FMD and Headache

- Headache reported among 67.5% of patients in the US Registry[1]
  - ~1/2 of patients characterized these as migraine type
  - 10.5% reported headaches were associated with menses
  - 14.8% of patients took suppressive medications for headache
- Among those in the Registry with headache reporting on frequency[1]
  - ~27% daily headache
  - ~27% weekly headache
  - ~46% infrequent headaches.
- Factors associated with headache include[1]: carotid/vertebral involvement of FMD, history of cerebrovascular aneurysm or dissection, pulsatile tinnitus, dizziness, and history of depression/anxiety
- Headache management is an important part of care for patients with FMD
  - We generally recommend against triptan use as an abortive agent given their vasoconstrictive properties and case reports of associated dissection
  - The CGRP receptor inhibitors have been a major advance for our patients and anecdotally seem to be well tolerated and helpful

[1]Wells BJ, et al. Vasc Med. 2020:25:348.

Ask the Headache Expert

Dr. Deborah Reed
Director, Headache Medicine
CWRU/University Hospitals

Clinical Assistant Professor of Medicine, CWRU

Master headache specialist and patient advocate!

Headache: Diagnosis & Treatment

Deborah Reed, MD FAHS

Director of Headache Medicine
and Assistant Clinical Professor
for University Hospitals of Cleveland

University Hospitals
Harrington Heart & Vascular Institute
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Headache: Diagnosis & Treatment

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Objectives

- Review prevalence and burden of migraine on the US population
- Review common pitfalls to diagnosis and thus barriers to treatment
- Review diagnostic criteria for migraine
- Discuss principals of successful treatment of migraine
- Review comorbidities, triggers, lifestyle management
- Migraine pathophysiology – how symptomatology is often misconstrued, leading to misdiagnosis – how new treatments are emerging from the study of the migraine brain
- Treatment therapies that have the best level of ***scientific evidence*** to support use in migraine management
- Discuss how optimal treatment is defined when evaluating the efficacy of preventive and abortive treatments
- Discuss Medication overuse headache and the MOTS clinical trial
- New available medications and devices that have been approved and those being studied
- Refractory migraine treatment: procedures, urgent care, ED, hospitalization and transfer to headache center

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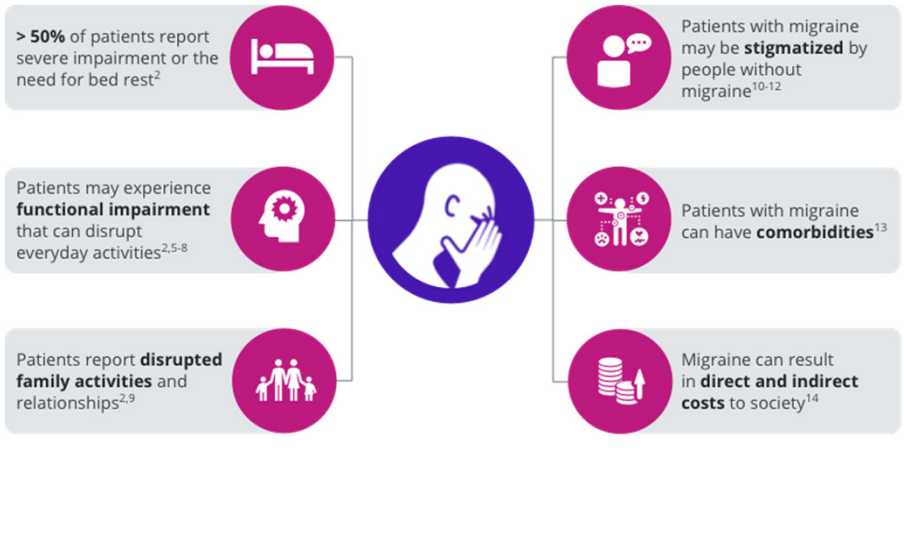

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Migraine by the numbers: You are not alone

