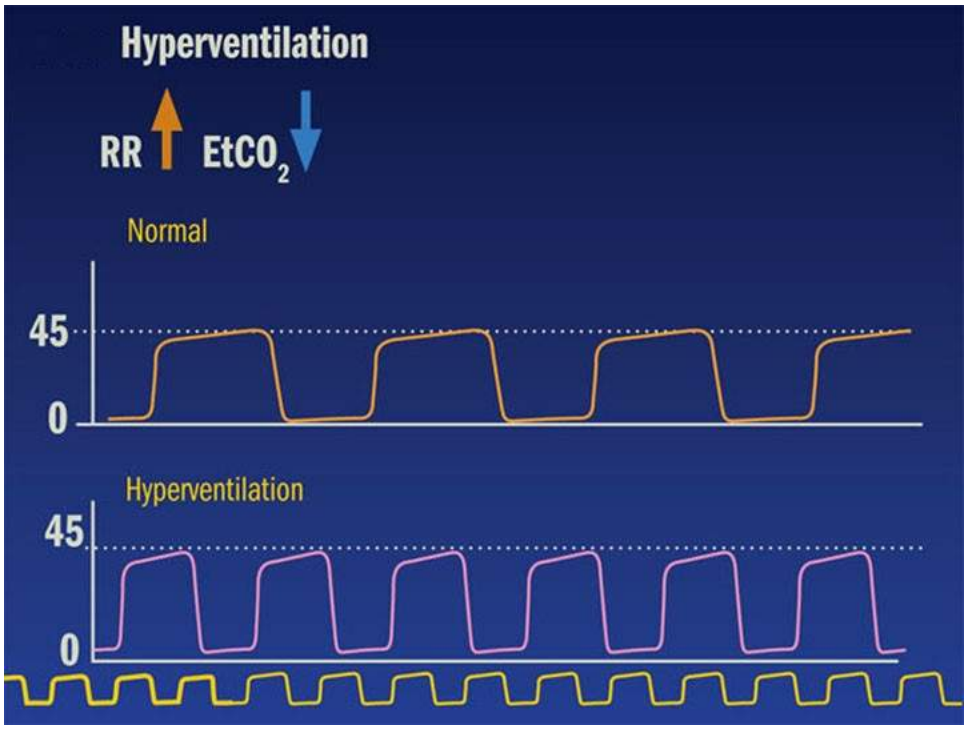
- Assess upper and lower airway patency and treat any obstruction or bronchospasm
- If concerned about decreased cardiac output, assess BP and pulse
- Treat per LIP order

Review both case studies above before moving on.

Capnography Wave Forms and Values







Waveform graphics courtesy of Covidien

CONTINUE

Determining Causes of Abnormal Wave Forms & Values

Abnormal wave forms may be seen during sedation. It is important to identify potential causes of these changes.

In the event of an abnormal wave form, check the equipment and the patient status

- Some abnormal wave forms can be due to poor connections, artifact, and misplaced cannulas rather than patient condition
- **Remember to check *both* equipment and patient!**

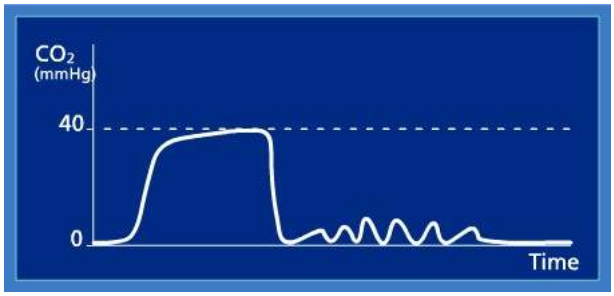
Select each section below to determine the causes of abnormal wave forms.

Abnormal Waveform - Loss of Waveform _

Sudden loss of waveform and $EtCO_2$ to zero or near zero means no respiration is detected!

Possible causes:

- Kinked or displaced cannula (check equipment first!)
- Apnea
- Very shallow respirations
- Total airway obstruction

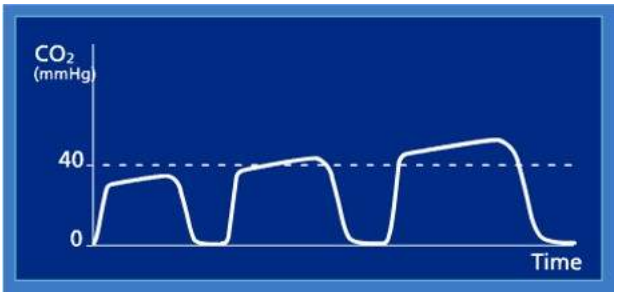


Abnormal Waveform - Increasing $EtCO_2$ Values

Gradual decrease in $EtCO_2$ with normal waveform indicates CO_2 production, or decreasing systemic or pulmonary perfusion

Possible causes:

- Hypoventilation due to analgesia or sedation
- Sudden increase in delivery of CO_2 to pulmonary circulation

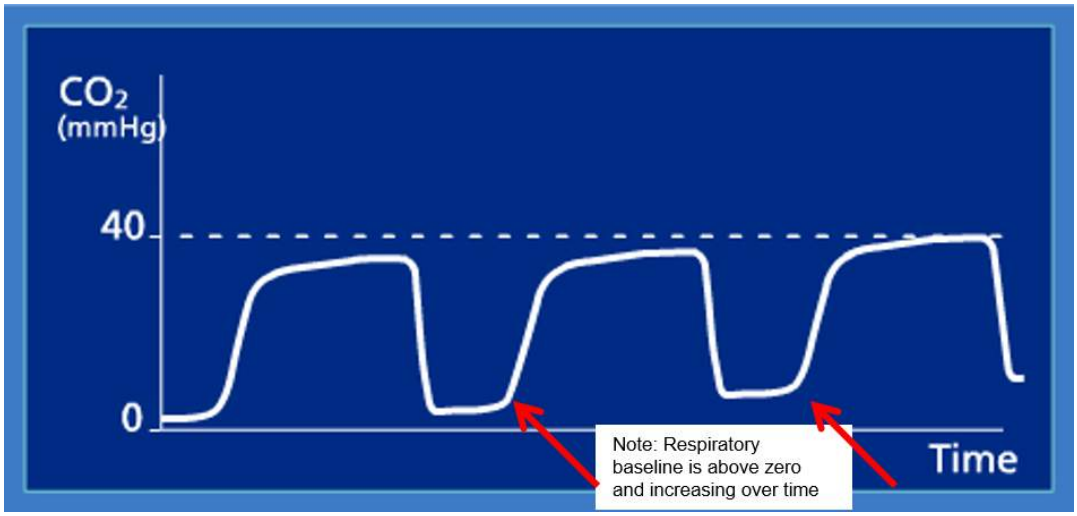


Abnormal Waveform - Rebreathing Exhaled CO_2

Rise in baseline CO_2 indicates rebreathing of CO_2

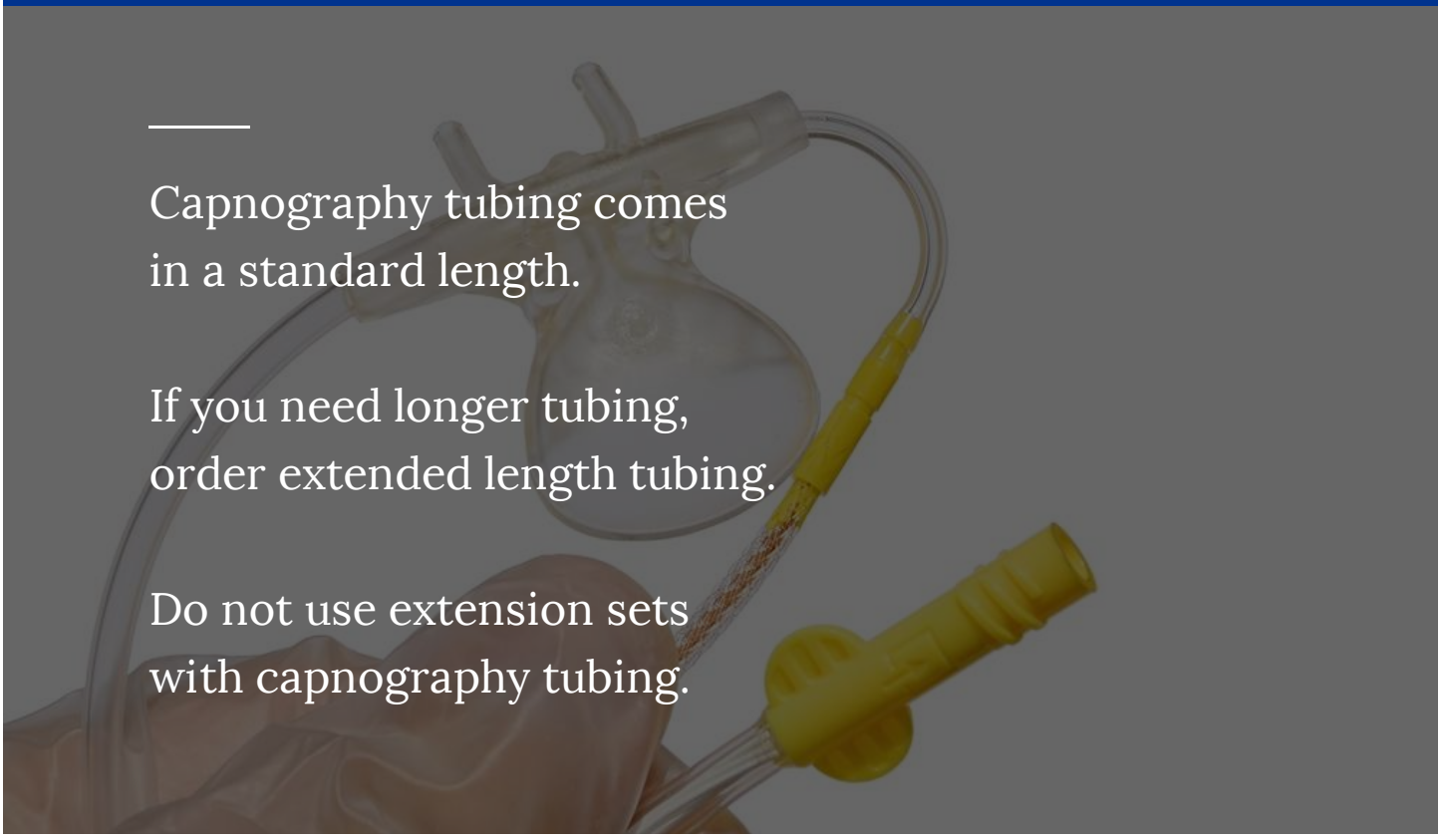
Possible causes:

- Poor head/neck alignment
- Draping at airway
- Insufficient flow to O_2 mask



Expand and review the content above before moving on.

Selecting the Correct Tubing



Capnography tubing comes designed for short term use or long term use. Review both uses by clicking or tapping on the flashcards below.

Short Term Use

Short term use tubing is only good for manufacturer recommended timeframe

- Typically used for monitoring during procedural sedation

Long Term Use

Long term use tubing has a filter for moisture control and can be used for longer durations

- This is the tubing to use if you anticipate the patient will need to be monitored after the procedure is complete

Complete the content above before moving on.

For more information on capnography or $ETCO_2$, click or tap the links below

Capnography

Respiratory compromise

Capnography during sedation

CONTINUE

Capnography: End Tidal CO_2 Monitoring During Sedation Review

True or False:

The normal $EtCO_2$ range is 35-45 mmHg.

- ◯ True
- ◯ False

SUBMIT

True or False:

Ventilation can be monitored with Pulse Oximetry.

- ◯ True
- ◯ False

SUBMIT

True or False:

Common causes of increase in $EtCO_2$ include and hypoventilation and oversedation.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

When monitoring a patient using capnography during procedural sedation, the RN will intervene in response the following changes?

- ◯ Decreased respiratory rate
- ◯ Increased $EtCO_2$ value
- ◯ Loss of capnography waveform
- ◯ All of the above

SUBMIT

Multiple Choice:

If observing significant changes from baseline $EtCO_2$ value, the RN will:

- ◯ Instruct patient to take a deep breath
- ◯ Ensure patient has an open airway

- ◯ Check the cannula and reposition if necessary
- ◯ All of the above

SUBMIT

True or False:

An abnormal waveform can indicate equipment issues.

- ◯ True
- ◯ False

SUBMIT

True or False:

Pulse oximetry has limitations because there is a delay before oxygen saturation reflects hypoxia.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

When is the best time to begin $EtCO_2$ monitoring?

- ◯ After the first dose of sedating medication
- ◯ When the pulse oximeter cannot display a reading
- ◯ Before any sedating medications are administered
- ◯ Only if supplemental oxygen is provided
- ◯ All of the above

SUBMIT

True or False:

Capnography provides a numeric value for $EtCO_2$ as well as a graphic display of the concentration of exhaled carbon dioxide in each breath.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

Capnography should be utilized during procedural sedation:

- ◯ Only if supplemental oxygen is used
- ◯ To identify hypoventilation, apnea, or airway obstruction
- ◯ Instead of pulse oximetry
- ◯ If a patient needs to be intubated

SUBMIT

Multiple Choice:

Complete loss of the capnography waveform may result from:

- ◯ Hypoventilation
- ◯ No detection of breath
- ◯ Partial airway obstruction
- ◯ All of the above

SUBMIT

True or False:

Capnography provides caregivers with breath-to-breath information.

True

False

SUBMIT

Complete the content above before moving on.

Pre-Procedure Sedation Considerations

Assessment and Preparation

Safe and effective sedation requires assessment of patient's current condition, medical history, and individual risk factors.

Tools for Determining Sedation Risk Factors

Click or tap the checkbox to the left of each statement to mark it as read.

- [ ] Thorough medical history interview
- [ ] Physical exam within 30 days
- [ ] Patient's response to previous sedation/ anesthesia
- [ ] Use of American Society of Anesthesiologists (ASA) classification of physical status

- [ ] Airway assessment (Mallampati)
- [ ] Use of the STOP-BANG Assessment

Complete the content above before moving on.

Pre-Sedation Assessment

- LIP must be certified to perform moderate and/or deep sedation
- Requirements to be completed by LIP:
  - Current history and physical
    - Completed within 30 days
    - If over 24 hours old, must have an interval note
  - Airway assessment (Mallampati)
  - ASA score
  - Informed consent for procedure and sedation
- Site and/or procedural verification
- Nursing assessment (focused)

Sedation Risk Factor - Compromised Airway

COMPROMISED AIRWAY

Patients with anatomically compromised airways are at greater risk of respiratory complications

- The Mallampati assessment (performed by the LIP) provides information regarding airway risk
- The sedation nurse should verify the Mallampati assessment was performed and documented prior to administering sedation
    - Mallampati scores of 3 or 4 have higher risk for respiratory compromise

Image provided by UpToDate

CONTINUE

Sedation Risk Factor - Baseline Patient Condition

BASELINE PATIENT CONDITION

- The **ASA score** is a subjective assessment of patient's overall health

- It is used to assess the fitness of patients before a procedure/surgery

Class I	Normal healthy patient
Class II	Patient with mild systemic disease
Class III	Patient with severe systemic disease
Class IV	Patient with severe systemic disease that is a constant threat to life
Class V	Moribund patient not expected to survive 24 hours.

Optimal ASA Class for Procedures with Sedation

- ASA scores 1 and 2 are the best predictors of a successful outcome for the patient
- ASA score 3 and greater identifies a patient at higher risk for a negative outcome and may require closer monitoring and/or additional support

CONTINUE

Sedation Risk Factor -
Obesity & Sleep Apnea (OSA)

- Medications may cause relaxation of the oropharyngeal structure resulting in partial or total airway obstruction

- Additional precautions are taken for patients with sleep apnea and obesity
- Assess using STOP-BANG

STOP-BANG ASSESSMENT | PRECAUTIONS FOR OSA

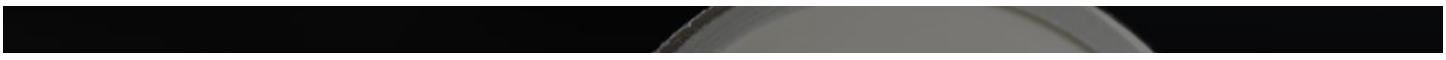
Scoring for STOP BANG:
5-8 "Yes" Responses = High risk of OSA
3-4 "Yes" Responses = Intermediate risk of OSA
0-2 "Yes" Responses = Low risk of OSA

- **S**noring
  - Do you **S**nore loudly?
- **T**ired
  - Do you often feel **T**ired, fatigued or sleepy during the daytime?
- **O**bserved
  - Has anyone **O**bserved you stop breathing during your sleep?
- **P**ressure
  - Do you have or are you being treated for high blood **P**ressure?
- **B**ody Mass Index
  - BMI > 35?
- **A**ge
  - > 50 years?
- **N**eck size
  - >16 inches or > 40 cm?
- **G**ender
  - Male?

