

Procedural Pain

Common medical procedures used to assess and treat children can cause significant pain and distress.¹ Untreated pain has short-term (pain and distress for the child, caregivers, and healthcare providers; prolonged procedure time; slower healing) and long-term consequences (increased sensitivity to pain; increased avoidance behavior; social hyper-vigilance; higher levels of anxiety before a procedure). Expedient and effective multi-modal pain care improves procedure success rates, prevents the need for repeated attempts, improves ED flow, and improves patient and caregiver satisfaction.²

General suggestions to minimize pain

PHYSICAL

- » **Ask the caregiver** if they wish to stay in the room and provide them with direction to calmly support their child with distraction, gentle touch (if desired by the child), and soothing words (e.g. “I’m here for you”, “I love you”).
- » Caregivers may **hold** their child in a number of comfort positions that do not interfere with procedures (e.g. upright and in direct physical contact with caregiver), and **rock** their child after the procedure.
- » If available, **breastfeeding** through procedures (e.g. venipuncture, IV insertion) can be soothing for the infant/young child; **non-nutritive sucking** (e.g. pacifier) can be used if breastfeeding is not available.
- » Young infants can have **facilitated tucking** (legs and arms tucked close to body) or **swaddling with blankets** to calm them during/after procedures.
- » If available, caregivers may provide **kangaroo care** for infants, with skin-to-skin contact during preparation for procedures (e.g. venipuncture, IV insertion).
- » Educate caregivers on how to help their child during needlestick procedures using [these resources](#).
- » Heel lances and intramuscular injections should be **avoided**.
- » **Oral sucrose** can be used up to 12 months of age and works best for infants < 1 month of age. Give 2 mL of 24% glucose solution PO, 2 minutes before initiating the painful procedure. If 24% glucose is unavailable, dilute D50W with equal parts sterile water to create D25W as a substitute. Can be used alone or in combination with other techniques for all painful procedures in this age group.

PSYCHOLOGICAL

- » If you have access to a Child Life specialist, **do** include them in planning, both ahead of and during the procedure.
- » **Simple distraction techniques** such as bubbles, books, I-spy books/cards, portable distraction kits, conversation.
- » **Technology-based distraction** such as tablet device, DVD player, smart phone games, music, videos, virtual reality.

Procedure-specific suggestions to minimize pain

NEEDLESTICK PROCEDURES

- » **Topical anesthetic creams** – Can be applied to all ages. Fast-acting creams (e.g. Maxilene[®], Ametop[®]) are preferred over slow-acting ones (e.g. EMLA[®]). Apply 30 minutes prior to procedure for fast-acting creams/60 minutes for slow-acting creams. Application at triage is recommended.
- » **Vapo-coolant spray** – Can be used for 3 years and older. If topical anesthetic cream is unavailable, vapo-coolant spray (e.g. Pain-Ease[®]) may be used. Spray on the skin for 4-10 seconds or until skin blanches prior to the skin-puncturing procedure. May repeat x 1.¹

NASOGASTRIC TUBE INSERTION

- » **Lidocaine Spray** – Evidence is limited for lidocaine spray efficacy; multi-modal therapy is key for this procedure. Lidocaine spray can be tried if patient is 6 months or older. Atomized 4% lidocaine nasal spray (10-20 mg) or nebulized 4% lidocaine (3-5 mL). Do not exceed 4 mg/kg/dose.
- » **Lidocaine Jelly** – Lubricating the nasogastric tube with 1-2 mL of 1-2% lidocaine jelly may be beneficial for minimizing post-insertion pain if patient is 6 months or older.