>38 million people in the U.S. have migraine – 12% of the population	25% of U.S. households have a migraineur in the home	Only 48% of migraineurs never get the correct diagnosis
Migraineurs are commonly MISDIAGNOSED with "sinus" headache, tension/stress headaches, or cervicogenic headache	60% of migraineurs use OTCs for their attacks	39% seek bed rest
Genetic Risk: 70-90% if both parents 40-50% if one parent	Over $24 billion US dollars are lost to migraine each year (majority indirect)	Headache is the number one chief complaint in pediatrics

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Your Headache Evaluation

Exclude	Identify	Diagnose	Identify	Assess	Review	Formulate
Exclude Secondary Headache	Identify the Primary Headache Syndrome	Diagnose disorder as episodic or chronic	Identify comorbidities and exacerbating factors	Assess disability and attack characteristics	Review prior treatments, unmet needs, and treatment goals	Formulate a treatment plan and schedule follow-up

Looking for Secondary Headaches: SNOOP[5]

S	**Systemic** symptoms (fever, weight loss) or Secondary risk factors (HIV, cancer)
N	**Neurologic** symptoms or signs (focal deficits)
O	**Onset**: abrupt peak < 1 minutes (thunderclap: subarachnoid hemorrhage, cerebral venous thrombosis, carotid or vertebral artery dissection)
O	**Older**: > 50 (GCA, glaucoma, cardiac cephalalgia)
P	**Previous** HEADACHE history (new or change in features), **Pattern** change, Progressive
P	**Postural** (e.g., orthostatic – CSF leak) standing or lying down worsens/alleviates the headache
P	**Precipitated** by Valsalva, exertion (e.g., Chiari malformations, space occupying lesion)
P	**Pulsatile** tinnitus (diplopia, transient visual obscurations > Idiopathic intracranial hypertension)
P	**Pregnancy** (hypercoagulable state, hypertension, pre-eclampsia, idiopathic intracranial hypertension, subarachnoid hemorrhage, cerebral venous sinus thrombosis, reversible cerebral vasoconstriction syndrome)

24

Critical questions

- Patients presenting to the ED with headache and new abnormal findings in a neurologic examination (e.g., focal deficit, altered mental status, altered cognitive function) should undergo emergent* noncontrast head CT.
- Patients presenting with new sudden-onset severe headache should undergo an emergent* head CT.
- HIV-positive patients with a new type of headache should be considered for an emergent* neuroimaging study.

**__Emergent studies__ are those essential for a timely decision regarding potentially life-threatening or severely disabling entities. Patients who are older than 50 years and presenting with new type of headache but with a normal neurologic examination should be considered for an urgent† neuroimaging study.*

†__Urgent studies__ are those that are arranged prior to discharge from the ED (scan appointment is included in the disposition) or performed prior to disposition when follow-up cannot be assured.

Your Headache Evaluation

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ICHD-3 Diagnostic Criteria For Migraine *Without* Aura

At least five attacks fulfilling the following criteria:

- Headache attacks lasting 4-72 hours *(when untreated or unsuccessfully treated)* with at least two of the following four characteristics:
  - Unilateral location
  - Pulsating quality
  - Moderate or severe pain intensity
  - Aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs)
- **And at least one of the following:**
  - Nausea and/or vomiting
  - Photophobia and phonophobia
- Not better accounted for by another ICHD-3 diagnosis.

