

Migraine

Migraine accounts for up to 30% of pediatric Emergency Department (ED) visits for headache and results in frequent ED revisits. The average age of onset is 7 years in boys and 9 years in girls. Migraine is more common in girls by adolescence. Evidence for ED management of acute migraine attacks in children and adolescents is limited, resulting in significant practice variation. This document focuses on the ED management of acute migraine attacks in children and adolescents.

Diagnosis

International Headache Society Criteria for Migraine without Aura in Children and Adolescents¹

- A. At least five attacks fulfilling criteria B-D (if fewer than 5 attacks, diagnosis of “probable migraine”)
- B. Headache attacks lasting 2-72 hours (untreated or unsuccessfully treated)
- C. Headache has at least two of the following four characteristics:
 - Unilateral location or bilateral frontotemporal location*
 - Pulsating quality
 - Moderate or severe pain intensity
 - Aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs)
- D. During headache at least one of the following:
 - Nausea and/or vomiting
 - Photophobia and phonophobia
- E. Not better accounted for by another International Classification of Headache Disorders diagnosis.

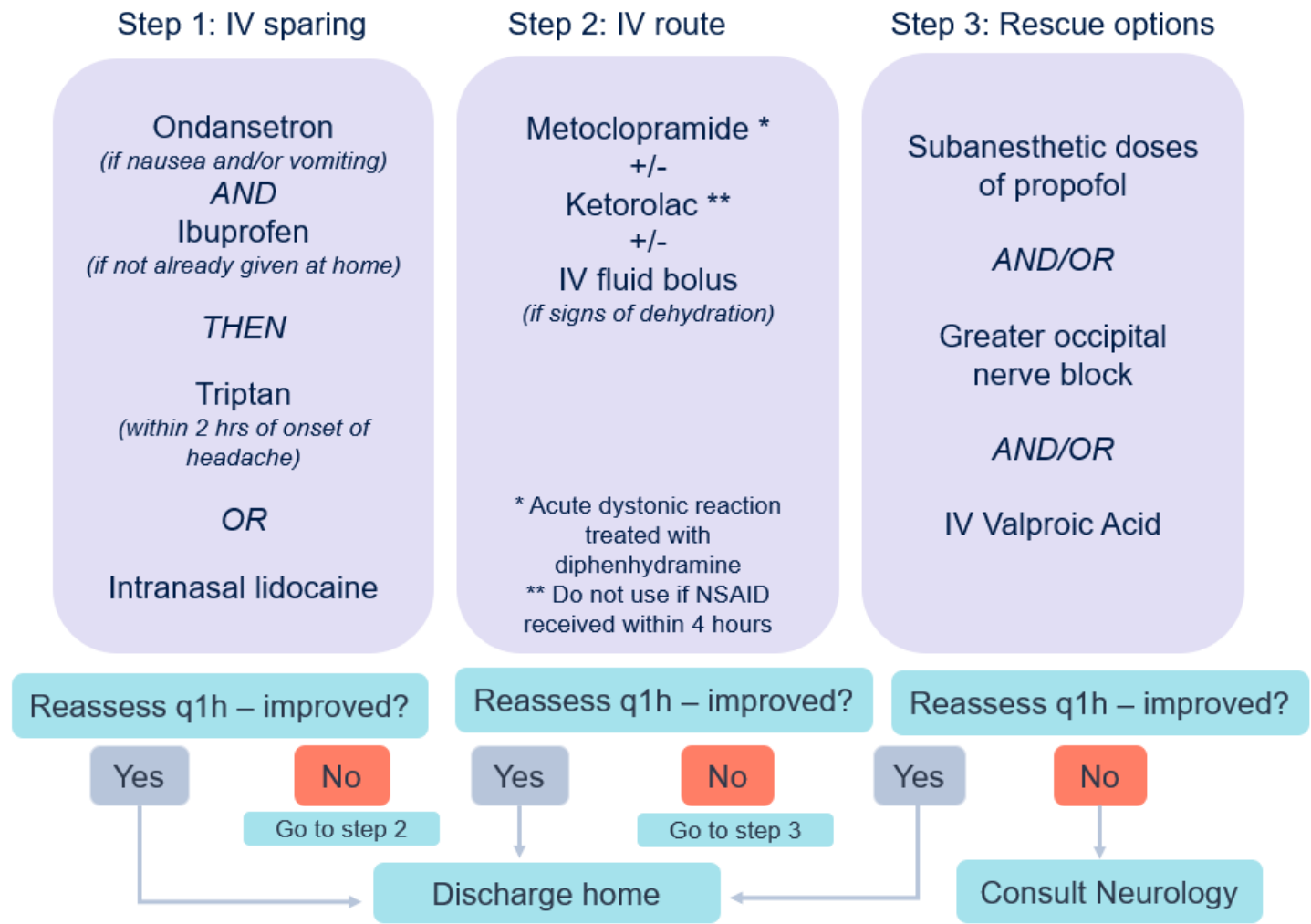
*Pediatric migraine is more often bilateral than in adults. Unilateral pain more commonly emerges in later adolescence or early adulthood.

