

# Position Statement

## Best practices in pain assessment and management for children

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### ABSTRACT

Pain assessment and management are essential components of paediatric care. Developmentally appropriate pain assessment is an important first step in optimizing pain management. Self-reported pain should be prioritized. Alternatively, developmentally appropriate behavioural tools should be used. Acute pain management and prevention guidelines and strategies that combine physical, psychological, and pharmacological approaches should be accessible in all health care settings. Chronic pain is best managed using combined treatment modalities and counselling, with the primary goal of attaining functional improvement. The planning and implementation of pain management strategies for children should always be personalized and family-centred.

**Keywords:** Analgesia; Assessment; Paediatrics; Pain; Treatment

Historically, children's pain has been under-recognized (1) and under-treated (2), and while progress in both assessment and treatment has been made in recent years, a knowledge-to-practice gap remains. Pain is under-evaluated in many settings (3), with the youngest children (4) and individuals who are cognitively impaired being the most negatively impacted (5,6). Multiple reasons for suboptimal treatment of pain are reported, including the difficulty of assessing pain in children (7), lack of time and resources, and educational, cultural, and legal factors (8).

Suboptimal pain management can have negative consequences in the short and longer term (8), including progression of acute discomfort and distress, increased fear and pain during subsequent medical visits, the development of chronic pain, and future avoidance of medical care (9). In contrast, adequate pain management is associated with faster recovery and reduced health care resource utilization (10). Treating pain does not delay diagnosis or decision-making (11,12) and often improves the health care provider's (HCP's) ability to evaluate and treat children (9).

This position statement focuses on timely, developmentally appropriate pain assessment and management strategies

for children in a family-centred context. It complements the Canadian Paediatric Society (CPS) statement on [procedural pain](#) published in 2019 (13).

### PAIN ASSESSMENT

Assessment is an essential step for optimal pain management (14). Appropriate assessment includes pain location, quality, duration, and intensity, and also requires use of a developmentally appropriate tool (Table 1) and repeated assessment(s) post-intervention. Particularly for chronic pain, a child's psychosocial context, with impacts on daily life (e.g., family, sleep, play, and school), should also be assessed (15).

### Self-reported pain scales

Pain is a subjective experience that can be modulated by emotions, developmental factors, culture, current context, and previous pain experiences (14,15). Whenever possible, children's pain should be evaluated through self-report rather than by proxy. Pain scales should be employed as directed,

using consistent, standardized scale anchors to facilitate comparison.

Among more than 60 readily available measurement tools, the most recommended scales include the verbal Numeric Rating Scale-11 (NRS-11), the Faces Pain Scale-Revised (FPS-R) (Figure 1), and the Color Analogue Scale (CAS) (16). These scales work best for acute presenting pain but have also been used in the post-operative setting. No single self-report scale has been strongly endorsed for children <6 years old or for the assessment of chronic pain (16,17).

The NRS-11 scale ranks pain severity from 0 (no pain) to 10 (worst pain possible or imaginable). The NRS-11 can be used for children ≥6 years old with acute pain (16,18). It can also be used, though with less supporting evidence, for post-operative and chronic pain. The main advantage of the NRS-11 is that it is verbally administered.

The FPS-R uses six facial images, ranging from 0 (no pain) to 10 (worst pain). Children sometimes prefer FPS-R to the NRS-11 and Visual Analogue Scale (VAS) (14,15). The FPS-R can be used in children aged 4 to 7 years old (14,15) to evaluate acute

and, with less evidence, post-operative pain (16). FPS-R is not recommended to evaluate chronic pain.

The CAS invites children to move a slider along the scale's length to indicate how much pain they have (from "no pain" to "most pain"), with a 0 to 10 scale printed on the back. CAS is used in children ≥8 years old, mainly to evaluate acute and, with less evidence, post-operative pain. Evidence to support the use of CAS for chronic pain assessment has been inconclusive (16).

Chronic pain assessment requires an evaluation of its multiple dimensions, with critical focus on the impacts of pain on a child's global functioning (e.g., school attendance, activities, socializing, and sleep) (19). Validated and readily available chronic pain assessment tools include the Bath Adolescent Pain Questionnaire (BAPQ), the Patient Reported Outcome Measurement Information System's (PROMIS's) Pediatric Pain Interference Scale (PPIS), and the Pediatric Pain Questionnaire (PPQ) (15). For more information, see the Holland Bloorview Kids Rehabilitation Hospital's [Toolbox for Children with Disabilities](#) (20). Emotional functioning measures for anxiety,

Table 1. Recommended pain scales

Scales	Age group recommended	Indications				Comments
		Acute pain	Procedural pain	Post-op pain	Chronic Pain <sup>†</sup>	
Self-report measures						
NRS-11	≥6 yo	++	++	+	+	No 'hard copy' tool required
FPS-R	≥4 yo*	++	++	+		Preferred by children
CAS	≥8 yo	++	++	+		
Observational measures						
NFCS	0 to 4 months	++	++		++	Acute, procedural, and prolonged pain
NIPS	0 to 1 month	+	+			Some potential bias
FLACC	2 months to 7 yo	+	+/-	+		Conflicting recommendations for procedural pain
r-FLACC	4 to 19 yo	+	+/-	+		
CHEOPS	1 to 7 yo		+/-	+		Score out of 13, conflicting recommendations for procedural pain
EVENDOL	0-7 yo	++	++		++	Score on 15

Supported by evidence: +/-, limited (conflictual recommendation); +, good (some bias, recommended in some review, less by other, weaker recommendation); ++, strong (less bias, more relevance, stronger recommendation). Based mainly on the reviews of references 4, 16, 23, 25, 26, 27, 28, 29.

