Headaches

Jackie Weaver-Agostoni, DO, MPH, FACOFP
Program Director, UPMC Shadyside Family Medicine Residency
Pittsburgh, PA
agostonijs@upmc.edu

#POFPS44

Disclosures

- Johnson & Johnson Resident Director Advisory Board
  - Approaches to resident education regarding over-the-counter medications

#POFPS44

Objectives

- By the end of this lecture, you will be able to:
  1. Recognize headache "red flags" and identify when imaging is recommended
  2. Differentiate between the most common types of headaches
  3. List several options for migraine prophylaxis

#POFPS44

Morbidity

- Approximately one-half of the adult population worldwide is affected by a headache disorder

#POFPS44

Pathophysiology

- Varies depending on headache
- Hyperactivity of central or peripheral neural nociceptive substrates
- Dysfunction of central pain modulatory systems
- Feed-forward activation of peripheral inflammatory or muscular contractile mechanisms

#POFPS44

Headache Classification

- International Headache Society classification and diagnostic criteria
  - Based on clinical consensus
  - Most useful for classifying patients in epidemiologic studies and clinical trials
- Primary vs. Secondary headaches

#POFPS44

International Classification of Headache Disorders, 2nd ed. (ICHD-2)

Primary Headaches
- Migraine
- Tension-type
- Cluster
- Other (cold stimulus headache)

Secondary Headaches
- Headaches cause by:
  - Trauma
  - Vascular disorders
  - Non-vascular intracranial disorder
  - Substance use/withdrawal
  - Infection
  - Psychiatric disorder
- Headaches or face pain caused by disorder of cranium, ENT, or other facial/cranial issues

#POFPS44

History - HPI

- Pain
  - Location
  - Quality
  - Length
  - Severity
- Associated symptoms
- Triggers
- Alleviating symptoms
- Worsening symptoms
- "Red Flags"

#POFPS44

History

Bilateral mild to moderate pressure without other associated symptoms?

- Tension-type headache

Headache associated with nausea, photophobia and phonophobia

- Migraine headache

Brief (15-180 minutes) episodes of severe head pain with associated autonomic symptoms

- Cluster Headache

#POFPS44

Other Useful History

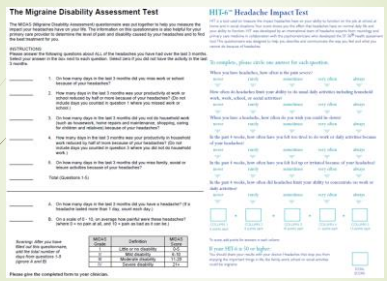
- Illicit drug use (cocaine/methamphetamine) - risk of intracranial bleeding or stroke
- Medication history
  - ASA, NSAID, anticoagulants, glucocorticoids - risk of intracranial bleeding
  - OCP and SSRI's - side effect can be headache
- Immunosuppressive conditions (HIV) - consider brain abscess, meningitis, CNS malignancy
- Coexisting infection in lungs/sinuses/orbital areas – CNS infection
- Response to pain relief?
- Should NOT be used as the sole diagnostic indicator of the underlying etiology of acute headache (per American College of Emergency Physicians)

#POFPS44

Objective Measures

- Limited evidence, but may help pts feel less helpless, which +/- can improve outcomes/response to drug therapy
- MIDAS is a 5-item questionnaire
  - How many days in the last 4 months patient was at least 50% disabled from migraines at work, home, school, recreational activities
- HIT-6 is another paper tool with 6 domains and 6 questions to evaluate headache impact

#POFPS44


The Migraine Disability Assessment Test

HIT-6™ Headache Impact Test

#POFPS44

Tension-Type Headache

- Most common
- Affects more than 40% adult population worldwide
- Women slightly more than men
- Pathophysiology: Nociceptors in the pericranial myofascial tissues are likely source

#POFPS44

Episodic Tension-Type Headache (ICHD-2)

Infrequent

- At least 10 episodes
  - Fewer than one day per month on avg (<12 per year)
  - Lasts 30 minutes to seven days
- At least 2 of the following features:
  - Bilateral
  - Pressing/tightening (nonpulsating) quality
  - Mild or moderate intensity
  - Not aggrevated by routine physical activity
- Both:
  - No nausea/vomiting
  - Either photophobia or phonophobia

Frequent

- At least 10 episodes
  - More than one but fewer than 15 days per month for at least three months
- Same criteria as infrequent