STOP-BANG ASSESSMENT | PRECAUTIONS FOR OSA

- Management by anesthesia if the patient has severe central nervous system sleep apnea
- Position in lateral or semi-fowlers position if possible
- Use CPAP machine during the procedure and recovery phase if patient uses CPAP when they sleep
- Position patient to facilitate an open airway

CONTINUE



Sedation Risk Factor - Cardiac Disease

Cardiac Disease (Acute Coronary Syndrome, History of Myocardial Infarction/Occlusion, Angina, etc.)

- Review patient's chart to see if an ECG has been obtained within the last 6 months
    - If a recent ECG is not available, consider recommending a 12 lead ECG prior to the procedure
- If it is a non-cardiac procedure, a cardiology consult may be requested
- The patient should be on a cardiac monitor throughout the procedure

CONTINUE

Sedation Risk Factor - Other Complicating Conditions

Patients presenting with the following conditions are known to have increased risks with sedation:

1. Inability to communicate or cooperate
2. Multiple drug allergies
3. Multiple medications with potential for drug interaction with sedative analgesics
4. Current substance abuse
5. Obesity (BMI > 40)

Consider appropriate specialty consultation (anesthesia, obstetrics, cardiology, etc.):

- Known history of respiratory or hemodynamic instability
- Previous difficulties with sedation or anesthesia
- Severe sleep apnea or other airway related issues
- One or more significant co-morbidities
- Pregnancy

CONTINUE

Pre-Sedation Preparation - Nursing Assessment

General Assessment

- Vital signs: BP, HR, RR, SaO_2, $ETCO_2$
- Pain level
- Level of consciousness (Using Ramsay scale)

Airway Assessment	• Airway patency, ventilatory effort, lung sounds • Assess physical features that may cause difficulty in maintaining a patent airway or may impair intubation should the need arise (e.g., thick neck, reduced neck extension, TMJ, etc.)
Cardiac Assessment	• Cardiac rhythm, heart sounds, peripheral pulses and other indicators of tissue perfusion

Complete the content above before moving on.

Pre-Sedation Preparation - Verify NPO Status

VERIFY NPO STATUS

- To decrease risk of aspiration, NPO status must be evaluated prior to the administration of sedation
- Verify and document time of patient's last intake of food/fluids
- If the desired NPO status is not met, the goal of sedation should be carefully assessed and balanced with the urgency of the procedure
- May also consider anesthesia consult

NPO Guidelines

Substance	Time Recommendation
Clear liquids	2 hours
Light meal (toast, clear liquids)	6 hours
Fried foods, fatty foods, meat	8 or more hours

CONTINUE

Pre-Sedation Preparation - Patient Education

Patient instruction must include detailed, patient specific information that is pertinent to the planned procedure.

This includes:

- NPO
- Medication instructions and procedure specific preparation PRN
- Patient understanding of the planned procedure
- Need for a designated lay caregiver to escort patient home following discharge and be available for recommended post procedure care
- No driving for 24 hours

Pre-Sedation Preparation - Sedation Plan

Click or tap the checkbox to the left of each statement to confirm you have reviewed it.

☐ Discuss sedation plan and target level of sedation (Ramsay score) with LIP.

☐ The RN is expected to consider potential risk factors that may increase the chance of complications associated with procedural sedation.

- Communicate this information and any other concerns to the appropriate members of the healthcare team.

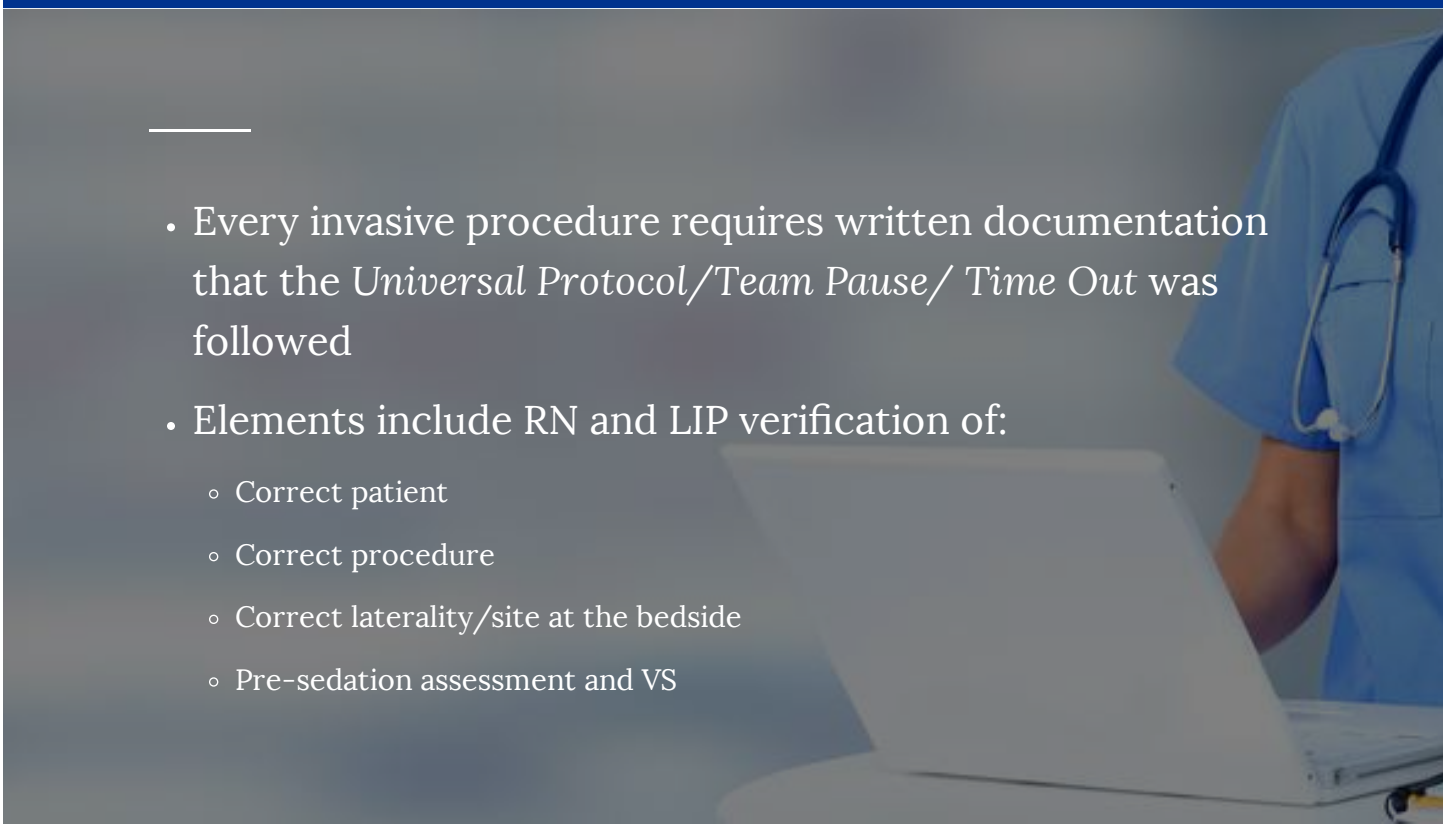
☐ The LIP and RN must consider whether sedation and monitoring would be more appropriately managed by an anesthesiologist.

🔒 Complete the content above before moving on.

Pre-Sedation Preparation - DNR/DNI Considerations

- DNR/DNI orders are not automatically rescinded during procedures.
- The existing DNR/DNI status is to remain active unless the LIP writes an order to initiate full code status during the procedure.
  - However, pre-existing code status may not be appropriate for the procedural circumstances as techniques routinely undertaken in the course of sedation could be classified as resuscitation.
- Every patient with DNR/DNI status should have a conversation with the LIP regarding code status prior to the procedure.

Pre-Sedation Preparation - Universal Protocol/Team Pause/Time Out



- Every invasive procedure requires written documentation that the *Universal Protocol/Team Pause/ Time Out* was followed
- Elements include RN and LIP verification of:
  - Correct patient
  - Correct procedure
  - Correct laterality/site at the bedside
  - Pre-sedation assessment and VS

Pre-Sedation Preparation - Required Equipment

Emergency equipment that must be immediately available:

Click or tap the checkbox to the left of each statement to mark it as read. Review all to move on.

- [ ] Bag/Valve/Mask and 100% oxygen source, airways, suction, and intubation equipment
- [ ] Code cart/defibrillator (include suction machine/equipment)
- [ ] Cardiac monitor (not required for all cases)
- [ ] Blood pressure monitoring (use correct cuff size)
- [ ] Pulse oximeter for continuous reading
- [ ] End-Tidal CO_2 monitor for continuous reading
- [ ] Patent IV site
- [ ] Drug antagonists/reversal agents (flumazenil and naloxone) must be at the bedside

Complete the content above before moving on.

Content - Intra-Procedure Sedation Considerations

Intra-Procedure Nursing Management

The sedation phase begins with the first dose of sedative agent. Level of sedation is assessed using a validated sedation scale.

Sedation ends when the procedure is complete and the patient achieves an Aldrete score of at least 8 (or pre-procedure score if baseline is < 8).

Sedation Scales

Sedation scales are tools used to:

- Determine accurate and consistent drug titration
- Decrease the risk of excessive drug dosing
- Decrease the risk of oversedation

Correlation between Ramsay Score and Level of Sedation

Ramsay Score	Clinical Status	Level of Sedation/Definition
1 2	Patient anxious, agitated or restless Patient cooperative, oriented and tranquil	**Minimal Sedation**: A drug induced state during which patients respond normally to verbal commands. Cognitive function and coordination may be impaired, but respiratory and cardiovascular functions are unaffected.
3	Patient asleep, responds to verbal commands	**Moderate Sedation**: A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain patent airway or adequate respirations. Cardiovascular functions and protective reflexes are usually maintained.
4	Patient asleep, brisk response to light glabellar tap, tactile stimuli or loud noise	**Moderate** ← → **Deep**
5	Patient asleep, sluggish response to light glabellar tap, tactile stimuli or noise	**Deep Sedation:** A drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. Patients may need assistance in maintaining a patent airway and respirations may be inadequate. Cardiovascular function is usually maintained.
6	No response to light glabellar tap* or loud noise	**General Anesthesia:** A drug-induced loss of consciousness during which patients are not arousable even with painful stimulation. Patent airway, adequate respirations, cardiovascular functions may be impaired and often require assistance.

Glabellar tap = Tap on forehead between eyebrows

Richmond Agitation-Sedation Scale (RASS)

RASS is a 10-point scale, with:

- four levels of anxiety or agitation,
- one level denoting a calm and alert state, and
- five levels of sedation,

On one extreme of the RASS score, **+4** represents a very combative, violent patient, who is considered dangerous to the staff.

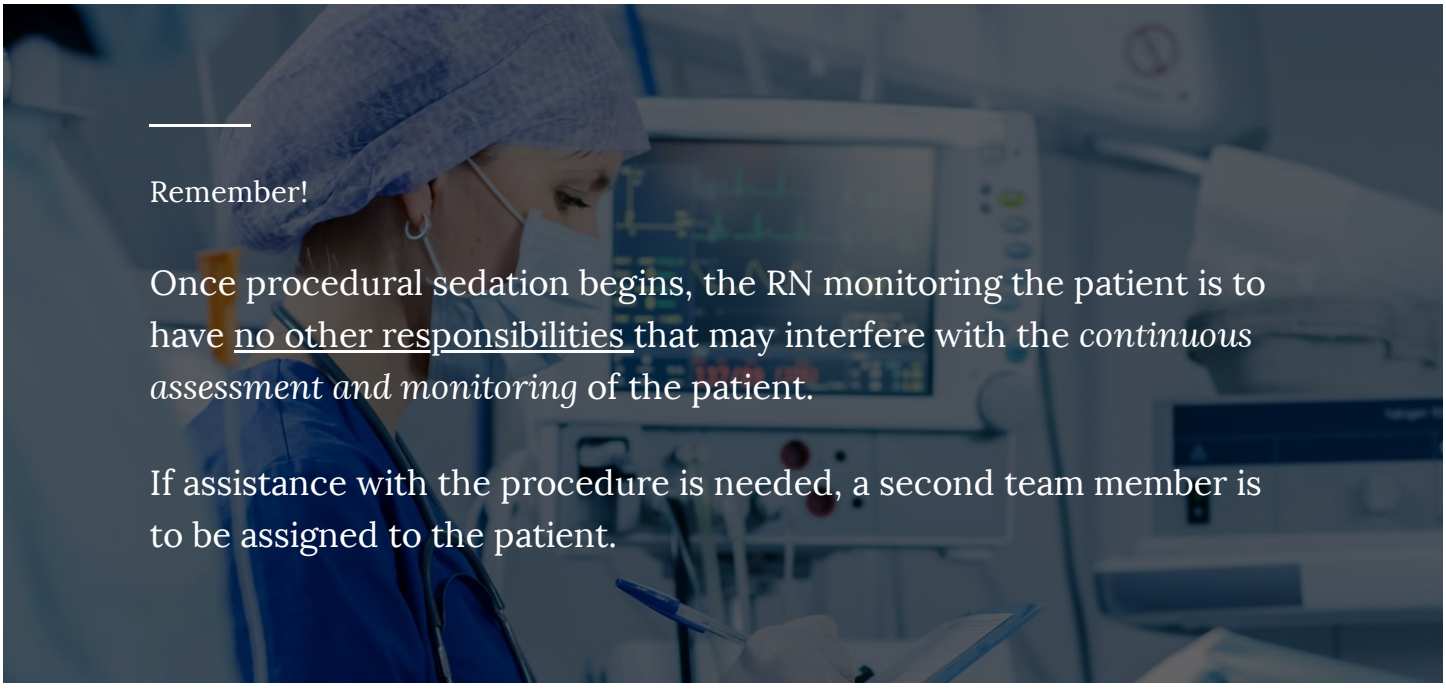
On the other extreme, **-5** represents a patient who is unarousable, with no response to voice or physical stimulation.

Score	Definition
+4	Combative, overtly combative or violent, immediate danger to staff.
+3	Very agitated, pulls on or removes tubes or catheters or is aggressive.
+2	Agitated, frequent non-purposeful movement or ventilator dyssynchrony.
+1	Restless, anxious or apprehensive but movements not aggressive or vigorous.

Score	Definition
0	Alert and calm.
-1	Drowsy, but sustains more than 10 seconds awake, with eye opening in response to verbal command.
-2	Light sedation: Awakens briefly (less than 10 seconds) with eye contact to verbal command.
-3	Moderate sedation: Any movement, except eye contact, in response to command.
-4	Deep sedation: No response to voice, but any movement to physical stimulation.
-5	Unarousable: No response to voice or physical stimulation.

Source: "The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care unit patients." *Am J Respir Crit Care Med* 2002;166:1338-1344.

CONTINUE



Remember!

Once procedural sedation begins, the RN monitoring the patient is to have no other responsibilities that may interfere with the *continuous assessment and monitoring* of the patient.

If assistance with the procedure is needed, a second team member is to be assigned to the patient.

Intra-Procedure Care & Documentation - Moderate Sedation

Monitoring	Frequency

Monitoring	Frequency
Electrocardiogram (ECG)	Continuously
Heart rate	Continuously
Ventilatory status, including: respiratory rate, oxygen saturation, and end-tidal carbon dioxide ($ETCO_2$)	Continuously
Blood pressure	Continuously
Sedation status	Continuously

Documentation	Frequency
RR, O_2 sat, $ETCO_2$, BP, HR, ECG, sedation level (respective scale/score used at your ministry)	Q 5 min
If change in patient condition: RR, O_2 sat, $ETCO_2$, BP, HR, **and** sedation level	Q 5 min until patient condition stabilizes

CONTINUE

Intra-Procedure Sedation Considerations Review

Multiple Choice:

You are providing sedation for a patient mid-endoscopy. He was medicated before the procedure started with Fentanyl 25 mcg IV and Versed 2.5 mg IV. You are unable to arouse your patient with a light tap to the forehead, nor does he arouse when you call his name loudly.

What is his Ramsay Sedation Score?

- ◯ 4
- ◯ 5
- ◯ 6

SUBMIT

Multiple Choice:

Your patient has been medicated with Morphine 4 mg IV and Versed 5 mg IV. He is sleeping but responds to commands.

What is his Ramsay Score?

- ◯ 2
- ◯ 3
- ◯ 4

SUBMIT

Complete the content above before moving on.

Content - Post-Procedure Sedation Considerations

Post-Procedure Equipment

- [ ] Patent IV site with IV fluids
- [ ] Oxygen and O_2 delivery devices (flow meters, nasal cannulae, face mask)
- [ ] Pulse oximeter
- [ ] Blood pressure monitoring (use correct cuff size)
- [ ] Cardiac monitor (if patient at risk)
- [ ] Code cart/defibrillator immediately available (including one-way valve mask, airways, suction, ambu-bag, intubation equipment, emergency drugs)
- [ ] Drug antagonists nearby

You should also consider monitoring $ETCO_2$ if you think the patient is at risk for post-procedure respiratory issues.

