Acute Pain Management

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Faculty/Presenter Disclosure

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1

Reflect on pain assessment tools

2

Develop approaches to acute pain management

3

Apply your approach to clinical cases

Why you might care

- Pain is the reason for most healthcare visits
- Children's pain is under-recognized and under-treated
- Undertreated pain has short- and long-term consequences
- Adequately treating pain leads to:
  - More successful procedures
  - Better efficiency
  - Improved patient and caregiver satisfaction

Drendel AL & Ali A. Ten Practical Ways to Make Your ED Practice Less Painful and More Child-Friendly. Clinical Pediatric Emergency Medicine 18 (2017): 242-255.

Ali S, McGrath T, Drendel AL. An Evidence-Based Approach to Minimizing Acute Procedural Pain in the Emergency Department and Beyond. Pediatr Emerg Care. 2016 Jan;32(1):36-42; quiz 43-4.

Assessing Pain

Pain Expression

- Pain is interpreted, expressed and reported differently based on familial, cultural, societal and gender-related factors.
- These factors influence children's response to pain

Case 1

- 8 yo M
- Previously healthy, no allergies
- Presenting with RLQ abdominal pain and nausea
- Laying calmly in the bed, playing on caregiver's smart phone

Case 1

- What is your approach to pain management?
- What does ‘comfortable’ look like?

Cultural Differences in Pain Expression

- Indigenous children and youth exhibit a learned pain behaviour of hiding their pain from adults to appear stoic.
- Canadian Indigenous children report difficulty describing their pain, which may be both due to language and cultural differences (Latimer et al., 2020).

POLL

Girls are described as experiencing more pain than boys, even when they have similar clinical circumstances and pain behaviours (True/False).

- True
- False

Gender Bias

- There is gender bias in the assessment of pain.
- Boys are described as experiencing more pain than girls, despite identical clinical circumstances and pain behaviours (Earp et al., 2019).
- The gender of the physician influences pain management decisions in the ED. Female physicians are more likely to administer pain medicine than male physician.
- Female physicians are more likely to administer opioids to female patients and male physicians are more likely to administer opioids to male patients (Safdar et al., 2009).

Self-Reflection

- Clinicians must reflect on their own conscious and unconscious biases when assessing and managing their patients' pain

Case 1

- Acetaminophen, NSAIDS
- Morphine PO, IV
- Anti-emetics (ondansetron SL)

Pain Assessment

- Accurate pain assessment is essential.
- Pain is often assessed and managed by a multidisciplinary team.
- Pain assessment must be tailored using age and cognition-appropriate instruments.
- Re-assess pain regularly using consistent instruments.

Pain Assessment Tools

- Use validated pain scales.
- Whenever possible, children should be asked to rate their pain using validated, self-reported measures (Birnie 2019).

Scale	Use
Faces, Legs, Arms, Consolability, Cry (FLACC) score	Observational Children < 4 years of age, non-verbal or cognitively delayed children
Children's Hospital of Eastern Ontario Pain Scale (CHEOPS)	Observational Children < 4 years of age, non-verbal or cognitively delayed children
Faces Pain Scale - Revised (FPS-R)	Observational Children 4-12 years of age
Verbal Numerical Rating (vNRS) scale	Self-reported Children > 6 years of age

POLL

You are seeing a 3 year old boy with a displaced forearm fracture. He is able to describe his pain to you. Which pain scale would be most appropriate to use?