- Migraine with aura is treated the same as migraine without aura.

Management

- Place the patient in a dark, quiet room with sunglasses and a stretcher, if possible. Ask about patient-specific needs and comfort measures.
- Needle-free therapies may be tried before parenteral/procedure-based therapies, despite limited evidence.
- Discuss goals of treatment with patient/caregiver. The goal of treatment is not to *eliminate* pain, but to see an *improvement* in pain score that is tolerable with continued rest at home after discharge.
- Only 6 randomized controlled trials (RCTs) address migraine management in the pediatric ED.²⁻⁷ Most data that informs other treatment comes from adult evidence, case series, or observational studies outside of the ED. See a summary of the relevant RCTs below ([Page 3](#)).
- Opioids are **NOT** recommended for the treatment of acute headache in children and adolescents.
- There is **no evidence** to support the use of:
 - Diphenhydramine (Benadryl™) to *prevent* acute dystonic reactions when using metoclopramide (Maxeran™). These reactions are rare and should only be *treated* with diphenhydramine, if they occur.⁸
 - Magnesium sulfate for treating migraine in children and adolescents.
- There is no pediatric data to support the routine use of steroids for prevention of rebound headache in pediatric migraine attacks. A large adult systemic review supports its use,⁹ but there are no pediatric trials.
- The treatment algorithm on Page 2 is recommended based on current evidence and reflects a common approach to migraine attacks used in Pediatric Referral Centres across Canada.

Treatment Algorithm for Acute Migraine Attacks in the ED



Refer to [TREKK's Medication Dosing Recommendations](#): Migraine in children aged 6 years and older.

Patient Disposition

- Discharge home if treatment has provided improvement in pain and the patient/caregiver feel they can manage symptoms at home. Provide discharge instructions about treatment at home and reasons to return to the ED. Avoid driving during acute migraine.
- Consider admission/discuss with Pediatrics/Pediatric Referral Centre if ongoing severe headache and significant functional limitation prohibiting discharge home.
- Counsel health hygiene using the following mnemonic:
 - “SMART” = sleep, meals, activity, relaxation (+/- Cognitive Behavioural Therapy), trigger avoidance
- Use shared decision-making with patient/caregiver regarding initiation of nutraceutical prophylaxis based on frequency and impact of headaches.
 - Nutraceuticals for migraine prevention: cheo.on.ca/en/resources-and-support/p6153.aspx
- Recommend using a headache diary app (e.g., Migraine Buddy, Migraine Tracker, Canadian Migraine Tracker).
- Provide a [Migraine Action Plan](#).

Evidence Summary

Randomized Control Trials	Summary
Brousseau et al. (2004) ² <i>Note: Prochlorperazine is not available in Canada</i>	<ul style="list-style-type: none"> • Double blind crossover RCT conducted in 2 pediatric EDs for patients aged 5-18 (n=62) comparing IV ketorolac and prochlorperazine • Conclusion: Initial treatment with IV prochlorperazine was found to meet defined criteria for treatment success in 84.4% of patients, in contrast to 55.2% in those who received IV ketorolac (difference of 30% between agents, 95% confidence interval 8-52%).
Richer et al. (2014) ³	<ul style="list-style-type: none"> • Single blind parallel arm RCT conducted in 1 pediatric ED (n=47) looking at effect of bolus 10 mL/kg IV 0.9% NaCl for children aged 5-17 years • Conclusion: There was no meaningful decrease in pain scores with IV fluid alone.
Sheridan et al. (2018) ⁴	<ul style="list-style-type: none"> • Pragmatic RCT in 2 pediatric EDs (n=66) comparing efficacy of low-dose propofol to standard therapy (ketorolac, metoclopramide, IV fluid) • Conclusion: Low-dose propofol did not achieve better pain reduction than standard therapy but was associated with significantly fewer rebound headaches.
Richer et al. (2022) ⁵	<ul style="list-style-type: none"> • Double blind RCT of children aged 5-17 (n=53) assessing efficacy and safety of IV metoclopramide compared to combination with IV ketorolac • Conclusion: The approach of combining IV metoclopramide with ketorolac failed to improve pain scores in children presenting for acute treatment of migraine headache.
Tsze et al. (2022) ⁶	<ul style="list-style-type: none"> • Double blind RCT non-inferiority trial of children aged 8-17 (n=59) comparing IV and intranasal ketorolac • Conclusion: intranasal ketorolac was non-inferior to IV ketorolac for reducing migraine headache pain in the emergency department.
Szperka et al. (2024) ⁷	<ul style="list-style-type: none"> • Double blind RCT of participants aged 10-21 (n=58) testing efficacy of greater occipital nerve blocks with lidocaine in children and adolescents with acute migraine refractory to standard therapies • Conclusion: Greater occipital nerve injections with lidocaine resulted in a significant improvement in pain scores compared to placebo.

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



Disclaimer: The purpose of this document is to provide healthcare professionals with key facts and recommendations for the diagnosis and treatment of migraine in children in the emergency department. 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.

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