Migraine Diagnosis and Treatment Planning

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changing the outcome together

FAST FACTS

10% of children and 26% of teenagers experience migraine

HA is one of the most common disorders in childhood

WHEN TO REFER

If one or more red flags are present, refer to ED and consider urgent imaging.

If yellow flags are present, refer for non-urgent imaging and further evaluation soon in the Neurology/ Headache Center.

If no flags are present and child meets ICHD criteria for migraine, management and referral guidance varies based on HA frequency. See page 2 algorithm for details.

For more information or to make a referral, call the Neurology referral line at 513-636-4222. For urgent issues, call Physician Priority Link® at 513-987-7997.

Migraine is a primary headache (HA) disorder characterized by recurrent moderate to severe head pain that is aggravated by routine activity.

ASSESSMENT

Perform thorough history, neurological and physical exam. Discuss:

- Age of onset
- Pain location and description
- Severity, intensity (0–10 pain scale)
- Time of day, frequency
- Associated symptoms
- Presence of auras
- Triggers
- Impact of HA on functioning (e.g., missed school, activities)
- Frequency of pain medication use

Diagnostic criteria for migraine without aura:
At least five attacks fulfilling the following:

- HA attacks lasting 2–72 hours (untreated or unsuccessfully treated)
- HA has at least two of the following four characteristics:
  - Unilateral location (can be bilateral in children; usually frontotemporal)
  - Pulsating quality
  - Moderate or severe pain intensity
  - Aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs)
- During HA at least one of the following:
  - Nausea and/or vomiting
  - Photophobia and phonophobia

Consider whether symptoms are better understood as a primary HA (e.g., migraine with aura, chronic migraine, analgesic-overuse headache). The International Classification of Headache Disorders (ICHD) is available free online at ICHD.org and contains diagnostic criteria for primary and secondary HA disorders.

HISTORY, NEUROLOGICAL AND PHYSICAL EXAM

RED FLAGS

If one or more is present, refer to ED to rule out secondary HA and consider urgent imaging if:

- Patient describes HA as "worst ever"
- Aura persists for more than an hour and new features (visual, motor, sensory)
- New-onset intractable vomiting upon awakening
- Abnormal neurological exam
- Provider concerns: e.g., fever with neck pain, fever in immune-deficient patient

YELLOW FLAGS

If one or more is present, refer for non-urgent imaging. Further evaluation will depend on imaging results.

- Patient is younger than 6
- New onset HA
- HA frequently waking patient up from sleep
- No family history
- Severe headache induced by strenuous exercise
- Possibility of exercise-induced HA

MANAGEMENT/TREATMENT

Refer to page 3 for migraine management/treatment guidance.

If you would like additional copies of this tool, or would like more information, please contact the Physician Outreach and Engagement team at Cincinnati Children's.

Tool developed by Cincinnati Children's physician-hospital organization (known as Tri-State Child Health Services, Inc.) and staff in the James M. Anderson Center for Health Systems Excellence. Developed using expert consensus and informed by Best Evidence Statements, Care Practice Guidelines, and other evidence-based documents as available. This tool is presented for the purpose of educating providers. It should not be considered inclusive of all proper methods of care or exclusive of other reasonable methods of care. The ultimate judgment regarding care of a particular patient must be made by the physician in light of the patient's individual circumstances.

Migraine Diagnosis and Treatment Planning

Patient Presents

Assessment

Perform thorough history, physical and neurological examination. Discuss:

- Age of onset
- Pain description
- Location
- Severity
- Intensity (0–10 pain scale)
- Frequency
- Time of day
- Age of onset
- Associated symptoms
- Presence of auras
- Triggers
- Impact of HA on functioning (e.g., missed school, activities)
- Frequency of pain medication use

History, Neurological and Physical Exam (HNPE) Red Flags

Refer to ED to rule out secondary HA if one or more red flags are present:

- Patient describes HA as "worst ever"
- Aura persists for more than an hour and new features (visual, motor, sensory)
- New-onset intractable vomiting upon awakening
- Abnormal neurological exam
- Provider concerns: e.g., fever with neck pain, fever in immune-deficient patient

Yes

Refer to ED; consider urgent imaging

No

History, Neurological and Physical Exam (HNPE) Yellow Flags

Refer for non-urgent imaging if one or more is present. Further evaluation will depend on imaging results.

- Patient is younger than 6
- New onset HA
- HA constantly waking patient up from sleep
- No family history
- Severe headache induced by strenuous exercise

Yes

- Imaging within 2 weeks
- Contact neurologist on call via PPL with questions/concerns

But meets ICHD criteria for migraine (see page 1 for criteria)

Less than 15 HA/month

Develop acute treatment plan. Consider preventive treatment if high disability or more then 1 severe HA/week. Refer to page 3 for acute treatment plan guidance and referral criteria.

More than 15 HA/month

Ensure patient is not in analgesic-overuse headache (using pain medication more than three times a week for three months or more).

Develop acute treatment plan and preventive treatment plan. Refer to page 3 for acute treatment plan guidance and referral criteria. Refer to page 4 for preventive treatment plan.

For more information or to make a referral, call the Neurology referral line at 513-636-4222.

Migraine Acute Treatment (Abortive Therapy)

The goal of the acute treatment plan is to stop a headache in 1–2 hours with patient back to baseline and able to function. Consider an ED referral if patient is not headache-free after two doses of acute treatment.

