

# Avera *e*CARE™

Conscious or Moderate Sedation

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# Moderate Sedation

# Our Objectives

1. Define the differences among types of sedation
2. Identify the main objectives of moderate sedation
3. Identify key elements of the Moderate Sedation Policy
4. Identify the departments where moderate sedation may administered/who may administer drugs /who has to be present
5. Recognize Normal Sinus Rhythm, Ventricular Tachycardia, Bradycardia, and Ventricular Fibrillation on an ECG strip
6. Identify normal adult BP, HR, and Respiratory Rate Etco2 .

# What is Moderate Sedation?

“A drug-induced depression of consciousness during which patients respond ‘purposefully’ to verbal commands, either alone or accompanied by light tactile stimulation”

# Comparing Types of Sedation

	Minimal Sedation	Moderate Sedation	Deep Sedation	General Anesthesia
Responsiveness	Normal response to verbal stimulation	Purposeful response to verbal or tactile stimulation	Purposeful response following repeated or painful stimulation	Unarousable even with painful stimuli
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

Courtesy of American Society of Anesthesiologists – **Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia**  
Amended 10/15/14

# Who Can Administer Moderate Sedation?

- Administration of moderate sedation must be on order of licensed practitioner credentialed by the Medical Staff to practice moderate sedation
- It is within the scope of practice of a RN to administer moderate sedation

# Who Can Administer Moderate Sedation?

- Must be a registered nurse or CRNA or Provider
- Must be BLS / ACLS certified
- Must have knowledge of rhythm interpretation

# Areas Where Moderate Sedation May Be Performed

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- Emergency Department
- Pediatric unit
- Out Patient Services
- Cath Lab
- CT/Radiology



# Goals of Moderate Sedation

- Reduce anxiety
- Provide sedation
- Provide analgesia
- Decrease cough and gag reflex
- Patient maintains own airway
- Patient remains communicative
- Patient can follow directions
- **NO LOSS OF CONSCIOUSNESS**

# Patient Care Management *Prior* to Moderate Sedation

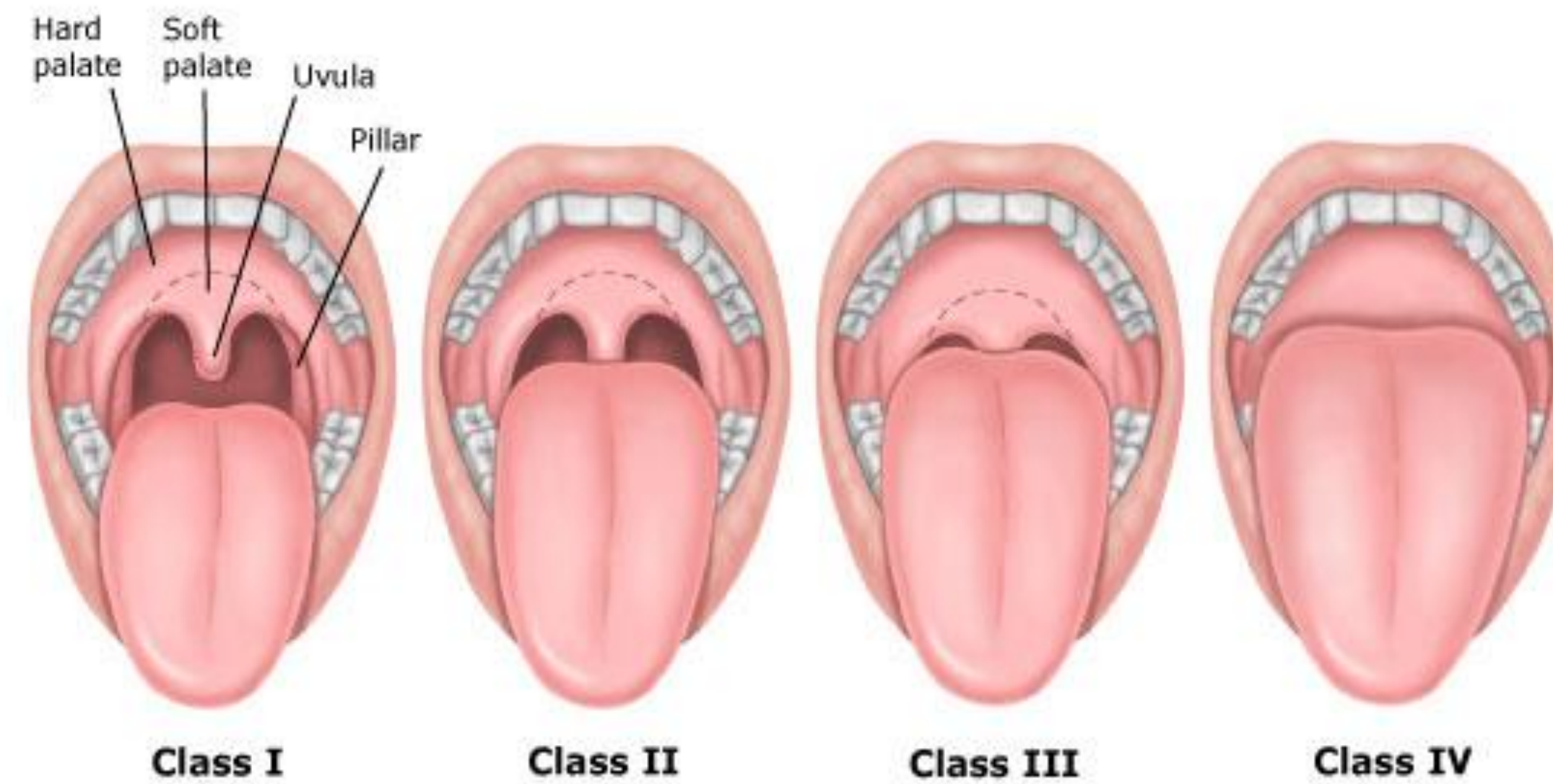
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- Confirm that appropriate informed consent for procedure has been obtained from patient/family member
- Patient must have reliable venous access in place
- Obtain H & P prior to procedure
  - Check for risk factors associated with airway problems during sedation