Post-Procedure Nursing Management

Continuous Monitoring

Continuous monitoring for no less than 30 minutes from administration of last dose of sedation medication **and** until an Aldrete score of greater than or equal to eight (≥ 8) is reached (or pre-procedure score if baseline is < 8).

Documentation

Documentation every 15 minutes for no less than 30 minutes from administration of last dose of sedation medication **and** until an Aldrete score of greater than or equal to eight (≥ 8) is reached (or pre-procedure score if baseline is < 8).

Additional Monitoring _

Additional monitoring may be required depending on patient's clinical status.

Post-Procedure Monitoring & Documentation

Monitoring	Frequency
Electrocardiogram (ECG)	Continuously
Heart rate	Continuously
Ventilatory status, including respiratory rate, oxygen saturation, and end-tidal carbon dioxide ($ETCO_2$)	Continuously
Blood pressure (e.g., every 5 minutes)	Continuously
Sedation level	Continuously
Documentation	**Frequency**
HR, BP, RR, O_2 sat, $ETCO_2$, sedation level, ECG (when included in plan of care)	Q 15 min
Aldrete score	Q 30 min

Aldrete Score

The Aldrete score evaluates recovery after sedation/anesthesia and patient readiness for discharge.

Level of Consciousness	• Fully awake or responds easily to verbal stimuli or pre-procedure baseline • Arousable on calling • Not responding	= 2 = 1 = 0

	Must be at least 1 at end of monitoring	
Respirations	• Able to breath and cough freely • Dyspnea or limited breathing • Apneic	**= 2** **= 1** **= 0**
Oxygen Saturation	• Maintains value ≥ 92% on room air • Requires supplemental O_2 to maintain saturation at ≥ 90% • Saturation ≤ 90% with supplemental O_2	**= 2** **= 1** **= 0**
Hemodynamic stability	• Blood pressure ± 20% baseline • Blood pressure ± 20-50% baseline • Blood pressure ± 50% baseline	**= 2** **= 1** **= 0**
Physical Activity	• Ability to move all extremities voluntarily or on command • Moves 2 extremities voluntarily or on command • Moves 0 extremities voluntarily or on command	**= 2** **= 1** **= 0**

Post-Procedure Nursing Management

Watch for Post-Procedure Sedation

- Once stimulation from the procedure is over, the patient may progress to a level of sedation deeper than what was assessed throughout the procedure
- This is why it is important to continue assessing sedation level in the post-procedure period

If reversal agents are used, ensure assessments are adequate to identify oversedation recurrence once the effect of the antagonist dissipates. This may require up to *2 hours of increased observation*.

Discharge Criteria

Procedural Area Discharge Criteria

Patient may be discharged from **procedural area** when patient has attained an Aldrete score of at least 8 (or pre-procedure score if baseline is < 8)

- Patient is alert and oriented
  - Mental status returned to baseline level or orientation
- Protective reflexes have returned to pre-procedure function
- Vital signs and respiratory function are stable (pre-procedure range) with adequate end-tidal CO_2 and O_2 saturation

Facility Discharge Criteria

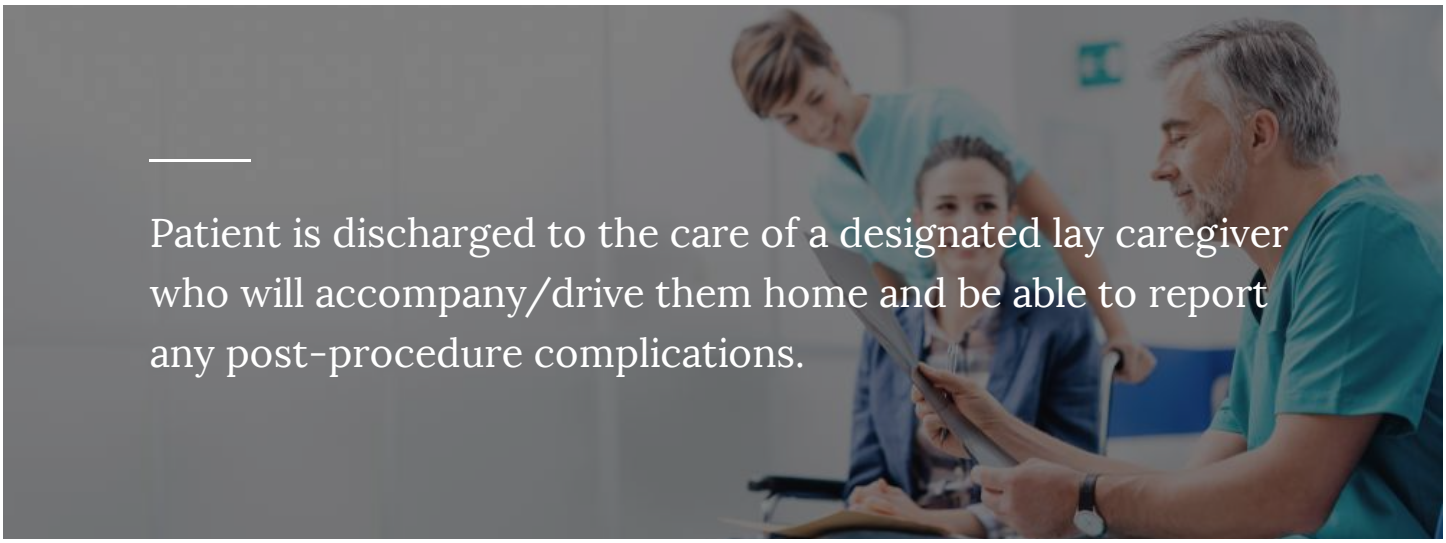
Patient may be discharged from **facility** when:

- Drinking liquids and/or eating light snack without nausea/vomiting

- Ambulating without dizziness
- Voiding without problems
- Minimal or no pain from the procedure
- If reversal agent used, a sufficient duration of monitoring completed to ensure re-sedation does not recur
    - Approximately 2 hours or more, based upon patient condition

Expand and review the content above before moving on.

Discharge



Discharge Education

- **Review information about expected behavior following sedation with patient and designated lay caregiver**
- **Provide written discharge instructions:**
    - No driving or using sharp instruments or equipment for 24 hours
    - Diet restrictions/allowances
    - No alcohol consumption for 24 hours
    - Use of medications

- Warning signs of complications or adverse drug interactions
- Special instructions in case of emergency
- Wound care or specific post procedure care
- Routine follow up with provider
- Provider contact numbers

Documentation Requirements

Document procedural sedation:

- Pre-sedation assessment
- Patient education
- Informed consent
- Current list of allergies and medications
- Time out/universal protocol/team pause (including pre-sedation assessment and vital signs)
- Documentation of vital signs, drugs, and procedure details
- Post-sedation assessment
- Patient response to procedure/medications

- Discharge criteria met

CONTINUE

Post-Procedure Sedation Considerations Review

Match the appropriate scale to the correct use.

Ramsay Sedation Scale	Used to measure level of sedation during and post-procedural monitoring
Aldrete Scale	Used to determine readiness for discharge after a procedure

SUBMIT

Use the Aldrete score tool below to answer the questions that follow:

Level of Consciousness	• Fully awake or responds easily to verbal stimuli or pre-procedure baseline • Arousable on calling • Not responding ***Must be at least 1 at end of monitoring***	**= 2** **= 1** **= 0**
Respirations	• Able to breath and cough freely • Dyspnea or limited breathing • Apneic	**= 2** **= 1** **= 0**
Oxygen Saturation	• Maintains value ≥ 92% on room air • Requires supplemental O_2 to maintain saturation at ≥ 90% • Saturation ≤ 90% with supplemental O_2	**= 2** **= 1** **= 0**
Hemodynamic stability	• Blood pressure ± 20% baseline • Blood pressure ± 20-50% baseline • Blood pressure ± 50% baseline	**= 2** **= 1** **= 0**
Physical Activity	• Ability to move all extremities voluntarily or on command • Moves 2 extremities voluntarily or on command • Moves 0 extremities voluntarily or on command	**= 2** **= 1** **= 0**

Multiple Choice Scenario:

After his endoscopy, your patient is asleep, but arouses to voice (quickly falls back to sleep). He moves all extremities on command, his respiratory rate is 8, his BP is 110/60 (baseline was 158/88), and his SPO_2 is 93-94% on 2 liters O_2 (baseline was 98% on room air).

What is his Aldrete score?

◯ 5

- ◯ 6
- ◯ 7
- ◯ 8

SUBMIT

Multiple Choice Scenario:

After a cardioversion for atrial fibrillation, your patient is awake and talking. He is able to move all extremities, has a respiratory rate of 12, his is BP 124/74 (baseline was 132/80), and his $Sa0_2$ is 96% on room air (baseline was 98%).

What is his Aldrete score?

- ◯ 7
- ◯ 8
- ◯ 9
- ◯ 10

SUBMIT

Fill in the Blank:

You are in the middle of a procedure using moderate sedation, your patient is on her back. Her pulse oximetry measurement falls to 86% (her baseline was 92%), her $ETCO_2$ rises to 60 (from her baseline of 40), and she is making "crowing sounds" with inspiration. What is the probable

cause?

(Hint: type in your 2 word answer below)

Type your answer here

SUBMIT

Multiple Choice:

The most frequent complication of moderate procedural sedation is:

- ◯ Allergic reaction to the drugs being administered
- ◯ Airway obstruction
- ◯ Hypotension
- ◯ Bradycardia

SUBMIT

Select All That Apply:

You are performing moderate sedation for an 82-year-old patient. Which of the following procedural sedation principles apply to this patient?

- ☐ Use incremental doses
- ☐ Allow adequate time between doses to achieve peak pharmacologic effects (5-10 minutes)

- [ ] Medication dosing should be increased 30-50% in the geriatric patient
- [ ] Assess effectiveness of each dose before administering more medication
- [ ] Geriatric patients are at high risk for over sedation and respiratory depression

SUBMIT

Multiple Choice Scenario:

You are in the middle of a moderate sedation procedure. Your patient's pulse oximeter measurement is down to 86%. The baseline is 92%. $ETCO_2$ is 50 and the waveform is getting taller. The patient is positioned on his back with sonorous respirations. What is the possible cause?

- ○ He is sleeping
- ○ He has an airway obstruction
- ○ He has secretions in the back of his mouth
- ○ He is hyperventilating

SUBMIT

Multiple Choice:

How frequently is the patient monitored during moderate procedural sedation?

- ○ Every 5 minutes

- ◯ Every 15 minutes through the procedure
- ◯ Every 15 minutes until the Aldrete score is 8 or greater
- ◯ Continuously

SUBMIT

True or False:

The Aldrete Score is used throughout procedural sedation to assess the level of sedation.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice:

What action should the RN take if the documented ASA Risk classification score is 4?

- ◯ None, it is only an assessment of risk.
- ◯ Refuse to help with the procedure as the RN's license is at risk.
- ◯ Discuss concerns with the LIP to ensure the patient's safety during the procedure. Escalate concern to immediate supervisor if needed.
- ◯ Call the RRT.

SUBMIT

Multiple Choice:

The Ramsey Sedation Scale tool is used for all **except**:

- ◯ Determining accurate and consistent drug titration
- ◯ Decreasing excessive drug administration
- ◯ Decreasing risk of sedation beyond the planned level of sedation
- ◯ Correlation to the Modified Aldrete Recovery Scale

SUBMIT

Multiple Choice:

The patient is sleeping but does awaken and respond easily to verbal and/or light tactile stimulation. Vital signs are stable, and respirations are unlabored. Airway patency is maintained without additional intervention.

What level of sedation has been achieved?

- ◯ Minimal sedation
- ◯ Moderate sedation
- ◯ Deep sedation

- ◯ General anesthesia

SUBMIT

Multiple Choice:

The patient is awake during the procedure, but calm and cooperative. Her vital signs are stable. She is a little slow in her verbal responses, but her responses are appropriate.

What level of sedation has been achieved?

- ◯ Minimal sedation
- ◯ Moderate sedation
- ◯ Deep sedation
- ◯ General anesthesia

SUBMIT

Multiple Choice Scenario:

You are performing the moderate sedation for a 42-year-old patient. How long should you wait to assess the effectiveness of a dose of before administering more medication?

- ◯ 1-2 minutes
- ◯ 3-5 minutes

- ◯ 5-8 minutes
- ◯ 10-15 minutes

SUBMIT

Multiple Choice Scenario:

Your patient is receiving procedural sedation for the closed reduction of a fracture of the left arm. Halfway through the procedure the patient's heart rate increases to 140, respirations are 26, he is moaning and responding to verbal command.

Using the Ramsey Sedation Scale, where would you rate the patient's sedation level?

- ◯ Ramsey 1: Patient is anxious, agitated, and restless
- ◯ Ramsey 2: Patient cooperative, oriented
- ◯ Ramsey 3: Patient asleep, responding to verbal commands
- ◯ Ramsey 4: Patient is asleep, brisk response to light gabellar tap or loud auditory stimulus

SUBMIT

Multiple Choice Scenario:

Mrs. Goldbloom, a 76-years-old patient, is going to have a colonoscopy under procedural sedation.

What interventions need to be considered?

- Total drug dosage should be decreased by 30-50% with careful titration of drugs
- Drugs will take longer to metabolize and therefore will circulate longer
- Mrs. Goldbloom will require careful and extended monitoring during the recovery period
- She is at high-risk for over-sedation and respiratory depression
- All of the above

SUBMIT

Complete the content above before moving on.

Content - Pharmacology

Nursing Management Topics

Click or tap the plus sign (+) next to each statement to read more. Review all to move on.

Pharmacological Considerations

Verify the sedation plan with the LIP:

- Moderate versus deep sedation?
- Is the LIP trained for the intended level of sedation?

Goals of Medication Administration

- A rapid and predictable onset of action following drug administration
- Minimal adverse respiratory and/or cardiovascular effects
- Allow for quick recovery
- Optimal patient satisfaction

Titrating Sedation Medications

- The administration of each dose of medication will be by the order of the LIP performing the procedure
- RN must be familiar with sedation medication, appropriate dosing, time to peak effect, and side effects
- Dosages and rates of administration must be individualized to patient response

Titrate each drug individually for desired effect:

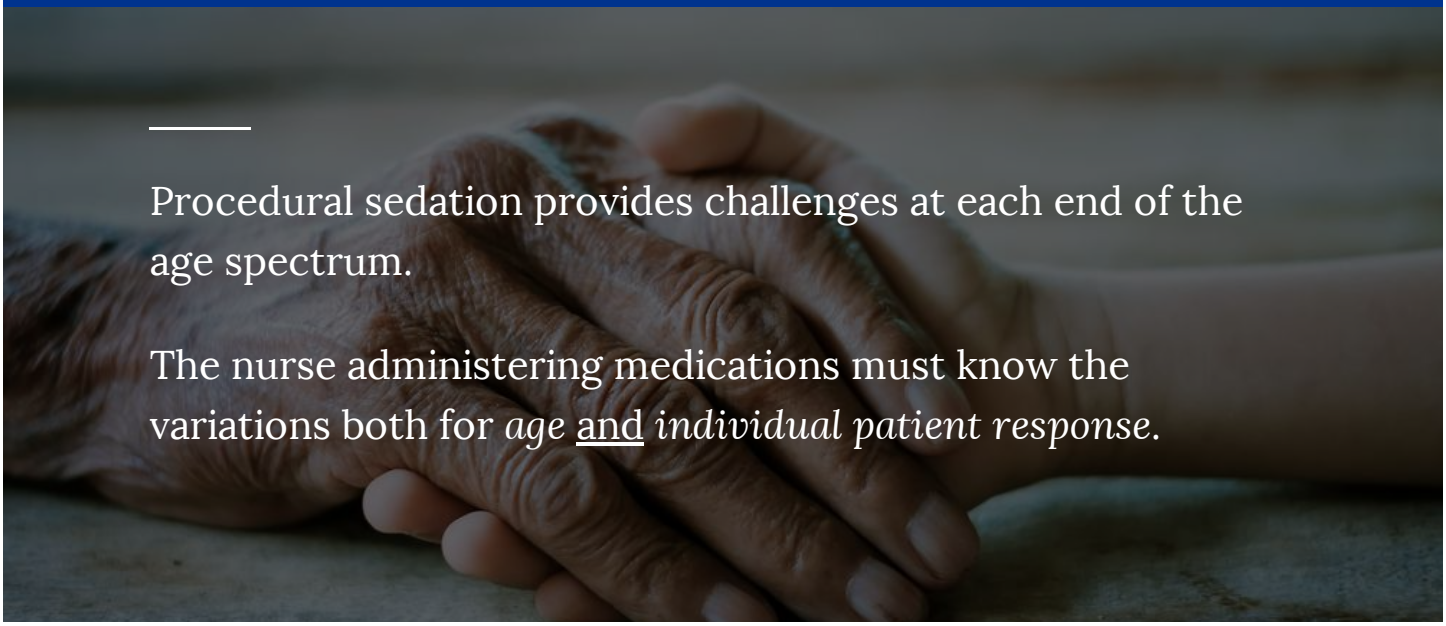
- Use incremental doses
- Allow adequate time between doses to achieve peak pharmacologic effects
- Assess effectiveness of each dose before administering more medication

Consider your patient's response before administering the entirety of an ordered dose. It is acceptable to provide the ordered dose in incremental doses to assess effectiveness before administering the next portion.