ID Migraine Screener: *The 3 strongest predictors of migraine*

During the last three months, did you have the following features ***with ANY* of your headaches?**

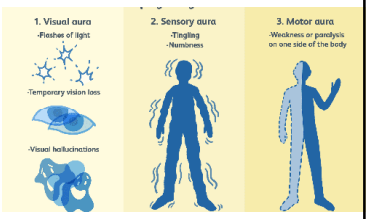
- **Nausea**
- **Disability (inability to work or continue activities)**
- **Photophobia**

2/3 = 93% chance of having migraine
3/3 = 98% chance of having migraine
Meets full ICHD 3 criteria for migraine diagnosis

ICHD-3 Diagnostic Criteria for Migraine with *Typical* Aura

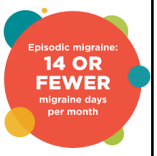
At least two attacks fulfilling the following criteria:

- **<u>One or more</u>** of the following fully reversible aura symptoms:
  - Visual
  - Sensory
  - Speech and/or language
- **<u>At least three</u>** of the following characteristics:
  - At least one aura symptom spreads gradually over ≥5 minutes
  - Two or more aura symptoms occur in succession
  - Each individual aura symptom lasts 5 - 60 minutes
  - At least one aura symptom is unilateral
  - At least one aura symptom is positive
  - Aura accompanied/followed within one hour by headache



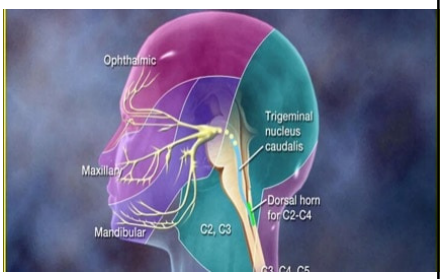
Episodic migraine vs. chronic migraine

- **Episodic Migraine:** < 15 headache days per month with some of the headaches fulfilling the full ICHC 3 diagnostic criteria for Migraine with or without aura
- **Chronic Migraine:** Patient has met the previous sited ICHD 3 diagnostic criteria for migraine with or without aura
  - Headache (migraine-like or tension-type-like) on ≥15 days/month for >3 months
  - On ≥8 days/month for >3 months, fulfilling any of the following:
    - Migraine without aura
    - Migraine with aura
    - Believed by the patient to be migraine at onset and relieved by triptan or ergot derivative
  - Not better accounted for by another ICHD-3 diagnosis

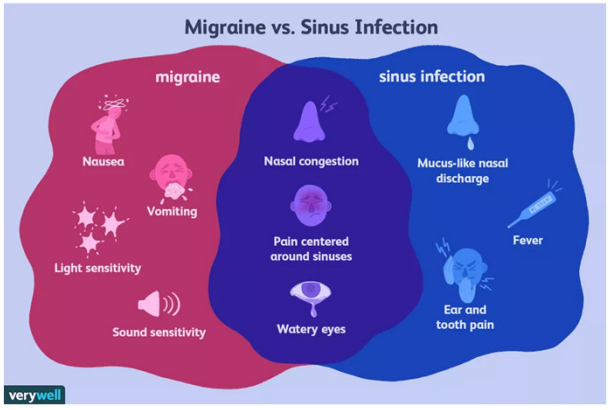


Neck pain and stiffness associated with migraine

- 70% of patients with migraine report that they get pain or stiffness in their neck before or during the headache.
- Migraineurs can experience neck pain and occipital neuralgia without any organic spinal pathology or nerve impingement

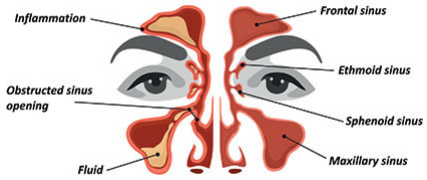


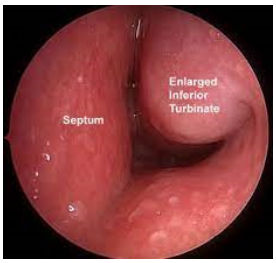
Migraine versus sinusitis

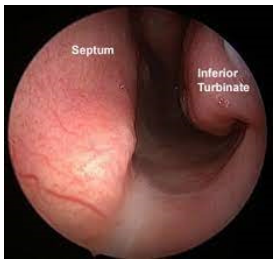


- 88% of patients diagnosed with ”sinus” headache fit the criteria for migraine or probable migraine *(AMPP Lipton)*
- 48/49 patients that claimed to have self- or physician-diagnosed “sinus headache” fit the criteria for migraine *(Roger Cady)*