#POFPS44

Migraine Headache

- History
  - Nausea
  - Photophobia
  - Phonophobia
  - Physical activity often exacerbates
  - **POUND** mnemonic- at least four of these criteria are most likely to have migraine
    - **P**ulsatile quality
    - **O**ne day duration (4 to 72 hours)
    - **U**nilateral location
    - **N**ausea/vomiting
    - **D**isabling intensity

#POFPS44

ICHD-2 Diagnostic Criteria for Migraine

Without Aura

- At least five episodes
- Lasts four to 72 hours (untreated or unsuccessfully treated)
- At least two of the following:
  - Unilateral
  - Pulsating
  - Moderate to severe intensity
  - Aggravated by (or causes avoidance of) routine physcial activity (walking/climbing stairs)
- At least one:
  - Nausea or vomiting
  - Photophobia and phonophobia

With Typical Aura

- At least 2 episodes with:
  - Aura not including muscle weakness
    - Fully reversible
      - Visual symptoms
      - Sensory symptoms
      - Dysphasic speech disturbance
    - Each symptom lasts at least 5 minutes but no longer than 60 minutes
    - Headache begins during the aura or follows the aura within 60 minutes

#POFPS44

Cluster Headache Facts

- Rare
- Estimated 500,000 Americans experience them at least once in a lifetime
- Age of onset varies- 70% of patients prior to age 30

- Only 25% diagnosed correctly within one year of symptoms
- More than 40% report a delay in diagnosis of 5 years or longer
- Most common incorrect diagnoses:
  - 34% migraine
  - 21% sinusitis
  - 6% allergies

- Possible family history

#POFPS44

Cluster Headache Comorbidities

- Depression (24%)
  - Many with suicidal thoughts
  - 2% in one study had attempted suicide
- Sleep apnea (14%)
- Restless legs syndrome (11%)
- Asthma (9%)

#POFPS44

Cluster Headache History

#POFPS44

ICHD-2 Diagnostic Criteria for Cluster Headache

- At least five episodes
  - Minimum of severe unilateral orbital, supraorbital, or temporal pain lasting 15-180 minutes if untreated
  - Accompanied by at least one of the following ipsilateral autonomic symptoms:
    - Conjunctival injection or lacrimation
    - Nasal congestion or rhinorrhea
    - Eyelid edema
    - Forehead and facial sweating
    - Miosis or ptosis
    - Restlessness or agitation
  - Episodes occur from one every other day to eight per day

#POFPS44

ICHD-2 Diagnostic Criteria for Cluster Headache

Episodic Cluster

- At least two cluster periods
- Lasting seven to 365 days
- Separated by pain-free remissions of more than one month

Chronic Cluster

- Recur for more than one year
- No remission periods or with remission periods lasting less than one month

#POFPS44

Criteria for Low-Risk Headaches

- Age younger than 30 years
- Features typical of primary headaches
- History of similar headaches
- No abnormal neurologic findings
- No concerning change in usual headache pattern
- No high-risk comorbid conditions
  - HIV
  - Cancer
- No new, concerning H&P findings

#POFPS44

Red Flag Symptoms

- Based on observational study and consensus reports
- Not 100% accurate
- Further work-up indicated

#POFPS44

Imaging

Head CT

- Most widely used for acute head trauma
  - Available
  - Speed
  - accuracy

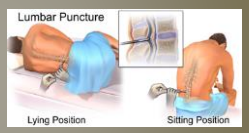
Brain MRI

- More sensitive for subdural hematoma
- Can identify smaller lesions

#POFPS44

Diagnostic Testing

- Neuroimaging
  - Signs or symptoms of dangerous headache
- Lumbar Puncture (LP)
  - Infection
  - RBC's
    - Bleeding
  - Abnormal cells
    - Malignancy
  - Subarachnoid hemorrhage
    - Blood or xanthochromia



#POFPS44

Diagnostic Algorithm

- Available at:
https://www.icsi.org/wp-content/uploads/2019/01/Headache.pdf

#POFPS44

Red Flag Signs and Symptoms Quiz

Danger sign/symptom
Possible Diagnoses
Recommended Testing
  * Americal College of Radiology Recommendations for Imaging

NOTE: CT head ALWAYS PRIOR to Lumbar Puncture to reduce risk of central herniation of brain

#POFPS44

First or worst headache of patient's life

CNS infection
Intracranial hemorrhage

Neuroimaging
* CT head without contrast, CTA head with contrast, MRA head with or without contrast, or MRI head without contrast