Remember: Risk of respiratory depression increases when multiple agents are used.

Expand and review the content above before moving on.

Medication Administration Across the Lifespan



Procedural sedation provides challenges at each end of the age spectrum.

The nurse administering medications must know the variations both for *age* and *individual patient response*.

Geriatric Considerations

- [ ] Aging is associated with a progressive decrease in the function of the major organ systems by 1-1.5% after 30 years
- [ ] Drugs circulate longer and take longer to metabolize
- [ ] Elderly persons often have co-morbidity health issues which may result in poly-pharmacy practices
  - Careful pre-procedure assessment is needed to identify possible synergistic drug interactions
- [ ] This population is at high risk for over sedation and respiratory depression
  - Geriatric patients will require close and extended monitoring throughout the procedure and recovery
- [ ] Discuss the sedation plan with LIP
  - Consider reducing the dosages of sedating agents by 30-50% in the geriatric patient

CONTINUE

Medications Used for Procedural Sedation

The two main types of medications used for procedural sedation are **Opioids/Synthetic Opioids** and **Benzodiazepines**.

Barbiturates *can* be used for sedation, but they are used infrequently.

Note: Combining drugs increases the risk of adverse effects in ALL age groups.

CONTINUE

Drugs Commonly Used in Procedural Sedation

Medication	Pharmacology	Effect	Adverse Effect
Morphine sulfate *Opioid*	• Dose: 2-4 mg IV • Onset: 5-10 minutes • Duration: 2-5 hours	Analgesia	Respiratory depression, apnea, laryngospasm, chest wall rigidity with RAPID administration, hypotension, bradycardia, shock, urinary retention, pupil constriction, agitation, tremor, and/or dysphoria
Hydromophone HCl (Dilaudid) *Synthetic opioid*	• Dose: 0.2-2 mg IV (decrease dose by 30-50% in geriatric patients) • Onset: 5-10 minutes • Duration: 2-3 hours	Analgesia *Shorter duration of effect than morphine*	Respiratory depression, hypotension, bradycardia, syncope, circulatory depression, drowsiness, dysphoria, and/or vertigo **WARNING:** Rapid administration of Fentanyl can cause chest wall rigidity, which may be fatal

Medication	Pharmacology	Effect	Adverse Effect
Fentanyl *Synthetic opioid*	<u>Note:</u> 100 times more potent than morphine. ***ADMINISTER SLOWLY!*** • Dose: 25-100 mcg IV • Onset: 3-5 minutes • Duration: 30-60 minutes		
Diazepam (Valium)* *Benzodiazepine*	• Dose: 1-5 mg IV • Onset: IV 2-5 minutes PO 45-60 minutes • Duration: IV 6 hours, PO up to 24 hours	Amnesia, anxiolysis, muscle relaxation, anticonvulsant	Respiratory depression, apnea with rapid administration, hypotension, bradycardia, confusion, restlessness, agitation, and/or combativeness **Diazepam is irritating to vein, may be painful on administration*
Midazolam (Versed) *Benzodiazepine*	• Dose: 0.5-1 mg IV • Onset: 1-5 minutes • Duration: 45-60 minutes Before administering a second dose, evaluate the effect of the medication: • 2 minutes for IV route • 5-10 minutes for nasal route • 10-20 minutes for oral route		
Phenobarbital *Barbiturates*	• Dose: 100-320 mg IV (larger doses may be needed for patients with epilepsy) • Onset: IV 5 minutes • Duration: 10-12 hours	CNS depression, anticonvulsant	Respiratory depression, apnea (Increases with rapid administration - Do not administer greater than 50 mg/min), hypotension, circulatory collapse, and/or paradoxical excitement

Reversal Agents

Remember: Not every medication has a reversal agent!

CONTINUE

Test Yourself

Before you click or tap to flip each card below to reveal the corresponding reversal agent, test yourself to see if you can recall what they are. Review all cards before moving on.

Opioids	Reverse with nalaxone (Narcan)

1 of 5

Benzodiazepines	Reverse with flumazenil (Romazicon)

Barbiturates

NO specific reversal agent

- Treat symptoms and provide supportive therapy

Naloxone (Narcan)

Respiratory depression:

Titrate agent using 1-10 micrograms/kg every 1-2 minutes as necessary until effective respiratory effort resumed

- Will maintain some analgesia for underlying pain

Acute pulmonary edema:

Provide full, immediate reversal using 0.1 mg/kg to max dose of 2 mg

- Will experience pain and hypertension associated with full reversal dose

Flumazenil (Romazicon)

- Dose = 0.2 mg
- May repeat, as needed

Safety Note: *The use of Flumazenil may lower the seizure threshold in patients taking long term benzodiazepines*

Complete the content above before moving on.

Treating Oversedation

If your patient progresses beyond the goal of therapy, supportive therapy should be provided.

- Consider reversal agent (per LIP order)
- Continue continuous monitoring for at least 30 minutes AND an Aldrete > 8 following procedure
  - May require 2 or more hours of additional monitoring
- Provide respiratory support, for example:
  - Increase oxygen
  - Jaw thrust/chin lift
  - Oral airway
  - Ambu bag
  - Prepare for intubation, etc.

CONTINUE

Pharmacology Review

True or False:

The correct drug administration procedure is to titrate each drug individually and to assess the effectiveness of the drug before giving additional doses.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice Scenario:

An endoscopy procedure has been ongoing for 30 minutes. The patient has received a total of Versed 7 mg IV and Fentanyl 100 mcg IV to achieve the planned level of moderate sedation. His vital signs have been stable. Respirations have slowed to 10 are even and unlabored. Oxygen saturation (SpO_2) is 90% on room air and his $ETCO_2$ is 46. The patient's response to a tap on the forehead is sluggish and he is unable to respond to commands.

The most appropriate nursing action at this time would be:

- ◯ Continue continuous monitoring. Increase documentation to Q 5 minutes until patient returns to planned moderate level of sedation, then resume documentation Q 10 minutes
- ◯ Administer a reversal agent immediately as the patient has crossed into deep sedation
- ◯ Ensure the patient's airway remains patent and ventilations adequate

- Be prepared to administer reversal agents should the patient's respiratory status decline further or the patient does not return to the moderate level of sedation quickly
- All but administer a reversal agent

SUBMIT

Multiple Choice Scenario:

Ms. Carson, an 82-year-old female in good health, is having an electrical cardioversion for sudden onset of rapid atrial fibrillation. The LIP plans to use Versed for the procedural sedation drug.

What considerations need to be made before proceeding with the cardioversion?

- Consider co-morbidities in determining the drug dose of Versed
- Give IV fluids rapidly to increase the elimination of the drug from the patient's system
- Reduce the total drug dose by 30-50% due to patient's age
- All of the above

SUBMIT

Multiple Choice Scenario:

Mr. Miller is undergoing an electrical cardioversion at the bedside. He has received Versed and Fentanyl for sedation and analgesia. The patient is now sleeping and does not awaken to normal tone of voice but attempts to open his eyes when tapped on the forehead and weakly squeezes the nurse's hand when asked.

What nursing interventions should be implemented?

- ◯ Increase frequency of monitoring
- ◯ Apply oxygen per nasal cannula at 2 liters/minute
- ◯ Prepare reversal agent and notify the physician
- ◯ Continue continuous patient monitoring

SUBMIT

Multiple Choice:

Which of the following statements about Fentanyl are true?

- ◯ 100 times more potent than Morphine Sulfate
- ◯ Short duration analgesic
- ◯ Rapid IV infusion may result in skeletal muscle and chest wall rigidity
- ◯ Onset of action for IV dose is 2-3 minutes
- ◯ All of the above

SUBMIT

Multiple Choice:

Adequate moderate sedation is achieved when the patient:

- ◯ No longer has a gag reflex
- ◯ Begins to snore
- ◯ Begins to relax and speech is slurred
- ◯ No longer responds to painful stimuli

SUBMIT

True or False:

As long as the patient is sedated you do not need to use analgesia.

- ◯ True
- ◯ False

SUBMIT

Select All That Apply:

Opiates most commonly used as adjuncts to benzodiazepines for procedural sedation are:

- ☐ Oxycodone
- ☐ Fentanyl

- [ ] Morphine sulfate
- [ ] Tramadol

SUBMIT

Multiple Choice:

In geriatric patients, the drug doses used in moderate sedation should be reduced by:

- ◯ 10-20%
- ◯ 15-40%
- ◯ 25-55%
- ◯ 30-50%

SUBMIT

Multiple Choice:

The appropriate dose of flumazenil (Romazicon) for reversing midazolam is:

- ◯ 0.2 mg IV
- ◯ 1 mg IV every 2 minutes

- ◯ 2 mg IV and repeat after 5 minutes of observation if needed
- ◯ 1 mg IV followed by 0.4 mg Narcan IV

SUBMIT

Multiple Choice:

Goals of drug administration in procedural sedation are:

- ◯ Minimum side effects
- ◯ Rapid recovery
- ◯ Patient satisfaction
- ◯ All of the above

SUBMIT

Multiple Choice:

The possible adverse effect of most concern when using midazolam is:

- ◯ Seizures
- ◯ Flaccid paralysis
- ◯ Respiratory depression

- Cardiac arrhythmias

SUBMIT

Multiple Choice:

Which of the following is true when administering reversal agents?

- The patient must be continuously monitored long enough to ensure that sedation and cardio-respiratory depression does not recur once the effect of the reversal agent dissipates
- The patient must be monitored every 15 minutes for 2 hours following administration of a reversal agent
- There is a reversal agent for every medication that may be used during procedural sedation
- One dose of a reversal agent will return patient to the desired level of procedural sedation

SUBMIT

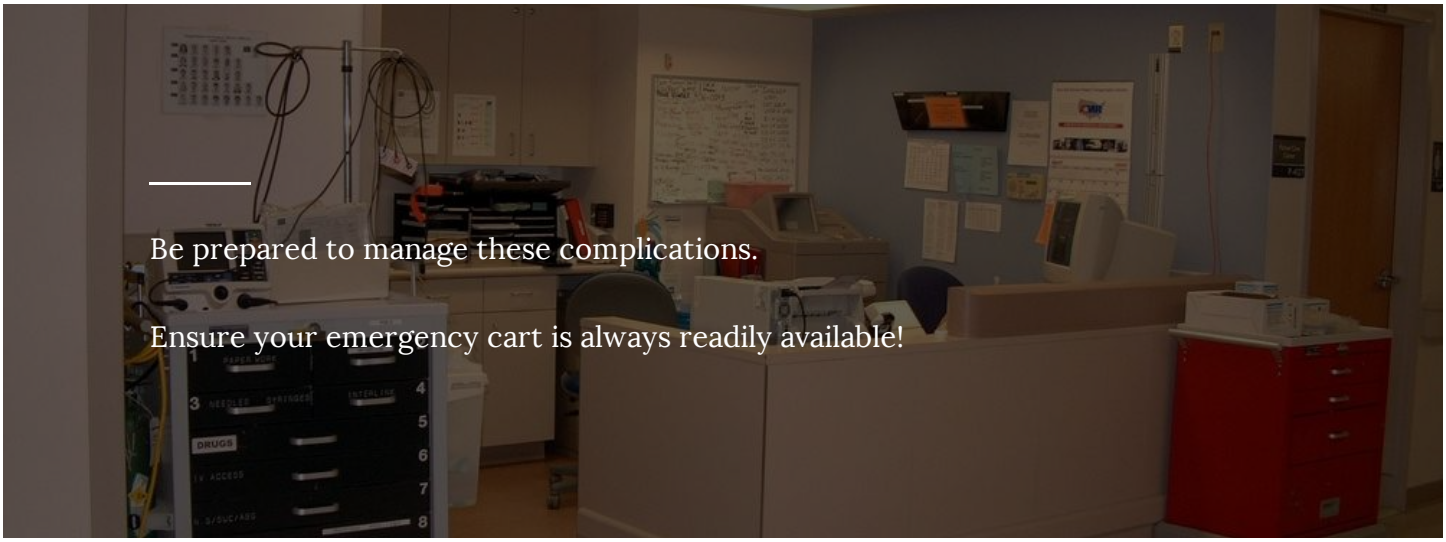
Complete the content above before moving on.

Content - Sedation Complications & Rescue for Adult Patients

Manage Complications of Sedation

Signs and symptoms of over sedation:

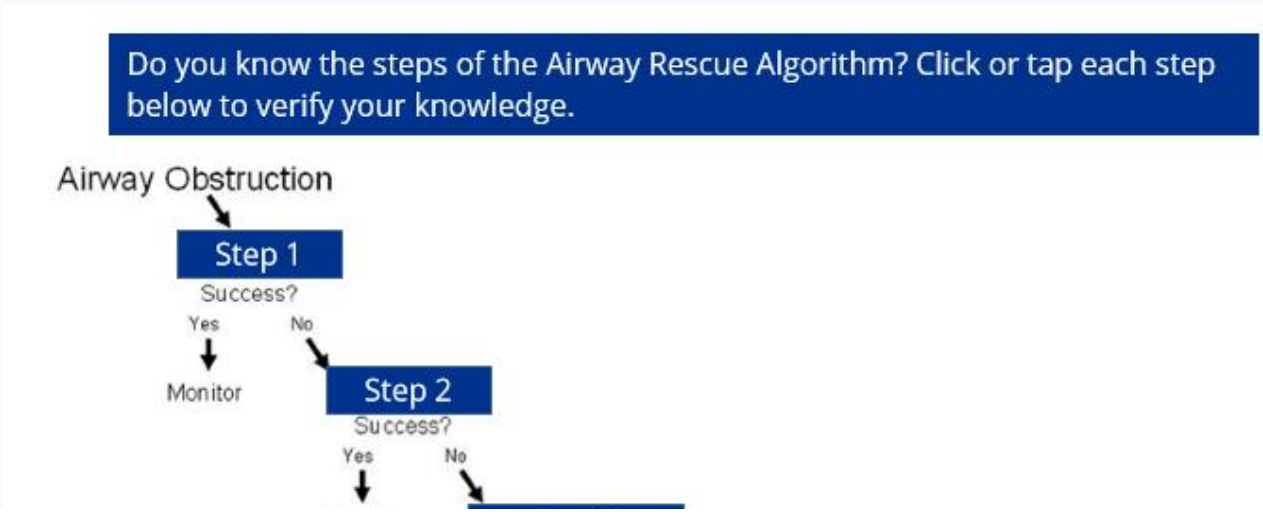
- [ ] Respiratory depression
- [ ] Airway compromise (most common sedation complication)
- [ ] Unresponsiveness
- [ ] Cardiovascular instability

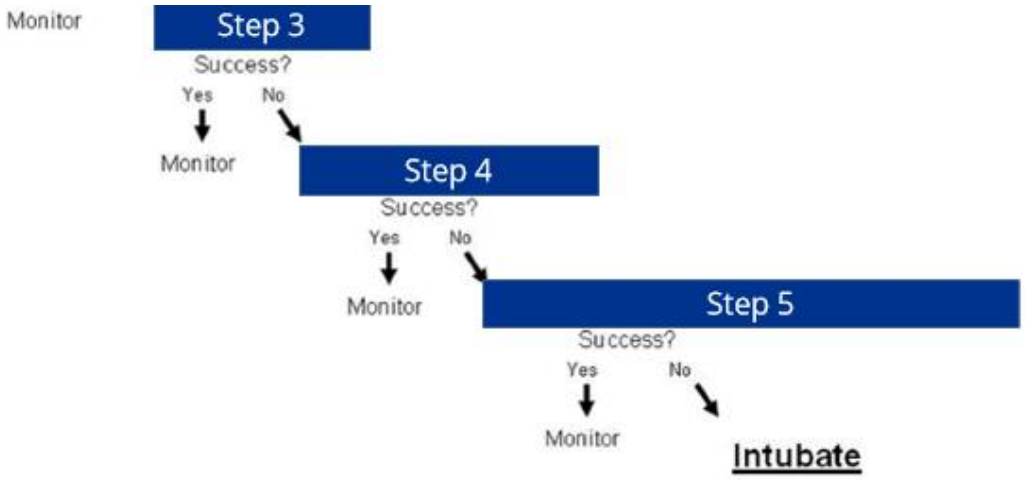


Airway Management

- Airway obstruction is the most common complication in sedation
- Follow ACLS/PALS airway management guidelines
- Airway resuscitation equipment must be at the bedside or immediately available (Airways, Ambu Bag, Suction)
- Oxygen mask or nasal cannula must be immediately available

Airway Rescue Algorithm





Complete the content above before moving on.

Click or tap on the numbers below to review five ways to manage sedation complications. Review all to move on.

Do NOT give more sedation medication

Initiate emergency airway management

Communicate patient status to provider

Consult with LIP about further management of patient status including use of reversal agents

If reversal agents are used, ensure assessments are adequate to identify over-sedation recurrence once the effect of the antagonist dissipates (may require up to 2 hours of increased observation)

Review all five ways to manage sedation complications above before moving on.