\*Recommended for ≥7 years by some authors (16).

<sup>†</sup>See also validated tools proposed in the text for chronic pain.

CAS, Color Analog Scale; CHEOPS, Children's Hospital of Eastern Ontario Pain Scale; EVENDOL, Evaluation Enfant, DOuLeur; FLACC, Face, Legs, Activity, Cry, Consolability; FPS-R, Faces Pain Scale-Revised; NFCS, Neonatal Facing Coding System; NIPS, Neonatal Infant Pain Scale; NRS-11, Numeric Rating Scale-11; r-FLACC, Face, Legs, Activity, Cry, Consolability revised for children with cognitive impairment; yo, years old.

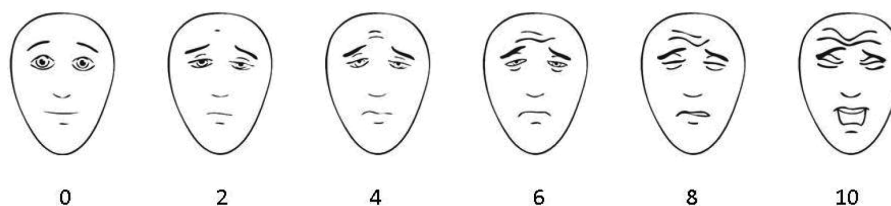


Figure 1. Faces pain scale-revised. Note: Consult the International Association for the Study of Pain (IASP) website for details. [www.iasp-pain.org/Education/Content.aspx?ItemNumber=1519](http://www.iasp-pain.org/Education/Content.aspx?ItemNumber=1519)

depressive symptoms, and pain catastrophizing (i.e., when an individual magnifies, dwells on, is pessimistic about or dreads pain), along with sleep measures, should also be employed to complete the evaluation (19).

### Observational pain measures

For pre-verbal and non-verbal children, evaluating behavioural signs such as facial expression, cry, irritability, poor feeding, sleep disturbance, and inactivity can help decode a child's discomfort level (21). Changing vital signs may be correlated with pain in infants, but are not reliable indicators in older children (4,21,22). Notably, an absence of change in vital signs does not indicate lack of pain in children.

When self-report of pain is not possible (e.g., due to young age, cognitive impairment, and mechanical ventilation), a behavioural pain scale or checklist should be used (23). For children with cognitive disability, never assume that a self-report cannot be obtained (4). If extent of intellectual disability truly precludes a child's ability to self-report pain, an observational scale should be used in tandem with a parent or caregiver's assessment. While self-reporting tools can be used by a caregiver or HCP to obtain a proxy assessment, caution is advised, particularly when an evaluator is not familiar with the child (23).

Out of more than 55 observational pain instruments currently available (4,24,25), only a small number are recommended (25). For infants, the Neonatal Infant Pain Scale (NIPS), and the Face, Legs, Activity, Cry, Consolability (FLACC) scale are recommended most often (4), though one recent systematic review has also suggested that the EVAluation ENfant DOuLour (EVENDOL), COMFORT, and Neonatal Facial Coding System (NFCS) scales carry lower risk for bias than other tools (25). Alternative scales to consider for infant pain are the Échelle de Douleur et d'Inconfort du Nouveau-né (EDIN), to assess prolonged pain in preterm infants; the Neonatal Pain, Agitation, and

Sedation Scale (N-PASS) for acute and prolonged pain; and the Premature Infant Pain Profile (PIPP) for procedural pain in pre-term and term neonates (25).

For toddlers and older children, the FLACC or the CHEOPS (Children's Hospital of Eastern Ontario Pain Scale) scales are also considered reliable and validated tools (23). However, some research has suggested that the EVENDOL, COMFORT, and NFCS scales are better choices due to lower risk for bias (25).

**The NIPS** is a 0 to 7 point scale comprising physiological, behavioural, and contextual indicators that were developed to assess procedural pain in newborns and older infants (24,26).

**The NFCS** measures acute, procedural, or prolonged pain by assessing facial cues (25). For more information on pain assessment and management in neonates, see this [joint statement](#) from the CPS and American Academy of Pediatrics (AAP) (27).

**The FLACC** 0 to 10 scale is recommended for evaluating post-operative pain in children 2 months to 7 years old. The FLACC is not optimal for evaluating procedural pain or for children who show fewer physical or vocal manifestations of pain (28,29). Further, during a procedure developmentally appropriate positioning (e.g., swaddling limits activity evaluation) can interfere with FLACC assessment (7,29). A revised scale (r-FLACC) includes measures for assessing cognitively impaired or non-verbal children 4 to 19 years old (4,29,30) (Figure 2).

**The EVENDOL** is a validated 16-point scale developed for children 0 to 7 years old in the emergency department and can be used for presenting, prolonged, and procedural pain (Figure 3) (25,31). It is particularly useful for children who show fewer physical or vocal manifestations of pain and is validated for use in prehospital settings (32).

**The CHEOPS** is a 14-point scale that measures post-operative pain. The main challenge with use is that a score of 4 to 6 represents no pain, which appears counterintuitive.

