

Diagnosing and Treating Pediatric Migraine

Epidemiology

Migraine is an inherited neurologic disorder characterized by sensory, autonomic, vestibular, cognitive and gastrointestinal symptoms. The mean age of onset of migraine is around 8 years for boys and 9 years for girls. Migraine has a prevalence similar to that of ADHD and asthma and is the second most disabling condition in the world.

Other syndromes and disorders that could be linked to migraine include:

- Infant colic
- Benign paroxysmal torticollis
- Benign paroxysmal vertigo
- Cyclic vomiting syndrome
- Abdominal migraine



Diagnosis

When it comes to diagnosing migraine, there are a number of criteria to consider:

Diagnosing Migraine		
	ICHD-3 Criteria	Pediatric-Specific Criteria
Number of attacks	≥ 5	
Duration	4-72 hours	2-72 hours
Location	Unilateral	Unilateral or bilateral
Description of pain	Pulsating	
Pain intensity	Moderate-severe	
Effect of routine physical activity	Aggravated by	
Nausea or vomiting	Yes	
Photophobia and phonophobia	Both	Inferred by behavior
Attributable to another disorder	No	

Only two of the four highlighted criteria need to be met for a migraine diagnosis to be made. Additionally, both children and adults need at least one of the following associated symptoms: nausea and/or vomiting or photophobia and phonophobia.

Treatment

Managing migraine requires a multifaceted approach. Treatment plans may include elements of lifestyle changes, acute treatment and preventive strategies.

Lifestyle Changes

Living a healthy lifestyle can potentially help patients reduce migraine attack frequency. S-M-A-R-T is a mnemonic patients can use to easily remember the different ways lifestyle changes may impact migraine.

Sleep	<ul style="list-style-type: none"> • Give specific sleep duration goals depending on age • Keep sleep and waketimes consistent and limit screen time before bed • Screen for insomnia and sleep apnea
Meals (Nutrition and Hydration)	<ul style="list-style-type: none"> • Eat at least 3 meals a day and snack as needed • Give specific hydration goals • Hydrate with every meal
Activity	<ul style="list-style-type: none"> • Limit unnecessary screen time • Aim for 30 minutes of physical activity 3-5 days per week • Screen/address obesity
Relaxation	<ul style="list-style-type: none"> • Consider biofeedback programs, mindfulness apps • Use deep breathing techniques • Practice yoga • Screen for depression/anxiety
Triggers	<ul style="list-style-type: none"> • Keep a headache log and track response • Modify behavior as appropriate • Limit or avoid caffeine/alcohol/tobacco use

Acute Treatment

Acute treatment can be divided into three tiers based on attack intensity. They include:

Stratified Acute Care	
High intensity	e.g., Triptan +/- NSAID 3 Dopamine antagonists
Average intensity	e.g., Triptan +/- NSAID
Low intensity	e.g., NSAID, snack, fluids, rest

Common formulations and dosing of acute therapies:

Acute Treatment: AAN/AHS Guidelines		
Classification	Agent	Dose
NSAIDs	Ibuprofen OS	7.5-10 mg/kg
Triptans	Sumatriptan/naproxen OT Zolmitriptan NS Sumatriptan NS Rizatriptan ODT Almotriptan OT	10/60 mg, 30/180 mg, 85/500 mg 5 mg 20 mg 5 mg or 10 mg 12.5 mg
Dopamine antagonists	Prochlorperazine Promethazine Metoclopramide	0.15 mg/kg 0.25-1 mg/kg 0.13-0.15 mg/kg

Key

OS: Oral Solution
OT: Oral Tablet
NS: Nasal Spray
ODT: Oral Dissolving Tablet

Considerations for use of triptans in the pediatric population:

Tips for Prescribing Triptans	
Rule of 2	Warning About Potential Side Effects
<ul style="list-style-type: none"> • Can take a 2nd dose after 2 hours • No more than 2 doses in 24 hours • Aim for 2 days per week or less 	<ul style="list-style-type: none"> • Tightness of face, neck and chest • Feeling hot or tingling • Flu-like symptoms, fatigue or myalgias
Serotonin Toxicity	Cautions and Contraindications
AHS position statement: The currently available evidence does not support limiting the use of triptans with SSRIs or SNRIs	<ul style="list-style-type: none"> • Cardiac disease (e.g., coronary artery disease, ischemic heart disease) • Cerebrovascular disease (e.g., stroke, TIA) • Rare migraine subtypes (e.g., hemiplegic migraine, migraine with brainstem aura) • Uncontrolled HTN, severe hepatic impairment