#POFPS44

Focal neurologic signs (not typical aura)

Arteriovenous malformation
Collagen vascular disease
Intracranial mass lesion

Blood tests, Neuroimaging

#POFPS44

Triggered by cough, exertion, or during sexual intercourse

Mass lesion
Subarachnoid hemorrhage
Carotid artery dissection

Neuroimaging, Lumbar puncture
* MRI head with and without contrast, MRA head and neck, or CTA head and neck if suspect arterial dissection

#POFPS44

Headache with change in personality, mental status, level of consciousness

CNS infection
Intracerebral bleed
Mass lesion

Blood tests, Neuroimaging, Lumbar puncture

#POFPS44

Neck stiffness or meningismus

Meningitis

Lumbar puncture
* CT or MRI head without contrast

#POFPS44

New onset severe headache in pregnancy or postpartum

Cortical vein/cranial sinus thrombosis
Carotid artery dissection
Pituitary apoplexy

Neuroimaging
* CT or MRI head without contrast

#POFPS44

Older than 50 years old

Mass lesion
Temporal arteritis

Blood tests (ESR), Neuroimaging
* MRI head with and without contrast (patients older than 60 with suspected temporal arteritis)

#POFPS44

Papilledema

Encephalitis
Mass lesion
Meningitis
Pseudotumor

Neuroimaging, Lumbar puncture

#POFPS44

Rapid onset with strenuous exercise

Carotid artery dissection
Intracranial bleed

Neuroimaging

#POFPS44

Sudden onset (thunderclap) - peak intensity within minutes

Bleeding into a mass or AV malformation
Mass lesion (posterior fossa)
Subarachnoid hemorrhage

Neuroimaging, Lumbar puncture

#POFPS44

Thunderclap Headache Differential Diagnoses

- Subarachnoid hemorrhage
  - Ruptured aneurysm
- Hypertensive emergency
- Vertebral artery dissections
- Acute angle-closure glaucoma

#POFPS44

Systemic illness (fever, rash)

Arteritis
Collagen vascular disease
Encephalitis
Meningitis

Blood tests, Neuroimaging, Lumbar puncture, Skin biopsy

#POFPS44

Tenderness over temporal artery

Polymyalgia rheumatica
Temporal arteritis

Erythrocyte sedimentation rate (ESR), Temporal artery biopsy

#POFPS44

Worsening pattern

History of medication overuse
Mass lesion
Subdural hematoma

Neuroimaging

#POFPS44

With comorbidity

Cancer - Metastasis
HIV - Opportunistic infection, Tumor
Lyme - Meningoencephalitis

Neuroimaging, Lumbar puncture
* MRI head with and without contrast

#POFPS44

Physical Examination

- Vital Signs
  - Fever, elevated BP (> 180/120)
    - Infection
    - Increased intracranial pressure
- HEENT
  - Dental/TMJ
  - Ear exam
  - Sinuses
  - Contusions/lacerations
    - Intracranial hemorrhage
  - Papilledema
    - Increased intracranial pressure
- Skin
  - Rash
- Tenderness over temporal artery
  - Polymyalgia rheumatica
  - Temporal arteritis
- Neurologic

#POFPS44

Neurologic Physical Exam

- Abnormalities one of the best predictors of CNS pathology
- Focal deficit not attributed to migraine unless similar pattern in the past
  - Aura lasts < 60 minutes
- Meningismus
- Unilateral vision loss
- Confusion

#POFPS44

Other Headache Lingo

#POFPS44

Chronic Daily Headache

- Headache 15 or more days per month for at least 3 months
- 3-5% patients presenting with acute heaaches
- U.S. 33% more common in caucasians and women
- Most common:
  - Chronic migraine
  - Chronic tension-type
- Medication overuse
  - Stop the medication
  - Consider prophylactic treatment
  - Nonpharmacologic and pharmacologic treatments

#POFPS44

Medication Overuse Headache

One of the most common causes of chronic daily headache
- Analgesics, ergots worst offenders
- Prevention: limit use to 2-3x/week
- Treatment: discontinue offending agent
  - Abrupt vs. taper
  - Headache prophylaxis (topirimate, amitripytiline)
- Can take 2 months to revert to normal

#POFPS44

Ottawa Subarachnoid Hemorrhage Clinical Decision Rule

- https://www.mdcalc.com/ottawa-subarachnoid-hemorrhage-sah-rule-headache-evaluation
- **Only apply in:** Alert patients ≥15 years old, new severe atraumatic headache, maximum intensity within 1 hour.
- **Do not use in:** Patients with new neurologic deficits, prior aneurysm, prior SAH, known brain tumors, or chronic recurrent headaches (≥3 headaches of the same character and intensity for >6 months).

