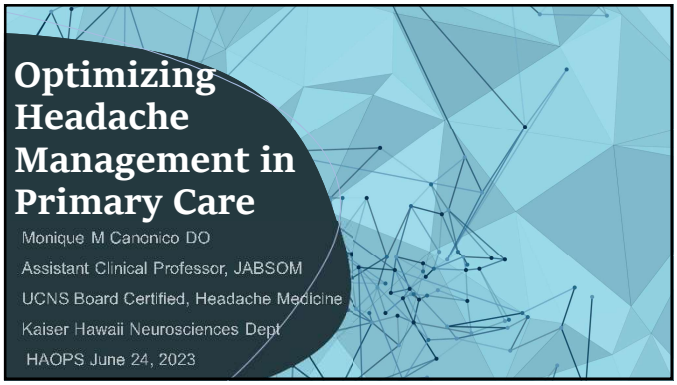


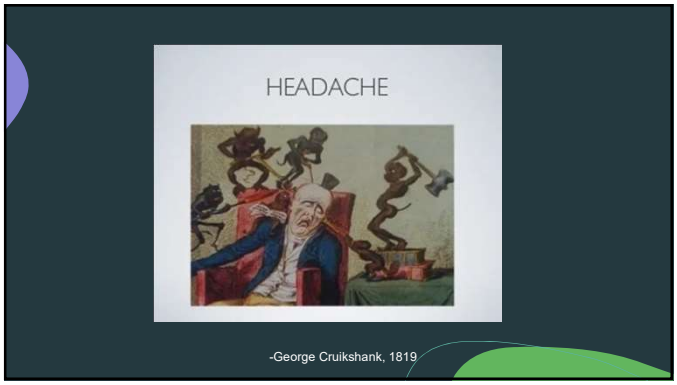

I have nothing to disclose.

More than a billion people worldwide have migraine

Migraine consists of a constellation of symptoms, one of which is headache

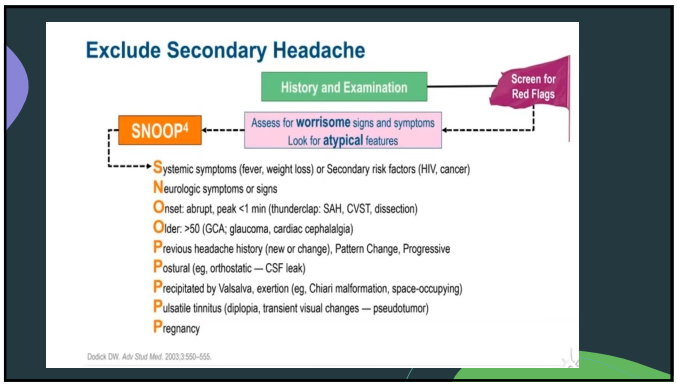
Most patients with migraine have never received a medical diagnosis

Patients with migraine are most likely to be seen in primary care (71%)




## Learning Objectives

- Review differential/red flags
- Define migraine
- Expand knowledge of acute treatment, migraine prevention and other management strategies



## When to Image?

- Neuroimaging NOT indicated in patients with recurrent headache with clinical features of migraine, normal neuro examination and no red flags
- Migraine by far the most common headache type in patients seeking help from physicians
- Patients consulting for bilateral headaches that interfere with daily activities likely to have migraine rather than tension-type headache (might require migraine-specific medication)

## •Migraine Definition

- An inherited disorder characterized by neurologic, sensory, autonomic, vestibular, GI, and cognitive symptoms

## Migraine Epidemiology

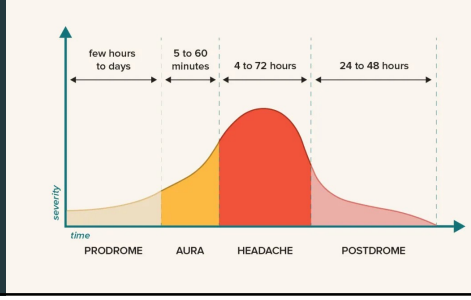
- 1/5 US adults has migraine
- Prevalence/Impact
  - Women 25% (lifetime); Men 8% (lifetime)
  - ~70% have + family history
  - Almost half have not been diagnosed
  - 2016 Global Burden of Disease Study: second leading cause of disability worldwide
  - 7 million PCP visits/year
  - Associated with 35% billion in direct and indirect healthcare costs