Trial and error is part of the process of finding treatment that works for each patient. Here are some helpful tips:

Clinical Pearls — Acute Treatment	
Nausea/vomiting	Consider addition of an anti-nausea medication or pursue non-oral route of administration (e.g., nasal, subcutaneous)
Ineffective NSAID	Ensure a sufficient dose is taken at onset or try a triptan
Ineffective triptan	Try a different triptan, add an NSAID and/or dopamine antagonist
Headache recurs after treatment	Add an NSAID and/or dopamine antagonist or consider switching to a triptan with a long half-life (e.g., naratriptan)
Excessive use	Start migraine prevention, discuss medication overuse
Failed therapy	Refer to a headache specialist

Preventive Treatment

If you find that migraine is interfering with school attendance or activities, they have more than one to two headache days per week and/or their acute medications are ineffective, overused or have adverse effects, it may be necessary to pursue preventive treatment. These may include:

Nutraceuticals		
Agent	Daily dose	Notes
Riboflavin (vitamin B2)	50-200 mg BID	Urine discoloration
Magnesium	9 mg/kg/day BID	Diarrhea; chelated forms better tolerated
Coenzyme Q10	1-3 mg/kg/day or 100 mg BID	Most expensive
Melatonin	0.3 mg/kg (up to 6 mg)	Conflicting evidence

Pharmaceuticals		
Agent	Daily dose	Notes
Topiramate	2 mg/kg divided BID	Reproductive risk; folic acid supplement and contraception in patients of child-bearing potential
Amitriptyline	1 mg/kg 2-4 hrs before bed	Black box warning for suicidality
Propranolol	20-40 mg TID	Contraindicated in asthma and may cause depression
Valproate	40 mg/kg divided BID	Reproductive risk; folic acid supplement and contraception in patients of child-bearing potential
Cyproheptadine	0.2-0.4 mg/kg divided BID	Available in liquid

Here are some tips for the use of preventive medication:

Tips for Use of Preventive Medication		
Set Appropriate Expectations	Mitigate Side Effects and Address Comorbidities	Preventive Medication Use Is Not Forever
<ul style="list-style-type: none"> Goals: Decrease attack frequency/ disability and improve response to acute treatment Minimum of 2 months at target dose is common to see effect 	<ul style="list-style-type: none"> Start at a low dose Titrate slowly Consider which comorbidities can be co-treated 	<ul style="list-style-type: none"> Wean 3-6 months after treatment goals met Discuss treatment course at initiation of preventive treatment

Neuromodulation

Neuromodulation devices can be effective tools for managing migraine and have applications for both acute and preventive therapy—including for pediatric patients. These devices might be favored by families and patients who desire an alternative to medication or who want to avoid potential side effects of medication. They can also be attractive to adolescents who might already have a comfort level with technology. Devices are typically not covered by prescription benefits but should be HSA/FSA eligible.

Neuromodulation Devices for Migraine		
	Description	Instructions
Cefaly	The device is attached to an electrode that is applied to the forehead just above the eyebrows via temporary adhesive. NOTE: Cefaly does not currently conduct studies below the age of 18.	Acute: 60 minute treatment at onset of migraine attack Prevention: 20 minute treatment every day
GammaCore	The device is turned on and positioned on the neck near the vagus nerve with varying intensity.	Acute: 2 two-minute stimulations at onset of migraine, may repeat if pain persists. Prevention: 2 two-minute stimulations in the morning and 2 two-minute stimulations in the evening.
Nerivio	The device is applied to the upper arm and then controlled by an application on a personal phone. With the application, patients can adjust the stimulation intensity as needed and automatically track usage into a migraine diary.	Acute: 45 minute treatment at onset of migraine attack Prevention: 45 minute treatment every other day Dual: 45 min treatment every other day for prevention or at onset of migraine
Relivion	The device is worn on a patient's head. It stimulates six nerve branches of the occipital and trigeminal nerves simultaneously.	Relivion can be used for both acute and preventive treatment of migraine. Treatments can be between 20 to 60 minutes.
SAVI Dual	The device is positioned behind the head, cradling the skull, and a therapeutic pulse is delivered with the push of the button(s).	Acute: Treat with four pulses at the onset of the attack Prevention: Treat with four pulses twice daily



For more information on neuromodulation, please scan the QR code to visit our website.



For more information on migraine and other headache disorders, visit [AHS' resources hub](#). If you are interested in pediatric migraine management, be sure to sign up for our brand new presentation about [pediatric migraine](#).

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