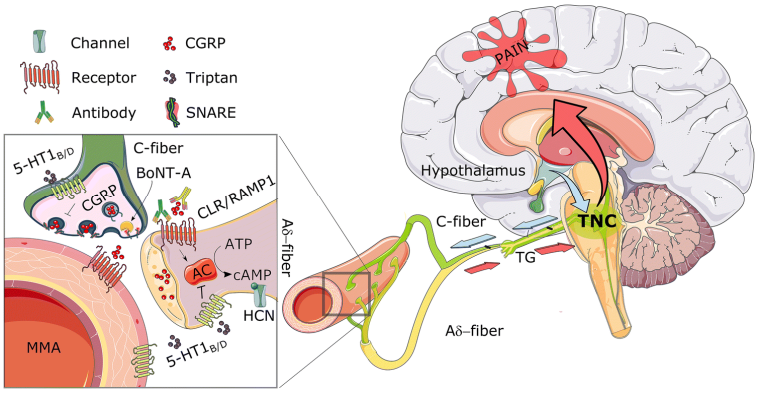
What happens during a migraine?





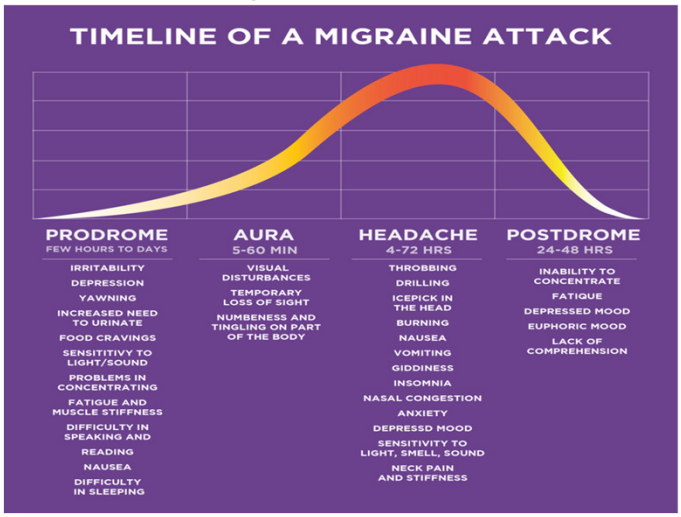


What's happening in my brain during a migraine?



Haanes, K.A., Edvinsson, L. Pathophysiological Mechanisms in Migraine and the Identification of New Therapeutic Targets. CNS Drugs ***33,*** *525–537 (2019). https://doi.org/10.1007/s40263-019-00630-6*

Phases of Migraine



Chowdhury D. *J Assoc Physicians, India.* 2010;58(Suppl):21-25.

Steps to successful treatment of headache disorders

Exclude	Identify	Diagnose	Identify	Assess	Review	Formulate
Exclude Secondary Headache	Identify the Primary Headache Syndrome	Diagnose disorder as episodic or chronic	Identify comorbidities and exacerbating factors	Assess disability and attack characteristics	Review prior treatments, unmet needs, and treatment goals	Formulate a treatment plan and schedule follow-up

Dodick DW. Adv Stud Med. 2003;3:550-55.

Common migraine triggers

- ✓ Dehydration
- ✓ Missing meals
- ✓ Smoked or cured meats
- ✓ Pickled products
- ✓ Aged cheeses
- ✓ Fruits and vegetables
- ✓ Artificial sweeteners
- ✓ MSG (monosodium glutamate)
- ✓ Alcoholic beverages
- ✓ Caffeinated beverages
- ✓ Smoking
- ✓ Overweight
- ✓ Pain medications
- ✓ Odors
- ✓ Bright lights
- ✓ Loud noises
- ✓ Too little sleep/Too much sleep/sleep pattern change
- ✓ Hair in a pony-tail
- ✓ **Changes in female hormone levels**
- ✓ Changes in male hormone levels
- ✓ Thyroid hormone changes
- ✓ **Weather or weather changes**
- ✓ Exertion or strenuous exercise
- ✓ Significant motion
- ✓ Fever or illness
- ✓ Minor head injuries
- ✓ Neck pain and muscle tension
- ✓ TMD (temporomandibular joint disorder) and tooth grinding (bruxism)
- ✓ Obstructive sleep apnea
- ✓ **Stress/Let down**