Category	0	1	2
<b>F</b> Face	No particular expression or smile	<b>Occasional grimace/frown;</b> <i>Withdrawn or disinterested; appears sad or worried</i>	<b>Consistent grimace or frown;</b> <i>frequent/constant quivering chin, clenched jaw; distressed-looking face; expression of fright or panic</i>
<b>L</b> Legs	<b>Normal position or relaxed;</b> <i>usual tone and motion to limbs</i>	<b>Uneasy, restless, tense;</b> <i>occasional tremors</i>	<b>Kicking, or legs drawn up;</b> <i>marked increase in spasticity, constant tremors or jerking</i>
<b>A</b> Activity	<b>Lying quietly, normal position, moves easily;</b> <i>regular, rhythmic respirations</i>	<b>Squirming, shifting back and forth, tense or guarded movements;</b> <i>mildly agitated (e.g. head back and forth, aggression); shallow, splinting respirations, intermittent sighs</i>	<b>Arched, rigid or jerking;</b> <i>severe agitation; head banging; shivering (not rigors); breath holding, gasping or sharp intake of breaths, severe splinting</i>
<b>C</b> Cry	<b>No cry/verbalisation</b>	<b>Moans or whimpers; occasional complaint;</b> <i>occasional verbal outburst or grunt</i>	<b>Crying steadily, screams or sobs, frequent complaints;</b> <i>repeated outbursts, constant grunting</i>
<b>C</b> Consolability	<b>Content and relaxed</b>	<b>Reassured by occasional touching, hugging, or being talked to, distractible</b>	<b>Difficult to console or comfort,</b> <i>pushing away caregiver, resisting care or comfort measures</i>

Figure 2. FLACC and r-FLACC scales. Adapted from Malviya 2006 (30) combining the original FLACC (text in bold) and the addition of the r-FLACC (text in italic)

Name		Signs				Assessment at admission		Following assessments and/or after analgesic <sup>2</sup>			
		sign absent	sign weak or transient	sign moderate or present about half the time	sign strong or present almost all the time	at rest <sup>1</sup> (R)	during examination <sup>2</sup> or mobilization (M)	R	M	R	M
Vocal or verbal expression											
cries and/or screams and/or moans and/or complains of pain		0	1	2	3						
Facial expression											
furrowed forehead and/or frown, furrowed or bulging brow and/or tense mouth		0	1	2	3						
Movements											
restlessness, agitation and/or rigidity and/or muscular tenseness		0	1	2	3						
Postures											
unusual and/or antalgic posture and/or protection of the painful area and/or immobility		0	1	2	3						
Interaction with the environment											
can be comforted and/or interested in playing and/or interacts with people		normal 0	low 1	very low 2	absent 3						
Remarks		Total / 15									
		Date & Time									
		Signature									

Figure 3. EVENDOL scale.

Instructions: <sup>1</sup>Assess at rest (R): observe the child from a distance, before performing any examination or procedure, at rest, ensuring the best possible conditions of safety and comfort, for example, with his/her parents, when he/she is playing. <sup>2</sup>During examination or mobilization (M): assess pain during examination or mobilization or palpation of the painful area by nurse or by doctor. <sup>3</sup>Reassess pain regularly after analgesic administration: wait 30 to 45 min if analgesic is administered by oral or rectal route, 5 to 10 min if administered by IV route. Note whether the child is at rest (R) or mobilized (M). From reference 31. Reproduced with permission.

Moreover, some studies have suggested that the CHEOPS scale is not appropriate for evaluating procedural pain (28). However, the MBPS (Modified Behavioral Pain Scale), a modified version of the CHEOPS, has been validated for evaluating immunization-related pain in children 2 to 22 months old, though it is not recommended for other procedures or age groups (33,34).

The COMFORT scale takes time to administer, but has been validated and adapted for use in children of all ages who are undergoing mechanical ventilation (23,25,26).

A valid behavioural scale for children experiencing chronic pain has not yet been identified (23).

### TIMING OF ASSESSMENT

Evaluating a child’s pain at first encounter is recommended, with regular reassessments during care. Re-evaluating pain following every intervention and during every procedure is essential for assessing therapeutic efficacy. To optimize comparison, the same scale(s) should be used each time (Table 1) (21). The dual goals of pain measurement are to relieve children’s pain and assess their response to treatment.

### ACUTE PAIN MANAGEMENT

Pain is the most common reason to seek medical attention in all acute care settings in Canada (21). There is strong evidence

that pain can be treated early without affecting diagnostic accuracy (4,11,12). In fact, pain relief often makes examination and testing easier, thereby facilitating diagnosis. A growing body of evidence supports many different effective pain management strategies. General pain treatment includes pharmacological but also, concomitantly and equally importantly, physical and psychological therapies. Treatment of pain in the health care setting must include preventing and managing pain associated with procedures. Adjunctively with pain prevention see the “3 P” approach described in a previous CPS statement (13) and the acute pain toolkit from Children’s Healthcare Canada (CHC) (35).

### PAIN MANAGEMENT GUIDELINES AND PROTOCOLS

Early pain assessment and management should be an essential component of any health care encounter. Advocating for nurse- or paramedic-initiated medical directives can empower these health professionals to address children’s pain needs in a timely fashion. For example, standing orders to administer analgesia or apply topical anesthetic before venipuncture in acute care settings facilitates early pain relief and may improve a child’s experience. Access to tools for distraction while awaiting a medical consultation or treatment can further improve the overall medical experience.