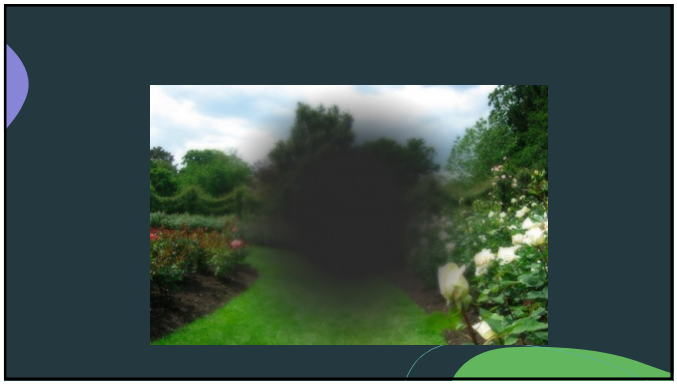
**Migraine, as defined by the International Classification of Headache Disorders, third edition (ICHD-3), should include the following:**

1. At least 5 or more attacks in lifetime
2. Headache attack lasting 4-72 hrs
3. At least 2 out of 4 features (unilateral location, pulsating/throbbing quality, moderate-severe intensity, aggravation by/causing avoidance of routine physical activity)
4. At least 1 of the following features (nausea and/or vomiting, photophobia and phonophobia)

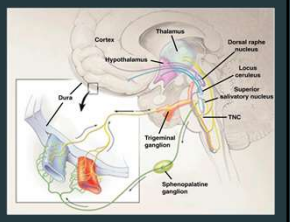
## Important Clinical Pearls:

- Consider dx of migraine in pts with previous dx of "recurring sinus headache"
- Medication overuse headache (a secondary headache disorder): considered present in patients with migraine (or tension-type headache) using combination analgesics, opioids or triptans ≥ 10 days/month, or acetaminophen/NSAIDs ≥ 15 days/month
- Comprehensive migraine therapy = management of healthy lifestyle modifications, avoiding triggers, hydration, keeping regular sleep schedule, preventive/acute medications





## Migraine Pathophysiology


Goadsby et al NEJM 2002

## The History Taking: Focus on Symptoms

- Description of pain-location, severity, quality
- Duration
- Frequency
- What improves or worsens it?
- n/v, photophobia, phonophobia
- Tearing, congestion, conjunctival injection, ptosis
- Pacing, agitation
- Aura, yawning irritability, food craving, dizziness

## Migraine Screener: PIN

- 3 questions: PIN
  - *P*hotophobia?
  - *I*mpairment? (Has ha limited your activity for >1 day in past 3 mo?)
  - *N*ausea

Answering 2/3 yes= 93% Predictive value of migraine and all 3 yes= 98% predictive value

-A self-administered screener for migraine in primary care: The ID Migraine validation study
-R B Lipton et al . Neurology 2003 Aug 12;61(3):375-82

## Migraine or Tension-type Headache?

| | Migraine | Tension-type Headache |
|---|---|---|
| Duration | 4-72 hours (2-72 in children) | 30 minutes – 7 days |
| Location | Unilateral (40% bilateral) | Bilateral |
| Description of pain | Pulsating (50% non-pulsating) | Pressing/Tightening (non-pulsating) |
| Pain intensity | Moderate-severe | Mild-moderate |
| Effect of routine physical activity | Aggravated by | None |
| Nausea or vomiting | Yes | No |
| Photophobia or phonophobia | Both | No more than 1 |
| Attributable | Not attributable to another disorder | Not attributable to another disorder |

NOTE: Tension-type headache rarely presents as a chief complaint.
If a patient is in your office for complaint of recurring headache, it is likely migraine.

It is unknown if the North American beaver suffers migraine

## Lifestyle modifications are the key foundation of non-medication therapies to help migraine:

- Regular eating schedule
- Regular sleeping schedule
- Avoid excess sugar/carbohydrates
- Hydration
- Cardio exercise: recommended 40 minutes, 3 days per week
- Stress/mental health management

## Choosing Rescue Therapy-Step 1

What is their headache frequency?

- Do they have both moderate and severe headaches?
- Consider the characteristics associated with their headaches
- Are their headaches rapid or gradual in onset?
- Can they tolerate oral meds during headache?

## Choosing Rescue Therapy- Step 2

Determine co-morbid conditions or concurrent meds that may be a contraindication to an acute migraine med.

