

Migraine

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Migraine (not very) Fun Facts

2nd leading cause of disability worldwide

70.3% of patients in a PCP office present for migraines at some point

Diagnosis is clinical, no changes on MRI, bloodwork, no practical biomarkers

Female : Male ratio 3 : 1

35 Million people in the US with migraine

Lost work due to migraine costs the US \$13 Billion per year

Genetic link: autosomal dominant inheritance




International Headache Society Migraine Definition:

A. At least five headache attacks lasting 4 - 72 hours, with at least two of following:

1. Unilateral location
2. Pulsating quality
3. Moderate or severe intensity (inhibits or stops daily activities)
4. Aggravated by walking stairs or similar routine physical activity

B. During headache at least one occurs:

1. Phonophobia and photophobia
 2. Nausea and/or vomiting
- 

Quick Office Screen for Migraine

Lipton's ID Migraine Tool¹


*In the last 3 months, did you have any of these features with your headache:

- Nausea
- Photophobia
- Limited activity

If "yes" for two of these questions, very likely migraine

- Positive predictive value 93%
- Sensitivity 81%, Specificity 75%

¹Cephalgia 2016;36(3):203-215

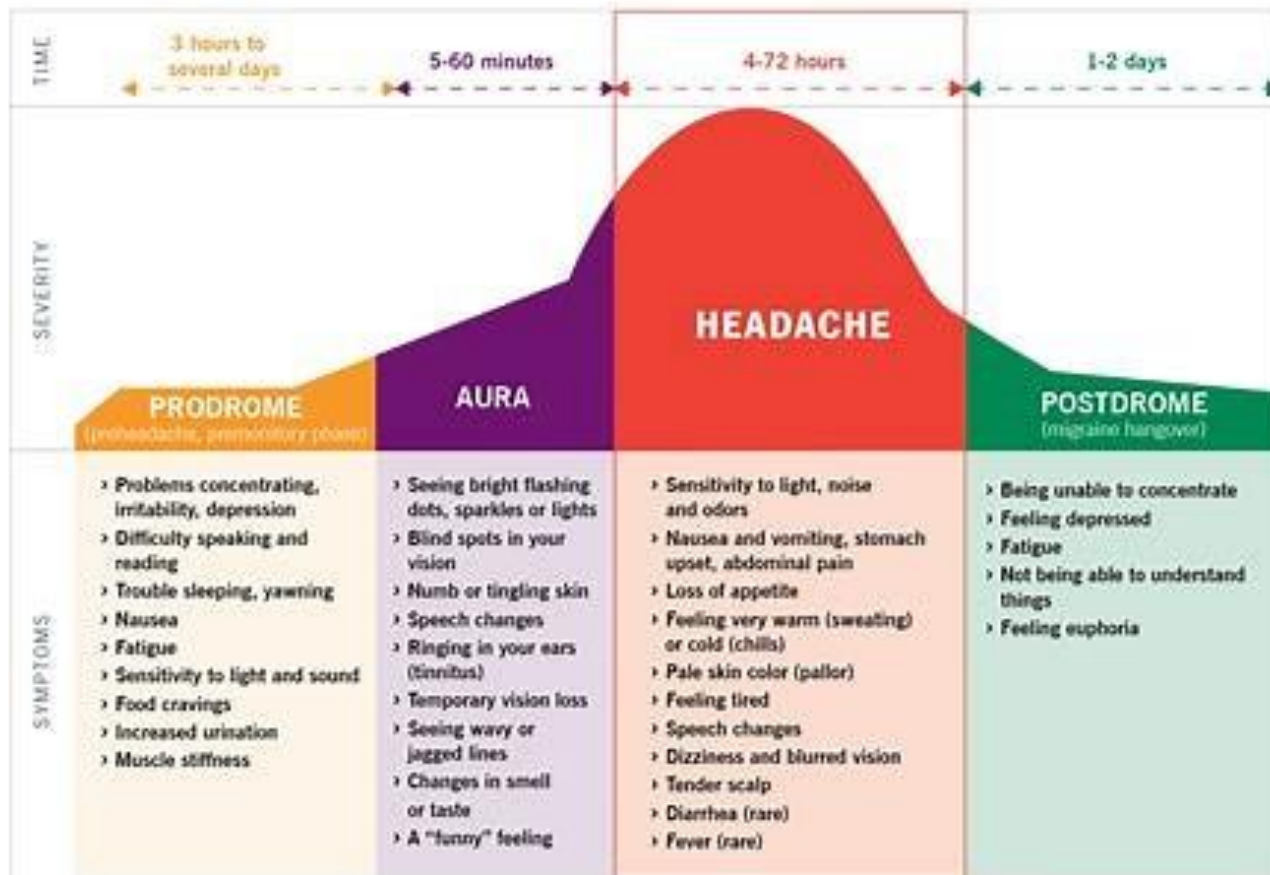


Migraine Pathophysiology: Neurovascular Event

1. Trigger stimulates the trigeminal nerve peripherally → centrally
2. The trigeminal nerve starts the CGRP cascade
3. Inflammation and vascular instability
4. Rolling depolarization from the occipital lobe forward
 - a. Initial hyperemia followed by oligemia