# Airway assessment

- ASA score
- ASA 1: Normal health patient
- ASA 11:A patient with mild systemic disease
- ASA 111:A patient with severe systemic disease
- ASA IV:A patient with severe systemic disease that is a constant threat to life

# Mallampati score



# Risk Factors Related to Moderate Sedation

- Airway
  - COPD
- Coronary Disease
- Hepatic & Renal Impairment
- Geriatric Patient
- Anxious Patient

# Airway Risk Factors

- Asthma , wheezing, crackles, cough
- COPD
  - Increased risk of ventilatory insufficiency
  - Administer smaller doses of opioids and benzodiazepines.
- Smoking history – can patient lie flat?
- Recent or recurrent upper respiratory infection
  - Excessive secretions can lead to laryngospasm or bronchospasm
- Activity tolerance: Baseline
- Labored, shallow respirations at rest may intensify with sedation

# Coronary Disease Risk Factors

- Administer antianginals, antidysrhythmics, and antihypertensive pre-procedure
- Providers discretion on what medications patients take pre planned procedure
- If they are not NPO can you do conscious sedation safely?
- Yes if prepared and plan

# Hepatic & Renal Impairment Risk Factors

- Administer smaller doses of opioids and benzodiazepines



# Geriatric Patient Risk Factors

- Increased aspiration risk
- Administer smaller doses of opioids and benzodiazepines

# Anxious Patient Risk Factors

- Constant communication is essential
- Beware of over-sedating

# Patient Care Management During and After Moderate Sedation

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- Airway Management/ Suction hooked up and ready.
- Airway Supplies/Bag or Cart
- Physiology/Pulse Oximetry/Etco2 waveform capnography if available
- Level of Consciousness
- Chest Movement
- Continuous Pulse Oximetry
- Vital Signs
- Continuous ECG Monitoring
- Arrhythmias
- Allergic Reactions

# Airway Management

- Look at chest movement, listen to breath sounds
  - Have emergency equipment immediately available including:
    - Ambu-bag and mask
    - Oxygen tubing, catheter, mask, and regulator/source
    - End tidal Co2 waveform capnography
    - Suction capability and equipment
    - Crash cart
    - Reversal agent, if applicable