- Patients with a history of stomach ulcer may not be a good candidate for oral NSAID
- Patients with a history of cardiovascular disease or uncontrolled hypertension may not be a good candidate for triptan
- Pregnancy/lactation status could impact safe or approved use of a medication

## Choosing Rescue Therapy- Step 3

**-NSAIDS**
naproxen, ibuprofen, diclofenac 75 mg bid, indomethacin
**-Triptans**
Fast acting PO: sumatriptan 50 mg #9, rizatriptan 5-10 mg #9, eletriptan 20-40 mg #9 (repeat in 2 hours)
Slow acting PO: naratriptan 1-2.5 mg #9 (repeat in 4 hours). (Gepants, Ditans are newer agents)
**-Antiemetics**
**–**ondansetron, metoclopramide**,** prochlorperazine promethazine

## Clarify Medication Limits- Step 4

Suggested Limits

- Triptans - 1 tab PRN, may repeat in 2 hours, limit 9 days/month
- NSAIDS - Ibuprofen - 1 tab PRN, may repeat in 8 hours, limit 12 days/month
- Naproxen - 1 tab PRN, may repeat in 12 hours, limit 15 days/month
- Ketorolac IM - 30mg IM PRN, may repeat in 8 hours, limit 4 days/month

## Rescue Therapy

**NSAIDS**
-Ibuprofen
-Naproxen
-Diclofenac 75 mg bid
-Indomethacin 50 mg bid

**Migraine-Specific**
-Suma
-Riza
-Ele
-Nara

**Anti-Nausea**
-ondansetron
-metoclopramide
-prochlorperazine
-promethazine

**Which of the following antiemetic medications used in migraine tends to have the best tolerability?**

A. Metoclopramide
B. Ondansetron
C. Prochlorperazine
D. Promethazine

**Which of the following antiemetic medications used in migraine tends to have the best tolerability?**

A. Metoclopramide
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C. Prochlorperazine
D. Promethazine

Culpeper published the English translation of the Pharmacopoeia, which upset his colleagues who kept their medical formulae "secret" by publishing in Latin

## When should migraine preventive treatment be considered/offered?

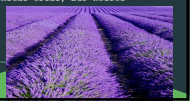
- When patients have > 4-6 migraine days a month
- If there is failure or overuse of acute tx and risk of medication overuse
- When a patient wants to pursue a preventive option
- When a patient is significantly debilitated

## Migraine Attack Frequency

- Divided into episodic and chronic
- 15 or more headache days a month is CHRONIC

## Nutraceuticals to Recommend

- Riboflavin (vitamin B2) 400 mg a day -Level B evidence
- Magnesium 400 mg qd or bid (threonate, glycinate, gluconate, citrate)
- Coenzyme Q10 300 mg a day (ubiquinone form)
- Lavender oil inhalation in acute migraine -Lavender essential oil in the treatment of migraine headache: a placebo-controlled clinical trial, Eur Neurol 2012; 67(5): 288-91



## Migraine Preventives

- Set realistic expectations regarding treatment goals: reduction in frequency, severity and burden, as opposed to complete elimination of migraine
- Adequate trial (2 months)
- Consider comorbidities
- Target dose reached in 4-6 wks

## β receptor Antagonists

**Non-selective**

Propranolol 120 mg/day target. Start at 40 mg in divided doses. Increase by 40 mg/wk

**$\beta_1$ selective**

Metoprolol 50 - 200 mg/d. Start at 25 mg a day and increase by 25 mg a wk to 100 mg/d target.

## β receptor Antagonists

**CV:** Hypotension, bradycardia, fatigue, decreased exercise tolerance, may worsen PVD and Raynaud disease

**CNS:** Drowsiness, nightmares, insomnia, depression (?)

**Other:** Masking symptoms of hypoglycemia ,rebound hypertension or tachycardia

**Potential other uses:** Hypertension, tachycardia, POTS, anxiety, essential tremor

## Antidepressants

- Amitriptyline 10-100 mg 2 hours before bedtime
- Nortriptyline 10-100 mg nightly
- Venlafaxine also has some data-Start at 37.5 mg daily and increase weekly up to 150 mg as needed

## Topiramate

**Disease State:** Migraine, Chronic Migraine

**Dose:** 25-100 mg/day given QD-BID. Available as extended release

**Mechanism of Action**

- Antagonist of AMPA/kainate subtype of glutamate receptors

(Main reason for effectiveness in migraine/epilepsy?)