- Faces, Legs, Arms, Consolability, Cry (FLACC) score
- Children's Hospital of Eastern Ontario Pain Scale (CHEOPS)
- Faces Pain Scale - Revised (FPS-R)
- Verbal Numerical Rating (vNRS) scale

Pain Assessment Tools

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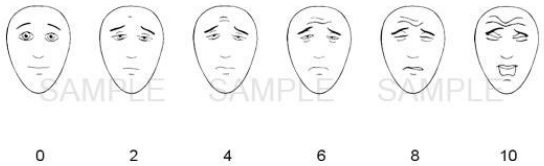
FLACC Scale

1. Rate the child on each of the five categories (face, legs, arms, crying, consolability).
2. Each category is scored on the 0 to 2 scale.
3. Add the scores together (for a total possible score of 0 to 10).
4. Document the total pain score.
    - 0 = relaxed and comfortable
    - 1-3 = moderate discomfort
    - 4-6 = moderate pain
    - 7-10 = severe pain or discomfort or both

- If awake, observe for 1-5 minutes or longer. If asleep, observe for 5 minutes or longer.
- Observe legs and body uncovered.
- If possible, re-position child and observe activity.
- Touch the child's body and assess the tenseness and tone.
- Console the child if needed.

Faces Pain Scale - Revised

- For children 4-12 years of age, use the Faces Pain Scale - Revised (Hicks et al., 2001).
- FPS-R is applicable across genders and ethnicities.
- The scale is comprised of six cartoon faces ranging from neutral to high pain expression



- “These faces show how much something can hurt. This face [point to left-most face] shows no pain. The faces show more and more pain [point to each from left to right] up to this one. [point to right-most face] It shows very much pain. Point to the face that shows how much you hurt [right now].”
- Score the chosen face 0, 2, 4, 6, 8, or 10, counting left to right, so "0" equals "No pain" and "10" equals "Very much pain."
- Use the words "Hurt" or "Pain," whichever seems right for a particular child. Do not use words like "happy" and '"sad." This scale is intended to measure how children feel inside, not how their face looks. (https://www.iasp-pain.org/resources/faces-pain-scale-revised/)

Verbal Numerical Rating Score

- For children over 6 years of age, use the Verbal Numerical Rating Score (vNRS) (Tsze et al., 2018)
- “On a scale from zero to ten, where zero means no pain and ten means the most or worst pain that you have experienced, how much pain do you have right now?”
- Categories of pain severity:
  - no pain = 0
  - mild pain = 1–3
  - moderate pain = 4–6
  - severe pain = 7–10

Approaches to Pain Mangement

Approaches to Pain Management

1

Physical

2

Psychological

3

Pharmacological

Physical Approaches

- Caregiver remains with their child and provides them with guidance and comfort
- Comfort positioning (e.g. child is seated upright on or with their caregiver, caregiver rocks child)
- Gentle touch, cuddling, skin-to-skin contact
- Deep breathing
- Breastfeeding or non-nutritive sucking (pacifier)
- Facilitated tucking g (i.e. legs and arms tucked close to body) or swaddling with a blanket (< 2 months)
- Warm or cold packs

Psychological Approaches

- Distraction techniques are age and cognition-dependent
- Involve Child Life Specialists when available
- Simple distractions vs. technology-based distractions
  - young children: bubbles, games, eye spy, videos, music and singing, fidget toys
  - older children: books, music, videos, virtual reality (VR), games on a tablet or smart phone
  - children with severe anxiety/needle phobia: give guidance to caregivers to help them support their child, quiet and calm environment, distractions as appropriate
  - children with autism spectrum disorder: let the child's caregiver be your guide, quiet and calm environment, sensory items (squishy balls, spinning toys, weighted blanket), other distractions as appropriate

Autism Cart


PDSAs
JUST DO ITS!
ALMOST IMPLEMENTED
1 WEEK
2 WEEKS
3 WEEKS
4 WEEKS

Certified Child Life Specialists

- CCLSs are an integral component of pain and distress management.
- Involving them early to assist with planning and provide anticipatory guidance to children and families, particularly for painful procedures.
- CCLSs can help guide an individualized distraction plan for each child.