MEDICATIONS

- Limit acute pain medication use (including ibuprofen) to 3 days/week to prevent medication-overuse headache.
- Patient should take medication with a sports drink for rehydration.
- Encourage family to track headaches using a calendar or headache app. Emphasize the importance of continuing to function (e.g., stay at school) when child has HA.

Ibuprofen

- 10–15 mg/kg. Maximum dose is 1000 mg.
- Take at headache onset. Can repeat dose once in 3-4 hours after first dose if no relief.
- Substitute Naprosyn (Aleve) based on patient preference or if the dosing is more weight-appropriate when using Naprosyn.
- Substitute acetaminophen if there is a convincing contraindication for NSAIDS.

Triptans

- Take triptan medication at HA onset along with NSAIDS, or as rescue if NSAIDS are not effective in the first hour.
- May repeat triptan once in 2 hours if needed for headache.
- Each treatment can be two doses 2 hours apart.
- Do not use a triptan for more than 8 headache treatments/month.

More than 15 HA/month	
Sumatriptan PO (Imitrex) • Weight ≥30kg dose = 100 mg • Weight <30kg dose = 50 mg	**Rizatriptran (Maxalt)** • Melt or tablet • Weight ≥30 kg = 10 mg • Weight <30 kg = 5 mg
Sumatriptan Nasal Spray (Imitrex) 20 mg • Use in children who cannot swallow pills or have significant nausea at onset • Give single spray into one nostril	**Zolmitriptan (Zomig)** • Melt or tablet • Weight >30 kg = 5 mg • Weight <30 kg = 2.5 mg

NEUROMODULATORS

Neuromodulators are FDA cleared for use in children >12 years of age. They can be used with any other abortive treatments. Some patients prefer them to medication. These devices are helpful for patients with medication-overuse HA and may benefit patients who have contraindications to NSAIDS. Insurance coverage varies. Families can use HSA and FSA funds to pay for the devices.

Types of Neuromodulators

Cefaly—External trigeminal nerve stimulation device

Cefaly is a transcutaneous neurostimulator that attaches to the forehead. The device sends electrical signals across the skin to treat and prevent migraine HA. Patients must use Cefaly for 60 minutes at HA onset.

Patients order the device and electrodes online without a prescription.
cefaly.com/how-it-works

gammaCore—Noninvasive vagal nerve stimulator

Patients must initiate gammaCore therapy at headache onset. Therapy involves two 2-minute stimulations 2 minutes apart. If no relief in 20 minutes, patient can repeat therapy. gammaCore requires a prescription.
gammacore.com

Nerivio—Removeable electrical neurostimulator

Patients wear the device on band around their upper arm. They use a smartphone app to activate the device and control the intensity of the electrical stimulation. Patients must use Nerivio for 45 minutes within 30 minutes of HA onset. Nerivio requires a prescription and is ordered via a specialty pharmacy.
nerivio.com/for-teens

Preventive Therapy

Discuss preventive options with any patient who is having more than one HA/week, especially if the headaches affect school and social activities.

FIRST-LINE THERAPIES

Healthy Habits

- **Hydrate**: Avoid caffeine; take water to school.
- **Exercise**: 3–4 days/week for at least 30 minutes.
- **Meals**: Avoid skipping meals and eat a healthy diet.
- **Sleep**: 8–10 hours. Keep consistent sleep schedule.
- **Identify and manage stressors** that can trigger HA.
- **Instruct child to treat HA early** before pain becomes severe.

Neutraceuticals

Choose one of the following:

- **Vitamin B2:** 50 mg twice a day if ≥30 kg, 50 mg once a day if ≤30 kg
- **Coenzyme Q10**: 100 mg orally once daily

ADJUNCT THERAPIES

Behavioral Apps

Cognitive Behavioral Therapy (CBT)

CBT teaches coping skills around stress and HA triggers. Consider CBT if child is having more than one headache per week.

- Refer to Behavioral Medicine at Cincinnati Children's at 513-636-4336 for CBT and specify for headache.
- Typical duration CBT is 1 hour a week for 4 weeks.

Neuromodulator Devices

See previous page for device information. Dosing for HA prevention is different than for HA abortive therapy.

- **Cefaly**: 20 minutes every day
- **gammaCore**: Use twice for 2-minute treatments three times per day
- **Nerivio**: Use for 45 minutes every other day

Medications

Achieving full dose on amitriptyline or topiramate takes two months. If patient is doing well and no side effects at two months, continue for two more months on therapeutic dose. Then taper off gradually if HA under good control. If headaches are not under good control after two months on the full dose, consider switching to another preventive medication or referring to a neurologist.

Amitriptyline

- Increase every 2 weeks to a dose of 1 mg/Kg
- Needs to be taken at night but no later than 8 pm
- Not recommended for patients with severe depression or suicidal thoughts. Helps kids who do not sleep well, as well as patients with prolonged QT.

A combination of CBT and amitriptyline had better outcomes than amitriptyline alone.

Topiramate

- Approved for headaches in kids 12 and older
- Increase the dose slowly over 8 weeks up to 50 mg BID
- Side effects include:
  - Decreased appetite
  - Kidney stones if not hydrating well
  - Tingling in extremities (Vitamin C supplementation may help with this)
  - Weight loss
  - Word-finding issues

For urgent issues, or to speak with the specialist on call 24/7, call the Physician Priority Link® at 1-888-987-7997.