Identifying Patients Transitioning to Deep Sedation

If the patient transitions to unplanned deep sedation, it is imperative that you initiate rescue procedures!

- The patient has transitioned to deep sedation if they cannot be easily aroused (even if they respond purposefully following repeated or painful stimuli)
  - These patients may have trouble breathing and often require assistance in maintaining a patent airway
- A score of 5 or 6 on Ramsay sedation score is indicative of transition to deep sedation

Actions for When Sedation Progresses Deeper Than Planned

Let's take a look at the steps to take when a patient progresses deeper into sedation than anticipated. Appropriate measures need to be taken to return patient to planned sedation level.

1

Notify team involved with the procedure of patient's status:

"The patient's sedation is increasing and has transitioned to a deeper sedation level than planned. We need to address sedation level before proceeding."

2

Assess patient's airway.

If respirations are impaired, prepare rescue procedures:

1. Manually open airway (jaw thrust)
2. Consider insertion of oral or nasal airway
3. Assist with ventilations (bag/valve mask)
4. Prepare for intubation: Consider calling for anesthesia or code blue as appropriate to situation
5. Suction airway PRN

4

Be aware that the progression towards deep sedation varies from person to person.

5

Be alert to accumulation of secretions in the airway - aspiration is the most common cause of death in procedural sedation.

6

If deep sedation has occurred, institute measures to return to the planned level of sedation.

7

Monitor patient for signs of decreased respiratory status and airway compromise. Follow airway rescue algorithm as needed.

8

Administer reversal agents per LIP orders.

Document patient status every 5 minutes, including:

- BP
- Pulse
- Respirations
- $ETCO_2$
- Pulse oximetry
- Sedation level
- ECG pattern

Remember!

Only caregivers specifically certified in endotracheal intubation may perform airway intubation.

Complete the content above before moving on.

Complications: Allergic Reactions

Allergic Reactions

Although they are rare, allergic reactions to medications do occur. Be sure to note allergies and symptoms at the pre-procedure assessment.

The following are the most common signs of an allergic reaction:

- Generalized flush with tingling
- Pruritus
- Tachycardia
- Urticaria
- Angioedema
- Inspiratory stridor
- Wheezing
- Sudden hypotension
- Cardiac arrhythmias
- Loss of consciousness
- Seizures

Responding to an Allergic Reaction

1. Stop procedure
2. Administer appropriate drugs to counteract the allergic response as ordered:
    a. Epinephrine
    b. Benadryl
    c. Hydrocortisone, etc.
3. Monitor blood pressure
4. Support cardiovascular system with emergency medications/fluids
5. Keep airway patent
6. Anticipate possible endotracheal intubation
7. Consider calling RRT (or Code Blue)

CONTINUE

Sedation Complications & Rescue for Adult Patients Review

Multiple Choice Scenario:

Your patient has progressed to unplanned deep sedation during the procedure. He does not have spontaneous respirations, the SpO_2 has dropped to 65% on 6 L of O_2 and the $ETCO_2$ waveform is flat. The LIP decides to stop the procedure to intubate the patient.

What should you do?

- ◯ Intubate the patient
- ◯ Call for assistance and support the airway until the LIP intubates the patient
- ◯ Call an RRT
- ◯ Transfer the patient to the critical care unit immediately, then intubate

SUBMIT

Multiple Choice Scenario:

Mr. Smythe has received 4 mg of morphine sulfate IV. You notice during your procedural assessment that hives are forming. He is now having difficulty breathing with high pitched crowing on inspiration with stridor. His blood pressure has dropped from 140/78 to 80/40. You alert the LIP of the suspected allergic reaction.

Which of the following interventions would you **NOT** perform?

- ◯ Stop the procedure

- ◯ Administer medications to reverse the allergic reaction per LIP order
- ◯ Intubate the patient immediately
- ◯ Call code team
- ◯ Support the airway

SUBMIT

Select All That Apply:

Your patient's baseline vital signs are HR 78, RR 16, B/P 132/78, O_2 saturation 96%, and $ETCO_2$ 35 mmHg on room air. 15 minutes into the procedure, you obtain the following vital signs: HR 65, RR 10, B/P 120/70, O_2 saturation 94%, $ETCO_2$ 47 mmHg.

Which parameter(s) is/are of concern and bears closer observation?

- ☐ RR of 10
- ☐ $ETCO_2$ of 47
- ☐ HR of 65
- ☐ B/P of 120/70
- ☐ O_2 saturation of 94%

SUBMIT

Multiple Choice:

What would be the first line intervention if airway obstruction is suspected?

- ◯ Administer the appropriate reversal agent
- ◯ Continue pulse oximetry monitoring
- ◯ Reposition the airway using techniques for opening the airway
- ◯ Intubate the patient immediately

SUBMIT

True or False:

The most common cause of death in procedural sedation is respiratory depression.

- ◯ True
- ◯ False

SUBMIT

Multiple Choice Scenario:

Your patient has received large doses of midazolam (Versed) and fentanyl for painful debridement of a wound. 20 minutes into the procedure the patient begins to have sonorous respirations. You perform a chin lift and reassess the patient's status. The patient does not respond to verbal, tactile or painful stimuli.

Which level of sedation describes the patient's current status?

- ◯ Minimal sedation
- ◯ Moderate sedation
- ◯ Deep sedation
- ◯ General anesthesia

SUBMIT

Multiple Choice Scenario:

Your patient is undergoing procedural sedation for suturing of a large laceration. 20 minutes into the procedure his Ramsey Sedation Scale has changed from 3 to 1. He is moaning and withdrawing from painful stimuli with each placement of the skin staple.

What is your assessment?

- ◯ The patient is hypoxic
- ◯ Patient needs a different pain medication
- ◯ The patient has inadequate analgesia for the procedure
- ◯ The patient is allergic to the medication used for the procedure

SUBMIT

Multiple Choice Scenario:

Your patient has received a total of 10 mg of IV morphine sulfate for procedural sedation. He is restless and agitated. His respirations are 10 and shallow.

What may be the cause?

- ◯ The patient is responding to the painful procedure and needs more medication
- ◯ The patient is showing early signs of an allergic response to the morphine sulfate
- ◯ The patient may be showing signs of hypoxemia and further assessment is needed
- ◯ The patient is having an opposite effect with the use of morphine sulfate and a different drug should be administered

SUBMIT

Select All That Apply:

Which of the following would suggest that your patient has drifted into deep sedation?

- ☐ Vital signs are stable, but oxygen saturation has decreased slightly
- ☐ Respirations have decreased to 10/minute, oxygen saturation remains at 99%, and $ETCO_2$ is 3 mmHg above baseline
- ☐ Patient attempts to open eyes only after pain stimulus (e.g., sternal rub)
- ☐ A chin lift is required to maintain a patent airway and $ETCO_2$ has risen 10 mm Hg above baseline

SUBMIT

Complete the content above before moving on.

Conclusion

Congratulations!
You have completed this course.

Thank you for completing the Procedural Sedation - Adult Patients course!

If you have any unit-specific questions, please contact your nursing unit manager or preceptor.

Exit
Click to exit the course.

EXIT

Status Active PolicyStat ID 17235364

Saint John's Health Center
Providence

Origination	11/2015
Last Approved	04/2025
Effective	04/2025
Last Revised	09/2021
Next Review	04/2028
Owner	Dana Gillette: Executive Director Nursing
Policy Area	Perioperative
Applicability	CA - Saint John's Health Center

Care of the Patient Receiving Local Anethesia

1. Purpose

1. To ensure safe patient care guidelines for Registered Nurses' (*RNs*) managing patients receiving local infiltration anesthesia.
2. To describe the process for providing care for patients who undergo procedures anticipated to require only local anesthesia in the operating room (*OR*).

Policy

1. Patients receiving local infiltration anesthesia during a surgical procedure that does not require the services of an anesthesia care provider must be assessed pre-operatively and continually observed intra-operatively/intra-procedural by an ACLS certified RN.
2. A dedicated monitoring RN will be assigned to assess the patient and provide monitoring care throughout surgery/theprocedure. The RN circulator may not monitor while performing circulator duties.
3. Patients will be considered for local monitoring if they have an ASA classification of two (2) or less and have an IV or saline lock availability.
4. Monitoring RNs who have concerns about appropriateness of straight local anesthesia must notify the clinical supervisor and the surgeon. Additional evaluation may be requested from an Anesthesiologist.

Important Considerations

The monitoring RN should use ASA classifications to determine patient acuity. See Appendix A.

PROCEDURE

1. The RN/staff verifies the patient's identity (using 2 identifiers), operative procedure, site/s and

surgeon. The patient signs the consent as per written order, and ID band is attached to the patient.

2. The RN reviews the patient's history and physical, laboratory results and other diagnostic test results as indicated.
3. The RN will assure appropriate equipment is available, including working suction, monitoring equipment, resuscitative equipment, and access to oxygen.
4. Vital signs (level of consciousness [LOC], blood pressure, O_2 saturation, respiration, ECG, pain level, heart rate, and temperature) are assessed and documented before the local anesthesia, during and after the procedure.
5. RN assesses and monitors the patient's physiological and psychological responses (LOC, BP, HR, RR, O_2 saturation, and level of pain) throughout the procedure and reports to physician significant changes in patient's status.
6. The RN should provide information to the patient regarding expected sequence of events and the performance of pain assessment and administration of pain relief measures.
7. Post-procedure and prior to discharge the PACU RN will reassess the above parameters including the patient's tolerance to the procedure and level of analgesia.
8. Discharge explanations and instructions given to patient. If indicated patient should be discharged to a responsible adult.
9. RN completes care plan on procedure record (including amount of local anesthetic given) and completes charges.

References

ASA Physical Status Classification System, Last approved by the ASA House of Delegates on October 15, 2014; http://www.asahq.org/resources/clinical-information/asa-physical-status-classification-system Accessed August 14, 2015.

Association of Operating Room Nurses: *AORN Guidelines for Perioperative Practice,* 2015.

Attachments

Appendix A ASA PS Classification.docx

Approval Signatures

Step Description	Approver	Date
Board of Directors	Siune Vartanian: Executive Assistant to CEO	04/2025

MEC	Peggy Mooney: Senior Manager Medical Staff Services	02/2025
Surgery	Peggy Mooney: Senior Manager Medical Staff Services	02/2025
PCSC	Jose Castro: Director Pharmacy	01/2025

Applicability

CA - Providence Saint John's Health Center

Standards

No standards are associated with this document

Status Active PolicyStat ID 17235364

Saint John's Health Center
Providence

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Last Approved	04/2025
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Association of Operating Room Nurses: *AORN Guidelines for Perioperative Practice,* 2015.

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Appendix A ASA PS Classification.docx

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Board of Directors	Siune Vartanian: Executive Assistant to CEO	04/2025

MEC	Peggy Mooney: Senior Manager Medical Staff Services	02/2025
Surgery	Peggy Mooney: Senior Manager Medical Staff Services	02/2025
PCSC	Jose Castro: Director Pharmacy	01/2025

Applicability

CA - Providence Saint John's Health Center

Standards

No standards are associated with this document

Status Active PolicyStat ID 17616072

Saint John's Health Center
Providence

Origination	11/2015
Last Approved	04/2025
Effective	04/2025
Last Revised	05/2018
Next Review	04/2028

Owner	Dana Gillette: Executive Director Nursing
Policy Area	Perioperative
Applicability	CA - Saint John's Health Center

Fire Prevention In The Operating Room

PURPOSE:

The purpose of this Fire Prevention in the Operating Room Standard Procedure is to reduce the risk of injury to patients and employees through proper implementation of fire prevention methodology and strategies.

PROCEDURE:

PREVENTION OF O.R. FIRE AND/ OR SPECIAL PROCEDURES

1. Electrosurgery/ Laser/ Video equipment:
    i. Use of alcohol-based solutions for skin prep.
        a. When an alcohol-based solution is used, use a minimal amount of solution and allow sufficient time for fumes to dissipate before draping.
        b. Do not allow pooling of any prep solution (including under the patient) and allow time for area to dry before draping.
        c. Conduct skin prep "Time Out" to validate the prep agent is dry. Refer to policy "Fire Prevention with Use of Alcohol-based Surgical Skin Prep."
    ii. During head and neck procedures, adhere to the following:
        a. Minimize build-up of N_2O and O_2 beneath drapes and in oropharynx. Tenting the drape dissipates gases during head and neck procedures.

b. When possible, stop supplemental oxygen at least 1 minute before and during use of electrosurgical unit (ESU)/Laser.

- Anesthesiologist, with cooperation of surgeon, would attempt this action. Surgical team communication is essential.
- Question the need for 100% O_2 for open delivery on the face. Use air or FiO_2 30% for open delivery.
- For head and neck laser procedures, use laser-resistant anti-reflective endotracheal tube.
- Use separate suction to scavenge excess oxygen in the oropharynx around the tracheal tube cuff.
- Use wet gauze or sponges with uncuffed tracheal tubes to minimize leakage of O_2 into the oropharynx;

keep them wet.

- If endotracheal tube cuff leaks are found during surgery in the oropharynx, do not use the electrosurgical unit (ESU)/Laser for at least 1 minute after stopping cuff leaks.

c.Coat facial hair near the surgical site with water-soluble surgical lubricating jelly (e.g. KY jelly, Surgilube) to decrease the risk of hair igniting during use of ESU or Laser.

iii.Activate unit only when the active tip is in view, especially if looking through a microscope.

a. When multiple foot controls are used in a procedure, assure that they are properly positioned and removed when not in use.
iv.Deactivate unit before tip leaves the surgical site.
v.Keep hand controlled tips in protective holster/holder when not in use.
    a. Do not use protective covers created from rubber catheter or packing materials as insulators on active electrode tip.
    b. If an ESU hand-piece is contaminated, do not leave it hanging down on side

connected to ESU. Immediately disconnect ESU hand-piece from ESU.

vi.Have basin of sterile saline on sterile field.

vii.Use wet sponges on surgical field.

A. 2Electrical Cords:
    1. Check all electrical cords and plugs for damage and verify inspection sticker is current before use.

A. 3Fiber optic Light Source:
    i. Connect the light cable to the light source and set intensity on low, before turning on the light source.
        a. Fiber optic light sources can get hot enough to start a fire.
        ii.Place the light source in "standby" mode or turn off when a light cable is not in active use.
        iii.Do not allow a light cable that is connected to a light source to contact drapes, sponges or other flammable materials.
        iv.Place the light source in "standby" mode when a light cable is connected to rigid endoscope that is not in a body cavity.
        1.4Drills, Saws:
        i.A slow drip of saline on a moving drill/burr/saw blade helps reduce heat buildup.
    ii. Do not place drills, burrs, or saws on the patient when not in use.
    iii. Ensure all equipment is periodically inspected by biomedical personnel for proper function.
        a. Check biomedical inspection stickers on equipment for currency.