Oral Sucrose

- Oral Sucrose can be used for infants < 12 months but works best in children < 1 month
- Give 2 mL of 24% glucose solution orally using a syringe or on a pacifier, 2 minutes before initiating the painful procedure.
- If 24% glucose is unavailable, dilute D50W with 1:1 equal parts sterile water to create D25W as a substitute.
- Oral sucrose can be used alone or in combination with other techniques for all painful procedures in this age group (TREKK Bottom Line Recommendations 2021).

Pharmacological Approaches

- Pain should ideally be managed using a combination of non-pharmacological and pharmacological therapies.
- Whenever possible, pharmacologic agents should be administered via the oral or intranasal routes, rather than intramuscular or intravenous routes, as they are less painful.
- It is important that analgesia be given as early as possible as there is no evidence that adequate pain management obscures the diagnosis.

Pharmacological Approaches

- First line pharmacologic agents should comprise of non-opioids (acetaminophen, NSAIDS).
- Opioids (morphine, fentanyl, hydromorphone, oxycodone) should be reserved as adjuncts for more severe pain.
- Opioids should be titrated based on clinical efficacy and adverse effects.
- Use caution if employing procedural sedation within 30 min of opioid administration due to increased risk of respiratory adverse events.
- Codeine is contraindicated in children under 12 years of age and in children with respiratory conditions due to risks of respiratory depression (Health Canada, 2016).

TREKK Dosing

ANALGESICS FOR CHILDREN 1 YEAR AND OLDER		
MILD PAIN (e.g. 1-3 out of 10)		
Drug	**Dose**	**Comments/Precautions**
Ibuprofen PO	10 mg/kg/dose q6h PRN (MAX 600 mg/dose)	First-line option for musculoskeletal injuries and most other painful inflammatory conditions.
Acetaminophen PO	15 mg/kg/dose q4h PRN (MAX 1000 mg/dose)	Do not exceed the lesser of 75 mg/kg/day or 4 g/day.
MODERATE PAIN (e.g. 4-6 out of 10)		
Ibuprofen AND Acetaminophen PO	Dosing as for Mild Pain section above	
*Consider **adding** an opioid.*		
Hydromorphone PO (tablets, liquid)	0.03-0.06 mg/kg/dose q3-4h PRN (MAX 1-2 mg/dose)	Higher risk of dosing errors. Possible increased risk of future misuse/opioid use disorders. Do not use if < 6 years old.
Morphine PO (tablets, liquid)	0.2-0.5 mg/kg/dose q3-4h PRN (MAX 15 mg/dose)	Most common pediatric opioid. Lack of demonstrated efficacy for musculoskeletal pain. For **initial** pain management, 2nd dose may be given sooner than 3 hrs.
Oxycodone PO (tablets)	0.1-0.2 mg/kg/dose q4-6h PRN (MAX 5-10 mg/dose)	Risk of QT interval prolongation. Tablets must be swallowed whole.
If not responding to PO opioid, consider lower dose IV/intranasal opioid (see Severe Pain below)		
SEVERE PAIN (e.g. 7-10 out of 10)		
Fentanyl Intranasal	1.5 mcg/kg/dose (MAX 100 mcg/dose) May repeat 0.5-1 mcg/kg/dose (MAX 50 mcg/dose) 10 min after 1st dose if needed. Divide dose between nostrils (MAX 1 mL/nostril).	Provides rapid pain reduction. Provides early pain relief if IV access is not yet established. Give via mucosal atomization device for enhanced absorption. Monitor level of consciousness, vital signs, and pain score prior to therapy and at 10 min post administration.
Morphine IV	0.05-0.1 mg/kg/dose q2-4h PRN (MAX 5-7.5 mg/dose)	Monitor level of consciousness, vital signs, and pain score prior to therapy and q10 min post administration (for MIN 30 min). Some institutions recommend continuous O_2 sat monitoring for 30 min post administration. For **initial** pain management, 2nd dose may be given sooner than 2 hrs.
Fentanyl IV	1 mcg/kg/dose q1-2h PRN (MAX 50 mcg/dose)	Monitoring as per Morphine IV above. For **initial** pain management, 2nd dose may be given sooner than 1 hr.
Always add PO or IV NSAID for opioid-sparing effect if the pain is expected to require multiple opioid doses.		
Ibuprofen PO	Dosing as for Mild Pain section above	
Ketorolac IV	0.5 mg/kg/dose q6h PRN (MAX 30 mg/dose)	Avoid ibuprofen or other NSAIDs for at least 6 hours after IV ketorolac.