Age ≥40
Neck pain or stiffness
Witnessed loss of consciousness
Onset during exertion
Thunderclap headache (peaking pain within 1 second)
Limited neck flexion on examination

#POFPS44

Treatment

#POFPS44

"Choosing Wisely" Regarding Headaches

1. Don't perform neuroimaging studies in patients with stable headaches that meet criteria for migraine
2. Don't perform computed tomography imaging for headache when magnetic resonance imaging is available, except in emergency settings
3. Don't recommend surgical deactivation of migraine trigger points ("migraine surgery") outside of a clinical trial
4. Don't prescribe opioid- or butalbital-containing medications as a first-line treatment for recurrent headache disorders
5. Don't recommend prolonged or frequent use of over-the-counter pain medications for headache.

#POFPS44

Migraine Prophylaxis

- Consider:
  - Four or more headaches a month
  - Eight or more headache days a month
  - Debilitating headaches
  - Medication overuse

#POFPS44

Migraine: Prophylaxis

CAM/OTC

Level A (established efficacy)	Level B (probably effective)	Level U/B negative (conflicting or probably ineffective)
Butterbur (HPA-free)	NSAIDs	Aspirin
Petasites	Riboflavin, Magnesium	Omega-3
Acupuncture	Feverfew Behavioral treatments (CBT, etc.)	Hyperbaric oxygen

Rx

Level A (established efficacy)	Level B (probably effective)	Level A-C negative (established – possibly ineffective)
Divalproex/valproate, topiramate	Amitriptyline, venlafaxine	Lamotrigine, oxcarbamazepine
Propranolol, metoprolol, timolol	Atenolol, nadolol	Clompirimine, clonazepam,
		Acebutolol, telmisartan
		Nabumetone

#POFPS44

Migraine Treatment

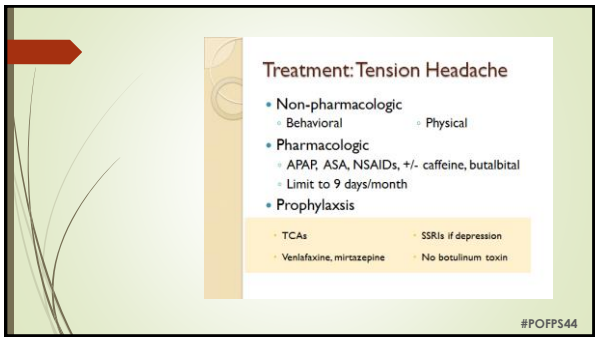
- NSAIDs first-line treatment for mild to moderate migraine (level A)
  - Availability and adverse effect profile
- Triptans first-line treatment for moderate to severe migraine (level A)
- Dopamine antagonist antiemetics 2nd-line (level B)
- Parenteral dihydroergotamine (DHE 45), magnesium sulfate, valproate, and opioids should be reserved for refractory migraines (level B)

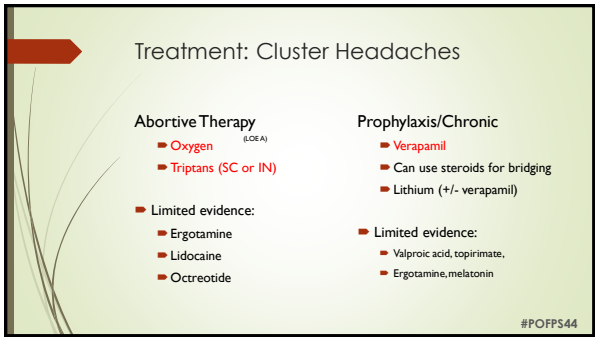
#POFPS44

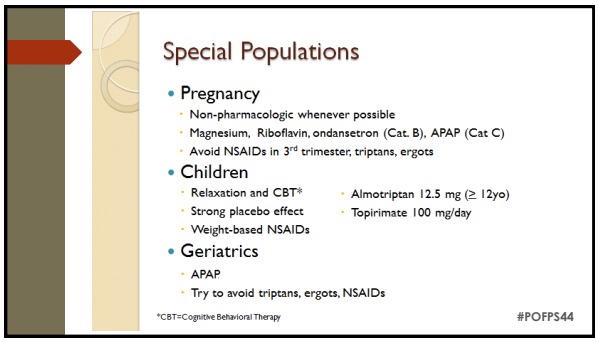
New Migraine Medication: Erenumab (Aimovig)