- Augments the $GABA_A$ receptor (Less sedating than most anxiolytics)
- Blocks voltage-dependent calcium and sodium channels
- Inhibits carbonic anhydrase isoenzymes II and IV. (metabolic acidosis, paresthesias)
- May inhibit protein kinase activity (? weight regulation / glucose homeostasis)
- Possible serotonin activity on $5\text{-}HT_{2C}$ receptor (cause of weight loss)

## Topiramate

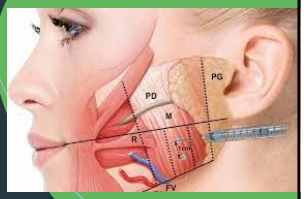
- **General**: Weight loss
- **Neurological**: Tingling, concentration /memory / language impairment
- **Ophtho:** acute angle closure glaucoma
- **Nephro**: Kidney stones

## Pearls: Migraine Preventives

| | |
|---|---|
| Migraine + htn | Propranolol, metoprolol |
| Migraine + depression/anxiety | Amitriptyline, nortriptyline,venlafaxine |
| Migraine + insomnia | Amitriptyline, nortriptyline |
| Women of child-bearing age | Avoid topiramate, and valproic acid |
| Obesity | Topiramate |
| Failure ≥ 3 or more orals | CGRP blocker, neurotoxin |

## Onabotulinum Toxin

- Botox is only FDA-approved for chronic migraines, (15 or more days a month)
- 15 minutes in office
- Coverage
- TMJ? Add on the masseters




## New Generation Txs That Should Be On Your Radar

- **Rescues**: Gepants (ubrogepant, rimegepant, atogepant, zavegepant)
- **Preventives**: CGRP antagonists (erenumab, fremanezumab, galcanezumab, eptinezumab)
  - 2/3 respond (and half of those do VERY WELL)
  - 1/3 do not respond
  - Constipation, GI side effects
- Serotonin IF target (Lasmiditan): no vasoconstriction. Use when triptan did not work or CI. Side effects: dizziness drowsiness. No driving for 8 hrs

## Update from the AAN Meeting April 2023

- Ubrogepant data presented that this can be helpful for PRODROME. Ubrogepant 100 mg can be used when the patient gets prodrome. This was a large randomized trial and will change practice.
- Atogepant 10, 30 and 60 mg qd approved by FDA for episodic and chronic. This is the only med approved for both.
- Remote Electrical neuromodulation Device (rescue and prevention)

## Headache Diary Aps

- Migraine Monitor
- Migraine Buddy

## Behavioral Therapies for Migraine

- Biofeedback
- Cognitive Behavioral Therapy
- Relaxation Training
- Ginger ap

# Special Considerations

## Menstrual Migraine

- True menstrual migraine: attacks ONLY with menses
- Menstrually-related migraine: attacks with AND without menses
- Significance is that predictability allows prevention by short course of anti-migraine medicine
  - Naproxen 500 mg bid as mini-prevention was shown to be effective when studied
  - Naratriptan 1 mg b


## Pregnancy and Migraine

- sumatriptan is ok: 50 mg at onset; repeat in 2 hours if no relief #9
- B2 400 mg a day for prevention is OK!
- metoclopramide 10 mg q 12 prn headache
- We can do occipital nerve blocks in neuro if needed
- Breastfeeding? eletriptan

## Consider Obstructive Sleep Apnea Contributory to Headache

- **Morning headaches**
- Typically abate within several hrs
- Can be tension-type or migrainous
- 20% of OSA patients have some form of headache
- Individuals with chronic migraine → more at risk for OSA

## Post Covid Headache

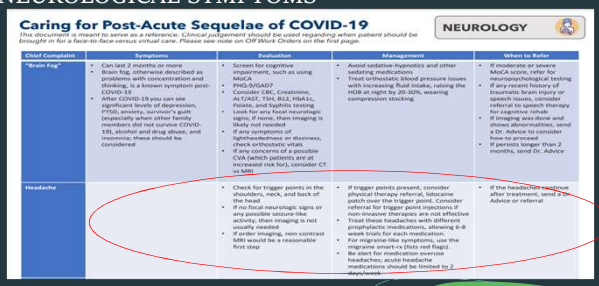
- 50% of pts with Covid present with headache
- Migraine or tension-type, bilateral
- More common in younger pts or ones with hx migraine

-Most improve in < 3 mos however up to 10-20% have persistent ha

-Try NSAIDS, prednisone taper, amitriptyline 10-50 mg nightly

-*Headache* Post Covid Headache May 2022 62, P 650-656

## B94.8 POST-ACUTE SEQUELAE OF COVID-19 With NEUROLOGICAL SYMPTOMS



**Caring for Post-Acute Sequelae of COVID-19** — NEUROLOGY

*This document is meant to serve as a reference. Clinical judgement should be used regarding when patient should be brought in for a face-to-face versus virtual care. Please see note on Off Work Orders on the first page.*