B. EMERGENCY PROCEDURES
2.1In the event of fire or smoke discovery, follow the hospital procedure.
2.2Department-Specific Fire Response Procedure
    1. If fire or smoke is discovered in the department, remain calm.
        i. No cases will start after the fire is announced. Surgeons and Anesthesiologist with cases in progress will be informed of the situation and asked to complete the procedure as quickly as possible.
        iii.If fire should occur in an OR during a surgical procedure, the first concern is the

safety of the patient and personnel. Immediately move the burning article from proximity of the oxygen source and the anesthesia machine or outlet of piped-in gases to prevent explosion.

a. If a small fire is present, immediately pat out or smother fire or remove burning material from patient to floor and extinguish fire.

b. If fire involves sterile disposable drapes:

- Smother fire. Water will not easily extinguish fire.
- To remove a drape that is on fire:
  - ***Remember to keep flames and heat away from patient face*** where flow of anesthesia oxygen and gases is most prevalent.
- ***Smother fire out as you pull drapes off onto floor.***

c. Disconnect all electrical equipment and move away from sterile field.

i. The fire should be extinguished in the room, if possible, but the patient must be removed immediately from any danger.

iv. If the patient is anesthetized, evacuate the patient on the operating table.

i. If the fire should occur in the ASU or PACU areas, the first concern is for the safety of the patient and personnel. Immediately move the burning article from proximity of the oxygen source and the any other combustible sources to prevent explosion. Use a fire extinguisher if you can safely. Pull fire alarm box. Alert the Operator (Dial 16). Close all doors.

ii. The fire should be extinguished in the unit, if possible, but the patient(s) must be removed immediately from any danger.

viii.Evacuation Protocol proceeds as follows:

a. The Incident Commander is responsible for EVACUATION of patients, visitors and staff to adjacent safe Smoke Zone (horizontal or vertical evacuation as necessary). Triage remaining patients, evacuating patients and visitors first to an adjacent safe HORIZONTAL Smoke Zone, then non-ambulatory patients, and finally patients on life support once appropriate staff and equipment have been assembled and a safe evacuation destination has been identified (take patient charts).

b. When preparing for evacuation, the Perioperative Director or designee will notify anesthesia to open their medical gas tanks. When this has been done, the Perioperative Director/ designee will shutoff the medical gas valves to the affected zone(s).

c. If evacuation becomes necessary, the patients will be stabilized and moved as quickly as possible to the closest safe area and recovered at that location. Patients under anesthesia will be transported with the anesthesia machine at the anesthesiologist's discretion. If a patient is ventilator dependant, ambu bag and portable oxygen will be used to transport the patient to the safest area. Respiratory Therapy will be notified to provide respiratory maintenance until the patient is able to breathe without assistance, if needed.

ix.Surgery Evacuation – Staff Responsibilities

i. Scrub nurse/technician – Remove necessary surgical instruments from mayo stand/back table and place on table with patient. Assist with movement of table.

ii. Circulating nurse – Move equipment away to clear path from table to door. Assist in moving table.

iii. Anesthesiologist – Remove IV bags from poles and place on table with patient. Take necessary drugs from anesthesia cart. Disconnect monitor leads, etc. from anesthesia machine and maintain respirations of patient with ambu bag or transport with anesthesia machine. Assist in moving table. Anesthesia tech to bring supplies as needed.

iv. Assisting Surgeon – Assist in moving table.

v. Primary Surgeon – Stabilize patient. Pack the open incision with sterile lap sponges as necessary. Cover the wounds with a sterile drape sheet. Give final directions to move.

vi. Pre-op nurse – No scheduled surgical patients will be sent for or released to OR. Move beds and/or equipment to provide a clear path of exit to door. Disconnect monitor leads and keep patients and family calm while preparing for evacuation.

vii. PACU nurse – Disconnect monitor leads, secure lines and place IV bags on bed with patient if fire is in adjacent area. Obtain portable oxygen to provide respiratory maintenance while transporting patients. Each PACU nurse will then turn off the individual wall oxygen flow meter for each patient bed area. Move equipment/beds to provide a clear path in preparation for evacuation.

viii. Pharmacy – Provide necessary drugs to maintain anesthesia if indicated.

ix. Perfusionist – Open Heart Room

- Ensure that all lines are tethered to extend as long as possible
- Disconnect heater/cooler lines
- Disconnect medical gas lines from piped-in system
- Attach portable oxygen to bypass machine
- Move bypass machine to head of table
- Maintain operation of machine

2.3Department-Specific Fire Response Procedure

a. Evacuation Routes have been designated as follows:

i. Evacuate patients in immediate fire and smoke danger first to an adjacent safe HORIZONTAL Smoke Zone. Close all doors.

ii. Horizontal evacuation would be to the PACU or Pre-Op, depending on the location of
fire and/or smoke. PACU provides the easiest access and should be primary choice depending on the location of fire and/or smoke.

iii. Vertical Evacuation from the OR/ PACU would be either of the following, depending on the location of fire and/or smoke.

- stairwell next to Anesthesia Offices

- stairwell in Cath Lab unit, next to OR 1
- stairwell next to Surgery Waiting Room
- elevators next to Surgery Waiting Room, if authorized.

iv. Vertical Evacuation from Pre-Op would be either of the following depending of the location of fire and/or smoke.

- stairwell between Keck and CSS buildings
- elevator between Keck and CSS buildings, if authorized
- stairwell next to Pre-Op Registration

REFERENCES

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Approval Signatures

Step Description	Approver	Date
Board of Directors	Siune Vartanian: Executive Assistant to CEO	04/2025
MEC	Peggy Mooney: Senior Manager Medical Staff Services	03/2025
Surgery	Peggy Mooney: Senior Manager Medical Staff Services	03/2025
PCSC	Jose Castro: Director Pharmacy	02/2025

Applicability

CA - Providence Saint John's Health Center

Standards

No standards are associated with this document

Status **Active** PolicyStat ID **13557053**

Saint John's Health Center
Providence

Origination	02/2018
Last Approved	05/2023
Effective	05/2023
Last Revised	05/2023
Next Review	05/2026
Owner	Teresa Claeson: Executive Director Nursing
Policy Area	Perioperative
Applicability	CA - Saint John's Health Center

Massive Transfusion Protocol

POLICY

In keeping with the mission and values of Providence Health & Services, the massive transfusion protocol is designed to be used throughout the Saint John's Health Center main hospital campus. Each algorithm designates the process to be followed based on location of the event and the time during which it occurs.

PROCEDURE/GENERAL INSTRUCTIONS

1. The massive transfusion protocol may only be initiated upon an order from an MD with privileges at Saint John's Health Center.

2. Four algorithms are provided:

    a. All areas (Except OR)

    b. Operating Room Days - for use in the operating room department from 0630-2300 Monday-Friday.

    c. Operating Room Nights & Weekends - for use in the operating room department from 2300-0630 Monday-Friday and 24 hours on Saturday and Sunday.

3. Rapid Transfusers are located within the facility: operating room, labor and delivery department, Intensive Care Unit, and the Emergency department.

4. Three massive transfusion supply carts are located within the facility: operating room, Staffing Office, and labor and delivery department.

Attachments

- MTP Protocol All Areas (Except Operating Room) 4.18.23.pdf
- Operating Room Days
- Operating Room Nights & Weekends

Approval Signatures

Step Description	Approver	Date
Board of Directors	Lori Higdon: Contracts Manager	05/2023
MEC	Peggy Mooney: Senior Manager Medical Staff Services	05/2023
Surgery	Peggy Mooney: Senior Manager Medical Staff Services	05/2023
PCSC	Rose Pelikan: Executive Director Nursing	04/2023

Applicability

CA - Providence Saint John's Health Center

Standards

No standards are associated with this document

Status **Active** PolicyStat ID **10105560**

Saint John's Health Center
Providence

Origination	06/2003
Last Approved	07/2021
Effective	07/2021
Last Revised	07/2021
Next Review	07/2024
Owner	Stephanie Nolan: Chief Nursing Officer
Policy Area	Patient Care Services
Applicability	CA - Saint John's Health Center

Moderate Sedation

Number: 200.79
900.187

PURPOSE

A. To outline the management of patients receiving moderate sedation (as defined below). Patient outcomes are:
    1. to assure uniform provision of care
    2. to minimize risk factors/ensure safety of care
    3. to ensure that patient is comfortable enough to enable him/her to be accepting and cooperative during invasive special procedures.

POLICY

A. Moderate Sedation may be administered by either the attending physician with moderate sedation privileges or a *registered nurse* under the supervision of the attending physician with moderate sedation privileges. The physician has primary responsibility for his/her patients who require moderate sedation. Only registered nurses with competency in moderate sedation can administer moderate sedation. In addition, registered nurses need to be certified in Advanced Cardiac Life Support (ACLS) and as appropriate Pediatric Advanced Life Support (PALS).

B. When possible, Moderate Sedation is used in procedural areas; however, Moderate Sedation can be administered in all locations within the Health Center dependent upon patient need. These include, but are not limited to:
    1. Endoscopy Suites
    2. Critical Care Units

3. Emergency Department
4. Radiology Department
5. Acute Care Nursing Units
6. Cardiology Catheterization Laboratory
7. Ambulatory Care Units
8. Post-Anesthesia Care Unit
9. Operating Room

DEFINITIONS

A. DEFINITION OF MODERATE SEDATION (formerly Conscious Sedation):
A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

B. DEFINITION OF DEEP SEDATION/ANESTHESIA:
(NOTE: **The guidelines contained in this policy do not apply to deep sedation**.)
A drug-induced depression of consciousness during which patients cannot be easily aroused, but respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.

PHYSICIAN PRIVILEGING FOR MODERATE SEDATION

A. Training and Experience Requirements for Initial Privileges
    1. Physicians applying for sedation privileges must be members in good standing of the medical staff at Saint John's Health Center and must have met requirements for their department's medical staff privileges.
    2. To be eligible for initial privileges for moderate sedation, physicians(except for members of Anesthesiology and Emergency Medicine Sections) must successfully complete a test designed to evaluate their knowledge of:
        a. The Saint John's Health Center Standard Procedure for the Use of Sedation and Analgesia during Procedures.
        b. The American Society of Anesthesiologists' Practice Guidelines for Sedation and Analgesia by Non-Anesthesiologists.
    3. The test results will be maintained in the physician's medical staff file.

B. Re-privileging
    1. Maintenance of privileges for moderate sedation will be based on the results of the safety (event) reporting mechanism (Quantros) and the monitoring performed by the

Anesthesia Section of the Department of Surgery.

2. All practitioners with less than four (4) documented cases of moderate sedation administered or complications related to Moderate Sedation ranked higher than "2" during their two-year appointment period will be required to take the sedation test for renewal of the privilege.

PROCEDURE

A. Pre-Sedation Activities – (SEE APPENDIX I: List of drugs for adult procedural sedation in hospital)

1. Validate the patient's readiness for moderate sedation utilizing the following criteria prior to initiating sedation:
    a. The patient is alert and oriented to time/ person/ place/ or baseline for developmental age or baseline as individualized for patient with physician awareness.
    b. The patient has no allergy/ sensitivity to the prescribed sedative medication.
    c. The patient's health history and recent physical examination are recorded and available for review - including ASA (anesthesia risk assessment). Patients with ASA scores of 3 or 4 must have an anesthesia consultation (waived when the moderate sedation will be administered by a cardiologist).
    d. Except for emergencies, the patient has been NPO at least 8 hours for adults or as individualized by M.D.
2. Verify that arrangements with a responsible adult have been made for the transportation home of outpatients.
3. Validate presence of patient's consent for procedure and sedation.
4. Confirm presence of a patent central or peripheral IV access site for all patients. If none is present obtain order from physician and place IV.
5. Assure that the following equipment is at the bedside and/or immediately accessible and in good working order.
    a. Emergency resuscitation equipment (Crash Cart) including defibrillator and Ambu bag
    b. Oxygen setup with tubing and face mask/nasal cannula
    c. Suctioning equipment
    d. Functioning emergency call system/telephone access in immediate vicinity
    e. Pulse Oximeter
    f. Emergency drugs: (**SEE APPENDIX II: Reversal Agents)**
        1. Reversal agents - Narcan for narcotic agents and Flumazenil for benzodiazepines.

2. Benadryl and Epinephrine.

g. EKG monitor

h. Blood pressure monitoring device.

6. Keep stretcher/bed rails elevated. Warn patient not to ambulate alone: supervise any necessary ambulation pre and post sedation.

B. Initial Assessment

1. Perform and document the following assessment prior to sedative administration:
    a. Vital signs (BP, Pulse rate/rhythm, SpO_2, respirations, temperature, and pain).
    b. Skin color, warmth, and sensation
    c. Patient responsiveness to verbal/tactile stimulus.
    d. Activity (able to move all extremities, or within limitations - Aldrete Scoring).
    e. Assess patient has a patent airway.
2. Instruct the patient in the following related to Moderate Sedation prior to sedation administration:
    a. To anticipate drowsiness/sleep lasting a short period
    b. That conscious awareness of activity will be limited
    c. The ability to hear will remain (esp. instructions)
    d. That BP Cuff and Pulse Oximeter Probe will remain on during sedative/ procedure
    e. The potential amnesic effect of certain medication
    f. Discharge Criteria and Discharge Instructions.
    g. That recovery period will be relatively short (approximately 30 minutes).
    h. Activity restrictions.
3. Determine patient perception/understanding of the procedure, sedation, and discharge criteria and instructions.
4. Answer questions; refer questions to the physician as appropriate.

C. Intra-Procedure Monitoring

1. Monitoring of the patient is to be performed by a person not involved in the conduct of the surgical/diagnostic procedure. Staff monitoring the patient receiving moderate sedation shall have no other responsibilities that would require leaving the patient unattended or would compromise continuous monitoring during the procedure.
2. Monitoring of the patient is to be continuous throughout the procedure and will include documentation of:

a. Vital signs, including blood pressure, pulse rate, percentage of oxygen saturation, and respirations taken and recorded on the chart prior to initiation of sedation, minimum of every 5 minutes during the procedure and for a minimum of 30 minutes after last sedation administered.

3. Continuous pulse oximetry with digital displays.
4. Report the following to the physician immediately:
    a. Clinically significant change in blood pressure, heart rate/rhythm, respiratory rate, SpO_2 <92%
    b. Signs of respiratory compromise
    c. Signs of marked decrease in responsiveness, report to physician immediately and administer reversal agents as ordered.

D. Post-Procedure Monitoring
    1. Assess and document the patient's vital signs, including blood pressure, pulse rate, percentage of oxygen saturation and respirations immediately post procedure, and q 15 until within 10% of baseline.
    2. Complete Aldrete scoring until 8 or > or as individualized by the physician (based on patient's pre-procedure baseline).
    3. Monitor patients receiving moderate sedation a minimum of 30 minutes post-procedure or per physician. If Flumazenil or Narcan are administered to reverse the sedative effects, the patient should be monitored for at least 2 hrs for re-sedation.

E. Discontinuation of Monitoring/Discharge
    1. Inpatients who have been transported off the unit for a procedure requiring moderate sedation may be returned to their previous level of care when the patient achieves total post procedure Aldrete Score of 8 or > or as individualized by the physician (based on patient's pre- procedure baseline).
        a. Verbal report has to be given by the designated qualified personnel to the licensed nurse assuming responsibility for the patient's care on the patient care unit.
    2. Discontinue monitoring thirty (30) minutes post sedation administration (unless a reversal agent has been given) and continue care/monitoring as appropriate for individual patient.
    3. Discharge: Outpatients may be discharged by a licensed practitioner whose scope of practice permits, when the following criteria are met, and, an order has been received by a physician.
        a. Patient is alert, oriented to time/person/place and conversant with clear articulation; or, as prior to procedure and as appropriate for developmental age.
        b. Patient's cardiovascular and respiratory status are assessed to be absent of complications and stable with:
            1. Oxygen saturation > 92% on room air, or as prior to procedure.

2. SBP > 100 mm Hg or +/- 20mm Hg of pre-operative baseline
3. Heart rate within 10% (increase or decrease) from baseline.

c. Patient is able to move and coordinate all muscle groups within pre-sedation abilities and according to developmental age.

d. Achieve total post procedure Aldrete Score ***of 9 or > or*** as individualized by the physician (based on patient's pre-procedure baseline).

e. Patient or responsible party (e.g., parent) can verbalize post-sedation/ discharge instructions.

f. Patient is experiencing minimal nausea and not vomiting.

g. Pain/discomfort is appropriate for procedure if applicable.

h. Patient is able to void (as appropriate).

i. Arrangements have been made for transportation home with a responsible adult.

4. Instruct/remind the patient/SO that it is recommended that patient may not drive, operate heavy/dangerous equipment or make any important decisions for at least 12 hours following Moderate Sedation.
5. Provide written discharge instructions with name(s) and number(s) of whom to contact post discharge (should any problems occur) to the patient/ SO at the time of discharge.
6. Report ADR (Adverse Drug Reaction) any possible or suspected adverse effects.

DOCUMENTATION

A. Documentation will occur on the electronic record.

PEDIATRIC PROCEDURE <14 YEARS:

(SEE APPENDIX III: List of drugs for pediatric procedural sedation)

A. Age Factors: Consider age differences when administering drugs. Assessment and maintenance of the airway is of utmost importance when providing moderate sedation to children. Infants and small children are much more susceptible to airway obstruction because of the unique anatomy of the head, neck, and chest. The clinician must be able to rapidly identify respiratory distress. Signs and symptoms of respiratory distress in a child include cyanosis, grunting, retractions, nasal flaring and tachycardia. All pediatric patients must be consented and accompanied by a parent or legal guardian.

B. Pre-Sedation Activities – Pediatric Considerations

1. Validate the patient's readiness for moderate sedation utilizing the following criteria prior to initiating sedation:

a. The patient is at baseline for developmental age

b. The pediatric patient has been NPO, as follows or as per physician order:

1. All pediatric patients: no clear liquids for at least 2 hrs.
2. < 6 months: no breast milk for at least 4 hrs; no formula or solids for at least 6 hours.
3. 6 – 36 months: no milk or solids for at least 6 hrs.
4. > 36 months: no milk or solids for at least 8 hrs. or as individualized by M.D.

2. Confirm presence of a patent central or peripheral IV access site for all patients. If none is present obtain order from physician. (IV order may be individualized per physician order e.g.: a physician may choose not to start an IV on a child.)
3. Assess/determine:
    a. Level of growth and development
    b. Appropriate vital signs and baseline physical assessment
    c. Potential for alteration in skin integrity (i.e. diaper, toilet needs)
    d. Level of comfort/anxiety
    e. Parent/ guardian support/ care
    f. Appropriate pain management tool (i.e. FLACC for children <3,
    g. Faces > 3 years or numerical scale 0-10 for > 5 years).
4. Instruct/review with patient/ parent/ guardian: Procedure and hospital routine appropriate for age level (answer all questions appropriately, engage in play acting when appropriate, offer choices when possible/appropriate).
    a. Appropriate pain scale.
    b. Safety:
        1. Do not leave child unattended
        2. Side rails up on crib/gurney.
        3. Use of call light.
        4. Cribs are used for a child < 4 years of age, or as indicated.
        5. Encourage fluid intake after sedation; if less than adequate for more than 4 hrs, then contact physician
5. Special Pediatric Considerations:
   Allow Child to:
    a. Take favorite toy, blanket, etc. to procedure.
    b. Keep underwear in place if it does not interfere with procedure or monitoring.
    c. Have parent/guardian to be with child at all times pre and post procedure.
    d. Monitor pediatric patient q5 min post procedure until return to baseline vital signs, then every 15 minutes until discharged per adult parameters.