Kelman L. Cephalalgia. 2007;27(5):394-402.

Many migraine patients also suffer from other disease states, called comorbidities

- Sleep Disorders
- Neurologic Disorders
- Psychiatric Disorders
- Obesity
- Restless Leg Syndrome
- Cardiovascular Disorders
- Pulmonary Disorders

Why didn't my doctor order an MRI?

DON'T perform neuroimaging studies in patients with stable headaches that meet criteria for migraine.

Numerous evidence-based guidelines agree that the risk of intracranial disease is not elevated in migraine. However, not all severe headaches are migraine. To avoid missing patients with more serious headaches, a migraine diagnosis should be made after a careful clinical history and physical examination that documents the absence of any focal deficits. Diagnostic criteria for migraine are contained in the International Classification of Headache Disorders.

DON'T perform CT imaging for headache when MRI is available, except in emergency settings.

When neuroimaging for headache is indicated, MRI is preferred over CT, except in emergency settings when hemorrhage, acute stroke, or head trauma are suspected. MRI is more sensitive than CT for the detection of neoplasms, vascular disease, posterior fossa and cervicomedullary lesions, and high and low intracranial pressure disorders. CT of the head is associated with substantial radiation exposure which may elevate the risk of later cancers, while there are no known biologic risks from MRI.

http://www.choosingwisely.org/as-part-of-choosing-wisely-campaign-american-headache-society - releases-list-of-commonly-used-tests-and-treatments-to-question/

American College of Radiology: Choosingwisely.org

- Imaging headache patients, in the absence of specific risk factors for structural disease, are not likely to change management or improve outcome.
- Those patients with a significant likelihood of structural disease requiring immediate attention are detected by clinical screens that have been validated in many settings. Many studies and clinical practice guidelines concur.
- Incidental findings lead to additional medical procedures and expenses that do not improve patient well-being.

Treatment options

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General Principles of Migraine Management (i.e. what to expect at your appointment)

All types of doctors and Advanced Practitioners (NP or PA) treat headaches.

Your headache doctor will:

- Establish the correct diagnosis
- Educate you about your diagnosis and treatment
  - Instruct you to keep a headache diary
  - Help you identify and avoid triggers
  - Discuss rational for selected treatment medications
  - Establish realistic expectations (this medication won't cure you overnight)
- Implement an individualized management plan
  - Select treatment based on your symptoms, comorbidities, contraindications, and preferences
  - Consider nondrug (behavior modification) if significant stressors are present
  - Adjust medication according to patient's response and tolerance
  - Consider preventive therapy for severe headache burden
- Empower patients to be actively involved in their own management

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Goals of attack treatment/acute therapy

- Terminate the attack, including associated symptoms, quickly and effectively.
- Decrease risk for subsequent attacks.
- Allow patient to return to work and daily activities.
- Optimize treatment for ***rapid onset of analgesic effect w/ low rate of recurrence.***

Ramadan NM et al. Evidence-Based Guidelines for Migraine Headache in the Primary Care Setting: Pharmacological Management for the Prevention of Migraine.
http://tools.aan.com/professionals/practice/pdfs/gl0090.pdf

Considerations for prescribing attack-specific therapy

When deciding on an individual, stratified, acute medication plan, the following should be considered:

- Time to peak intensity
- Nausea or vomiting
- Peak severity
- Recurrence risk
- Migraine upon awakening
- Duration of attack
- Time from onset to taking medication
- Severity of headache at time of treatment
- Speed of relief and degree of relief
- Acceptable time to meaningful pain relief
- Tolerability
- Need for rescue – Urgent care, ER

*Rothrock JF. Acute migraine treatment: "stratified" care. Headache. 2012;52(1):*193.

