

Pediatric Pain Management and Anxiolysis

Small Group Cases

HREM Pediatric Learning Lab 2024

Case 1

A 2-year old boy presents to the emergency department with a lip laceration after he tripped and fell onto his face on a hardwood floor while running at home. There are no other concerning elements of the history.

When you enter the room in full PPE, the boy glances at you and immediately begins screaming.

What can you do?

Toddlers can often be fearful of strangers, and at 2 years of age, have some but likely limited speech capacity.

Some things you can try to ease your approach with toddlers:

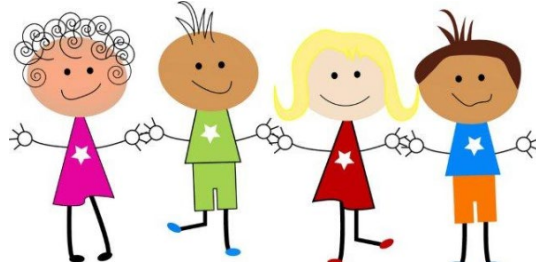
1. Stand back at first and act like they are the least interesting thing in the room. This would be a good time to get a history from the parent.
 - a. You can make brief, intermittent eye contact and wave at the child during this time.
2. Encourage close contact between the parent and the child. If the child is sitting on the bed, encourage the parent to hold the child in his/her lap.
3. When you are finished with your history and are ready to approach the child, make sure that you are eye-level with the child; this may include crouching down or sitting in a nearby chair.
4. First examine the parent's lip and perform all of the movements that you would perform when examining the child, on the parent.
 - a. If the child is carrying a stuffed animal or other security object, you can perform your "exam" on this object in addition.
5. Then say "it's [child's name] turn", and perform the same examination movements on the patient.
6. When possible, try to give the child a realistic choice (e.g., "Do you want me to look in your left ear first or your right ear first?").
7. If the child starts crying and needs to be held for parts of the examination, be sure to acknowledge their fear ("I know that this must be scary for you").

Here are some helpful things to remember about how children express pain at different developmental ages.

Pain Expression by Developmental Age

Infants

- Observed through behavior
- Physiological measurement/vitals
- Parental assessment is important



Toddlers

- Language skills affect reporting/description of pain
- Can report location, cannot describe severity
- Fear can interfere with accurate assessment of pain
- Parental assessment is very important

Pre-Schoolers

- Language skills affect reporting/description of pain
- Can report location, cannot describe severity
- Fear can interfere with accurate assessment of pain
- Parental assessment is very important
- Can confuse emotional states with pain ratings
- More verbal
- Able to use different methods of pain assessment (FACES, Poker Chip Tool, etc.)
- Also influenced by fear and past experiences (ex: 4-5yr immunizations)

School Age

- Medical staff is quick to expect more from this age group in terms of reporting pain
- Still use different language from adults in reporting/describing pain
- Able to anticipate what might happen if they report pain (further interventions)
- Can quickly feel out of control when experiencing pain

Adolescents and Young Adults

- Often minimize or deny pain
- Pain expression/reporting may be different with parents in the room
- Trying to maintain control of self and environment
- May refuse strategies or medications
- Should be offered privacy and choices

Jason tolerates your examination but has a difficult time staying still, even after you start playing Disney's Encanto movie on the room TV. Your examination reveals a 1.2cm gaping laceration of the lower lip that traverses the vermilion border but is not full thickness.

You decide that sutures will be necessary to ensure proper approximation of the vermilion border.

What are some options for analgesia and sedation that you can discuss with the parent?

1. Anxiolysis + local analgesia – no PIV but may require needle infiltration of medication
 - a. Anxiolysis – Midazolam (IN or PO) or Dexmedetomidine (IN) + distraction and positioning
 - b. Local analgesia – LET vs mental nerve block vs local infiltration
 - i. LET – no needle; will cause blanching that may obscure landmarks
 - ii. Mental nerve block – requires needle; will not distort landmarks; variable provider comfort
 - iii. Local infiltration – requires needle; may distort landmarks
 - c. Pros and Cons
 - i. Pros – may not require any needle injection
 - ii. Cons – may result in poor cosmetic result if unable to well approximate vermilion border due to patient noncompliance; intervention alone may lead to high anxiety and duress to child despite no involvement of needles/injections
2. Sedation + local analgesia – requires PIV and sedation; addition of local analgesia reduces needed sedation time
 - a. Sedation – Ketamine (IV); IM can be unpredictable
 - b. Local analgesia – LET vs mental nerve block vs local infiltration (see above)
 - c. Pros and Cons
 - i. Pros – will allow for optimal cosmetic result as child will not be moving; together sedation time can be reduced; ketamine is a very safe and effective sedation agent in children
 - ii. Cons – requires PIV placement in child and ensuring that the child keeps the PIV in long enough to complete the procedure; high ED resource utilization (1:1 monitoring)

After a lengthy discussion with the parent, there is shared decision-making to proceed with IV ketamine sedation and a mental nerve block.

