Kinder, Gentler Pain Management

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Objectives

Describe alternatives for non-invasive pain management in children

- **Pharmacologic options**
  - Intranasal drug administration—fentanyl
  - Topical anesthesia—J-tip lidocaine

- **Support positive coping**
  - Preparation, including appropriate language
  - Comfort positioning
  - Distraction
ED Pain Management—What’s the Problem?

Inadequate pain management of children in EDs well documented

- Alexander 2003—analgesia for long bone fractures and burns for different ages in ped ED
  - Compared 6-24 mo vs. 6-10 yr olds
    - Only 35% of 6-24 mo got analgesia vs. 52% of school age
    - Burns—only 50% of 6-24 mo got analgesia (21% narcotics) vs. 75% of school age (100% narcotics)

Why is children’s pain undertreated?

- Multifactorial problem
- Have good medications, but underused
  - Starting IV is a barrier, especially in young children
    - Uncooperative
    - Technically difficult
- Needlestick pain often not addressed
  - Seen as minor procedure by staff, but very feared by children
  - Topical anesthetics typically have required long application times (30-60 min)
Intranasal fentanyl for acute pain

- It’s fast (faster than starting an IV)
- It’s non-invasive
- It works!
  - Rapid absorption
  - Significant analgesia within 10 min
  - 70% bioavailability
Intranasal Drug Delivery

- Nasal mucosa
  - Large surface area (180 cm$^2$ in adult)
  - Rich blood supply
  - Higher drug levels than oral/rectal
- Part of dose goes directly into brain (nose-brain pathway)
- Many drugs well absorbed
  - Fentanyl
  - Midazolam
  - Ketamine
- MAD (mucosal atomizer device) allows easy, effective administration
- Resource: www.intranasal.net
Opiate levels—Intranasal vs IV

IV vs IN serum drug levels - theoretical example of an opiate

- IV medication levels above respiratory depression threshold
- Respiratory depression threshold
- IN medication achieves therapeutic threshold
- Therapeutic efficacy threshold

www.intranasal.net
Intranasal Fentanyl—ED Studies

- IN fentanyl worked as well as IV morphine in placebo controlled RCT
- IN fentanyl given sooner than IV morphine (~30 min vs 60 min)
- More children receive analgesia once IN fentanyl implemented
- Majority have decreased pain within 10 minutes

Holdgate A. Acad Emerg Med 2010;17:214-217
Saunders et al, Acad Emerg Med 2010;17:1155
IN Fentanyl—Dosage/Administration

- IV formulation 50 mcg/mL
- Dosage 1.5-2 mcg/kg, max 100 mcg (1 mL/nostril)
  - 70% bioavailability
- Head tilted back ~45°
- Divide dose between nostrils
- Onset 5-10 minutes
- May repeat ~0.5-1 mcg/kg after 10 minutes
- Prepare for IV if needed, or give PO medication
- Doesn’t sting or taste bad
IN Fentanyl—
Contraindications/Complications

- **Contraindications**
  - Drug hypersensitivity
  - Nasal blockage/trauma/epistaxis (?URI)

- **Complications (very rare)**
  - Nausea/vomiting
  - Itching
  - Respiratory depression
  - Rigid chest (theoretical, not reported)

- **Reversal**—naloxone (IM if no IV)

- **Monitoring**—pulse ox?
Topical Anesthesia for Needle Procedures

- **LMX or EMLA**
  - Require 30-60 minutes
  - Can be used if time allows
  - LMX works a little quicker

- **J-tip lidocaine**
  - CO₂ powered needleless injection
  - Works rapidly (< 5 min)
  - Better anesthesia than LMX/EMLA for IV placement

Spanos et al, Pediatr Emerg Care 2008;24:511
J-tip Lidocaine

- 1% buffered lidocaine jet injection
- Topical anesthesia for needlesticks
  - IV/venipuncture
  - LP
- Onset 1-3 minutes
  - 5 min—nickel sized area
  - 10-15 min—quarter sized area
- Duration ~90 minutes
- Depth of anesthesia 8 mm at 5 min
- Warn child of “pop can” whoosh
You can make a difference!

- Noninvasive, fast, effective pain control
- Reduce needlestick pain/apprehension
- Reduce trauma of ED visit
- Simple, easy to incorporate
- Children and families very appreciative
- Staff like it too!
Supporting Positive Coping in the Emergency Setting

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Preparation


- Preparation promotes understanding of medical interventions and experiences.

- Manipulating materials fosters understanding of their use, and provides the opportunity for patients to ask questions and express and cope with fears related to the procedure or experience.

- The patient can participate in developing an individualized coping plan.

- Children may not understand adult terminology: “Child Life Suggested Words or Phrases”
Preparation Can Include:

- Verbal description of procedural steps or experiences
- Manipulation of appropriate medical materials
- Reviewing past experiences with similar/same event to address possible misconceptions
When Providing Preparation

- Be honest with the patient
- Include any pharmaceutical interventions in preparation (i.e. j-tip, numbing creams, or Buzzy)
- Use developmentally appropriate language
  - Concrete descriptions
  - Developmentally appropriate terminology
Procedural Support


- Procedural Support can be provided to help facilitate effective coping during any stressful event.

- A coping plan should be devised prior to the event.

- The support should be tailored to each patient’s needs (developmental level, amount of stimulation, area of procedure).
Considerations for Procedural Support and Distraction

- The environment of the room
- The developmental level of the patient
- The patient’s desired coping plan
- Comfort positioning
Why Position for Comfort?

- Family centered care
  - Parents who interact with their child during a procedure are calmer and have increased satisfaction

- Developmental focus
  - Sitting up in infancy is accompanied by sense of control
  - Lying children down results in a loss of control and is frightening
  - When developmental milestone reached, the mere act of making child lie down usually results in struggle to get up


Psychosocial focus

- IVs are the 2\textsuperscript{nd} most common cause of worst pain experienced during hospitalization *
- Fear, anxiety and tension heighten a child’s response to pain
- Painful procedures result in negative memory and greater pain in future procedures**


Infant Cradle

Infant Front to Front
Positioning for IV Start

Straddle School Age  
Back to Front School Age  
Side Sitting
Positioning for IM Injection

Front to Back School Age

Straddle School Age

Side Sit School Age
Let Them Be in Control

• Children don’t get to make a lot of decisions when visiting the hospital. They have to endure multiple procedures/tests, they lose privacy, their schedule is changed, etc. Acting out is common in children trying to regain control of their environment.

• Offering children as many appropriate choices as possible can help put a child at ease. Many choices can be very simple, such as:
  
  • How would you like to sit?
  
  • Do you want the lights on or off?
  
  • Which toy would you like to play with?
  
  • Would you like to see what is happening?
  
  • Would you like a countdown?
References


References continued

Questions?

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