Reduced GI motility during a migraine

Published in final edited form as:
Cephalalgia. 2013 April ; 33(6): 408–415. doi:10.1177/0333102412473371.

Gastric stasis in migraineurs: Etiology, characteristics, and clinical and therapeutic implications

Sheena K Aurora[1], **Spyridon Papapetropoulos**[2,3], **Shashidhar H Kori**[4], **Archana Kedar**[5], and **Thomas L Abell**[5]

[1]Swedish Neuroscience Institute, USA

[2]Allergan Inc., USA

[3]University of Miami, Miller School of Medicine, USA

[4]MAP Pharmaceuticals, USA

[5]University of Mississippi Medical Center, USA

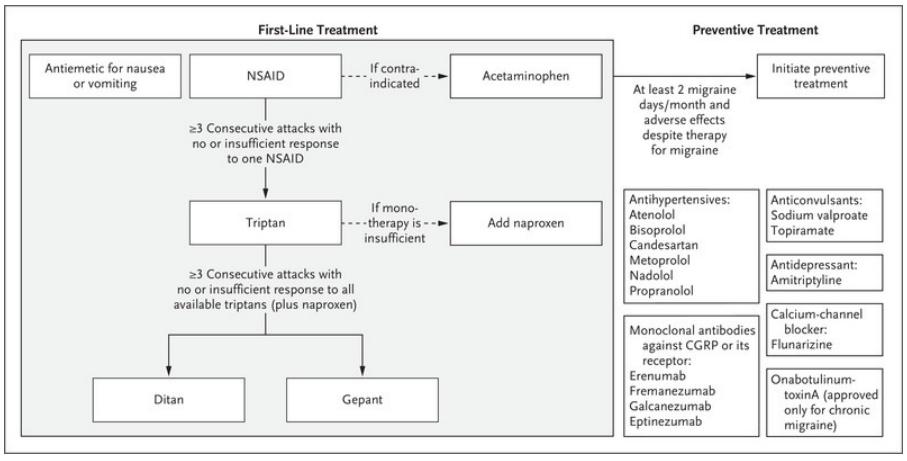
Abstract

Background—Migraine is a disabling neurological disorder often complicated by gastrointestinal conditions such as gastric stasis. The association between migraine and gastric stasis has received very little attention in the literature, but the existing evidence suggests that they may share a common etiology.

Results—Patients with migraine and those with gastric stasis exhibit abnormal autonomic nervous system function. Furthermore, empirical studies demonstrate that migraineurs experience significant delays in gastric emptying, both during and outside of attacks, when compared to non-migrainous controls.

Conclusion—More research is needed to establish the relationship between gastric stasis and migraine burden and to determine the impact of gastric stasis on migraine treatment.

Medications to Treat Migraine



Ashina, N Engl J Med 2020; 383:1866-1876 DOI: 10.1056/NEJMra1915327

Medication Overuse Headache (MOH)

Medication-overuse headache (MOH) is a chronic daily headache and a secondary disorder in which excessive use of acute medications causes headache in a headache-prone patient.[1-4]

MOH is a clinical diagnosis indicated by a history of analgesic use more than 2-3 days per week in a patient with chronic daily headache.

MOH most commonly occurs in people with less effective or nonspecific medications resulting in primary headache disorders, like migraine, cluster, or tension-type headaches using an inadequate treatment response and redosing.[2]

MOH has been found to render headaches refractory to both pharmacological and non-pharmacological prophylactic medications, and also reduces the efficacy of acute abortive therapy for migraines.

