AMERICAN COLLEGE OF EMERGENCY PHYSICIANS
SCIENTIFIC ASSEMBLY
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What Is the Best Way to Sedate This Child?

What is the best way to manage a frightened, screaming 6-year-old who needs a fracture relocated or a terrified 2-year-old with a facial laceration? These common clinical scenarios too often result in a stressful experience for the child, family, and emergency department staff. Multiple management options exist, but none are "perfect." In this course, representative cases will be presented, and the optimal management will be debated by a panel of experts.

- List the available agents for conscious sedation of children and their risks and benefits.
- Explain how to optimally match sedation regimens with the specific procedures being performed.
- Discuss appropriate non-pharmacologic methods for managing acute anxiety and pain in children.

MO-08
Monday, October 11, 1999
8:00 AM - 9:55 AM
Room # N204
Las Vegas Convention Center

FACULTY

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How Would You Sedate This Child?

John Brennan
Michael Murphy
Brent King

Format:

- A Case-based discussion of pediatric sedation
- Panel discussion
- Audience participation

Objectives:

- By the end of the panel discussion the participant should be able to:
  - 1. List common situations for which a child may require sedation
  - 2. Discuss alternatives to sedation
  - 3. Describe appropriate preparations for sedation

Objectives

- By the end of the panel discussion the participant should be able to:
  - 4. List several alternative agents for each situation and the pros and cons of each agent
  - 5. Describe which children may have problems with certain agents
  - 6. Discuss the role of reversal agents in sedation

The "Ideal" Sedative

- Painless administration
- Wide therapeutic index
- No untoward side effects
- Reliable and predictable onset and duration of action

The "Ideal" Sedative

- Rapid and complete recovery without residual effects
- Antiemetic properties
- Inexpensive
- Useful for a wide range of clinical circumstances

Reality Check

- The ideal agent does not exist
- Some agents work well in certain patients and poorly in others
- Some agents are better for certain situations
- Most hospitals cannot maintain a stock of every available agent
- Staff will be most comfortable with frequently used agents

Overview

- Choose a few agents that fit your most common situations
- Learn everything about these agents
- Prepare in advance for known complications and side effects
- Be prepared to discard an agent as newer, better agents are released

Overview

- When sedation is elective, think like an anesthesiologist
  - History of previous sedative reactions
  - History of unusual airway anatomy
  - Last meal
  - Co-morbidity

Case 1

- A three year old child with a 3 cm linear forehead laceration. The child screams the second any health care personnel enter the room. The patient is otherwise healthy. He/She last ate a small meal four hours prior to the ED visit.

Case 1 - Questions

- Would you sedate this patient at all?
- If you would not what are some alternatives to sedation?
- If you would employ sedation, which agents would you use and why?

King's Answers

- I would try an alternative to sedation
  - Brief procedure
  - Operational impact
    - Space
    - Nursing time

King's Answers

- Possible alternatives
  - Topical anesthetic agent
  - "Skin glue" instead of sutures
  - Environmental control
  - Restraint

King's Answers

- If forced to use sedation:
  - Anxiolytic coupled with the alternatives above
    - Oral Midazolam

Murphy's Answers

- I agree, light sedation is probably the choice I'd make too!
- Remember though... expect the child to respond to stimulation, though in an attenuated fashion.

Brennan's Answers

- Midazolam
  - P.O. vs. I.V. vs.. Other
  - Topical Anesthesia
  - Skin Glue
  - Restraint

Case 2

- A ten year old presents to the emergency department with a Colles' fracture of the right arm. The orthopedic surgeon wants to reduce the fracture in the ED.

Questions

- What considerations are important in selection of sedation?
- What some examples of agents that may work well in this circumstance?
- What should we avoid? Why?