**Table 2.** Dosing of pain medications for children and youth

	Dose (maximum)	Notes and contraindications (CI)
Ibuprofen, oral	10 mg/kg/dose (maximum 600 mg/dose) By mouth every 6 to 8 h, as needed (maximum daily: 40 mg/kg/day or 2400 mg/day)	<ul style="list-style-type: none"> <li>• First-line for mild to moderate pain, co-analgesia for moderate to severe pain</li> <li>• Choose oral or intravenous (IV) NSAID, not both</li> <li>• This dose is generally for patients <math>\geq 6</math> months old</li> </ul> CI: Allergy, moderate or severe dehydration, impaired renal function, severe impaired cardiac or hepatic function, active bleeding, gastrointestinal (GI) bleeding or ulcer, surgery planned in the next 24 h, coagulopathy, thrombopenia, active chickenpox, undergoing anticoagulant drug or chemotherapy
Acetaminophen, oral	15 mg/kg/dose (maximum 650 mg to 1 g/dose)  By mouth every 4 to 6 h, as needed (maximum daily: 75 mg/kg/day or 4 g/day, whichever is less)	<ul style="list-style-type: none"> <li>• First-line for mild pain if ibuprofen is contraindicated, co-analgesia for moderate to severe pain</li> <li>• Do not administer if IV acetaminophen is used</li> </ul> CI: Allergy, severe hepatic impairment, acetaminophen intoxication
Morphine, oral	0.2 mg/kg/dose to 0.5 mg/kg/dose (maximum 15 mg/dose) By mouth every 4 to 6 h, as needed (maximum daily: 6 doses) (maximum 3 days for acute pain)	<ul style="list-style-type: none"> <li>• Co-analgesia for moderate to severe pain with first-line medications</li> <li>• Make sure that ibuprofen and acetaminophen are taken around the clock before oral opiate, if no contraindications</li> <li>• Should not be used for an infant at home</li> <li>• Undergoing opioid monitoring (refer to local guidelines)</li> <li>• Discuss safe storing at home and safe disposal of unused medication</li> </ul> CI: Allergy, unstable patient (including apnea)
Fentanyl, intranasal	1 mcg/kg/dose to 2 mcg/kg/dose (maximum 75 to 100 mcg/dose) Intranasal for 1 to 2 doses (maximum 100 mcg total, until alternative mode of analgesia is administered)	<ul style="list-style-type: none"> <li>• Co-analgesia for severe pain with first-line medications</li> <li>• Divide dose between nostrils to maximize absorption</li> <li>• Use fentanyl 50 mcg/mL for a maximum of 1 mL per nostril</li> <li>• Use for patients <math>\geq 1</math> yo</li> <li>• Only for hospital use</li> <li>• Undergoing opioid monitoring (refer to local guidelines)</li> </ul> CI: Allergy, unstable patient, active epistaxis, nasal abnormality
Ketorolac, IV	0.5 mg/kg/dose (maximum <16 years: 15 mg/dose, $\geq 16$ years: 30 mg/dose) IV every 6 to 8 h as needed (maximum daily: 4 doses for a maximum of 2 days)	<ul style="list-style-type: none"> <li>• May be used instead of oral ibuprofen if the patient has an IV line as first-line medication</li> <li>• Choose oral or IV NSAID, not both</li> </ul> CI: See ibuprofen
Acetaminophen, IV	15 mg/kg/dose (maximum 1 g/dose) IV every 6 h over 15 minutes, as needed (maximum daily: 60 mg/kg/day or 4 g/day, whichever is less)	<ul style="list-style-type: none"> <li>• May be used instead of oral acetaminophen if patient cannot tolerate medication by mouth</li> <li>• Do not administer faster than over 15 minutes because of risk of hypotension. Be especially careful with precarious hemodynamic patients</li> <li>• Expensive. Reserve for patients who cannot tolerate oral acetaminophen</li> </ul> CI: Allergy, unstable patient, severe hepatic impairment, acetaminophen intoxication, neonates
Morphine, IV (intermittent dosing)	0.05 mg/kg/dose to 0.1 mg/kg/dose (maximum 5 mg/dose) IV over 5 minutes every 2 to 4 h, as needed	<ul style="list-style-type: none"> <li>• Co-analgesia for severe pain with first-line medications</li> <li>• Consider lower doses in opioid-naïve patients</li> <li>• If pain is insufficiently controlled with intermittent morphine dosing, consider initiating a morphine infusion or patient-controlled analgesia (PCA). Consultation with paediatric pain team is recommended</li> <li>• Undergoing opiate monitoring (refer to local guideline)</li> </ul> CI: Allergy, unstable patient

NSAID, non-steroidal anti-inflammatory drug; yo, years old.

### First-line medications

Combined with physical and psychological strategies, over-the-counter (OTC) analgesics can be used as monotherapy for mild to moderate (1–3 to 4–6/10) pain or as co-therapy for moderate to severe pain (4–6 to 7–10/10). OTC analgesics include acetaminophen and non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Table 2).

Ibuprofen is more effective than acetaminophen for the treatment of children's pain (36), particularly for acute pain, musculoskeletal trauma, headache, and post-dental extraction (21,37,38) and has a comparable safety profile (36,39). Moreover, ibuprofen is comparable to oral morphine for sprains, simple fractures, and following minor orthopedic procedures and tonsillectomy, with less risk for adverse events (40–43). The

combination of acetaminophen and ibuprofen to manage dental extraction or tonsillectomy pain is superior compared with acetaminophen used alone (21).

### Opioid analgesia

Patients presenting with acute moderate to severe pain unlikely to be resolved by physical and psychological strategies and first-line analgesics should be offered pharmacological interventions on an escalating basis. Opioids should be used judiciously, with appropriate dosing assessment to avoid adverse events, and careful monitoring (Table 2). Co-therapy with OTC analgesics should be ongoing due to opioid-sparing effects and to reduce adverse events (21,39,44,45). Codeine should never be used in children under 18 years old, as per Health Canada directives (46,47).

In the context of the international opioid crisis, concerns regarding substance misuse and dependency following even short-term therapeutic use in youth have emerged (48–50). However, they should not discourage appropriate opioid use for children and youth presenting with acute severe pain or who are not responding to first-line treatments. In medical settings, opioid administration should be as rapid and painless as possible. When required at discharge (3), prescriptions of no more than five to ten doses are advised for a 2- to 3-day period (50). This prescription must be accompanied by instructions for follow-up if pain relief is inadequate, safe storage at home, and safe disposal of unused medication (i.e., returning it to a pharmacy) (48,51). See [Solutions for Kids](#) in Pain resources (51).