https://trekk.ca

Check out

TREKK's BOTTOM LINE RECOMMENDATIONS for Pain Treatment

Case 2

- 8 yo F
- Healthy, no allergies
- Tripped during gym and crashed into the wall
- Finger has significant deformity

What is your approach to pain management?

Case 2

- Physical?
- Psychological?
- Pharmacological?

Case 2

- Comfort positioning - upright
- Simple and technology-based distractions
- Topical anaesthetic
  - LET (Lidocaine, EPINEPHrine, and Tetracaine)
  - Maxilene/Emla
- Intranasal analgesic and sedation
  - Fentanyl
  - Midazolam
- Local block
  - Lidocaine +/- Epinephrine +/- Bicarbonate

Case 3

- 6 yo M
- Sickle cell anemia, no allergies
- Woke from sleep at midnight with severe leg pain
  You suspect he is having a vaso-occlusive crisis

What is your approach to pain management?

Case 3

- Physical?
- Psychological?
- Pharmacological?

Case 3

- Comfort positioning
- Warm packs
- Simple and technology-based distractions
- Acetaminophen, NSAIDS
- Opioids
  - Fentanyl IN
  - Morphine or hydromorphone PO
  - Morphine or hydromorphone IV bolus +/- infusion

Racial and Cultural Stereotypes

- Racial and cultural stereotypes affect how clinicians treat patients with pain.
- In one study, over half of white medical students and residents falsely believed that there are biological differences between black and white patients' pain perception (Johnson 2013).
- In several studies, black patients were less likely to be given pain medicine than white patients when presenting with similar painful conditions, and when they were given pain medicine, they were given lower doses (Hoffman et al., 2016).

Racial and Cultural Stereotypes

- Pediatric research shows conflicting results on the racial differences in pain treatment.
- In a systematic review, one study reported no racial differences in pain medication administered in the emergency department for children with fractures (Yen et al., 2003), while other studies reported that African American and Latinx children received significantly less pain medications than Caucasian children for the same types of painful conditions.

Interpreting the Research

- It is challenging to interpret the research because the research methods may not have the cultural sensitivity to uncover the nuances.
- For example, the wording of interview questions, the gender/race/ethnicity of the interviewer and the environment, among other factors, may impact the results (Kristjansdottir et al., 2012).

Case 4

- 16 yo M
- Riding his bike and hit by a car
- Blunt abdominal trauma and femur fracture
- Preferred language is Tamil
- Caregiver arrives, she has limited English language proficiency

Case 4

- CLS, SW
- Age appropriate information sharing and distractions
- Fentanyl IN, IV
- Ketamine for pain? IV? IN?
- Immobilize fracture

Graudins A, Meek R, Egerton-Warburton D, Oakley E, Seith R: The PICHFORK (Pain in Children Fentanyl or Ketamine) trial: a randomized controlled trial comparing intranasal ketamine and fentanyl for the relief of moderate to severe pain in children with limb injuries. Ann Emerg Med. 2015, 65:248-54.

Frey TM, Florin TA, Caruso M, Zhang N, Zhang Y, Mittiga MR: Effect of intranasal ketamine vs fentanyl on pain reduction for extremity injuries in children: the prime randomized clinical trial. JAMA Pediatr. 2019, 173:140-6.