5. Neuronal hyperactivity → aura
6. Reactive oligemia → headache



The 4 Phases of a Migraine Headache



my.clevelandclinic.org

What causes migraine?

Different triggers for different patients

Scents

Foods

Sleep deprivation

Stress

Menstrual cycle

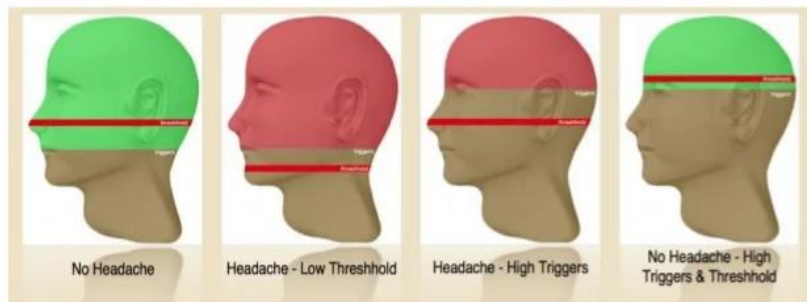
Change in routine

Holidays

Weather

Different threshold day to day

Migraine Triggers



If summation of triggers are greater than threshold – a headache happens

Migraine Evaluation

1. History

- a. Typically onset in teens to twenties
- b. Frequency should be similar from onset
- c. Severity can vary, location can vary, onset triggers can vary

2. Examination

- a. Neurological examination should be *normal*

3. Family History

- a. Helpful but not necessary



tnchiro.com



www.migraineagain.com

Migraine variations

Episodic = 4-14 days per month (ICD-10 G43)

Chronic = 15+ days per month (ICD-10 G43.7)

With/without aura, usually visual (ICD-10 G43.1XX/G43.0XX)

Intractable/not intractable (ICD-10 G43.X1/G43.X0)

With/without status migrainosus (ICD-10 G43.XX0/G43.XX9)

Migraine without aura, intractable, without status migrainosus

G43.019





<https://youtu.be/qVF1cF9lyk8>

Scintillating scotomata/fortification

Red Flags: When is a headache not a migraine?

Increase in frequency (growing mass)

Atypical severity (mass, bleed)

Abrupt/cataclysmic onset (bleed, especially subarachnoid/aneurysmal)

Increased pain in supine position (increased intracranial pressure)

Head pain awakens the person from sleep (increased intracranial pressure)



When to image?