King's Answers

- The procedure is likely to produce both pain and anxiety
- Sedation should address both problems
- The procedure may have to be repeated to achieve adequate reduction
- The sedation regimen should accommodate this

Kings Answers

- There may be some of the "stimulation effect"
- With certain combinations of drugs we should prepare for respiratory depression after the event

King's Answers

- Possible Agents
- Nitrous Oxide
- Combination Narcotic and Benzodiazepine
- Ketamine
- Propofol

Brennan's Answers

- Medication Considerations:
  - HX, PE, and ASA classification
    - how much pain: VAS, OSBD, CHEOPS
  - Conscious Sedation vs.. Deep Sedation vs.. General
  - Need for Analgesic and/or Sedative
  - Age and developmental stage
  - Previous experience with medications (Patient and MD)

Brennan's Answers

- Medication Considerations
  - Complexity and Duration of Procedure
  - Parents (ability to handle emergence, etc.)
  - Contents of stomach
  - Staff and equipment available

Brennan's Answers

- Possible Agents
  - Bier Block
  - Opiod and anxiolytic
  - Systemic anesthetics
    - ketamine
    - propofol
    - nitrous oxide

Brennan's Answers

- No
  - Chloral Hydrate
  - DPT

Murphy's Answers

- Typically this is a situation for "deep" or "dissociative" sedation
- Issue of "full stomach" will dictate how deeply to sedate in the ED (if at all)
- Is your ED prepared to manage the spectrum of procedural sedation techniques?
- Establish "analgesia" before adding a sedative agent (unless ketamine)

Case 3

- A 5 year old child is brought to the emergency department for evaluation. Her mother alleges that the child was sexually molested by her uncle six hours prior to the ED visit. Law enforcement official want an examination and cultures.

Questions

- What are the considerations in this case?
- Given those considerations which agents may work well? Why?

King's Answers

- The procedure will likely produce more anxiety than pain or discomfort
- Amnesia for the examination and culture collection may be desirable

Brennan's Answers

- Dependent on:
  - Age
  - Support
  - Developmental and Psychological History
- Anxiolytic
- Analgesic
  - GU Trauma
    - Assault
    - Procedure

Murphy

- Bear in mind that some authorities advise against the use of amnestic agents … they contend that it may exacerbate the long term psychological impact.

Case 4

- A slightly obese 5 year old fell from playground equipment and sustained an obviously broken arm. The PCP arranged to have an orthopedic surgeon meet the family in the ED. In exchange for "being good" the mother agreed to take the child to McDonalds. The child demanded payment in advance. He ate a burger and fries en route.

Question

- How would you approach this case?
- The mother read a magazine article about this lollipop that can be used to treat pain. She wants to know if her child can have one.

Murphy's Answers

- Might as well have a lollipop … stomach is already full!!!
- Fentanyl lollipop even better … surrogate for ipecac and almost guaranteed to make the kid barf!
- Does barfing effect near total gastric emptying...???

Murphy's Answers

- This is a situation where the amnesia/deeply sedated trade off is carefully weighed
- If deep sedation is needed and the risk of loss of airway reflexes is a material risk... needs to go to the OR!

Brennan's Answers

- Bier Block
- Delay the procedure

King's Answers

- Risks outweigh the benefits
- Splinting and pain control
- Delay the procedure
  - How long?
- Lock the fridge

Case 5

- A two year old fell down stairs and was unconscious for 2 minutes. In the ED he is very irritable. Attempts to perform a CT scan have been unsuccessful because is is uncooperative.

Questions

- What should we consider as we contemplate sedation?
- How do these considerations change if the child is a victim of multiple trauma as opposed to isolated head trauma?
- Which agents should we use?
- Which should we avoid?

Murphy's Answers

- Is ketamine safe in this situation?
- The pendulum is swinging in the anesthetic literature with respect to ketamine and acute severe head injury/ raised ICP!
- Is paralysis and intubation a consideration?

Brennan's Answers

- Contemplation of sedation must include the "next step" i.e. RSI
- Medications (CPP better measure than ICP)
  - Barbiturates
- No
  - Propofol -Lowers MAP
  - Ketamine

King's Answers

- A benzodiazepine may be enough
  - short acting
- If pure head trauma - may consider propofol or a barbiturate
  - Monitoring and support needs are increased with either agent.

Case 6

- As you begin a shift, one of your colleagues signs out a child who requires repair of a very small laceration. He/She tells you that the child has been given an oral benzodiazepine “just to take the edge off”. You enter the room to find the child running around, screaming, and totally uncontrollable.