Here are some tips and tricks to consider when performing a ketamine sedation in a toddler.

Preparing for sedation

- PIV placement considerations
 - In a younger child, it is important to wait until the last minute to place the PIV as they will typically attempt to remove it.
 - Once the PIV is placed, be sure to secure it with an arm board.
- Equipment
 - Standard pediatric and infant face masks that come with Ambubags are often too small/the wrong size.
 - Have additional masks of various sizes readily accessible.
 - Using a Yankauer for suctioning is most useful for the majority of pediatric sedations.
 - Smaller/flexible suctioning tubing is often not necessary.
 - Waiting until the child is sedated to secure the end-tidal CO₂ nasal piece will often reduce pre-procedure anxiety in younger patients.
- Medications

- If unfamiliar with pediatric dosing, have a list of pre-calculated weight-based dosing of code medications readily available at the bedside.
- Ketamine
 - The effects of IM ketamine are often unpredictable in children, so when it is used, it is most often helpful as a pathway to safely obtain a PIV (for IV ketamine) or for very quick procedures.
 - For the most common moderate sedations in children, a starting dose of 1.5 mg/kg with 1-2 additional prepared doses of 1 mg/kg will make drug delivery easier.
 - For concentrated formulations, diluting small doses into a target volume of 5-10 mL will help with being able to administer the medication over 60 seconds.
- Patient positioning
 - Allowing the parent/caregiver to sit with the child until they are sedated will often reduce pre-procedure anxiety in most children.
 - For younger children with large occiputs, securing proper in-line head and neck positioning will help prevent airway occlusion during the sedation and procedure.
 - Have rolled and/or folded towels readily available to secure positioning once the child is sedated; this will free your hands and attention.

Things to consider during the sedation

- Children, especially toddlers, can often require repetitive doses of ketamine during a prolonged sedation.
 - To avoid this situation, bedside pediatric sedations should not be used for any procedure anticipated to last > 20 minutes.
 - Anticipating the most painful portions of the procedure to deliver additional doses can help decrease the total dose needed (e.g., manipulation during fracture reduction, molding during cast placement).
 - Using local analgesia when possible can also help decrease the total dose needed.

Things to consider after the sedation

- If riding home in a car post-sedation, ensure that parents/caregivers of young children understand that they need to be monitored in the back seat as they can fall asleep with their head bent forward and obstruct their airway.
- If a child is sedated late at night, they may not completely “wake up” post-sedation, however if they are appropriately arousable, they can be safely discharged home with anticipatory guidance.

Congratulations, we successfully complete the laceration repair with a good cosmetic result and no complications! The child is awake after 20 minutes and able to be safely discharged home about 40 minutes later.

Case 2

A 12-year old healthy girl presents to the emergency department with an abscess on her left thigh. There are no concerning historical findings. On examination there is a 2cm round, erythematous raised area on the anterior portion of the left thigh with a 2mm central whitehead. It is fluctuant and tender to the touch.

The girl is extremely anxious due to the pain. She allows you to visualize her leg but immediately pulls away when you reach to palpate it. Her father has to hold her down to allow you to examine it more closely.

How could you approach analgesia and sedation in this patient?

1. Anxiolysis – one of the most important things to address in this patient
 - a. Non-pharmacologic – this age group can respond well to several calming methods including deep breathing and counting, listening to music on headphones
 - b. Pharmacologic
 - i. Midazolam – oral midazolam is an excellent option in this age group, who is generally compliant with taking oral medications
2. Analgesia
 - a. Topical
 - i. LMX placed generously on the abscess and covered with a tegaderm can often lead to spontaneous drainage of abscesses like these.
 - b. Intradermal vs ketamine sedation for drainage and packing/vessel loop
 - i. See above for pros and cons
 - ii. Incision and drainage of abscesses is often a very painful and very anxiety-provoking procedure, so have a low threshold to consider ketamine sedation especially in young children.

After thorough discussion with the father, you decide to start with oral midazolam and LMX.

When you return 20 minutes later, the abscess has already begun draining and the patient is sleeping. She awakens when you remove the tegaderm but you are able to easily inject intradermal lidocaine while her father practices deep breathing exercises with her. You quickly complete the procedure while her father holds her hand; she is wincing but afterwards reports that “it wasn’t that bad”.

Real life

What scenarios have you run into in the emergency department with children that you would like to discuss?

Potential examples to talk through:

- Finger injuries
 - Fingernail/nailbed lacerations
 - Paronychia)
- Nose/ear foreign body removal

- Sedation for non-painful procedures (e.g., MRI)
- Lumbar puncture