Pediatric Procedural Sedation Course

Pre-sedation

Patient Factors

Consultation in Special Circumstances

Children at High Risk for Sedation Complications

Pre-sedation Evaluation
Consultation in Special Circumstances

- Pre-procedure consultation with an appropriate medical specialist may be helpful in children with underlying medical conditions related to:
  - cardiac function
  - pulmonary function
  - hepatic function
  - renal function
  - pregnancy
  - drug or alcohol abuse
Consultation in Special Circumstances

• Pre-procedure consultation with an intensivist or anesthesiologist is required for children with significant sedation-related risk factors such as
  » morbid obesity
  » potentially difficult airway
  » significant medical history

• Prior to sedating severely compromised or medically unstable children, practitioners who are not trained in the administration of general anesthesia must consult an anesthesiologist or pediatric intensivist
Children at High Risk for Sedation Complications

- Children with certain conditions and/or medical histories are at high risk for sedation complications.

- These conditions and/or medical histories can be categorized as:
  - medical problems
  - management problems
  - history of failed sedation
Children at High Risk for Sedation Complications

Medical Problems:

- ASA physical status 3 or greater
- Known airway conditions
  - snoring, obstructive sleep apnea, large tonsils or adenoids, laryngomalacia, tracheomalacia, tracheal stenosis
  - congenital anomalies involving the airway (Trisomy 21, Pierre Robin Syndrome, Treacher-Collins Syndrome, Crouzon disease)
- History of prematurity (less than 60 weeks post-conception at time of sedation)
Children at High Risk for Sedation Complications

Medical Problems, continued:

- Cardiovascular disease
  - repaired or unrepaired congenital heart disease (particularly right-to-left shunts), congestive heart failure
- Severe neurological disease
  - severe MRCP with hypotonia, excessive drooling
- Guillain Barré/ Myasthenia Gravis
- Severe renal or liver disease
- Severe gastroesophageal reflux
- Uncontrolled diabetes
- Severe lung disease
- Mediastinal mass
- Metabolic disorders (Hunter’s, Hurler’s syndrome)
- High risk of vomiting/aspiration
- Emergency procedures
Children at High Risk for Sedation Complications

Management Problems:

• Severe attention deficit disorder, severe psychosis, or aggressive behaviors
  » children may paradoxically develop increased agitation and may be difficult to control during sedation and recovery

History of Failed Sedation:

• Over-sedation (loss of airway reflexes)
• Inability to adequately sedate
• Paradoxical response to sedation
Pre-Sedation Evaluation

Required History & Physical Includes:

• Airway
• ASA Physical Status
• Respiratory and Cardiovascular Status
• Developmental Status
• Previous Experience with Sedation
• Allergies/Adverse Reactions
• Aspiration Risk/ NPO Status
Pre-Sedation Evaluation

• A qualified physician or nurse practitioner must document a baseline history and physical assessment on the patient care record as part of the pre-procedure assessment.

• The child should undergo a targeted physical examination focusing on the following systems:
  • Airway
  • Cardiovascular
  • Respiratory
Pre-Sedation Evaluation

UNC Healthcare policy requires that the pre-sedation history includes:

- Age
- Drug allergies
- Recent or current illness
- Major illnesses or congenital defects
- Previous hospitalizations, surgeries, sedations and anesthesia
- Previous problems with anesthesia/sedation
- Current medication use
  - including opioid and sedative use in the past 24 hours
- Time and type of last enteral intake
  - solids, liquids, breast milk)
Pre-Sedation Evaluation

UNC Healthcare policy requires the pre-sedation physical includes:

- Weight in kilograms
- Assessment for risk of airway compromise (i.e. dysmorphic facies, tonsillar hypertrophy, history of obstructive sleep apnea or snoring)
- Respiratory and cardiovascular status
- ASA status classification score
- Brief neurological examination and determination of developmental status
- Heart rate, blood pressure, respiratory rate, oxygen saturation, and temperature
- Baseline assessment of pain, where appropriate
- Baseline determination of sedation score
Pre-Sedation Evaluation

Airway Assessment

• Specific abnormalities of the airway should be noted
  • small or malformed mandible
  • large tongue
  • teeth that are protruding or particularly loose
  • any syndrome that results in an "unusual face"

• For children able to cooperate, a Mallampati examination and classification is included as part of the pre-sedation evaluation

• Mallampati examination:
  • classifies the relative size of the tongue in the mouth
  • may trigger a pre-procedure consultation with an intensivist or anesthesiologist
Pre-Sedation Evaluation

- To perform the Mallampati examination, have the child sit facing you and ask him/her to open the mouth as wide as possible and stick out the tongue. **Click on the images to see description of classification**

Fig. 5-6 Classification of pharyngeal structures. Note that in Class III the soft palate is visible but in Class IV it is not. (From Samsoon GLT, Young JRB: *Anaesthesia* 42:487, 1987.)
Pre-sedation Evaluation

- Some children can not fully cooperate with a Mallampati examination

- Any game that encourages a child to open his/her mouth fully should be employed to assess the status of the mouth opening and tongue size
American Society of Anesthesiologists (ASA) Physical Status Classification

- The ASA scoring system, developed by the American Society of Anesthesiologists, classifies patients based on physical status.