# Airway Physiology/Pulse Oximetry

- Oxygen availability and utilization are affected by:
  - Hemoglobin
  - Temperature
  - pH
  - Metabolic rate
- Pulse oximetry gives only an estimate of arterial partial pressure of oxygen (PaO<sub>2</sub>) when the oxyhemoglobin dissociation curve is not shifted and abnormal hemoglobin is not present
- An SaO<sub>2</sub> of 97% correlates with a PaO<sub>2</sub> of 80-100 mmHg

# Other Factors Affecting the Accuracy of Pulse Oximetry

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- External light
- Hypothermia
- Hypotension
- Heavy dark nail polish
- Poor peripheral perfusion – PVD
- Decreased cardiac output
- Low hemoglobin or bleeding disorders/ Blood Dyscrasia's

# Level of Consciousness

- Monitor continuously as the medication(s) is/are administered
- Document LOC every 5-10 minutes until the patient is awake and at their pre-procedure level of consciousness
- Comfort measures such as verbal reassurance and maintaining a quiet environment should be employed whenever possible to facilitate the effects of sedation

# Chest Movement

- Should be monitored continuously throughout the procedure
- The primary cause of morbidity associated with moderate sedation is respiratory depression



# Vital Signs

- Blood pressure and heart rate should be checked before the initiation of sedation and then every 5-10 minutes thereafter, until the patient is fully recovered from the procedure

# Continuous ECG Monitoring

- Notify the physician if the patient develops a new tachycardia, bradycardia, or arrhythmia
- 3 lead or 5 lead is fine
- Be alert to any airway problems, which may be related to the cardiac arrhythmias

# Cardiac Arrhythmias

- The first sign of hypoxia/hypercarbia is tachycardia
- PVCs, bigeminy or trigeminy may be caused by several problems such as:
  - Hypoxia
  - Stress
  - Heart failure,
  - Myocardial infarction/ischemia
  - Digitalis toxicity
  - Hypokalemia
  - Hypocalcemia
  - Hypertension

# Drugs Used

- Morphine Sulfate: Adult 1-2mg IV every 5-10 minutes prn/Onset 5-10 minutes: Dose may be titrated up
- Peds: > 6 months to < 50kg 0.05 to 0.1mg/kg/Dose before procedure may repeat
- Dilaudid/Hydromorphone: Adult:0.2-0.6mg IV
- or 0.8 to 1mg IM may **titrate** up: IV onset 1-5 minutes: IM not recommended for sedation procedure due to absorption variability procedure:
- Peds dose<50 kg: IV 0.015mg/kg Peds max 0.2mg
- Valium/Diazepam:Adults IV: 5mg ,ay repeat with 2.5mg dose
- May have to reduce dose when used with Opioid
- Peds dose: IV or [IM:0.04-0.3mg/kg](#) may titrate up

# Drugs Used

- **Versed:**
- Adults IV:0.5 -1 mg additional doses may be administered every two minutes to achieve effect: some facilities start with 2mg and titrate. Max dose usually 5 mg -10 mg
- Onset IV 1-5 Minutes IM 15 minutes not recommended due to variable effectiveness for procedural sedation
- Duration IV 20-30 minutes
- IM 2 hours or greater
  
- Pediatric dose IV 0.05 -0.1 mg/kg Max dose from 6 months to 5 years 6mg.
- Max 6 years to 16 may give up to 10mg.

# Drugs Used

- Ativan Adult: IV 0.044 mg/kg or start with 0.5mg IV: Usual dose of 2 mg Max does of 4 mg
- Pediatric Dose: 0.05 mg/kg IV max dose 2mg : Not all facilities use for sedation for procedures

# Pharmacology

- In general, opioids cause:
  - Dose dependent analgesia
  - Respiratory depression
  - Suppression of cough reflex
  - Drowsiness
  - Depression of ventilatory responses to hypoxia/hypercarbia
- In large doses opioids, especially Fentanyl, given rapidly can cause muscular rigidity (chest wall rigidity), glottic closure, and seizure-like movement of the extremities

# Pharmacology

- Ketamine: Dissociative Anesthetic
- Found to be safe to use in ED for procedural sedation,
- Adult dose: 1-2mg/kg given over 2-3 minutes
- IM dosing 3-8mg/kg
- Onset: IV within 30 seconds
- IM: 3-4 Minutes