Change in headache character or frequency

Subacutely = MRI brain with contrast (screen for mass, aneurysm)

Acutely = CT head without contrast (bleed)

Sudden, cataclysmic onset or atypically severe headache

CT head without contrast



Migraine Treatment Acute

This Headache, Right Now



NSAIDs

Mechanism: probably anti-inflammatory effect, by blocking prostaglandins

Benefits:

Easy to obtain

Over the counter

Can re-dose later for ongoing pain

Drawbacks:

Upset stomach

Renal injury at high doses

Medication overuse with >2 days/wk



Acetaminophen

Mechanism: unknown

Benefits:

Easy to obtain

Over the counter

Combination products

Drawbacks:

Liver injury with high, regular dosing

Medication overuse with >2 days/wk



Antihistamines

Mechanism: Block H1 receptor peripheral and central activation

Benefits:

Help promote sleep

IV or PO, can use with vomiting

Can combine with other treatments

Drawbacks:

Somnolence

Generally do not work alone



Dihydroergotamine (DHE)

Mechanism: serotonergic and adrenergic modulation

Benefits:

IV or PO or intranasal

Very effective

Drawbacks:

IV form → nausea/vomiting

Retroperitoneal/retrocardiac fibrosis



woman.thenest.com

Triptans

Mechanism: Block CGRP release pre-synaptically, induce vasoconstriction

Benefits:

Developed specifically for migraine

Generic, less expensive

Treat approximately 2/3 of attacks

Drawbacks:

Somnolence

Medication overuse risk >2 days/wk

Tachycardia/hypertension

Vasoconstriction

Flushing



Antispasmodics

Mechanism: baclofen GABA effect; tizanidine centrally prevents pain sensitization

Benefits:

Inexpensive

No medication overuse risk

Drawbacks:

Somnolence

Dry mouth



homenaturalcures.com

Muscle relaxants

Mechanism: cyclobenzaprine serotonin augmentation; metaxalone uncertain

Benefits:

Reduce muscle activation

Assist with sleep

Reduce pain sensitization

Drawbacks:

Somnolence

Dry mouth

Muscle weakness



Lasmitidan

Mechanism: activates 5-HT_{1F} receptors peripherally and centrally

Benefits:

Works on severe headaches

Schedule V controlled substance

Drawbacks:

Somnolence



GEPANTS

Mechanism: block CGRP post-synaptic receptor

Benefits:

Rapid onset (2 hours)

Effective (60% pain reduction)

Can use with other medications

No medication overuse risk

Drawbacks:

Expensive

Somnolence

Nausea

Fatigue



Antiemetics

Mechanism: relieve migraine-associated nausea, enhance absorption of PO meds

Benefits:

Reduce nausea

Assist with sleep

Drawbacks:

Somnolence

Extrapyramidal side effects possible



Cefaly device

External trigeminal nerve stimulation

Electrical pulsation across the V1 trigeminal branches as the nerves exit the frontal bones

Benefits:

Not a medication

FDA approved

Drawbacks:

Insurance doesn't cover

\$325

Relief is temporary



[cefaly.com](https://www.cefaly.com)

Other options

Acupuncture

Aromatherapy - peppermint

Address the NECK!

- Craniosacral therapy
- Osteopathic manipulations
- Cervical traction



Migraine Treatment Prevention

Future Headaches



When to add preventive strategies?

≥ 4 headache days OR 8 headaches per month

Debilitating headaches despite acute treatment

Overuse of acute medications > 2 days per week

Patient request



Beta-blockers

Mechanism: reduce cerebral hyperemia, inhibit neuronal sensitivity to prevent spreading cortical depression, increase activity in the hypothalamus

Benefits:

Inexpensive, easy to obtain

Reduce anxiety

Propranolol 50% reduction

Drawbacks:

Exercise intolerance

Erectile dysfunction

Bradycardia

Hypotension

Fatigue



Calcium channel blockers

Mechanism: prevent vasoconstriction, cerebral hyperemia

Benefits:

Up to 50% reduction

Inexpensive

Drawbacks:

Hypotension, fatigue

Constipation

Conflicting data +/- effective

Flushing

Edema



Tricyclic antidepressants

Mechanism: serotonin effect (probably) to reduce pain

Benefits:

50% migraine reduction

Help with sleep

Reduce anxiety at higher doses

Drawbacks:

Dry mouth

Somnolence

Hypotension

Confusion



Selective serotonin reuptake inhibitors

Mechanism: serotonin modulation to reduce pain

Benefits:

Reduce anxiety/depression

Inexpensive

Less effective than others

Drawbacks:

Sexual dysfunction

Mood modulation

Weight gain



Selective Serotonin-Norepinephrine reuptake inhibitors

Mechanism: Serotonin modulation to reduce pain sensitivity

Benefits:

Weight neutral

Helps depression

Drawbacks:

May increase anxiety

Nausea/vomiting

Hypertension



Antiepileptics

Gabapentin +/-

Topiramate (50%)

Valproic acid

Zonisamide

Levetiracetam

Mechanism: probably CNS modulation to reduce sensitivity

Benefits:

Effective

Weight loss (TPX)

Drawbacks:

Somnolence

Weight gain (VPA)



CGRP modulators (IM Mabs and PO GEPANT)

Mechanism: block CGRP ligand or post-synaptic CGRP receptor

Benefits:

50% reduction

Rapid onset within 1-4 weeks

Drawbacks:

Expensive

Constipation



Onabotulinum toxin

Mechanism: muscle relaxation, peripheral nerve desensitization

Benefits:

Highly effective in some

Few side effects

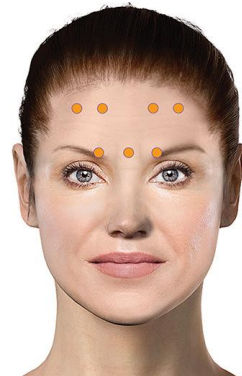
Not ongoing medication

Can mix with other meds

Drawbacks:

Expensive \$1500 per treatment

31 stings every 12 weeks



Samandiadds.com

BOTOX[®]
onabotulinumtoxinA injection

Other options

Magnesium 400 mg bid (diarrhea)

Coenzyme Q10 100 mg bid-tid

Riboflavin 100 mg bid (upset stomach)

Pestasis (Butterbur) 150 mg qd (liver injury)

Acupuncture (expensive, not covered by insurance)

Biofeedback

Cervical traction



Medication
Overuse
Headache

Rebound



Who is at risk

15+ headache days per month

Frequent (2+ days per week or 8+ days per month) use of

Analgesics

Narcotics

Soporifics

Triptans

Caffeine

Ergotamines



How does medication overuse present

Morning headaches

“The only thing that works” is the rebounding agent

Increasing frequency of headaches

Decreasing efficacy of acute medications

Increasing need for more and more of the rebounding agent



Which Medications are MOST likely to cause MOH?

Fioricet

Narcotics



How to manage medication overuse

Counsel patients to use medications no more than 2 days per week

Use preventive medications to reduce need for acute medications

Use medications that do not cause rebound

- GEPANTS, Cox-2 inhibitors, antispasmodics, muscle relaxants

Alternate analgesics every third day

- e.g., triptan day – Excedrin day – NSAID day



Migraine Management

Pearls



Strategy for preventive medications

Start with first- and second-line agents depending on comorbidities:

- Topiramate
- Propranolol
- Amitriptyline
- Venlafaxine

Give medications 2-3 months to work, full effect may take longer

Start low, increase slowly and titrate to effect/tolerance



What ICD codes to use?

G43.XYZ = migraine

X = with aura (1) or without aura (0) or chronic (7)

Y = intractable (1) or not intractable (0)

Z = with status migrainosus (0) or without status migrainosus (9)

Migraine without aura, intractable, without status migrainosus

G43.019

FDA/Insurance Criteria for Botox

Chronic migraine, 15+ days per month

Tried/failed or failed to tolerate 2-3 medications in at least 2 categories:

- B-blocker
- Tricyclic antidepressant
- SSRI
- Ca channel blocker
- Antiepileptic
- SNRI

Cost is +/- \$1300 for the Botox, +/- \$200 for the injection



How to use CGRP inhibitors

Preventives

- Try/fail 2+ preventives
- Ask what insurance covers, start with that

Acute treatments

- Try/fail 2+ triptans
- Ask what insurance covers, start with that



Thank you!