- Some children classified as ASA 3 may be candidates for moderate sedation, but are considered high risk and must be individually assessed.
# American Society of Anesthesiologists (ASA) Physical Status Classification

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>Healthy patient, no medical problems</td>
</tr>
<tr>
<td>Class 2</td>
<td>Mild systemic disease</td>
</tr>
<tr>
<td>Class 3</td>
<td>Severe systemic disease, but not incapacitating</td>
</tr>
<tr>
<td>Class 4</td>
<td>Severe systemic disease that is a constant threat to life</td>
</tr>
<tr>
<td>Class 5</td>
<td>Moribund, not expected to live 24 hours irrespective of operation</td>
</tr>
</tbody>
</table>

An “e” is added to the status number to designate an emergency operation. An organ donor is usually designated as Class 6.
Mallampati and ASA Physical Status Classification

- Mallampati of III and/or ASA classification of 3 places a child at high risk for sedation related complications
  » may necessitate a discussion with an anesthesiologist prior to sedation.
- Mallampati of IV and/or ASA classification of IV or greater **requires** an anesthesiologist consult prior to sedation.
Pre-Sedation Evaluation

Respiratory Assessment

Asthma

- Children with asthma should be in the best possible medical condition prior to administration of sedation.
- Children actively wheezing should not be sedated for elective procedures.
- Consider use of the child’s usual inhalers prior to sedation administration.
- No data exists to support improved outcomes resulting from prophylactic administration of oral steroids or antibiotics prior to sedation.
Pre-Sedation Evaluation

Respiratory Assessment

Upper Respiratory Tract Infections (URI)

- Pulmonary assessment includes thorough evaluation of any URI symptoms
- Children with URI symptoms should be considered for sedation on a case-by-case basis
- Elective procedures in children with fever or significant cough with or without mucous production should be postponed
- Children actively wheezing or with croup symptoms should not be sedated for elective procedures
Pre-Sedation Patient Evaluation

Cardiovascular Assessment

• Assessment of the child’s cardiovascular status includes:
  • Heart rate and rhythm
  • Blood pressure
  • Perfusion
  • Hydration
Pre-Sedation Evaluation

Developmental Assessment

- Always assess the neuro-developmental status of the child
- Developmental delays may affect a child’s sedation requirements – more or less sedation medication may be needed to achieve the desired affect
- Family or primary caregiver input is critical in assessing a child’s sedation needs
Pre-Sedation Evaluation

Past Sedation Experience

• A thorough sedation history is often neglected by providers
  • the response and satisfaction that a child and family have with a particular sedation are heavily influenced by their previous experience

• Previous experiences of the child should be elicited
  • both good and bad experiences should be reviewed as well as the drugs previously administered

• Child and family anxiety about the procedure and sedation should also be assessed
  • a severely anxious child will often need significant sedation
  • a relaxed child may only need support or distraction
Pre-Sedation Evaluation

Allergies/Adverse Reactions

• Allergy/adverse reaction history should include the medication given and the type of reaction that occurred
• Nausea after sedation does not usually indicate an allergy
• Urticaria and/or shortness of breath could indicate an allergy
  • medications causing these reactions should be avoided
• Paradoxical reactions to medications such as midazolam include disinhibition, crying, and combative behavior
  • medications causing this response should be avoided
**Pre-Sedation Evaluation**

**Fasting Guidelines for Sedation or Anesthesia**

<table>
<thead>
<tr>
<th>Food</th>
<th>Hours of Fasting Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear liquids</td>
<td>2 h</td>
</tr>
<tr>
<td>Breast milk</td>
<td>4h</td>
</tr>
<tr>
<td>Infant formula</td>
<td>6 h</td>
</tr>
<tr>
<td>Light meal*</td>
<td>6 h</td>
</tr>
</tbody>
</table>

* Fried or fatty foods may delay gastric emptying. The amount and type of foods ingested must be considered. In some cases, the fasting period may need to be extended to 8 hours. Nasogastric, nasoduodenal and gastric tube feeds must adhere to same fasting guidelines.*
You have successfully completed the Pre-sedation: Patient Factors module.