Intranasal (IN) fentanyl is an effective analgesic for treating acute moderate to severe pain in children and causes minimal distress at administration (52,53). IN fentanyl allows for faster and less painful administration than the IV or intramuscular (IM) routes and has a faster onset of action than oral delivery. Also safe and effective in the prehospital setting (54), IN fentanyl is the opioid of first-line for moderate to severe pain in Canadian paediatric EDs (55). It has also been evaluated as a safe and effective initial treatment for painful vaso-occlusive episodes (VOE) in sickle cell disease (SCD), reducing time to first parenteral opioid and the number of IV insertions (56–58).

IV opioids are often used preferentially in acute medical settings, once vascular access has been established (21), with IV morphine being the most common agent (59). IV and IN opioids must be monitored appropriately and titrated to effect, always considering severity of the patient's pain and whether they are opioid-naïve.

### Analgesic adjuncts and alternatives

Numerous agents and routes of administration are being explored in the acute care setting. Recently, sub-dissociative dosing of IN ketamine has been shown to have comparable efficacy to IN fentanyl for limb injuries, but with increased risk for adverse effects (60–62). IV ketorolac appears to have opioid-sparing effects, but its role as monotherapy remains unclear (21). Other emerging options in Canada include IV acetaminophen. One retrospective study has reported promising results for IV acetaminophen in reducing pain in children with SCD presenting with VOE (63), but further study is required (Table 2).

## CHRONIC PAIN

Chronic pain (defined as persistent or recurrent for >3 months) is a common problem that can significantly impact social, economic, and health outcomes for children, youth, and families. Pain can be secondary to underlying chronic conditions such as SCD or inflammatory bowel disease, or part of a primary pain disorder, as with irritable bowel syndrome or complex regional pain syndrome (64–66). Headaches, abdominal, and musculoskeletal pain are the most prevalent forms of paediatric chronic pain (67). Chronic pain prevalence rates in children range between 11% and 38% (67), are generally higher in girls, and increase with age (except for abdominal pain, which tends to present in younger children). Associated factors include lower socioeconomic status, anxiety, depression, and low self-esteem (67). Frequency of chronic pain in children rises when there is a parental history of chronic pain (68).

About 5% of children and youth living with chronic pain are functionally disabled by it (i.e., missing out on school and social activities) (64,69). Pain catastrophizing (70) can further influence pain-related behaviours, such as avoiding activity or physical hypervigilance.

Neuropathic pain can be secondary to several different conditions, such as trauma, surgery, cancer (or its treatment), autoimmune disorders (e.g., Guillain-Barré syndrome), or rare diseases (e.g., mitochondrial disorders) (71,72). Few studies on managing neuropathic pain in children have been published, and current guidance is based largely on experience with adults.

## CHRONIC PAIN MANAGEMENT

Chronic pain is best managed by combining treatment modalities, including psychological, physical, occupational, and pharmacological therapies. Approaches should be individualized, with symptom severity, level of function, co-morbidities (including anxiety or depression), and the child's and family's ability to actively engage in therapy being prime considerations. The primary initial focus of treatment is functional improvement rather than pain reduction per se (70). In cases of severe functional disability, or when symptom intensity has not improved despite multimodal outpatient treatment, referral to an interdisciplinary chronic pain treatment program is needed (69,70).

Psychological therapies include psychoeducation, physiological self-regulation training (e.g., biofeedback, hypnosis), cognitive skills training, and behavioural exposure therapy. Involving parents and caregivers in pain and coping strategies education is key to success (73). The goal of physical therapy is to assess and treat secondary musculoskeletal impairments and use evidence-based chronic pain strategies, such as gradual exposure to movement, pacing, and graded motor imaging to increase tolerance of physical activity and optimize participation. Occupational therapy (OT) helps promote sensory rehabilitation to decrease sensitivity to stimuli that are perceived as painful. OT helps the child to get back to activities of daily living and self-care (70). Pharmacological therapy may include antidepressants (e.g., amitriptyline) or antiepileptics (e.g., gabapentin, pregabalin). There is no quality evidence for the pharmacological treatment of chronic non-cancer pain in children (74). For more on chronic pain management strategies, see the chronic pain toolkit from [Children's Healthcare Canada](#) (35).

## EMPOWERING PATIENTS, PARENTS, AND CAREGIVERS

Patient- and family-centred care are essential to pain management, and parents, children, and youth all have active roles to play in pain management and health care planning (75). At home, a child's acute pain should be self-assessed whenever possible, and when a proxy is needed, parents or caregivers should be taught to assess a child's pain regularly using developmentally appropriate tools (23,76). To facilitate both acute and chronic pain management at home, involving parents and caregivers in clinical encounters informs and empowers them to provide optimal pain management later on. Psychological strategies, such as distraction, can be equally useful on the home front, and physical care strategies, such as appropriate wound dressing or encouraging physical activity, are important, teachable 'take home' skills. Adequate analgesics should be prescribed, with detailed guidance on how best to prevent pain and risk for adverse events. Clear, written instructions on medication dose, frequency, and duration of use must be provided (35,77).

## RECOMMENDATIONS

- Education on the use of developmentally appropriate pain assessment tools is an essential first step to providing optimal pain management in paediatrics.
- Whenever possible, children's pain should be self-reported. When self-reporting is not possible or appropriate, an appropriate assessment tool should be used.
- In medical settings, pain management can be improved through:
  - mandatory pain assessment at the first encounter with children and youth,
  - timely reassessment (and documentation) during and after procedures, as appropriate, and following every clinical intervention,
  - integrating pain assessment and management steps into treatment algorithms, electronic medical records, hospital guidelines, and regional or provincial/territorial guidelines.
- Pain prevention and management guidelines must include psychological, physical, and pharmacological strategies for acute and chronic pain. Health care directives and practice guidelines should combine strategies and approaches in the health care setting and for use at home.
- When managing chronic pain in paediatrics, relief of symptoms and improved function are the primary goals.
- Parents and caregivers should be counselled and trained in appropriate pain assessment and management and provided with clear instructions for therapy and medication use at home.

