Pediatric Procedural Sedation Course

Pre-sedation
Informed Consent
Sedation Equipment
Informed Consent

- A qualified practitioner must obtain consent for sedation from the parent or legal guardian prior to administering sedation
- The hospital approved consent form must be used
- When possible, obtain verbal assent from the child prior to administering sedation
- The informed consent process includes detailed discussion of:
  » need for sedation
  » risks and benefits
  » alternatives (if any)
Informed Consent

- Consent form must be signed, witnessed, and placed in child’s chart prior to administration of sedation

- For details on treating a child whose parent or legal guardian is unavailable to give consent, refer to UNC Healthcare Administrative Policy 0100 – Treatment of Minors, available through the Intranet at Work
The following equipment:

- Is required regardless of the depth of sedation intended
- Must be in place and operational prior to administering sedation

SOBA
- Suction
- Oxygen
- Bag-mask
- Airways

MDI
- Monitor
- Drugs
- IV-access
Sedation Equipment

**Suction**

- Emesis with/without aspiration during sedation is a potentially life threatening event
- Yankauer suction – removes food particles and thick secretions from the upper airway
- Flexible suction catheter – removes thin secretions but may stimulate vagal response or laryngospasm
- Nasal suctioning should be performed cautiously, may result in epistaxis
Sedation Equipment

SOBA

Suction

• Suction apparatus must be available and operational during any pediatric sedation
Sedation Equipment
SOBA

Oxygen

• Anytime a child is undergoing sedation, a reliable source of oxygen should be present and activated.

• A wall oxygen source or a portable oxygen cylinder capable of delivering 15 liters/minute for a minimum of 60 minutes is required.

• All children, unless medically contraindicated, should receive supplemental oxygen throughout the sedation period regardless of baseline oxygen saturation.
**Bag/mask**

- A bag and mask must be available during sedation administration.
- Sedation providers should be proficient at bag-mask ventilation with the type of bag and mask available at the sedation location.
  - The “pop-off” valve on a self-inflating bag may need to be closed to adequately deliver positive pressure ventilation.
Sedation Equipment

**SOBA**

**Bag/mask**

- Ensure that the child has an appropriate sized mask that allows for a good seal around the nose and mouth.
Sedation Equipment

**SOBA Airways**

**Oropharyngeal airway (OPA)**

- Inserted over the surface of the tongue to hold it and the soft hypopharyngeal structures away from the posterior wall of the pharynx
- Only used for unconscious patients
- May relieve upper airway obstruction when a head tilt – chin lift or jaw thrust fails to provide and maintain a clear unobstructed airway
- May facilitate bag/mask ventilation
Sedation Equipment

SOBA Airways

Oropharyngeal airway (OPA)

- A variety of OPA sizes should be available
- Appropriate size can be estimated by holding the OPA along side the child’s face. The OPA should extend from the mouth to the angle of the mandible.
Sedation Equipment

SOBA Airways

Oropharyngeal airway (OPA)
Sedation Equipment

SOBA Airways

Nasopharyngeal airway (NPA)

- Provides a conduit for airflow between the nares and the pharynx
- Used for conscious or unconscious patients
- Should not be used in a patient with a coagulopathy
- Available in sizes 12fr to 36fr. The NPA should not be so large in diameter that it causes sustained blanching of the nares
- Appropriate length is approximated by the distance from the tip of the nose to the tragus of the ear
Sedation Equipment

MDI

Monitoring Devices

- Required during pediatric procedural sedation:
  - continuous pulse oximetry
  - EKG monitoring
  - end tidal CO2 monitoring
  - non-invasive blood pressure monitoring

- Data must be recorded every 5 minutes
- Non-invasive blood pressure monitoring can be obtained less frequently if it interferes with the sedation
Monitoring Devices

**Pulse Oximetry**

- Compares the relative amounts of oxygenated vs. deoxygenated hemoglobin in the pulsing blood of an extremity or digit
- Analyzes the amount of light absorbed at different wavelengths that correspond with these different forms of hemoglobin
- Numeric read-out includes the percent of hemoglobin saturated with oxygen and the pulse rate
- Plethysmograph (pleth) indicates the accuracy with which the pulse is being detected
Sedation Equipment