LACERATION REPAIR

- » Lidocaine-Epinephrine-Tetracaine (LET) gel (lidocaine 4% - epinephrine 0.05% - tetracaine 0.5%) 0.18 mL/kg/dose (MAX 3 mL/dose) for patients 3 months or older. Apply LET gel to laceration, with or without gauze, then cover with occlusive dressing (e.g. Tegaderm™). Apply early! Application at triage is recommended as LET gel **requires 30 minutes to be effective**.
- » Tissue adhesives – Can be used for all ages. Use caution around eye area. Avoid areas of tension. Can reinforce glue with perpendicularly applied steri-strips. Do not use for bites/dirty wounds.
- » Absorbable sutures – Are used preferentially for most pediatric suturing in the ED (other than wounds under significant tension). Removing sutures can be associated with a high degree of distress and discomfort for children.
- » pH adjustment of injected lidocaine – Buffering lidocaine decreases the pain of injection. Add 1 mL of 8.4% sodium bicarbonate to 9 mL of 1% or 2% lidocaine (do not exceed lidocaine 4 mg/kg/dose, MAX 300 mg/dose).¹
- » Minimize lidocaine injection pain – Warm lidocaine to body temperature by rubbing vial between hands, use a 27-30 gauge needle, and use slow injection technique.

URETHRAL CATHETERIZATION

- » Consider new, non-invasive techniques for urine collection (e.g. [QuickWee](#)).
- » **Physical and psychological methods** of minimizing pain are key due to limited evidence for pharmacotherapy.
- » **Lidocaine Jelly** – Limited evidence for benefit. Lubricating the catheter with 1-2 mL of 1-2% lidocaine jelly may be beneficial in treating post-insertion pain in infants/children 6 months and older.

LUMBAR PUNCTURE

- » **Topical anesthetic creams** – Can be applied in all ages. Fast-acting creams (e.g. Maxilene®, Ametop®) are preferred over slow-acting ones in the ED setting. Apply 30 minutes prior to procedure for fast-acting creams/60 minutes for slow-acting creams.
- » **Injected Lidocaine** – Topical creams only numb the superficial few millimeters of the skin. Inject the deeper area for lumbar puncture needle insertion with approximately 1-3 mL of 1-2% lidocaine (do not exceed 4 mg/kg/dose, MAX 300 mg/dose). Warm and buffer lidocaine as described above.

Special considerations for children with special needs

Children with special needs (e.g. autism, global developmental delay, non-verbal) may not perceive, report, or respond to pain in a typical manner. Refer to [TREKK Recommendations for Caring for Kids with Developmental and Intellectual Disabilities](#). Consider the following:

- » **Ask the caregiver!** Caregivers know what works best for their child.
- » Sensory considerations: low light, low noise, and minimal staff in the room can help some children.
- » In some circumstances (e.g. extreme agitation), you may need to offer anxiolysis or perform procedural sedation and batch all the required procedures together.

The purpose of this document is to provide healthcare professionals with key facts and recommendations for procedural pain management in children. This summary was produced by the pain content advisors for the TREKK Network, Dr. Samina Ali of the Stollery Children's Hospital and Dr. Amy Drendel of the Medical College of Wisconsin and uses the best available knowledge at the time of publication. However, healthcare professionals should continue to use their own judgment and take into consideration context, resources and other relevant factors. The TREKK Network is not liable for any damages, claims, liabilities, costs or obligations arising from the use of this document including loss or damages arising from any claims made by a third party. The TREKK Network also assumes no responsibility or liability for changes made to this document without its consent. Key references for this summary include:

1. Trottier E, Doré-Bergeron MJ, Chauvin-Kimoff L, Baerg K, Ali S. [Managing Pain and Distress in Children Undergoing Brief Diagnostic and Therapeutic Procedures](#). Paediatr Child Health 2019; 24(8):509-521.
2. Drendel AL, Ali S. [Ten Practical Ways to Make Your ED Practice Less Painful and More Child-Friendly](#). *Clinical Pediatric Emergency Medicine*. Volume 18, Issue 4, December 2017, 242-255.
3. 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;32(1):36-42.
4. Committee on Fetus and Newborn & Section on Anesthesiology and Pain Medicine. [Prevention and Management of Procedural Pain in the Neonate: An Update](#). *Pediatrics* 2016; 137(2):e20154271.
5. The Canadian Association of Paediatric Health Centres, Knowledge Exchange Network. [Acute Procedural Pain: Paediatric Recommendations and Implementation Toolkits](#). (Accessed online, August 2016).