References:

American Association of Nurse Anesthetists. Registered Nurses Engaged in the Administration of Sedation and Analgesia." Accessed on 2/13/2015 on http://www.aana.com/resources.
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"Practice Guidelines for Sedation and Analgesia by Non-Anesthesiologists." (2002) **Anesthesiology, 96**, pg. 1004-1017.
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APPENDIX I: List of drugs for ADULT procedural sedation in the hospital.

Table 1. Preferred agents

DRUG	ADULT DOSE	ONSET OF ACTION	DURATION OF ACTION	COMMENTS
Midazolam (Versed ®)	Adults under age 60: 1 -2.5mg IVP over at least 2 mins, repeat in 2 mins if needed, total dose up to 5mg may be used. Adults ≥60: 1.5mg or less IVP over 2 mins, repeat if needed not to exceed 1mg over 2 mins. Total doses exceeding 3.5mg aren't usually necessary.[2]	Onset:1.5-5 min Peak: Rapid	2-6 hr	Respiratory depression or hypotension may occur, particularly when rapidly administered or combined with fentanyl (may need to decrease midazolam dose)
Fentanyl	1-2mcg/kg/dose, may repeat in 30-to 60 minutes, slow IVP[1,2]	Onset: 1-2 min Peak: 3-5 min	30-60 min	May cause chest wall rigidity, apnea, respiratory depression, or hypotension; elicits minimal cardiovascular depression; may cause dysphoria, nausea, vomiting, or ECG changes; action reversed by naloxone

Table 2. Other agents

DRUG	ADULT DOSE	ONSET OF ACTION	DURATION OF	COMMENTS

			ACTION	
Diazepam	5-15mg IVP[2,3]	Onset: 1-2min Peak: Immediate	15-60 min	Respiratory depression, hypotension, bradycardia. Use cautiously in the elderly,
Morphine	1-4mg IVP q2-5min	Onset: 5min Peak 30 min	4-5 hr	Hypotension, respiratory depression, apnea, sedation, dizziness
Meperidine	50-100mg IVP[2]	Onset: 1min Peak: 5-7 min	2-4 hr	Contraindicated in patients who have received MAO inhibitors within the past 14 days. Use cautiously in geriatric patients with impaired renal or hepatic disease or increased intracranial pressure
Propofol	1mg/kg IVP followed by 0.5mg/kg every 3-5min as needed[3]	Onset: <40 sec Peak: unknown	10-15 min	**Anesthesia must be present during procedures, except in ED; MD ADMINISTRATION ONLY** Provides rapid onset and recovery phase, and brief duration of action; has anticonvulsant properties; can rapidly cause deepening sedation; causes cardiovascular depression and hypotension

Table 3. Emergency Room Use Agents (MD administration ONLY)

DRUG	ADULT DOSE	ONSET OF ACTION	DURATION OF ACTION	COMMENTS
Etomidate (adult)	0.1-0.2mg/kg slow IVP over 30-60 sec[3]	Onset: 30-60 sec Peak: 1 min	3-5 min	**MD ADMINISTRATION ONLY** Commonly causes myoclonus, pain upon injection, adrenal suppression (typically no clinical significance); lower seizure threshold, causes a slight to moderate decrease in intracranial pressure ithat only lasts for several minutes; does not cause histamine release; useful for patients with trauma and hypotension
Propofol (adult)	1mg/kg IVP followed by 0.5mg/kg every 3-5min as needed[3]	Onset: <40 sec Peak:	10-15 min	**MD ADMINISTRATION ONLY** Provides rapid onset and recovery phase, and brief

		unknown		duration of action; has anticonvulsant properties; can rapidly cause deepening sedation; causes cardiovascular depression and hypotension
Ketamine (adult)	1 to 2 mg/kg IV over 1-2 min, may be followed by 0.25 to 0.5 mg/kg IV every 5-10 min as needed[3]	Onset: 30sec Peak: Unknown	5-10min	**MD ADMINISTRATION ONLY** Contraindicated in patients with schizophrenia or other acute psychosis.

APPENDIX II – Reversal Agents

DRUG	ADULT DOSE	ONSET OF ACTION	DURATION OF ACTION	COMMENTS
Naloxone	**Adult dose**: 0.4-2mg q2-3min, may repeat q20-50 min; if no response after 10mg, reassess the diagnosis. 0.1-0.2mg in opiate depended or post op patients. **Pediatric dose**: 0.01mg/kg q2-3min	2 min	20-60min	Dose increments decreased in opiate dependent patient to avoid withdrawal symptoms, including HTN. Dose increments in post op patients to avoid large cardiovascular changes, such as an increase in BP and reversal of anesthesia; caution in patients with cardiovascular disease.
Flumazenil	**Reversal of conscious sedation**: **Adult dose:** 0.2mg over 15 sec q1min;maximum total dose=1mg (usual total dose 0.6-1mg) **Pediatric dose:** 0.01mg/kg IVP over 15sec (max=0.2mg) Repeat doses: 0.005-0.01mg/kg q1min (max 0.2mg, max 4 repeat doses); Total cumulative max dose=1mg (or 0.05mg/kg) whichever is lower. **Suspected benzodiazepine overdose:** 0.2mg IVP over 30 sec, may repeat 0.3mg x 1; may repeated 0.5mg q1min. Total cumulative	1-2 min	60min	**Benzodiazepine reversal may result in seizures in some patients**.. **Patients at risk are:** those on benzodiazepines for long term sedation, tricyclic antidepressant overdose patients, recent therapy with repeated doses of parenteral benzodiazepines, concurrent major sedative-hypnotic drug withdrawal. **Use with caution in ICU because of increased risk of unrecognized benzodiazepine dependence in such settings**. Use with caution in patients with panic disorders-may provoke panic attacks, use with caution in alcohol dependent patients – those patients may

	max=3mg (usual 1-3mg). If partial response to 3mg, may give additional doses up to a total of 5mg. If no response after 5mg, reassess diagnosis.			also be dependent on benzodiazepines. Use with caution in head injury patients and in patients with mixed drug overdoses.

APPENDIX III: List of drugs for PEDIATRIC procedural sedation in the hospital.

DRUG	Pediatric DOSE	ONSET OF ACTION	DURATION OF ACTION	COMMENTS
Midazolam	**ORAL**: 0.25 - 0.5mg/kg x 1 30-45min prior to procedure; max 20mg. **Children <6yo** or less cooperative patients: 1mg/kg x 1 **Children 6-16yo**: 0.25mg/kg **IV: children 6 months-5yrs**: 0.05-0.1mg/kg; titrate carefully, may require total dose of 0.6mg/kg. Usual max total dose=6mg. **Children 6-12yo**: 0.025-0.05mg/kg, then titrate; total dose of 0.4mg/kg may be required, usual max dose=10mg. **Children 12-16:** dose as adults, usual max total dose=10mg. **IM**: 0.1-0.15mg/kg 30-60min prior to procedure. Range: 0.05-0.15mg/kg **INTRANASAL:** 0.2mg/kg, may repeat in 5-15min, range: 0.2-0.3mg/kg/dose	PO: 10-20min IV: 1-5min IM: 15 min Intranasal: 5min	IV: 30-80min IM: up to 6hrs, mean 2hrs Intranasal: 30-60min	Decrease dose by 30% if other CNS depressants or narcotics administered concomitantly; use multiple doses and titrate to desired sedative effect, allow 3-5min between doses to decrease chance of oversedation. Younger children (<6yo) may require higher doses.
Fentanyl	**Neonates and young infants:** 1-4mcg/kg/dose, may repeat q2-4hrs **Children 1-2yo:** 1-2mcg/kg/dose, may repeat q 30-60min, **Children 18=36monhts**: may require 2-3mcg/kg/dose **Children>12yo**:	IV: almost immediate IM: 4-15min	IV: 30-60min IM: 1-2hrs	Chest wall rigidity associated with rapid IV push, increased risk of respiratory depression when combined with sedatives (reduce sedative dose)

	0.5-1mcg/kg/dose, may repeat q 30-60 min; or 25-50mcg, repeat fill dose in 5min; may repeat 25mcg dose q5min x 4 - 5 times			
Pentobarbital	**Infants>6 months and children**: 1-3mg/kg/dose to a max of 100mg until asleep IM: 2-6mg/kg, maximum dose 100mg **Children >18months:** 2mg/kg, then 1-2mg/kg q5-10min; maximum total dose 6mg/kg or 150-200mg. Mean total dose required (for CT scan sedation)= 3.3-4.5mg/kg)	1 min	15min	**ANESTHESIA PRESENCE REQUIRED; ADMINISTRATION BY ANESTHESIA MD ONLY** Do not inject faster than 50mg/min. Administer over 10-30min; Max concentration = 50mg/ml for slow IV push; dilute in D5W, N S, LR IV solution very alkaline-avoid extravasation. Rapid IVinjection may cause respiratory depression, apnea, laryngospasms, bronchospasms and hypotension. Short acting barbiturate useful for procedures requiring immobilization (ex. diagnostic radiologic procedures)
Methohexital	**Infants > 1month and children:** **PR:** induction dose = 25mg/kg of a 1% solution **IM:** induction dose = 6.6-10mg/kg of a 5% solution **Children 3-12yo induction:** **IV:** 1-2mg/kg/dose **IM:** 5-10mg/kg/dose **PR:** 25-30mg/kg/dose (usual=25mg/kg/dose, maximum 500mg dose), give as 10% aqueous solution	IV: 1min IM: 2-10min PR: 5-15min	IV: 7-10min IM: 1-1.5hrs PR: 1-1.5hrs	**ANESTHESIA PRESENCE REQUIRED, ADMINISTRATION BY ANESTHESIA MD ONLY** Ultra short acting barbiturate providing good immobilization and hypnosis; Use extreme caution in pts with liver impairment, asthma, cardiovascular instability; may precipitate seizures in pts with history of convulsions. Do not dilute with solutions containing bacteriostatic agents. D5W, NS, Sterile water OK as diluents. Do not use IV/IM solutions if not clear and colorless. Solutions are very alkaline

				and incompatible with acids (atropine, succinylcholine), LR.
Ketamine	IV: 0.5 to 2 mg/kg IV over 1-2 min, may repeat 0.25 to 1 mg/kg IV (one-half initial dose) every 10-15 min as needed[3] Use smaller doses (0.5-1mg/kg) for minor procedures; usual induction dose 1-2mg/kg IM: 3-7mg/kg PO: 6-10mg/kg x 1 (mixed in cola or juice), 30 min prior to procedure	IV: 30sec IM: 3-4min PO: 30min	IV: 5-10min IM: 12-25min	**ADMINISTRATION BY ANESTHESIA AND ED MDs ONLY** Provides excellent sedation and analgesia; elicits dissociative state; increase bronchial and salivary secretions; increases heart rate, blood pressure, and intracranial pressure; emergence hallucinations observed in older children (15 years) and adults; pharmacologic effects NOT reversible
Propofol	1 mg/kg IV followed by 0.5 mg/kg every 3 to 5 min as needed[3]	Onset: <40 sec Peak: unknown	10-15 min	**ADMINISTRATION BY ANESTHESIA AND ED MDs ONLY** Provides rapid anesthesia; apnea occurs upon induction and unpredictably causes loss of airway reflexes (even at sedative doses); irritation and burning with IV administration; effect NOT reversible

Aldrete Scoring System

Activity	2	1	0
	Moves all extremities voluntarily on command	Moves two extremities voluntarily on command	Unable to moveextremeties
Respiration	2	1	0
	Breath deeply and coughs freely	Shallow or limited breathing	Apneic
O2 Saturation	2	1	0
	Sp02 > 92 % on room air	Supplemental 02 required to maintain Sp02 >90%	Sp02 < 90% with supplemental 02
Circulation	2	1	0
	BP ± 20 mmHg of baseline/preanesthetic	BP ± 21-49 mmHg of baseline/preanesthetic level	BP ± 50 mmHg baseline/ preanesthetic level

	level		
Consciousness	2	1	0
	Fully Awake	Arousable on calling	Not responding

Policy References

Provisions of Care, Treatment, Services

Moderate Sedation; Policy # 200.79

Provision of Care, Treatment, Services, Perioperative Services

Documentation of Nursing Care in Post Anesthesia Care Unit (PACU) Phase I & II

Care of the PostAnesthesia/Post Sedation Phase II Patient

Drug Table References:	1. **Drug Information Handbook 15th Edition**. 2008 Lexi-Comp 2. **Pharmacist's Drug Handbook**, 2001 ASHP 3. Micromedex 2.0 Thomson Reuters. Accessed via Saint John's Health Center Intranet 3/30/11 4. **Pediatric Dosage Handbook, 13th Edition**, 2009 Lexi-Comp

Approval Signatures

Step Description	Approver	Date
Board of Directors	Lori Higdon: Contracts Manager	07/2021
MEC	Peggy Mooney: Sr Mgr Medical Staff	07/2021
PCSC	Rose Pelikan: Svc Line Exec Dir Nursing	07/2021

Applicability

CA - Providence Saint John's Health Center

Standards

No standards are associated with this document

Status **Active** PolicyStat ID **14811777**

Saint John's Health Center
Providence

Origination	11/2015
Last Approved	02/2024
Effective	02/2024
Last Revised	02/2024
Next Review	02/2025

Owner	Deanna Wofford: Manager Surgical Services RN
Policy Area	Perioperative
Applicability	CA - Saint John's Health Center

Standardized Procedure Discharge Phase I Patient

STATEMENT:

Designated Registered Nurses who have demonstrated competency in the discharge of Phase I post anesthesia/post sedation patient may perform this action using the criteria in this standardized procedure under the supervision of the medical staff.

PURPOSE:

To define standardized criteria approved by the medical staff for discharge of phase I post operative/ post procedural patients to an inpatient unit.

PROCEDURE:

Development and Review:

A. All standardized procedures are developed collaboratively by nursing leadership and medical staff and approved by the Medical Director.
B. All standardized procedures are to be reviewed every three years and as practice changes by the Chief Nurse Executive and the Medical Director.
C. All changes or additions to the standardized procedures are to be approved by the Medical Director accompanied by a dated and signed approval sheet.
D. Designated registered nurses may discharge to home patients who have received general/ regional anesthesia/conscious sedation for a procedure following recovery and appropriate assessment.

Recovery is per Phase I and Phase II standards of practice.

Designated RNs may Discharge to inpatient unit when following criteria met or as ordered by physician:

A. Aldrete score >= 8, except when discharge is authorized by anesthesiologist or patient is

transferred to critical care on monitor or documented limitations are present.

B. Patients should be hemodynamically stable (HR, cardiac rhythm, and BP)

C. Oxygen therapy has been discontinued for a minimum of 30 minutes before discharge patients who had general anesthesia. A. Oxygen saturation is maintained within the parameters established by the anesthesiologist in the PACU orders (may be on supplemental oxygen) and/or returned to the preoperative level.

D. The pain level will be assessed according to the verbal or nonverbal pain scale of 0 (no pain) through 10 (maximum pain) at rest, using the appropriate scoring according to the patient's status (refer to the Pain Management Philosophy and Pain Management Protocol).

    1. A. Pain score must decrease from the level indicated upon admission to PACU and/ or return to pre-operative level or patient states adequate control while at rest.

E. The last dose of respiratory depressant drug was administered a minimum of 15 minutes (IV, epidural, or intrathecal bolus) or 30 minutes (IM) prior to discharge from PACU.

    1. . Patients receiving continuous opioid infusions (IV or epidural) will meet the minimum consciousness score and meet the respiratory discharge criteria.
    2. B. Patients receiving any reversal agents for Neurovascular blockade or sedative and opioids must be monitored for 30 minutes from the last dose of reversal agent prior to discharge.

F. . Patients that have received spinal or epidural anesthesia must be able to bend knees and lift buttocks.

G. For obstetrical patients fundus is firm, lochia is small to moderate.

QUALIFICATIONS:

A. Employee of Saint John's Health Center in good standing.

B. Each nurse performing standardized procedure functions must have a current California registered nurse license and be competent in the assessment of outpatients for discharge to home after anesthesia/sedation.

C. Evaluation of the nurses' competence in performance of standardized procedure functions will be done in the following manner.

Areas requiring increased proficiency as determined by the initial or routine evaluation will be re-evaluated by the nurse manager at appropriate intervals until acceptable skill level is achieved, e.g. direct supervision.

AUTHORIZED NURSES

Registered nurses in the following areas on successful completion of classroom instruction or self study module.