# Pharmacology

- Ketamine
- Pediatric dose: IV 0.5mg-1mg/kg
- IM dose:3-7mg/kg
- Max dose 2mg/kg/IV route
- Onset within 30 seconds
- IM: 12-25 minutes

# Allergic Reactions

- Allergic reactions can vary from patient to patient but the histamine effects will be what you see.
- May need to reverse the current drug, withhold any additional drug, or change to another agent if the patient is experiencing an idiosyncratic reaction
- May need to treat the symptoms of itching, skin wheals, and flushing

# Opioid Antagonists and Agonist-Antagonists

## Narcan (Naloxone)

- Given in 20 – 40 mcg doses
- Onset of action is 2 – 3 minutes
- Peak effect in 1 – 2 minutes
- Duration is 1 – 4 hours
- Large doses not titrated and given quickly can abruptly reverse the analgesia leading to a massive sympathetic response that could cause hypertension, arrhythmias, pulmonary edema or even cardiac arrest

# Benzodiazepines

## Midazolam (Versed)

- Shorter than acting that other benzodiazepines
- Recovery usually in 1 – 2 hours, but some patients may have effects up to 6 hours
- All effects are dose dependent and include:
  - Amnesia
  - Anticonvulsant
  - Hypnotic
  - Muscle relaxant
  - Sedative
- Onset within 2 – 3 min
- Peak sedation in 30 – 60 min
- Opioids potentiate the respiratory depressant effects

# Benzodiazepine Antagonists

## Flumazenil (Romazicon)

- Onset in 2 min. with peak effect in 6 – 10 min
- Dose should be titrated in IV boluses of 0.2 mg every minute to a max dose of 5 mg
- Rapidly metabolized by the liver and half-life is 60 – 90 minutes
- Potential side effects:
  - Headache
  - Nausea/Vomiting
  - Blurred vision
  - Dizziness
  - Pain on injection
  - Parasthesias



# About Avera eCARE

<b>MODERATE SEDATION FLOWSHEET</b>										
<i>To be completed by Nurse</i>					Allergies:					
Date:		Time:		NPO Time:		Sedation Start Time:		End time:		
Diagnosis/Indication:					Procedure Start Time:			End time:		
Procedure:										
<b>Time out documentation (Verbal time out conducted by procedure team)</b>				Patient	Procedure	Consent	Site Marking Positioning (if applicable)		Implant, Special Equipment (if applicable)	
Verification Done (Initials):										
<b>Time Out Participants</b>										
<b>Provider signature</b>					<b>Nurse signature</b>					
Medication/Dosage	Initials	Time	Initials	Time	Initials	Time	Initials	Time	Initials	Time

# About Avera eCARE

** See attached Rhythm Strip																
***See Key on Page 2 for abbreviations/codes																
Procedure	Initial assessment	Initials	5min	10min	15min	20min	25min	30min	35min	40min	45min	50min	55min	60min	65min	70min
Blood Pressure																
Pulse																
Respirations																
O <sub>2</sub> Sat																
LOC																
Cardiac rhythm																
Oxygen therapy																
Skin color																
<b>Post Procedure</b>																
PAR Score																
Pain Score																
Injury Free																

Document: \*Cardiac Rhythm required for history of HTN, dysrhythmias, coronary disease, vascular disease or cardiomyopathy.

1. VS, O<sub>2</sub> Sat, LOC, and Cardiac Rhythm \* q 5 min during the procedure and medication titration
2. VS, O<sub>2</sub> Sat, LOC, and Cardiac Rhythm \* q 15 min post-procedure (minimum q 30 min post procedure) until patient reaches PAR score of 9 (or equal to baseline if less than PAR score of 9)
3. Apply Oxygen 2L/NC, if O<sub>2</sub> Sat <90% for adult of <93% for pediatric patients

Discharge Criteria Met (Total Par at 9 or equal to baseline)  Yes  No  
 If NO, patient discharge per Provider: \_\_\_\_\_  
 For inpatients, continue routine unit monitoring. Time: \_\_\_\_\_ Initials: \_\_\_\_\_

Nurse Signature	Initials

Provider Signature After Procedure \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_



# Summary

- Know where supplies are located: End tidal Co2, Airway cart
- Be prepared
- Know medications and possible side effects, reversal agents
- Call eER for nursing assistance and MD assistance.