MDI

Monitoring Devices

Pulse Oximetry

• Oxygen saturation should be maintained above 90%
  • oxygen saturation less than 90% signifies developing hypoxemia and requires intervention such as suctioning, positioning, or oxygen administration

• All children, unless medically contraindicated, must receive supplemental oxygen throughout the sedation period regardless of baseline oxygen saturation
Sedation Equipment

Monitoring Devices

Pulse Oximetry

- Choose appropriate size and type of sensor.
  - reusable sensors for spot checks or short-term use
  - disposable adhesive sensors for continuous monitoring
- Place sensor with light beam and photo sensor opposing each other
- Warm cold extremities to improve circulation
- Avoid extremities with blood pressure cuff, arterial line, or tourniquet
- Avoid placing sensor on an area that is moved frequently
- Remove nail polish or dirt, which may prevent light beam from passing through tissue
- Clean reusable sensors
- Cover the sensor to protect from bright external light sources
Monitoring Devices

*Pulse Oximetry - Troubleshooting*

Low Pulse Oximeter Readings:

- Assess for airway obstruction
  - paradoxical chest rise
  - retractions - use of accessory muscles
  - absent breath sounds
- Open the airway!
  - perform head tilt – chin lift and jaw thrust
  - reposition head
  - place OPA/NPA
- Assess for decreased respiratory effort
  - circumoral cyanosis or pallor
  - minimal chest rise
  - shallow, infrequent respirations
  - absence of oxygen mask fogging with each breath
Sedation Equipment

MDI

Monitoring Devices

*Pulse Oximetry - Troubleshooting*

**Low Pulse Oximeter Readings:**

- Check connections
  - Is the probe in good position?
  - Is the pulse signal (pleth) strong?
  - Are all connections secure?
- Assess circulation
  - Are the blood pressure cuff and pulse oximeter probe on the same extremity?
  - Pale? cool? Poor perfusion?
- Check external light that might be interfering
- Stop movement or move sensor to another extremity or area
- Try the machine on yourself to see if it is working!
Monitoring Devices

**Pulse Oximetry - Limitations**

- Only provides information concerning oxygen saturation
- Does not provide information about ventilatory status - exchange of CO2.
- Has a significant "lag time" between the cessation of respirations (apnea) and the change in the pulse oximeter reading.
- Depending on the child’s size, apnea may be present for 30-90 seconds before the oxygen saturation changes.
Monitoring Devices

Ventilation Monitors/Capnography

- Non-invasive monitoring tool measuring CO₂ concentration in exhaled gas, displayed continuously as a waveform through the respiratory cycle.
- Most capnographs use a "side stream" detection technique in which a small amount of gas is continuously sampled from a nasal cannula or inside an oxygen mask.
  - The amount of CO₂ in the gas is measured and graphically displayed on the monitor screen.
- Module 5 discusses capnography in greater detail.
Sedation Equipment

MDI

Monitoring Devices

**EKG and Blood Pressure**

- **EKG**
  - provides information on heart rhythm and rate
  - can be used to confirm the accuracy of the pulse oximeter by confirming the accuracy of the pulse rate

- **Blood pressure**
  - cycling of the cuff may be disturbing to a moderately sedated child, inhibiting the effectiveness of sedation.
  - at minimum, blood pressure should be documented at the start and end of moderate sedation
Drugs for Emergency Resuscitation

• Location of the code cart should be identified prior to the start of the sedation
• Medications used to reverse sedation medications must be readily available
• Weight – based code drug sheets, located on code carts, must be readily available
Intra-Vascular Access

- Placement of an intravenous line is at the discretion of the responsible physician.
- An individual with the skills to establish intravenous access must be immediately available.
- Intravenous access allows the practitioner to administer medications to:
  - immediately relieve laryngospasm
  - reverse bradycardia
  - Reverse effects of inadvertent over-sedation with benzodiazepines or opioids.
Resuscitation Equipment

Laryngoscopes and Endotracheal Tubes

- Sedation providers must be prepared for the rare instance when a child becomes apneic and requires prolonged positive pressure ventilation
- If respiratory arrest occurs, the Pediatric Code team should be activated by calling 6-4111
- Intubation supplies are available on the code carts and should be brought to the bedside while activating the Pediatric Code team.
You have successfully completed the Pre-sedation: Informed Consent & Sedation Equipment module.