- Once-monthly injection
- Monoclonal antibody
- Migraine prophylaxis
- Block the receptor of calcitonin gene-related peptide, a vasodilatory neurotransmitter that accumulates during active migraine
- Reduces migraine days by one to 2.5 days per month
- Safe option for adults
- Expensive
- Reserved for patients with intolerable side effects to oral treatment or who have poor adherence to daily prevention

#POFPS44


Treatment: Tension Headache
Non-pharmacologic
Behavioral
Physical
Pharmacologic
APAP, ASA, NSAIDs, +/- caffeine, butalbital
Limit to 9 days/month
Prophylaxsis
TCAs
SSRIs if depression
Venlafaxine, mirtazepine
No botulinum toxin
#POFPS44


Treatment: Cluster Headaches
Abortive Therapy
(LOE A)
Oxygen
Triptans (SC or IN)
Limited evidence:
Ergotamine
Lidocaine
Octreotide
Prophylaxis/Chronic
Verapamil
Can use steroids for bridging
Lithium (+/- verapamil)
Limited evidence:
Valproic acid, topirimate,
Ergotamine, melatonin
#POFPS44


Special Populations
Pregnancy
Non-pharmacologic whenever possible
Magnesium, Riboflavin, ondansetron (Cat. B), APAP (Cat C)
Avoid NSAIDs in 3rd trimester, triptans, ergots
Children
Relaxation and CBT*
Strong placebo effect
Weight-based NSAIDs
Almotriptan 12.5 mg (≥ 12yo)
Topirimate 100 mg/day
Geriatrics
APAP
Try to avoid triptans, ergots, NSAIDs
*CBT=Cognitive Behavioral Therapy
#POFPS44

Objectives

- By the end of this lecture, you will be able to:
  1. Recognize headache "red flags" and identify when imaging is recommended
  2. Differentiate between the most common types of headaches
  3. List several options for migraine prophylaxis

#POFPS44

References

- Hainer BL, Metheson EM. Approach to Acute Headache in Adults. Am Fam Physician. 2013;87(10):682-687.
- Beithon J, Gallenberg M, Johnson K, Kildahl P, Krenik J, Liebow M, Linbo L, Myers C, Peterson S, Schmidt J, Swanson J. Institute for Clinical Systems Improvement. Diagnosis and Treatment of Headache. Updated January 2013. Available at: https://www.icsi.org/wp-content/uploads/2019/01/Headache.pdf. Last accessed Aug 6, 2019.
- Weaver-Agostoni J. Cluster Headache. *Am Family Physician.* 2013; 88(2): 122-128.
- Yancey JR, Sheridan R, Koren KG. Chronic Daily Headache: Diagnosis and Management. *Am Fam Physician.* 2014;89(8):642-648.
- Loder E, Weizenbaum E, et al. Choosing Wisely in Headache Medicine: The American Headache Society's List of Five Things Physicians and Patients Should Question. *Headache* 2013;53:1651-1659
- Holland S, Silberstein F, Freitag et al. Evidence-based Guideline Update: NSAIDs and Other Complimentary Treatments for Episodic Migraine Prevention in Adults. *Neuology*. 2012;78:1346-53
- Holland S, Silberstein F, Freitag et al. Evidence-based Guideline Update: Pharmacologic Treatments for Episodic Migraine Prevention in Adults. *Neurology*. 2012;78:1337-45

#POFPS44

References- Page 2

- Mayans L, Walling A. Acute Migraine Headache: Treatment Strategies. *Am Fam Physician*. 2018;97(4):243-251.
- Ha H, Gonzalez A. Migraine Headache Prophylaxis. *Am Fam Physician.* 2019;99(1):17-24.
- Kale N, Osayande AS. Point-of-Care Guides: Identifying Patients with Headache Who Are at Risk of Subarachnoid Hemorrhage. *Am Fam Physician*. 2018;98(4):256-257
- Shreiber AM. STEPS New Drug Reviews: Erenumab (Aimovig) for Migraine Prophylaxis in Adults. *Am Fam Physician*. 2019;99(12):781-782.
- Sierpina V, Astin J, Giordano J. Mind-Body Therapies for Headache. *Am Fam Physician*. 2007;76:1518-22, 1523-4.

#POFPS44


Questions?
#POFPS44