Endoscopy Lab

Post Anesthesia Care Unit (PACU)

Labor and Delivery

Attachments

Appendix A

Approval Signatures

Step Description	Approver	Date
Board of Directors	Irma Castaneda: Executive Assistant	02/2024
Medical Executive Director	Peggy Mooney: Senior Manager Medical Staff Services	02/2024
Interdisciplinary Practice Committee	Peggy Mooney: Senior Manager Medical Staff Services	02/2024
PCSC	Jose Castro: Director Pharmacy	12/2023

Applicability

CA - Providence Saint John's Health Center

Standards

No standards are associated with this document

Status **Active** PolicyStat ID **14811988**

Saint John's Health Center
Providence

Origination	11/2015
Last Approved	02/2024
Effective	02/2024
Last Revised	02/2024
Next Review	02/2025
Owner	Deanna Wofford: Manager Surgical Services RN
Policy Area	Perioperative
Applicability	CA - Saint John's Health Center

Standardized Procedure Discharge Phase II

STATEMENT:

Designated Registered Nurses who have demonstrated competency in the discharge of Phase II post anesthesia/post sedation patient may perform this action using the criteria in this standardized procedure under the supervision of the medical staff.

PURPOSE:

To define standardized criteria approved by the medical staff for discharge of post operative/post procedural patients.

PROCEDURE:

A. All standardized procedures are developed collaboratively by nursing leadership and medical staff and approved by the Medical Director.

B. All standardized procedures are to be reviewed every three years and as practice changes by the Chief Nurse Executive and the Medical Director.

C. All changes or additions to the standardized procedures are to be approved by the Medical Director accompanied by a dated and signed approval sheet.

D. Designated registered nurses may discharge to home patients who have received general/ regional anesthesia/conscious sedation for a procedure following recovery and appropriate assessment. Recovery is per Phase I and Phase II standards of practice. Designated RNs may Discharge when following criteria met:

- Discharge of Phase II Patients to Home
    - This phase focuses on preparing the patient, family, and/or significant other for care in the home, or an extended care environment.

- 1. To assure that outpatients are discharged home safely and efficiently. Outpatients will meet following criteria before home discharge.
    - A. Patient is awake, alert, responds to commands appropriate to age, or returned to pre-procedure status.
    - B. SpO2 greater than 95% or pre-procedure baseline on room air for 30 minutes without airway support. Breathing even and unlabored. Respiratory rate greater than 10 and less than 30 for adults.
    - C. Able to sit in an upright position without signs and symptoms of orthostatic hypotension. BP +/- 20 Hq mm of pre-procedure range or within patient's stated normal range. No active bleeding.
    - D. Able to ambulate with minimal assistance or at pre-procedure level.
    - E. Pain score at rest is < 4 or at pre-procedure level at rest and patient states adequate pain control. No IV opioids or sedatives given within 30 minute, any IM agents within 1 hour.
    - F. Patient is not actively vomiting and nausea is mild in severity.
    - G. Patient is able to void if patient had spinal or epidural anesthesia, or use of contrast media.
    - H. IV/ saline lock is discontinued unless ordered to the contrary.
    - I. Arrangements have been confirmed for a responsible adult to accompany the patient home and an individual remains available for the first 24 hours unless alternative arrangements have been approved by the surgeon and documented in the medical record.
    - J. Discharge medication prescriptions are given to the patient.
    - K. Patient discharge teaching and written instructions are provided to patient and/or companion.
    - L. Patient is informed that the staff will make a post-operative telephone call within 72 hrs of procedure, unless specified differently by the physician, or per patient's request.
    - M. Patient is discharged to a responsible adult and escorted out of the hospital.
- Patients receiving any reversal agents for Neurovascular blockade or sedative and opioids must be monitored for 30 minutes from the last dose of reversal agent prior to discharge.

QUALIFICATIONS:

A. Employee of Providence Saint John's Health Center in good standing.

B. Each nurse performing standardized procedure functions must have a current California registered nurse license and be competent in the assessment of outpatients for discharge to home after anesthesia/sedation.

C. Evaluation of the nurses' competence in performance of standardized procedure functions will be done in the following manner.

D. Areas requiring increased proficiency as determined by the initial or routine evaluation will be re-

evaluated by the nurse manager at appropriate intervals until acceptable skill level is achieved, e.g. direct supervision.

AUTHORIZED NURSES

Registered nurses in the Endoscopy Unit and Post Anesthesia Care Unit (PACU) on successful completion of classroom instruction or self study module.

Attachments

Appendix A

Approval Signatures

Step Description	Approver	Date
Board of Directors	Irma Castaneda: Executive Assistant	02/2024
Medical Executive Director	Peggy Mooney: Senior Manager Medical Staff Services	02/2024
Interdisciplinary Practice Committee	Peggy Mooney: Senior Manager Medical Staff Services	02/2024
PCSC	Jose Castro: Director Pharmacy	02/2024

Applicability

CA - Providence Saint John's Health Center

Standards

No standards are associated with this document

Status **Active** PolicyStat ID **14074112**

Saint John's Health Center
Providence

Origination	05/2018
Last Approved	10/2023
Effective	10/2023
Last Revised	10/2023
Next Review	10/2026
Owner	Paul Makarewicz: Chief Mission Officer Ministry
Policy Area	Patient Rights & Ethics
Applicability	CA - Saint John's Health Center

Treatment and Informed Consent

AUTHORIZED PERSONNEL

A. All hospital personnel and members of the medical staff who are involved in obtaining or verification of treatment consent and/or informed consent.

PURPOSE

A. To provide direction to members of the medical staff who are involved in obtaining consent or informed consent, or hospital personnel involved in verifying consent, in accordance with all federal and state laws governing consent.

POLICY

A. Every competent adult has the fundamental right of self-determination over his/her body and property. Individuals who are unable to exercise their right of self-determination, such as minors and incompetent adults, have the right to be represented by another person who will protect their interests and preserve their basic rights.

B. Informed consent is the responsibility of the physician performing the procedure and must be documented in the medical record prior to the procedure being performed. There is a specific Informed Consent form for the provision of Anesthesia.

C. The hospital's role in obtaining informed consent is limited to verifying that the physician obtained and properly documented the patient's informed consent prior to the beginning of the procedure.

D. In the event of any communication barriers, including hearing, vision, or speech impairment, or language or cultural barrier, the patient must be offered interpreters competent to afford such

patients an equal opportunity to benefit from the hospital's services. Translator services for spoken languages and hearing impaired shall be provided through the current service available at Providence Saint John's Health Center.

E. Documented consents are obtained in accordance with all governmental guidelines and Providence Saint John's Health Center follows the consent standards set forth in the California Hospital Association (CHA) Consent Manual.

DEFINITIONS

A. Treatment

1. For the purpose of this policy, treatment includes all medical interventions, procedures, therapies, and diagnostic tests not covered under the Conditions of Admission.

B. Consent

1. Consent is any voluntary assent to treatment. Failure to obtain consent for treatment, except in emergency situations, may be considered legal battery.
2. Procedures Covered by the Conditions of Admission Agreement: Conditions of Admission (COA) procedures are those simple and common parts of inpatient and/or outpatient services, for which related risks are commonly understood, relatively minor, and/or of low probability. These procedures do not require informed consent.
3. Informed consent is required for surgical procedures under general or regional anesthesia, or moderate sedation, or diagnostic procedures associated with significant risk to the patient as evidenced by the need for continuous, electronic, physiologic monitoring during or following the procedure.
    1. Informed consent is consent based on the disclosure of: all material information that a reasonable person would want to have in order to make a decision about the treatment including:
        a. Respond knowingly and intelligently to queries about the medical treatment in question;
        b. Participate in the treatment decision by means of a rational thought process; and
        c. Understand and appreciate all of the following items of minimum basic medical treatment information with respect to the treatment in question:
    2. The nature and seriousness of the illness, disorder, or defect that the patient has;
    3. The nature of the medical treatment that is being recommended by the patient's health care providers;
    4. The probable degree and duration of any benefits and risks of any medical intervention that is being recommended by the patient's health care providers, and the consequences of lack of treatment;
    5. The nature, risks, and benefits of any reasonable alternatives and;

6. The likelihood of the patient achieving his/her goals.

C. Procedures which require documented informed consent in the medical record include:
    a. Any procedure performed in the Operating Room (OR)
    b. Any procedure performed in the Ambulatory Surgery Center (ASC)
    c. Any procedure performed in the Cardiac Catheterization Laboratory
    d. Any procedure performed in the GI Laboratory
    e. All procedures performed in Radiation Oncology
    f. All Interventional Radiology procedures
    g. All Pediatrics procedures listed on privilege form
    h. All C-Sections and obstetric-related surgeries
    i. Any endoscopic procedure excluding bedside laryngoscopy and nasal endoscopy
    j. Any biopsy, image guided aspiration, abscess I&D
    k. Lumbar puncture
    l. Thoracentesis
    m. Paracentesis
    n. Chest Tube Insertion
    o. Tracheostomy
    p. Bronchoscopy
    q. Swan-Ganz Catheter Placement
    r. Central Line Placement
    s. Transesophageal Echocardiography
    t. Pacemaker
    u. Electrocardioversion
    v. Systemic or Local Cancer Therapy
    w. Paul Gann Act documentation; refer to Blood Transfusion Administration Policy #3283073

D. Medical Emergency
    1. The physician first determines whether the patient is competent to give consent, since the emergency exception applies only when consent needs to be given. The scope of the emergency must be determined, and any treatment must be limited to that necessary to alleviate severe pain or to prevent the patient's severe disability or death. Only the emergency medical condition may be treated under this exception, since it is the existence of the emergency condition that establishes the implied consent.
    2. The physician must document in the medical record the nature of the emergency PRIOR to the procedure. Only one physician signature with date and time is required.

3. Special Consents are required for specific procedures (outlined in the CHA Consent Manual) Telephone and/or FAX consents can be obtained in emergent situations where a delay in treatment would jeopardize the life or health of the patient.

E. Incompetent (Lack of Legal Capacity to Give or Withhold Informed Consent)

1. A patient may lack legal capacity to give or withhold informed consent if it is determined that the patient lacks the capacities list in B.#3 above and there is evidence of a deficiency in a least one of the following mental functions:
    a. Alertness and attention, including, but not limited to, the following:
        1. Level of arousal or consciousness.
        2. Orientation to time, place, person, and situation.
        3. Ability to attend and concentrate.
    b. Information processing, including but not limited to, the following:
        1. Short- and long-term memory, including immediate recall.
        2. Ability to understand or communicate with others, either verbally or otherwise.
        3. Recognition of objects and familiar persons.
        4. Ability to understand and appreciate quantities.
        5. Ability to reason using abstract concepts.
        6. Ability to plan, organize, and carry out actions in one's own rational self-interest.
        7. Ability to reason logically.
    c. Thought processes (deficits in these functions may be demonstrated by the presence of the following):
        1. Severely disorganized thinking.
        2. Hallucinations.
        3. Delusions.
        4. Uncontrollable, repetitive, or intrusive thoughts.
    d. Ability to modulate mood and affect (deficits in this ability may be demonstrated by the presence of a pervasive and persistent state of euphoria, or anger, or anxiety, or fear, or panic, or depression, or hopelessness, or despair, or helplessness, or apathy, or indifference, which is inappropriate in the degree to the individual patient's own circumstances).
2. When determining lack of capacity according to criteria listed above in G.1, a deficit may be considered *only if* the deficit, by itself or in combination with one or more other mental function deficits, significantly impairs the patient's ability to understand and appreciate the consequences of his or her decisions regarding medical treatment.

3. In determining whether a patient suffers from a deficit in mental function so substantial that the patient lacks legal capacity to give or withhold informed consent for medical treatment, the frequency, severity, and duration of periods of impairment should be taken into consideration.
4. The mere diagnosis of a mental or physical disorder is not sufficient in and of itself to support a determination that a person is of unsound mind or lacks the capacity to give or withhold informed consent.

F. Legally Appointed or Recognized Surrogate
    1. An incompetent patient's legally appointed or recognized surrogate is:
        a. For an unemancipated minor, a guardian with legal custody of the minor;
        b. For an adult, an individual other than the patient who appropriately speaks for the patient in medical decisions when the patient is incompetent. A surrogate's decision is legally binding if the surrogate is acting in accord with the patient's wishes or the patient's best interests. If a patient is determined by the attending physician to be incompetent, the surrogate, in order of priority, is:
            1. **Legally Appointed Agent**: An agent appointed under a Durable Power of Attorney for Health Care as established by California law **OR** a court-appointed conservator with specific powers for health care decisions.
            a. **Legally Recognized Surrogate**: The closest available relative or friend, who can represent the patient's wishes, or when wishes are not known, the patient's best interests, from any of the following persons:
                - The spouse or domestic partner of the patient.
                - An adult child of the patient.
                - A parent of the patient.
                - An adult sibling of the patient.
                - An adult grandchild of the patient.
                - An adult relative or close personal friend.

            b. A significant other who can represent the patient's wishes, or when wishes are not known, the patient's best interests. For a patient who lacks capacity and who has no known friend or relative, refer to Policy/ Procedure “Treatment Decisions for Patients Without a Surrogate Decision-Maker."

PROCEDURE:

A. Role of the Surgeon or Physician in the Informed Consent Process

1. It is the treating physician's responsibility to obtain the informed consent. Hospital personnel should not be involved in providing the information necessary to secure the patient's informed consent or responding to the patient's questions concerning the procedure. The duty to provide this information and obtain informed consent is the exclusive duty of the treating physician.
2. The surgeon or physician is not required to obtain informed consent for the following:
    a. Treatment ordered or given under emergency circumstances; treatments covered under the COA and;
    b. The patient has informed the surgeon or physician that he/she does not want to know the information to which he/she has a right. This waiver of the right to informed consent must be made voluntarily and without any coercion or duress.
3. The surgeon or physician must obtain the informed consent of an incompetent patient's legally appointed or recognized surrogate before any treatment or therapy can be initiated, except in emergency circumstances and except for the simple and common parts of hospital care. All information owed to the patient must also be given to the surrogate.
4. Informed consent is obtained prior to the delivery of inpatient or outpatient services and is to be documented in the patient's hospital medical record.
5. It is the surgeon's or physician's responsibility to inform the hospital when the services of a translator are required.

B. Role of the Nurse

1. If there is an indication that the patient does not understand any procedure for which the patient has given consent or for which verification of consent is being requested, the nurse should:
    a. Attempt to identify the area(s) of the patient's concern;
    b. Notify the physician of the patient's concerns; and
    c. Respond to patient's questions within the scope of practice of the registered nurse.
2. When the patient signs the Authorization For Surgery, Special Diagnostic or Therapeutic Procedures form, a nurse is responsible for verifying that:
    a. The date and time on the form are the date and time the patient's signature was obtained;
    b. The physician listed on the form is the physician who will be responsible for performance of the procedure;
    c. The operation or procedure listed on the form is the operation or procedure to be performed; and
    d. Any hospital designated translator whose services have been required signs the form.

3. The signature of the nurse as a witness on the authorization For Surgery, Special Diagnostic or Therapeutic Procedures represents verification that the signature on the form is the patient's signature or the patient's legal surrogate for healthcare decisions. The nurse's signature does **not** verify informed consent. The **patient's signature** verifies informed consent.

C. Duration

1. Informed consent may be considered to have continuing force and effect until (1) the patient revokes the consent or (2) until circumstances change so as to materially affect the nature, or the risks of the procedure and/or the alternatives to the treatment to which the patient consented.

D. Presumption of Consent

1. In the case of a medical emergency, patient's consent may be presumed so long as no evidence exists to indicate that the patient or the patient's legally appointed or recognized surrogate would refuse the treatment.
2. The conditions warranting presumption of consent should be thoroughly documented by the physician in the progress notes.
3. The presumption does not apply to occurrences of known risks associated with the treatment or procedure for which consent has already been given.

E. Minors

1. If a patient is a minor, one of the parents who has custody of the child acts as the agent in the informed consent process and signs, when appropriate, the Authorization For Consent for Surgery, Special Diagnostic or Therapeutic Procedures form on behalf of the patient.
2. If the patient is a liberated/emancipated minor, he/she provides consent. Minors who (1) have received a declaration of emancipation from the court, (2) are living apart from their parents and are self-supporting, (3) are in the Armed Forces, or (4) are married or were previously married have the legal right to consent to or refuse medical treatment. (See CAHHS Consent Manual for "Medical Treatment of Minors in Various Circumstances").
3. It is recommended that minors should be included in the consent process whenever possible.

Attachment:

A – Authorization For and Consent to Surgery Special Diagnostic or Therapeutic Procedures form (1246F; 1/26/18)

References: CHA Consent Manual – 2017, Chapter 2, 2.1, and 2.2. The Joint commission RI.01.03.01, EP.1-13; RC.02.01.01, EP-4; CMS 42CFR42.51(b)(2); Title 22 70223(d)(3)

Attachments

Authorization/Consent For Surgery Special Diagnositc or Therapeutic Procedures

Approval Signatures

Step Description	Approver	Date
Board of Directors	Lori Higdon: Contracts Manager	10/2023
Ethics Committee	Paul Makarewicz: Chief Mission Officer Ministry	07/2023

Applicability

CA - Providence Saint John's Health Center

Standards

No standards are associated with this document