Questions

- What is going on?
- How would you proceed?

King’s Answers

- Paradoxical reaction to Benzodiazepine
- Usually the result of under-dosing or erratic absorption
- Akin to a sleepy child

Murphy's Answers

- Best option is tranquilizing darts… call a vet!
- Better yet…give more benzo

Brennan's Answers

- Agree
- Never give a Benzo without telling parents this can occur

Case 7

- A 10 year old child with mild MR requires sedation for a lumbar puncture. She has had several airway surgeries. She has been hospitalized three times for "croup" and required intubation two of those times.

Questions

- What special problems must we consider?
- How do these problems affect our choice of sedative agents?

Murphy's Answers

- Start an IV using EMLA and a benzo, if possible
- I don't routinely advocate an antisialagogue with ketamine... but in this situation I'd use glycopyrrolate 0.01 mg/kg IM 20 mins before TITRATING ketamine

Brennan's Answers

- I always give an antisialagogue with ketamine if less than 24 months
- I never give ketamine to anyone < 12 months old
- I presume this child had abn upper AW anatomy which would be another reason not to give ketamine (Laryngospasm)

King's Answers

- I can't even pronounce antisialagogue
- Ketamine is a risk
- So is any type of deep sedation
  - Laryngospasm can occur during the second stage of anesthesia
- I would try EMLA on the back and a benzo

Case 8

- The police bring a 13 year-old to your ED. He has been fighting and has sustained multiple lacerations and a "boxer's fracture". He is very agitated and aggressive. His friends tell you that he was "doing angel dust". He is in handcuffs and leg shackles.

Case 8

- After he spits on one of the police officers the resident suggests leaving him restrained for a while "just to teach him a lesson"

Questions

- How should we approach this patient?
- What sedative regimen(s) should be considered?
- Should we follow the resident's suggestion?

King's Answers

- He should be approached very carefully!
- Another use for Dr. Murphy's tranquilizer darts?
- Patient is at risk to harm staff
- He is also at risk to develop life threatening rhabdomyolysis and acidosis

King's Answers

- He should be quickly sedated
- IV access should be obtained, if possible
- If not an IM injection should be given

Murphy's Answers

- Tough one!!!
- Ketamine and PCP are the same class… hard to guess what may happen
- Opiods won't help
- NMDA receptor antagonists and neuroleptic agents like Haldol???
- My preference is a sedative hypnotic…propofol or benzo

Brennan's Answers

- Benzo and neuroleptic
  - Ativan and Haldol
- I would not give ketamine

Case 9

- You have just finished a procedure
- Your patient will now recover from his/her sedation

Questions

- What criteria will you use to determine that the patient is ready for discharge and what cautions and instructions will you give to the family?
- What about:
- IM Ketamine?
- Benzo/Narcotic?

Questions

- Under what circumstances would you consider using reversal agents?
- Who should not get these agents?

King's Answers

- Patient should ideally be awake and able to drink
- IM ketamine is associated with prolonged ataxia
- Benzos may cause sleep disturbance and amnesia

King's Answers

- Reversal agents should be reserved for over-sedation that is life threatening or can't be managed in another way.
- Children with a history of seizure disorder should not receive flumazenil.
- Those who are likely to have severe pain should receive naloxone only if absolutely necessary

Case 10

- A 9 month old fell 3 feet from a changing table and had momentary loss of consciousness
- Questions:
  - Head CT?
  - Medications?
  - Bottle (formula vs.. Wild Turkey)

Case 11

- 2 1/2 year old female, very irritable, 103 fever needs line and LP. Is thrashing around. Last ate 2 hours ago.
- Questions
  - Medications?
  - Other?

Case 12

- 5 year old with 104 fever and newly diagnosed ALL
- Questions
  - Needs IV, LP (will eventually need Bone Marrow)
  - General?

Documentation

- Indications
- Consent
  - Including risks of agent to be used
  - Alternatives
- Assent (older child)
- Patient monitoring through procedure
- Recovery
- Discharge instructions