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## REFERENCES

1. Bulloch B, Garcia-Filion P, Notracia D, Bryson M, McConahay T. Reliability of the color analog scale: Repeatability of scores in traumatic and nontraumatic injuries. *Acad Emerg Med* 2009;16(5):465–9.
2. Birnie KA, Chambers CT, Fernandez CV, et al. Hospitalized children continue to report undertreated and preventable pain. *Pain Res Manag* 2014;19(4):198–204.
3. Paquin H, Trottier ED, Robitaille N, Pastore Y, Bergeron MJ, Bailey B. Oral morphine protocol evaluation for the treatment of vaso-occlusive crisis in paediatric sickle cell patients. *Paediatr Child Health* 2019;24(1):e45–50.
4. Drendel AL, Kelly BT, Ali S. Pain assessment for children: Overcoming challenges and optimizing care. *Pediatr Emerg Care* 2011;27(8):773–81.
5. Malviya S, Voepel-Lewis T, Merkel S, Tait AR. Difficult pain assessment and lack of clinician knowledge are ongoing barriers to effective pain management in children with cognitive impairment. *Acute Pain* 2005;7(1):27–32.
6. Hauer J, Houtrow AJ. Section on Hospice and Palliative Medicine, Council on Children with Disabilities. Pain assessment and treatment in children with significant impairment of the central nervous system. *Pediatrics* 2017;139(6):e20171002.
7. Crellin DJ, Harrison D, Santamaria N, Huque H, Babl FE. The psychometric properties of the FLACC scale used to assess procedural pain. *J Pain* 2018;19(8):862–72.
8. Brennan F, Carr DB, Cousins M. Pain management: A fundamental human right. *Anesth Analg* 2007;105(1):205–21.
9. 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; quiz 43.
10. Stinson JN, McGrath P. No pain – all gain: Advocating for improved paediatric pain management. *Paediatr Child Health* 2007;12(2):93–4.
11. Bailey B, Bergeron S, Gravel J, Bussières JF, Bensoussan A. Efficacy and impact of intravenous morphine before surgical consultation in children with right lower quadrant pain suggestive of appendicitis: A randomized controlled trial. *Ann Emerg Med* 2007;50(4):371–8.
12. Poonai N, Paskar D, Konrad SL, et al. Opioid analgesia for acute abdominal pain in children: A systematic review and meta-analysis. *Acad Emerg Med* 2014;21(11):1183–92.
13. Trottier ED, Bergeron MJ, Chauvin-Kimoff L, Baerg K, Ali S; Canadian Paediatric Society Acute Care Committee Hospital Paediatrics Section, Community Paediatrics Section Paediatric Emergency Care Section. Managing pain and distress in children undergoing brief diagnostic and therapeutic procedures. *Paediatr Child Health* 2019;24(8):509–21.
14. Huguet A, Stinson JN, McGrath PJ. Measurement of self-reported pain intensity in children and adolescents. *J Psychosom Res* 2010;68(4):329–36.
15. Manworren RC, Stinson J. Pediatric pain measurement, assessment, and evaluation. *Semin Pediatr Neurol* 2016;23(3):189–200.



