

- Why does my head hurt?
- ## Essentials of Primary Headache Disorders

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9/18/2026

Overview

- Approach to Primary Headache Disorders
 - Rule Out Secondary Headache Disorders (SNOOP4)
 - Migraines
 - International Classification of Headache Disorders 3rd Edition (ICHD-3) Classification
 - Abortive Therapies
 - Prophylactic Therapies
 - Tension Headaches
 - Trigeminal Autonomic Cephalgias
 - Cluster Headaches
 - Other Primary Headache Disorders

Approach to Primary Headache Disorders

- Rule out secondary headache disorders through history and red flag screening
 - SNOOP4
 - Systemic symptoms
 - Neurological exam or behavioral changes
 - Onset, sudden
 - Older age at onset (age >50 years)
 - Pattern change
 - Precipitated by Valsalva maneuver
 - Postural
 - Papilledema or visual field deficits

Approach to Primary Headache Disorders

- While migraine has a prevalence of 12% in the general population, several studies have suggested that migraines may account for up to ~75-94% of patients presenting with “headache” as their primary concern in a primary care setting.
 - Though this number goes down when headache is not the primary concern
- Next step: Rule out migraine
- Use of screening tools can be helpful in ruling out migraine
 - ID Migraine (mnemonic- PIN)
 - 1. Photophobia?
 - 2. Incapacity (either physical or intellectual)?
 - 3. Nausea?
 - Two positives would be considered a positive screen
 - Positive increases pretest probability to 84%
 - Negative decreases pretest probability to 23%

Migraine

- ICHD-3 Criteria for Migraine Without Aura
- A. At least 5 attacks that fulfill criteria B-D
- B. Headache lasting 4-72 hours untreated or unsuccessfully treated
- C. Two of the following four:
 - 1. Unilateral
 - 2. Throbbing/pulsatile
 - 3. Moderate to Severe In Intensity
 - 4. Made worse by or causing avoidance in activity
- D. During headache at least one of the following:
 - 1. Nausea and/or vomiting
 - 2. Photophobia and phonophobia
- E. Not better accounted for by a different ICHD-3 diagnosis

Migraine

- ICHD-3 Criteria for Migraine With Aura
- A. At least 2 attacks fulfilling criteria B and C
- B. One or more of the following fully reversible aura symptoms:
 - Visual, sensory, speech and/or language, motor, brainstem, retinal
- C. At least 3 of the following 6 characteristics:
 - 1. At least one aura symptom spreads gradually over ≥ 5 minutes
 - 2. Two or more aura symptoms occur in succession
 - 3. Each individual aura symptom lasts 5-60 minutes (motor can be up to 72 hours)
 - 4. At least one aura symptom is unilateral
 - 5. At least one aura symptom is positive
 - 6. The aura is accompanied, or followed within 60 minutes, by a headache
- D. Not better accounted for by a different ICHD-3 diagnosis

Migraine

- Chronic Migraine
 - 15 or more migraine days per month for more than 3 months
- Probable Migraine
 - Meets all but one criteria for migraine
 - In practice, this means that any headache that causes limitation in activity and is moderate to severe in intensity lasting at least 4 hours could be considered probable migraine

Migraine

- Abortive therapies
 - Acetaminophen and NSAIDs (i.e. ibuprofen, naproxen)
 - Triptans
 - Rizatriptan and sumatriptan
 - Eletriptan, naratriptan, frovatriptan, zolmitriptan, almotriptan
 - In comparison studies, eletriptan was higher in complete pain relief at two hours than comparators such as naproxen, ubrogepant, and lasmiditan
 - Important to note- triptans are contraindicated in anyone with history of ischemic stroke, ischemic heart disease, Prinzmetal's angina, and uncontrolled hypertension
 - Also should be avoided in patients with hemiplegic migraine or migraine with brainstem aura
 - Of note, serotonin syndrome risk in combination with SSRIs or SNRIs is very low to non-existent
 - Combination of naproxen (or other NSAIDs) and triptans has a synergistic effect and studies have shown that the response is often more robust than with either agent alone

Migraine

- Abortive therapies
 - Small-Molecule CGRP-Antagonists: ubrogepant, rimegepant, zavegepant (intranasal)
 - No contraindication in patients with prior stroke or MI
 - Can make Raynaud's phenomenon symptoms worse (though this is a lower risk side effect)
 - Selective serotonin 1F receptor agonist: lasmiditan
 - Recently discontinued in 2025 for business reasons and sales issues
 - Carried an 8 hour driving restriction secondary to its CNS depressive effects
 - Timolol 0.5% eye drops
 - No large scale studies yet, though this is beginning to potentially show some promise in smaller studies

