

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; avoidance of healthcare settings; needle phobia, higher levels of anxiety before a procedure). Timely and effective multi-modal pain care improves procedure success rates, prevents the need for repeated attempts, improves patient flow, and improves patient and caregiver satisfaction.² Before initiating any procedure: consider whether it is truly necessary, batch procedures together, optimize pain management, and engage caregivers in planning/decision-making.

GENERAL SUGGESTIONS TO MINIMIZE PAIN

Physical

- Ask the caregiver(s) to **remain present** if possible and provide them with guidance to calmly support their child with distraction, gentle touch (if desired by the child), singing, and soothing words (e.g., “I’m here for you”).
- Caregivers or personnel may **hold** the 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.
- Infants <2 months can benefit from **facilitated tucking** (legs and arms tucked close to body) or **swaddling with blankets** to calm them before/during/after procedures.
- **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.
- **Oral sucrose** can be used up to 12 months of age and works best for infants <1 month of age. Give 0.5 mL of 24% glucose solution PO, 2 minutes before initiating the painful procedure. If 24% sucrose is unavailable, dilute D50W with equal parts sterile water to create D25W as a substitute. Can be used alone or in combination with pacifier or swaddling for all painful procedures in this age group.
- If available, caregivers may provide [skin-to-skin contact](#) for infants during preparation for procedures (e.g., venipuncture, IV insertion).
- Educate caregivers on how to help their child during [needlestick procedures](#).
- Heel lances and intramuscular injections should be **avoided** if possible.
- All limb injuries should be splinted with cold packs applied to reduce pain and prevent further injury.

Psychological

- Providing comprehensive anticipatory guidance and strategies for distraction is important and can be facilitated with the help of certified child life specialists if available, both ahead of and during the procedure.
- **Simple distraction techniques** such as bubbles, books, I-spy books/cards, portable distraction kits, and conversation.
- **Technology-based distraction** such as smart phone videos/games, tablet device, music, tv/videos, and virtual reality.

PROCEDURE-SPECIFIC SUGGESTIONS TO MINIMIZE PAIN

Laceration Repair

- **Tissue adhesives** – Can be used for all ages. Use caution around eye area. Avoid areas of tension. Can optimize use of glue with perpendicularly-applied steri-strip adhesive bandages prior to application of glue. 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.
- **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 at least 30 minutes to be effective and a minimum of 45 minutes for joints and palmar surfaces.
- **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.
- **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).

Procedural Pain

Lumbar Puncture

- **Topical anesthetic creams** – Can be applied in all ages. Fast-acting creams (e.g., Maxilene®, Ametop®, L.M.X.4®) 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 with an adhesive dressing (e.g., Tegaderm®).
- **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.
- **Oral sucrose** (see above) for infants in addition to anesthetics mentioned in this section.

Musculoskeletal Injury

- Pain management should involve non-opioids (ibuprofen, acetaminophen, ketorolac) as a first line, with opioids reserved for more severe pain or in anticipation of more painful procedures (e.g., diagnostic imaging).
- Pain during reduction can be managed with regional anesthesia (hematoma block, intra-articular block, or regional nerve block) or using procedural sedation Bottom Line Recommendation

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.

Needlestick Procedures

- **Topical anesthetic creams** – Can be applied to all ages. Fast-acting creams (e.g., Maxilene®, Ametop®, L.M.X.4®) 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 with an adhesive dressing (e.g., Tegaderm®).
- **Vapo-coolant spray** – Can be used for 3 years and older. If topical anesthetic is unavailable, vapo-coolant spray (e.g., Pain-Ease®) may be used. Spray on intact skin for 4-10 seconds or until skin blanches prior to the skin-puncturing procedure. Immediately perform procedure as cooling effect last 45-60 seconds. May repeat x1.¹

Urethral Catheterization

- Consider non-invasive techniques to collect urine for screening (e.g., bag or stimulated clean catch method).
- 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.

SPECIAL CONSIDERATIONS FOR CHILDREN WITH SPECIAL NEEDS

Children with special needs (e.g., autistic spectrum disorder, 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 pharmacologic anxiolysis or perform procedural sedation and batch all the required procedures together.

For a full list of references and development team members, please see the following page.

The purpose of this document is to provide healthcare professionals with key facts and recommendations for treating pain in children. Healthcare professionals should continue to use their own judgment and take into consideration context, resources and other relevant factors. The TREKK Network and EIC are 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 and EIC also assumes no responsibility or liability for changes made to this document without its consent.

BOTTOM LINE RECOMMENDATIONS

Bottom Line Recommendations are short summaries for healthcare providers of the latest knowledge related to the diagnosis and management of pediatric emergency conditions. This resource is not intended to be used as a step-by-step guide. It is ideal for educational purposes and to summarize existing evidence on pain treatment in pediatric emergency care. Development of this resource involved a rigorous and iterative process, bringing together experts from a variety of specialties (nursing, simulation, emergency medicine, intensive care, and pharmacy). To learn more about the development, see the References & Development Team section below.

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