16. Birnie KA, Hundert AS, Lalloo C, Nguyen C, Stinson JN. Recommendations for selection of self-report pain intensity measures in children and adolescents: A systematic review and quality assessment of measurement properties. *Pain* 2019;160(1):5–18.
17. Tomlinson D, von Baeyer CL, Stinson JN, Sung L. A systematic review of faces scales for the self-report of pain intensity in children. *Pediatrics* 2010;126(5):e1168–98.
18. Bailey B, Daoust R, Trottier ED, Dauphin-Pierre S, Gravel J. Validation and properties of the verbal numeric scale in children with acute pain. *Pain* 2010;149(2):216–21.
19. Palermo TM. Assessment of chronic pain in children: Current status and emerging topics. *Pain Res Manag* 2009;14(1):21–6.
20. Kingsnorth S, Townley A, Provvienza C, et al. *Chronic Pain Assessment Toolbox for Children with Disabilities: Section 3.0; Chronic pain assessment tools*. Version 2. Toronto, Ontario: Holland Bloorview Kids Rehabilitation Hospital, 2018: <http://hollandbloorview.ca/toolbox> (Accessed November 25, 2021).
21. Bailey B, Trottier ED. Managing pediatric pain in the emergency department. *Paediatr Drugs* 2016;18(4):287–301.
22. Krauss BS, Calligaris L, Green SM, Barbi E. Current concepts in management of pain in children in the emergency department. *Lancet* 2016;387(10013):83–92.
23. von Baeyer CL, Spagrud LJ. Systematic review of observational (behavioral) measures of pain for children and adolescents aged 3 to 18 years. *Pain* 2007;127(1-2):140–50.
24. Cong X, McGrath JM, Cusson RM, Zhang D. Pain assessment and measurement in neonates: An updated review. *Adv Neonatal Care* 2013;13(6):379–95.
25. Giordano V, Edobor J, Deindl P, et al. Pain and sedation scales for neonatal and pediatric patients in a preverbal stage of development: A systematic review. *JAMA Pediatr* 2019;173(12):1186–97.
26. Beltramini A, Milojevic K, Pateron D. Pain assessment in newborns, infants, and children. *Pediatr Ann* 2017;46(10):e387–95.
27. Barrington KJ, Batton DG, Finley GA, Wallman C; Canadian Paediatric Society, Fetus and Newborn Committee. Joint statement with the AAP: Prevention and management of pain in the neonate: An update. *Pediatrics* 2006;118(5):2231–41.
28. Crellin D, Sullivan TP, Babl FE, O'Sullivan R, Hutchinson A. Analysis of the validation of existing behavioral pain and distress scales for use in the procedural setting. *Paediatr Anaesth* 2007;17(8):720–33.
29. Crellin DJ, Harrison D, Santamaria N, Babl FE. Systematic review of the Face, Legs, Activity, Cry and Consolability scale for assessing pain in infants and children: Is it reliable, valid, and feasible for use? *Pain* 2015;156(11):2132–51.
30. Malviya S, Voepel-Lewis T, Burke C, Merkel S, Tait AR. The revised FLACC observational pain tool: improved reliability and validity for pain assessment in children with cognitive impairment. *Pediatr Anesthesia*. 2006;16(3):258–65.
31. Fournier-Charrière E, Tourniaire B, Carbajal R, et al. EVENDOL, a new behavioral pain scale for children ages 0 to 7 years in the emergency department: Design and validation. *Pain* 2012;153:1573–82. <https://pediadol.org/evendol-echelle-pour-evaluer-la-douleur-de-lenfant-de-moins-de-7-ans-aux-urgences/> (Accessed November, 2021).
32. Beltramini A, Galinski M, Chabernaud JL, et al. Pain assessment in children younger than 8 years in out-of-hospital emergency medicine: Reliability and validity of EVENDOL score. *Pediatr Emerg Care* 2019;35(2):125–31.
33. Taddio A, Hogan ML, Moyer P, et al. Evaluation of the reliability, validity and practicality of 3 measures of acute pain in infants undergoing immunization injections. *Vaccine* 2011;29(7):1390–4.
34. Crellin DJ, Babl FE, Santamaria N, Harrison D. A systematic review of the psychometric properties of the Modified Behavioral Pain Scale (MBPS). *J Pediatr Nurs* 2018;40:14–26.
35. Knowledge Exchange Network (KEN)/Children's Healthcare Canada (CHS). Pediatric pain, toolkits and resources: <https://ken.childrenshealthcarecanada.ca/xwiki/bin/view/Paediatric+Pain/> (Accessed November 8, 2021).
36. Pierce CA, Voss B. Efficacy and safety of ibuprofen and acetaminophen in children and adults: A meta-analysis and qualitative review. *Ann Pharmacother* 2010;44(3):489–506.
37. Le May S, Ali S, Khadra C, et al. Pain management of pediatric musculoskeletal injury in the emergency department: A systematic review. *Pain Res Manag* 2016;2016:4809394.
38. Tan F, Braithwaite I, McKinlay C, Dalziel SR. Comparison of acetaminophen (paracetamol) with ibuprofen for treatment of fever or pain in children younger than 2 years: A systematic review and meta-analysis. *JAMA Netw Open* 2020;3(10):e2022398.
39. Hartling L, Ali S, Dryden DM, et al. How safe are common analgesics for the treatment of acute pain for children? A systematic review. *Pain Res Manag* 2016;2016:1–5.
40. Poonai N, Bhullar G, Lin K, et al. Oral administration of morphine versus ibuprofen to manage postfracture pain in children: A randomized trial. *CMAJ* 2014;186(18):1358–63.
41. Poonai N, Dato N, Ali S, et al. Oral morphine versus ibuprofen administered at home for postoperative orthopedic pain in children: A randomized controlled trial. *CMAJ* 2017;189(40):E1252–8.
42. Le May S, Ali S, Plint AC, et al. Oral analgesics utilization for children with musculoskeletal injury (OUCH Trial): An RCT. *Pediatrics* 2017;140(5):1–9.
43. Kelly LE, Sommer DD, Ramakrishna J, et al. Morphine or ibuprofen for post-tonsillectomy analgesia: A randomized trial. *Pediatrics* 2015;135(2):307–13.
44. Ferland CE, Vega E, Ingelmo PM. Acute pain management in children: Challenges and recent improvements. *Curr Opin Anaesthesiol* 2018;31(3):327–32.
45. American College of Emergency Physicians. Optimizing the treatment of acute pain in the emergency department. 2017: [www.acep.org/patient-care/policy-statements/optimizing-the-treatment-of-acute-pain-in-the-emergency-department/](http://www.acep.org/patient-care/policy-statements/optimizing-the-treatment-of-acute-pain-in-the-emergency-department/) (Accessed October 27, 2021).
46. Government of Canada. Health Canada's review recommends codeine only be used in patients aged 12 and over. 2013: [healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2013/33915a-eng.php](http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2013/33915a-eng.php) (Accessed October 27, 2021).
47. Government of Canada. Recalls and safety alerts: non-prescription pain relief products containing codeine are not recommended for use in people under 18 years of age. 2020: [healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2020/73635a-eng.php](http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2020/73635a-eng.php) (Accessed October 27, 2021).
48. Ahrari M, Ali S, Hartling L, et al. Nonmedical opioid use after short-term therapeutic exposure in children: A systematic review. *Pediatrics* 2021;148(6):e2021051927.
49. Institute for Safe Medication Practices Canada. Safer decisions save lives: key opioid prescribing messages for community practitioners. *ISMP Canada Safety Bulletin* 2016;16(8): [www.ismp-canada.org/ISMPSafetyBulletins.htm](http://www.ismp-canada.org/ISMPSafetyBulletins.htm) (Accessed October 27, 2021).
50. Health Quality Ontario. Evidence to improve care: opioid prescribing for acute pain. 2018: [www.hqontario.ca/evidence-to-improve-care/quality-standards/view-all-quality-standards/opioid-prescribing-for-acute-pain](http://www.hqontario.ca/evidence-to-improve-care/quality-standards/view-all-quality-standards/opioid-prescribing-for-acute-pain) (Accessed October 27, 2021).
51. Reiter E, Ali; Solutions for kids in pain. so you have been prescribed an Opioid?: <https://kidsinpain.ca/skip-resources/> (Accessed November 8, 2021).
52. Mudd S. Intranasal fentanyl for pain management in children: A systematic review of the literature. *J Pediatr Health Care* 2011;25(5):316–22.
53. Murphy A, O'Sullivan R, Wakai A, et al. Intranasal fentanyl for the management of acute pain in children. *Cochrane Database Syst Rev* 2014(10):CD009942.
54. Murphy AP, Hughes M, McCoy S, Crispino G, Wakai A, O'Sullivan R. Intranasal fentanyl for the prehospital management of acute pain in children. *Eur J Emerg Med* 2017;24(6):450–4.
55. Fowler M, Ali S, Gouin S, et al. Knowledge, attitudes and practices of Canadian pediatric emergency physicians regarding short-term opioid use: A descriptive, cross-sectional survey. *CMAJ Open* 2020;8(1):E148–55.