| Chief Complaint | Symptoms | Evaluation | Management | When to Refer |
|---|---|---|---|---|
| "Brain Fog" | • Can last 2 months or more<br>• Brain fog, otherwise described as problems with concentration and thinking, is a known symptom post-COVID-19<br>• After COVID-19 you can see significant levels of depression, PTSD, anxiety, survivor's guilt (especially when other family members did not survive COVID-19), alcohol and drug abuse, and suicide. All these should be considered | • Screen for cognitive impairment, such as using MoCA<br>• PHQ-9/GAD7<br>• Consider CBC, Creatinine, ALT/AST, TSH, B12, HbA1c, Folate, and Syphilis testing<br>• Look for any focal neurologic signs; if none, then imaging is likely not needed<br>• If complaints of lightheadedness or dizziness, check orthostatic vitals<br>• If any concerns of a possible CVA (which patients are at increased risk for), consider CT vs MRI | • Avoid sedative-hypnotics and other sedating medications<br>• Treat orthostatic blood pressure issues with increasing fluid intake, raising the HOB at night by 20-30%, wearing compression stocking | • If moderate or severe MoCA score, refer for neuropsychological testing<br>• If any recent history of traumatic brain injury or speech issues, consider referral to speech therapy for cognitive rehab<br>• If imaging was done and shows abnormalities, send to the specialist to consider how to proceed<br>• If persists longer than 2 months, send Dr. Advice |
| Headache | | • Check for trigger points in the shoulders, neck, and back of the head<br>• If no focal neurologic signs or any possible seizure-like activity, then imaging is not usually needed<br>• If order imaging, non-contrast MRI would be a reasonable first step | • If trigger points present, consider physical therapy referral, lidocaine patch over the trigger point. Consider referral for trigger point injections if non-invasive therapies are not effective<br>• Treat these headaches with different prophylactic medications, allowing 6-8 week trials for each medication.<br>• For migraine-like symptoms, use the migraine smart-rx (lists red flags).<br>• Be alert for medication overuse headaches; acute headache medications should be limited to 2 days/week | • If the headache continue after treatment, send 2 to Advice or referral |

## Pediatric Migraine

- **Keys:**
  - **Migraines are shorter in kids (may be 1 hr)**
  - **Bilateral pain > unilateral**
  - Pediatric patients have difficulty describing throbbing pain or severity, and expressing associated symptoms
  - **Red flags in kids: escalating severity/freq/fever/sx/ms change**
- **Rizatriptan is approved for children ages 6-17. Smaller children weighing 20-39 kg are approved for lower dose rizatriptan at 5 mg po x 1**
  - **Over 40 kg = 10 mg po x 1**
- Topiramate is FDA approved as a prevention of migraine headaches in adolescents ages 12 - 17

## FMLA?

- Migraines: up to 3 days a month for 6 months

## Pearls Review

- SNOOP[5]
- PIN to diagnose
- If fail suma try nara, riza or ele
- Consider preventive if > 4-6 ha/mo
- Migraine plus depression? Also consider venlafaxine
- Menstrual migraine:

With nara 1 mg po bid -2 +3

**Box 1. The SNOOP mnemonic may catch potentially life-threatening headaches**

- **S**ystemic signs and disorders
- **N**eurologic symptoms
- **O**nset new or changed & patient >50 years old
- **O**nset in thunderclap presentation
- **P**apilledema, Pulsatile tinnitus, Positional provocation, Precipitated by exercise

## Migraine Screener: PIN

- 3 questions: PIN
  - *P*hotophobia?
  - *I*mpairment? (Has ha limited your activity for >1 day in past 3 mo?)
  - *N*ausea

Answering 2/3 yes= 93% Predictive value of migraine and all 3 yes= 98% predictive value

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## Pearls: Migraine Preventives

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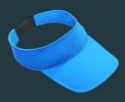
| Migraine + insomnia | Amitriptyline, nortriptyline |
| Women of child-bearing age | Avoid topiramate, and valproic acid |
| Obesity | Topiramate |
| Failure ≥ 3 or more orals | CGRP blocker, neurotoxin |

## In Summary



- Make the diagnosis
- Provide acute and preventive treatment as needed
- As always, confer hope

**There is no medicine like hope, no incentive so great, and no tonic so powerful as expectation of something better tomorrow.**

**-Orison Marden**

**Which of the following is included in the ICHD-3 criteria for migraine?**

A. Cutaneous allodynia
B. Improvement with activity
C. Nausea or vomiting
D. Photophobia or osmophobia
E. Unilateral autonomic symptoms

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A. Cutaneous allodynia
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D. Photophobia or osmophobia
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## Patient Resources

- Migraine Buddy- ap to track headaches
- Tools for Vets: National Headache Foundation- https://headaches.org/operationbrainstorm/
- Info to print for patients: American Headache Society- https://americanheadachesociety.org/resources/infographics/
- Supplements: https://americanmigrainefoundation.org/patient-guides: A Guide to Nutraceuticals for Migraine

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