Language Barriers and Pain Management

- It can be more difficult to properly assess and treat pain for patients and families where English or French is not their first language.
- Spanish-speaking Latinx children received 30% less opioid analgesics post-operatively than English-speaking Caucasian children (Kristjansdottir et al., 2012; Hostetler et al., 2002; Jimenez et al., 2010).
- Language and sign language interpreters are available by phone/virtually in many centres and can dramatically improve communication regarding pain assessment, treatments and to provide education on pain management after discharge from the ED.

Tips to Counsel Caregivers

- Common questions:
  - Is it safe to give pain medications to my child?
  - How will the medicine affect my child?
  - What are the potential adverse effects?
  - Is a risk of later addiction or dependence?
  - Are these medications (Fentanyl, Ketamine) the same as “street drugs”?

- When counselling caregivers, clinicians can emphasize:
  - It is important to treat pain even before the cause of the pain is diagnosed
  - Treating pain will not mask a dangerous condition
  - Untreated pain can have long term consequences for their child and cause fear and anxiety with procedures and medical encounters later in life
  - We start with pain medicines that have the fewest side effects and add stronger medications when and if they are needed
  - If opioid medications are needed because their child has severe pain, the dose will be carefully tailored to the child’s weight and level of pain

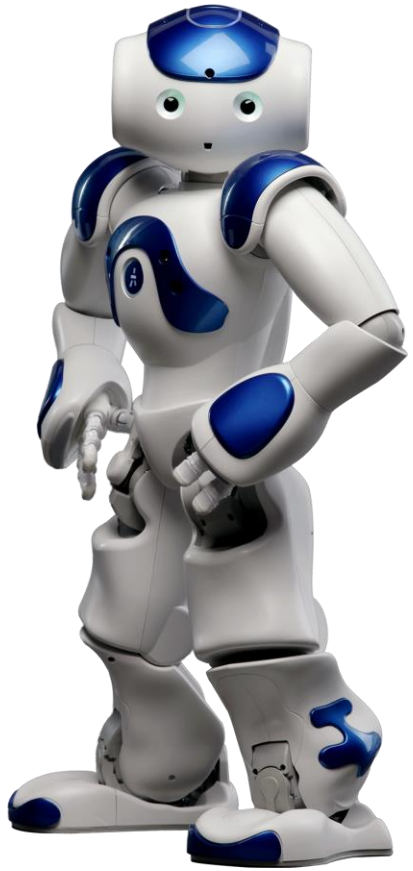
Discharging Patients with Opioids

- When do you give a prescription for opioids?
- If discharging patient home with PO opioids, prescribe for no more than 3 days (or 10 doses total) for most outpatient conditions.
- Recommend stool softener for those discharged with PO opioids. Refer to TREKK Recommendations for Constipation.
- All families should have an opioid risk assessment performed before prescribing outpatient opioids. Opioids should be stored safely out of reach and only given as needed. Unused quantities of any medication should be returned to the pharmacy for safe disposal.

Technology-based Distractions

- Digital distraction methods are effective to reduce pain and anxiety for children of almost all ages (Gates et al., 2020).
  - Movies/video clips
  - Smart phone games
  - Music
  - Social media
- Virtual Reality (VR) can reduce acute pain and anxiety in children during painful procedures in the emergency department (Eijlers et al., 2019, Lambert et al., 2020). VR is a good distraction tool because its immersive and interactive nature requires more of the patient's attention (Law et al., 2011).
- There is no evidence that technological distraction methods are more effective than non-technological distraction methods (e.g. bubbles, books, music), so it is important for clinicians to use whichever tools are available.

Humanoid Robots



- Humanoid robots have been used to distract children from painful procedures (Trost et al., 2020).
- Robots can be controlled remotely to speak to children, dance or play music.
- Artificial intelligence enabled robots may be able to assess children's body language, facial expression and words and respond to children's level of pain, anxiety or distress by employing distraction methods.
- There are ethical considerations when using robots to autonomously assess pain and provide distraction to reduce pain related to children's and parents' trust of the robot.

Thank you

Questions? Comments?