56. Kavanagh PL, Sprinz PG, Wolfgang TL, et al. Improving the management of vaso-occlusive episodes in the pediatric emergency department. *Pediatrics* 2015;136(4):e1016–25.
57. Akinsola B, Hagbom R, Zmitrovich A, et al. Impact of intranasal fentanyl in nurse initiated protocols for sickle cell vaso-occlusive pain episodes in a pediatric emergency department. *Am J Hematol* 2018;E205–6.
58. Paquin H, Trottier ED, Pastore Y, Robitaille N, Doré Bergeron MJ, Bailey B. Evaluation of a clinical protocol using intranasal fentanyl for treatment of vaso-occlusive crisis in sickle cell patients in the emergency department. *Paediatr Child Health* 2020;25(5):293–9.
59. Poonai N, Zhu R. Analgesia for children in acute pain in the post-codeine era. *Curr Pediatr Rev* 2018;14(1):34–40.
60. Gaudins A, Meek R, Egerton-Warburon 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(3):248–254.e1.
61. 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(2):140–6.
62. Reynolds SL, Bryant KK, Studnek JR, et al. Randomized controlled feasibility trial of intranasal ketamine compared to intranasal fentanyl for analgesia in children with suspected extremity fractures. *Acad Emerg Med* 2017;24(12):1430–40.
63. Baichoo P, Asuncion A, El-Chaar G. Intravenous acetaminophen for the management of pain during vaso-occlusive crises in pediatric patients. *P T* 2019;44(1):5–8.
64. Friedrichsdorf SJ, Giordano J, Dakoji KD, Warmuth A, Daughtry C, Schulz CA. Chronic pain in children and adolescents: Diagnosis and treatment of primary pain disorders in head, abdomen, muscles and joints. *Children (Basel)* 2016;3(4):1–26.
65. Schechter NL. Functional pain: Time for a new name. *JAMA Pediatr* 2014;168(8):693–4.
66. Treede RD, Rief W, Barke A, et al. A classification of chronic pain for ICD-11. *Pain* 2015;156(6):1003–7.
67. King S, Chambers CT, Hugueta A, et al. The epidemiology of chronic pain in children and adolescents revisited: A systematic review. *Pain* 2011;152(12):2729–38.
68. McKillop HN, Banez GA. A broad consideration of risk factors in pediatric chronic pain: Where to go from here? *Children (Basel)* 2016;3(4):1–18.
69. Miró J, Hugueta A, Nieto R. Predictive factors of chronic pediatric pain and disability: A Delphi poll. *J Pain* 2007;8(10):774–92.
70. Harrison LE, Pate JW, Richardson PA, Ickmans K, Wicksell RK, Simons LE. Best-evidence for the rehabilitation of chronic pain. Part 1. Pediatric pain. *J Clin Med* 2019;8(9):1–19.
71. Walco GA, Dworkin RH, Krane EJ, LeBel AA, Treede RD. Neuropathic pain in children: Special considerations. *Mayo Clin Proc* 2010;85(3 Suppl):S33–41.
72. Verriotis MA, Walker SM. Neuropathic pain in children. In: McGrath PJ, Stevens BJ, Walker SM, Zempsky WT, eds. *Oxford Textbook of Paediatric Pain*. Oxford, UK: Oxford University Press, 2021.
73. Simons LE, Basch MC. State of the art in biobehavioral approaches to the management of chronic pain in childhood. *Pain Manag* 2016;6(1):49–61.
74. Eccleston C, Fisher E, Cooper TE, et al. Pharmacological interventions for chronic pain in children: An overview of systematic reviews. *Pain* 2019;160(8):1698–707.
75. Whiston C, Ali S, Wright B, et al. Is caregiver refusal of analgesics a barrier to pediatric emergency pain management? A cross-sectional study in two Canadian centres. *CJEM* 2018;20(6):892–902.
76. Drendel A. Spotlight Pain Scale. 2014: <http://www.stoplightpainscale.com/> (Accessed November 25, 2021).
77. Institute for Safe Meditation Practices Canada. 5 Questions to Ask about Your Medications. 2021: [safemedicationuse.ca/tools\\_resources/5questions.html](https://safemedicationuse.ca/tools_resources/5questions.html) (Accessed October 27, 2021).

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