Migraine

- Abortive therapies
 - Ergots- ergotamine and dihydroergotamine
 - Limited in use secondary to significant rebound headache risk and side effect profile
 - Significant nausea/vomiting, prolonged vasoconstriction, several drug-drug interactions
 - Can be quite helpful for emergency treatment, though regular use should be limited/avoided if possible
 - Butalbital-based treatments: Fioricet and Fiorinal
 - Limited in use secondary to significant rebound headache risk
 - Can be quite helpful for emergency treatment, though regular use should be limited/avoided if possible
 - 1-2 doses/week or less maximum to minimize medication overuse headache risk

Migraine

- Abortive therapies
 - Emergency Options
 - Sumatriptan 6mg subcutaneous injection
 - Ketorolac 60mg IM vs 30mg IV
 - “Migraine Cocktail” - Emergency Room Version
 - 1L NS bolus
 - 2gm Magnesium Sulfate IV
 - 10mg metoclopramide vs 10mg prochlorperazine vs 25mg promethazine
 - 25-50mg diphenhydramine
 - 1gm IV depakote
 - Nerve blocks- such as occipital nerve blocks, sphenopalatine ganglion blocks
 - Neuromodulation- cephalic and cranial nerve stimulation, remote electrical neuromodulation, transcranial magnetic stimulation

Migraine

- Abortive therapies
 - Outpatient options for emergency migraine treatment
 - Steroid taper vs steroid burst for prolonged migraines
 - Prednisone 40-50mg daily for 5 days
 - Patients will often not see improvements until around day 3
 - Home Emergency Migraine Cocktail- recommend a patient try this if they are considering coming into the emergency room for treatment
 - Magnesium glycinate 400mg
 - Ondansetron 4-8mg vs metoclopramide/promethazine/prochlorperazine
 - Diphenhydramine 25-50mg
 - Naproxen 500mg

Migraine

- Prophylactic Therapies
 - Should begin consideration of prophylactic therapies in cases where there are 3 or more migraine days per month
 - First line therapies (can take 4-8 weeks to show full effect, therefore recommend **8 week trials**)
 - TCAs/SNRIs: amitriptyline, nortriptyline, venlafaxine
 - Largest obstacle to use is somnolence
 - Dose 10-12 hours prior to desired wake-up time
 - Nortriptyline 10mg 10-12 hours prior to desired wake up time, then in 2 weeks increase to 20mg every night
 - Weight gain risk is low with nortriptyline and when present, there is only an average of 3-4 pound weight gain

Migraine

- Prophylactic Therapies
 - First line therapies (can take 4-8 weeks to show full effect, therefore recommend **8 week trials**)
 - Anti-seizure medications: topiramate, divalproex sodium
 - Topiramate 25mg every night, then in 2 weeks increase to 50mg every night
 - Depakote ER 500mg daily
 - Both are associated with teratogenic effects
 - Beta-blockers: propranolol, metoprolol, timolol, nadolol, atenolol
 - Long active form of propranolol is often better tolerated and allows for higher dosing over time
 - Propranolol LA 60mg daily
 - Calcium channel blockers: verapamil, flunarizine, nifedipine, nimodipine
 - Verapamil is the first line therapy for hemiplegic migraines
 - ARBs/ACE Inhibitors: candesartan recently found to have efficacy, possibly lisinopril

Migraine

- Prophylactic Therapies
 - Second line therapies
 - Injectable CGRP-Antagonists (monoclonal antibodies): galcanezumab, fremanezumab, erenumab
 - Every 4 week administration (recommend 3 dose trial)
 - Can increase risk for Raynaud's phenomenon
 - Erenumab carries higher risk for constipation (3%)
 - Galcanezumab <2% risk of constipation
 - Fremanezumab may improve comorbid depression in patients with migraine
 - Botulinum Toxin Injections
 - Every 12 week administration (recommend 3 dose trial)
 - Small-Molecule CGRP-Antagonists: rimegepant (every other day dosing), atogepant
 - Intravenous CGRP-Antagonist (monoclonal antibody): eptinezumab (every 3 month dosing)

