Headaches

A guide to evaluation and treatment in primary care

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Objectives

- At the end of this session, participants should be able to:
  - Conduct a specific history and physical exam for a migraine/headache patient
  - Recognize the clinical features of migraines/headaches
  - Initiate a successful treatment plan for a migraine/headache patient

Disclosures

- No Financial Disclosures
- We will not discuss every type of migraine/headaches in detail
  - 41 types in one source
  - Another source had an additional 11 types
- Highlight the most common types, distinctions, red flags, treatments

a) Heal your Headache by David Buchholz MD

b) IHS Classification ICHD-3 Beta

c) Annals Indian Academy Neurology. 2012 Aug; 15(Suppl 1): S62–S65.

Ann Indian Acad Neurol. 2012 Aug; 15(Suppl 1): S62–S65.
doi: 10.4103/0972-2327.100011

Information for this lecture

Resources

d) General concepts from:
- Pocket Neurology-Westover, DeCroos, Awad, Bianchi
- Continuum Volume 21 , Number 4, August 2015- Journal of American Academy of Neurology

e) American Headache Society

"I don't have a migraine, I have a headache"

- Is there a difference?

Does your patient say this?

Headache Evaluation

- History
  - Personal
  - Family
  - Medical/Surgical
  - Specific headache history
- ROS
- Physical Exam
- Differential Diagnosis
- Investigational Options
- Diagnosis
- Treatment

History

- Gender
- Age of onset-how it began/trauma, sudden vs chronic
- Frequency of attacks
  - How often/how long do they last
- Quality-throbbing, stabbing, etc.
- Location of headache
  - How bad-Mild, Moderate, Severe
  - Disability from attacks vs. 0-10
- What activities makes it better/worse

(reference b,c,d)

History

- What have you taken/done in the past to treat?
  - Current medications-including supplements
  - Does this help?
- Other factors such as depression, anxiety, emotional, physical or sexual trauma
- Lifestyle questions-sleep, eating, stress
- Past medical history/Past surgical history
- Relevant studies-MRI, CT scan, EMG, EEG, labs
- Consider intake form

(reference b,c,d)

- Migraine has a strong genetic component.
  - Approximately 80% of migraine patients
    - First degree relative
  - The risk of migraine is increased
    - migraine with aura
  - Chromosome 19 for Familial Hemiplegic Migraine
    - Mostly unknown specific genetic defect

Family History (reference b,c,d,)

- **Foods:**
  - Some fruits
  - Caffeinated beverages
  - Alcohol
  - Cheese-aged
  - Chocolate
  - MSG (monosodium glutamate)
  - Onions
  - Cured meats
  - Peanut Butter/Nuts
  - Pork
  - Sour cream
  - Yogurt
  - Some beans, peas
  - Fermented, pickled or marinated foods
- **Other:**
  - Stress
  - Missing meals
  - Fatigue
  - Lack of sleep
  - Smoke
  - Odors
  - Medications
    - Hormones-testosterone replacement
    - Stimulants-including caffeine
    - BP Medications-not all
    - Accutane
    - SSRI-not all
    - GERD Meds-PPI
      - Use H2 Blockers
- Careful History will help identify causes

Triggers

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Prodrome-days to hours before	Aura-Just before or during
Fatigue	Blurry vision
Emotional irritability	Blind spots
Difficulty with concentration	Zig-Zag lines
Sensitivity to light/noise	Double vision
Muscle pain	Total Blindness
Loss of appetite	Flashing/colored lights
Nausea	Tunnel vision
vomiting	Dizziness
food cravings	Difficulty finding words
thirst	Slurred speech
Stomach pain	One-sided weakness
Yawning	General weakness
Teary eyes	Numbess and tingling
Sinus pressure/congestion	Other
Light-headiness	
Other	

Ask about these symptoms

**American Headache Society

Review of Systems Neurological	Mental Status
Headache	Level of consciousness/orientation
Dizziness	Memory (3-5 words/short and long term
Decreased visual/auditory acuity	Concentration (serial 7s/spell words backward)
Dysphagia	Language (repetition/concentration/fluency)
Diplopia	Praxis (demonstrate a action)
Dysarthria	Visual spatial construction (clock)
Nausea/vomiting	
Focal numbness or weakness	
Ataxia	
Bladder or bowel problems	
(retention or incontinence)	**American Headache Society

- **S -- Systemic Symptoms**
  - symptoms, in addition to headache
  - affect the body as a whole.
  - fevers, muscle pain, and weight loss.
  - secondary risk factors, like HIV or cancer.
- **N -- Neurological Signs or Symptoms**
  - Change in cognition or mental functioning,
  - or deficits in one or more areas of the body,
    - weakness or loss of sensation requires immediate medical attention.
  - This could be an indication of a stroke, mass in the brain, or other vascular or autoimmune process in the nervous system.
- American Headache Society-Headache Warning Signs
- **O -- Onset**
  - Headaches that hit suddenly and severely, without warning, (thunderclap headaches)
  - ? sign of a stroke, especially a bleed in the brain known as a subarachnoid hemorrhage.
  - If straining, coughing, or sexual activity causes a headache
- **O -- Older Age of Onset**
  - start to experience headaches age 50 or older
  - DD: giant cell arteritis.
- **P -- Prior Headache History**
  - Headache pattern has changed,
  - more severe in intensity, more frequent, or associated with new symptoms like fatigue

