

Procedural Anxiety and Fear

Anxiety and fears about medical procedures are common in children/youth: two-thirds report needle fear and 10% report needle phobia.¹ Addressing this anxiety/fear is critical, as up to half of children seen in the Emergency Department undergo painful procedures (e.g., IVs, blood tests, catheterizations, wound repair). Procedural pain is complex, involving both physical pain and anxiety/fear.² Inadequate management of either increases future anxiety and can lead to healthcare avoidance that persists into adulthood. Managing both improves procedural success and optimizes future care.³

This document complements [TREKK's Caring for Patients with Anxiety Bottom Line Recommendations](#), with a focus on medical procedures.

Assessment of Need / Risk Assessment

- Ask ALL children/youth and caregivers about past procedure experiences *before* the procedure to identify anxiety/fear and discuss both pain and anxiolysis management options.
- Observe verbal and nonverbal behaviours and reactions. Procedural anxiety/fear can present as externalizing (e.g., crying, screaming, acting out) or internalizing (e.g., stoicism, withdrawal) behaviours.
- Recognize that caregivers may also have procedural anxiety/fear. Despite this, caregivers can be a great source of support to their child and should be involved as much as they and the child wish.
- Apply principles of trauma-informed care (e.g., safety, trust, transparency, collaboration, empowerment and choice). Poorly managed procedures are potentially traumatic.
- Delay non-urgent procedures until supports are in place (e.g., transfer to Pediatric Referral Centre or involvement of a Child Life Specialist, if available).
- Consider other factors that may be influencing the child's anxiety and/or distress (e.g., hunger, time of day).
- Prevent and treat pain with pharmacologic, physical, and psychosocial interventions. Pain and fear/distress are closely related, and treating one often makes the other better. Refer to [TREKK's Procedural Pain Bottom Line Recommendations](#).
- Complete a pre-procedure assessment if pharmacologic anxiolysis (i.e., "light sedation") is being considered. Refer to [TREKK's Procedural Sedation Bottom Line Recommendations](#).

AVOID

- Minimizing, dismissing, and/or criticizing a child's behaviour.
- Assuming or holding biases about whether a child will experience procedural anxiety or how they may express it (e.g., based on age, past medical experiences, sex or gender, culture, ethnicity, verbal or cognitive ability, medical condition).

Psychosocial and Physical Interventions

1. **Use supports** when available (e.g., Child Life Specialist).
2. **Prepare and partner.** Develop a coping plan with children and caregivers. Ensure they all have a supportive and active role in implementing coping strategies (e.g., comfort positioning, distraction).
3. **Never physically restrain the child.** If the child cannot remain still or safe, pause and refocus on coping strategies. Use of restraint can contribute to a traumatic event in the moment and avoidance of future medical care. Use comfort holds instead (e.g., sitting on caregiver's lap in a big hug).
4. **Try digital** (e.g., mobile phone, tablet, show) or **non-digital** (e.g., i-spy books, bubbles, music, conversation) **distraction** to draw a child's attention away from the procedure.
5. **Encourage in-the-moment coping** (e.g., deep breaths, positive coping statements like "I can do this").
6. **Ask about culturally relevant strategies/practices** (e.g., Indigenous traditions, prayers).
7. **Offer a calming environment** (e.g., low lighting, reduced noise, fewer people, privacy, one person speaking to child at a time).
8. **Use clear, honest, and supportive language before, during, and after the procedure.** Describe what they will see, smell, feel, or hear. Offer encouraging statements about coping and what went well.
9. **Offer appropriate and realistic choices.** Ensure consent/assent. Assent can be obtained even when a child is highly anxious. When able, modify procedures to reduce distress (e.g., IV location choice).
10. **Use applied muscle tension** for children with fainting: tense arms/legs/trunk 10-15 seconds until they feel a warm sensation in the head, then relax 20-30 seconds. Repeat 5 times.

Pharmacologic Interventions

All medications in this table are recommended to be a **SINGLE dose of a SINGLE agent** administered to patients 6 months or older. Monitoring requirements for a single dose of a single agent should be guided by each child's presenting condition and ongoing clinical status (see Monitoring below).

For intranasal medication administration:

- Use a mucosal atomizer device to enhance drug delivery/increased absorption
- Split dose between nostrils; maximum volume 1 mL/nostril
- Use most concentrated form of injectable medication:
 - midazolam 5 mg/mL, ketamine 50 mg/mL, dexmedetomidine 100 mcg/mL

Drug & Route	Dose	Comments/Cautions
Midazolam IntraNASAL	0.4 - 0.5 mg/kg/dose (MAX 10 mg/dose)	<ul style="list-style-type: none"> • Intranasal route preferred due to faster onset, higher sedation rates, and greater caregiver satisfaction versus oral midazolam.⁴ • Intranasal midazolam can be nasally irritating. • Onset: 5-10 minutes. Duration: 20-30 minutes
Midazolam ORAL	0.5 mg/kg/dose (MAX 20 mg/dose)	<ul style="list-style-type: none"> • Efficacy is lower for oral versus intranasal delivery;⁵ oral may be used if child has previous poor experience with intranasal irritation. • Onset: 15-20 minutes. Duration: variable
Ketamine IntraNASAL	3 mg/kg/dose (MAX 100 mg/dose)	<ul style="list-style-type: none"> • Provides analgesia at sub-dissociative (1 mg/kg) doses; results in mild sedative effects at higher doses (3 mg/kg).⁶ • Onset: within 10 minutes. Duration: up to 60 min
Dexmedetomidine IntraNASAL	3 - 4 mcg/kg/dose (MAX 200 mcg/dose)	<ul style="list-style-type: none"> • Do not use if patient has heart block, renal or hepatic impairment, or on beta-blockers. • Evidence is emerging and is promising for anxiolytic use in the ED. • Onset: 20-30 minutes. Duration: variable, dependent on time of day⁷
Nitrous oxide inhaled	Minimum 50-70% with oxygen; administer via continuous flow or demand valve	<ul style="list-style-type: none"> • Do not use if asthma exacerbation, cystic fibrosis, trapped air (e.g. bowel obstruction, pneumothorax), recent abdominal or thoracic surgery, altered level of consciousness, first trimester pregnancy. • On-demand valve minimizes oversedation and environmental emissions. Scavenger system recommended. • Begin 2-3 minutes before the procedure; allow equal washout time after. During the procedure, it can be used as needed to the desired level of anxiolysis.⁸ Offset is 2-3 minutes after discontinuation.

Monitoring

- A single dose of a single agent above is considered minimal sedation; monitor for adverse events (e.g., nausea, vomiting, dizziness, bradycardia, hypotension, rash) as per institution-specific guidelines if available.
- If institution-specific guidelines not available, monitoring should include continuous O₂ saturation monitoring; additional monitoring could also include heart rate, respiratory rate, end-tidal CO₂, and blood pressure. A full set of vital signs should be completed prior to the procedure, at least once within 30 minutes of medication administration, and before discharge.
- Observe the child/youth until able to perform their baseline activities as appropriate for time of day.

Future Preventative Steps

- If distress persists despite strategies, procedural sedation with batching of procedures will be required. Refer to [TREKK's Procedural Sedation Bottom Line Recommendations](#).
- For future support, refer to psychology, child life specialist, or similar professionals, if available, to develop coping plans and enable the family to access the quality care they need.

Scan or click the QR code to learn more and to see a full list of references and development team members



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