Certain classes of acute medications (opioids, barbiturate-containing analgesics, butalbital, aspirin, caffeine) are associated with increased risk of chronic migraine.[4]

Simple analgesics:
Common medications, such as aspirin, acetaminophen, NSAIDS (ibuprofen, naproxen, indomethacin), may contribute to rebound headaches, especially when exceeding the recommended daily dosage. These medications cause MOH when used 15 or more days per month.

Combination pain relievers:
Over-the-counter pain relievers that contain a combination of caffeine, aspirin and acetaminophen or butalbital commonly cause MOH. All of these medications are high risk for the development of MOH if taken for 10 or more days per month.

Triptans and Ergotamines
have a moderate risk of causing MOH when used for 10 or more days per month.

Opioids:
Oxycodone, tramadol, butorphanol, morphine, codeine and hydrocodone, among others, cause MOH when used 10 or more days per month.

Caffeine:
Intake of more than 200 mg per day increases the risk of MOH.

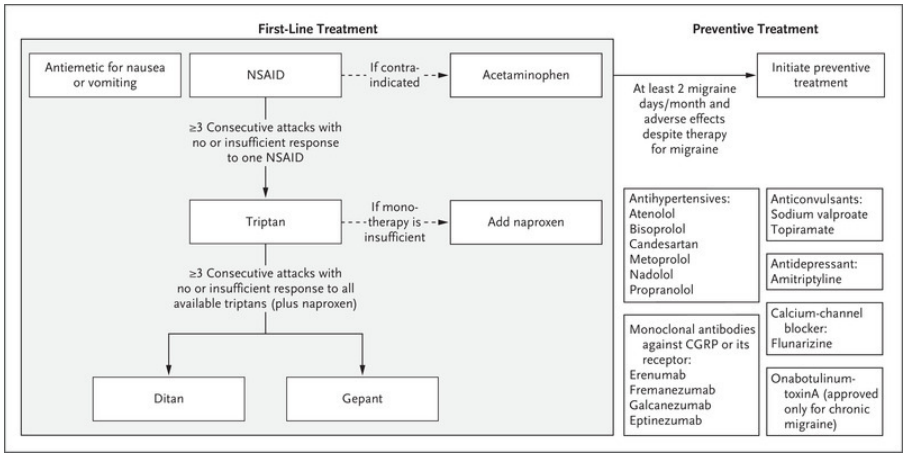
Guidelines: When to initiate *Prevention Therapy*

American Academy of Neurology/American Headache Society provide guidelines for managing migraine.

- Recommend starting **prevention therapy** on patients that have **ANY** of the following:
  - Frequent headaches
  - Medication overuse
  - Severely disabling headache
- Preventive treatment of migraine is intended to **decrease frequency** of headache days, **decrease severity** of migraine attacks and **improve response (efficacy) to attack-specific medications**.

Silberstein SD. Practice parameters: evidence-based guidelines for migraine headache (an evidence-based review). Neurology. 2000; 55:754-762.

Medications to Treat Migraine

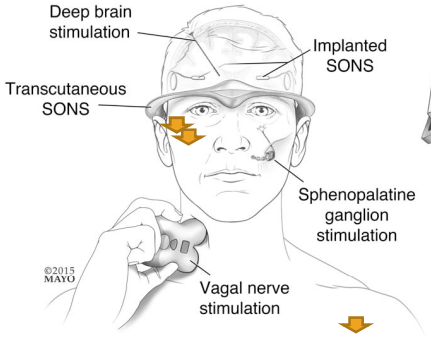


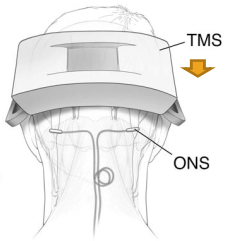
Ashina, N Engl J Med 2020; 383:1866-1876 DOI: 10.1056/NEJMra1915327

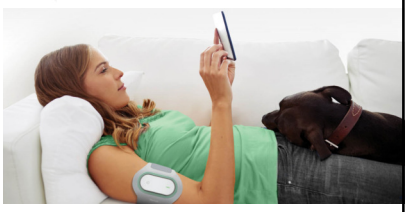
Procedure in Migraine Management

- Peripheral Nerve blocks
- Trigger point injections
- SC, IM and IV infusions
- SPG blocks
- Botox

Types of neuromodulation







What can you expect from a device?