Migraine

- Prophylactic Therapies
 - Other options
 - Magnesium glycinate 400mg every night
 - Riboflavin (vitamin B2) 200mg BID vs 400mg daily
 - Coenzyme Q10 100mg TID
 - Only confirmed through small scale trials thus far
 - Memantine 10mg daily
 - Limited data for support

Migraine

- Prophylactic Therapies
 - Therapies without good data or with conflicting data:
 - Gabapentin
 - Feverfew
 - Melatonin
 - Butterbur
 - Closure of right-to-left cardiac shunt
 - Conflicting evidence connecting PFO/ASD with migraine with aura
 - Clinical trials do not show improvement with closure of these right-to-left cardiac shunts
 - Closure groups had more serious adverse events than those without

Tension-Type Headaches

- ICHD-3 Criteria for Tension-Type Headaches
 - A. Not going into detail here, though overall this is differences in frequency definitions and stating that criteria B-D need to be met
 - B. Lasting 30 minutes to 7 days
 - C. At least two of the following four characteristics:
 - 1. Bilateral location
 - 2. Pressing or tightening (not pulsating) quality
 - 3. Mild or moderate intensity
 - 4. Not aggravated by routine physical activity such as walking or climbing stairs
 - D. Both of the following:
 - 1. No nausea or vomiting
 - 2. No more than one of photophobia or phonophobia
 - E. Not better accounted for by another ICHD-3 diagnosis

Tension-Type Headaches

- Abortive therapies
 - NSAIDs, acetaminophen, or aspirin
 - In the emergency setting, similar treatment to “migraine cocktail”
 - Refractory cases can sometimes have improvements when treated with combination of NSAID or acetaminophen with 130mg caffeine
 - Not recommended
 - Muscle relaxants- no adequate controlled trials to support use of muscle relaxants in treatment of TTH

Tension-Type Headaches

- Prophylactic therapies
 - Should be considered if headaches occur >2 times per week or last longer than 4 hours and are only partially responsive to abortive therapies
 - Biofeedback, relaxation therapy, cognitive behavioral therapy
- Lifestyle factors
 - Adequate sleep (7-8 hours of sleep per night)
 - Adequate hydration (64 oz / 2 L water daily)
 - Not skipping meals
 - Regular exercise
- TCAs: amitriptyline, nortriptyline
- Mirtazapine 15mg QHS
- Venlafaxine
- Topiramate

Tension-Type Headaches

- Prophylactic therapies
 - Physical therapy has some evidence of efficacy (though no high-quality randomized trials)
 - Physiotherapy with exercises targeting the neck/shoulder muscles
 - Therapeutic heat or cold
 - Massage therapy
 - Postural correction
 - Spinal manipulation, traction, inactivation of muscle trigger points
 - Acupuncture
 - Can be therapeutically helpful, though this improvement can also be seen with sham acupuncture
 - Local injection treatments such as trigger point injections and Botulinum toxin injections
 - No clear data suggesting strong efficacy

Trigeminal Autonomic Cephalgias

- Unilateral in location, often with marked parasympathetic autonomic features on the side of the headache
- Cluster headaches
- Paroxysmal Hemicrania
- SUNCT/SUNA
- Hemicrania continua
- Probable autonomic cephalgia

Trigeminal Autonomic Cephalgias

- ICHD-3 Criteria for Cluster Headaches
 - A. At least 5 attacks fulfilling B-D
 - B. Severe or very severe unilateral orbital, supraorbital, and/or temporal pain lasting 15-180 minutes (untreated)
 - C. Either or both of the following:
 - 1. At least one of the following symptoms or signs, ipsilateral to the headache:
 - Conjunctival injection and/or lacrimation
 - Nasal congestion and/or rhinorrhea
 - Eyelid edema
 - Forehead and facial swelling
 - Miosis and/or ptosis
 - 2. A sense of restlessness or agitation
 - D. Occurring with a frequency between one every other day and 8 per day
 - E. Not better accounted for by another ICHD-3 diagnosis

Other Primary Headache Syndromes

- ICHD-3 criteria exist for several other primary headache syndromes
 - Primary cough headache
 - Primary exercise headache
 - Primary headache associated with sexual activity
 - Primary thunderclap headache
 - Cold-stimulus headache
 - External pressure headache
 - Primary stabbing headache
 - Nummular headache
 - Hypnic headache
 - New daily persistent headache

Thank you