ASSOCIATION OF MIGRAINE DISORDERS
www.MigraineDisorders.org

A Guide to Neuromodulation Devices for Migraine

BRAND NAME	CEFALY	Nerivio™	gammaCore Sapphire™
MANUFACTURER	CEFALY Technology	Theranica	electroCore
INDICATION *unless otherwise explained, indications are for patients 18+ years old	Acute and Preventive Treatment of Episodic Migraine	Acute Treatment of Episodic Migraine	Acute and Preventive Treatment of Migraine and Cluster
PRICE	$500 for a device Additional electrodes range from $25-$33 for more uses	$99 per device which holds 12 uses	$575 (24 stimulations/day for 31 days) Patients may be eligible for assistance ≤$100 for ≤12 months, Cost-free options for veterans & active military
EFFICACY *See individual websites for complete study results. Stats given for migraine only.	Acute: 79% of patients reported pain relief after 1 hr* Preventive: 38% of patients had at least a 50% reduction in migraine days	67% of patients achieve pain relief at 2 hours	Acute: 41% pain relief at two hours after 8 minutes of stimulation Preventive: 2.27 fewer migraine days
DELIVERY ADMINISTRATION	Acute: 1 hour as needed, on forehead Preventive: 20 mins. nightly	Start within 1 hour of migraine onset, on outer upper arm. Set intensity to a level that is strong but not painful and keep it at that setting for the 45 minute treatment	Acute: Two 2-minute stimulations at symptom onset, on neck. Can be repeated 20 mins. and 2 hours from start of 1st treatment. Preventive: 3 treatments (morning, mid-day and night) consisting of 2 consecutive two-minute stimulations daily
SIDE EFFECTS	Sedative effect during treatment session, sensitivity to the feeling of Cefaly on forehead, vasodilation and contact dermatitis.	Warmth, itching, tingling or mild pain in the arm, shoulders, or neck, muscle spasm, temporary numbness in the arm or hand	Application site discomfort, irritation, muscle twitching of face/head/neck resolving after treatment finishes

General Principles of Migraine Management (i.e. what to expect at your appointment)

All types of doctors and Advanced Practitioners (NP or PA) treat headaches.

Your headache doctor will:

- Establish the correct diagnosis
- Educate you about your diagnosis and treatment
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  - Adjust medication according to patient's response and tolerance
  - Consider preventive therapy for severe headache burden
- Empower patients to be actively involved in their own management

Migraine advocacy: My favorites

Today/anytime – watch a video on **American Migraine Foundation**

June 21 - **Shades for Migraine**, check out their website and wear sunglasses on the longest day of the year

July 17 - **Miles for Migraine** event at South Mastik Picnic Area

Clinicaltrials.gov

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Thank you!

To schedule an appointment:

216-353-2175

To learn more:

UHhospitals.org/Headache

Agenda

Welcome, Intros & Patient Stories	Dr. Heather Gornik/All
Polling Q&A	Dr. Heather Gornik/All
FMDSA Meeting Recap	Pamela Mace, RN
Ask the Headache Physician	Dr. Deborah Reed
Open Discussion/Q&A	All
Adjourn	

Q & A

Please Enter Your Questions into the "Chat" Box

Save the Date and Register Now!

Next date is April 19, 2021
Topic: t/b/d

Register online at UHhospitals.org/FMDGroup

Once registered, you will receive an email with log-in instructions to use for this session.
Video and audio will be enabled for all participants. Group meetings are not recorded.

Save the Date: Upcoming 2022 Sessions
Tuesday, April 19
Tuesday, July 19
Tuesday, October 18