SNOOP

Red Flag	Differential Diagnosis	Workup
Headache beginning **after** 50 years of age	Temporal arteritis, mass lesion	Sed Rate, CRP, neuroimaging
Sudden onset of headache	Subarachnoid hemorrhage,hemorrhage into a mass lesion, vascular malformation, (especially posterior fossa mass)	Neuroimaging, Lumbar puncture if imagine is negative
Headaches increasing in frequency and severity	Mass lesion, subdural hematoma, medication overuse	Neuroimaging, drug screen
New-onset headache in a patient with risk factors for HIV infection or cancer	Meningitis (chronic or carcinomatous), brain abscess (including toxoplasmosis), metastasis	Neuroimaging, Lumbar puncture if imagine is negative

(reference b,c,d)

Red Flags	Differential Diagnosis	Workup
Headache with signs of systemic illness (fever, stiff neck, rash)	Meningitis, encephalitis, Lyme disease, systemic infection, collagen vascular disease	Neuroimaging, Lumbar puncture, serology
Focal neurologic signs or symptoms of disease (other than typical aura)	Mass lesion, vascular malformation, stroke, collagen vascular disease	Neuroimaging, collagen vascular evaluation (including antiphospholipid antibodies)
Papilledema	Mass lesion, pseudotumor cerebri, meningitis	Neuroimaging, Lumbar puncture
Headache subsequent to head trauma	Intracranial hemorrhage, subdural hematoma, epidural hematoma, post-traumatic headache	Neuroimaging of brain, skull and +/-cervical spine

- (reference b,c,d)

Physical Exam

- General: vital signs, neck, heart
- Fundoscopic
- Motor: pronator drift, weakness, tremor, fasciculation, atrophy, abnormal tone, abnormal involuntary movements, DTR (now called stretch reflexes) plantar responses

(reference b,c,)

- Sensory: light touch, temperature, vibration/proprioception, double simultaneous stimulation, two-point discrimination
- Cerebellar: Finger to nose, heel to shin
- Stance: eyes open, eyes closed
- Gait: heel walking, toe walking, tandem gait

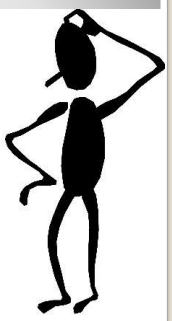
II: Pupils are equally reactive to light. Visual fields are full to confrontational testing.	VIII: Hearing is symmetrically preserved.
III, IV, VI: Eye movements are full and conjugate without nystagmus.	IX, X: Palate and uvula raise symmetrically.
V: Facial sensation is symmetrically preserved.	XI: Sternocleidomastoid and trapezius strength are full.
VII: Facial expression is symmetric.	XII: Tongue protrudes midline

Quick cranial nerve test

Cranial Nerves

- **Cranial Nerve I:** Olfactory Nerve- smell
- **Cranial Nerve II:** Optic Nerve- vision
- **Cranial Nerve III:** Oculomotor Nerve-allows the eye to move within the orbit.
- **Cranial Nerve IV:** Trochlear Nerve-abduction, depression and internal rotation of the eye.
- **Cranial Nerve V:** Trigeminal Nerve-sensory innervation of the face, sinuses and teeth.
- **Cranial Nerve VI:** Abducent Nerve innervates the lateral rectus muscle of the eye, which retracts the eye within the orbit.
- **Cranial Nerve VII** Facial Nerve- muscles of the face with motoric fibers and taste sensation to the anterior two thirds of the tongue.
- **Cranial Nerve VIII:** Vestibulocochlear Nerve sensory innervation to the inner ear.
- **Cranial Nerve IX:** Glossopharyngeal Nerve-taste sensation for the posterior third of the Tongue, sensation to the tonsils, pharynx and middle ear and motoric fibers to the stylopharyngeus muscle and the parotid gland.
- **Cranial Nerve X:** Vagus Nerve-sensation to the heart, lungs, trachea, bronchi, larynx, pharynx, gastrointestinal tract and the external ear
- **Cranial Nerve XI:** Accessory Nerve-innervates the Sternocleidomastoid muscles and Trapezius muscles.
- **Cranial Nerve XII:** Hypoglossal Nerve- muscles of the tongue, except the palatoglossal, strap muscles

So now what?



Types of Headaches

Primary Headaches	Secondary Headaches	Cranial Neuropathies, other facial pain/headaches
Migraine	Trauma to head or neck	Cranial neuropathies/other facial pain
Tension	Attributed to cranial or cervical disorder	
Trigeminal autonomic cephalalgia	Attributed to non-vascular intracranial disorder	
Other primary headache disorders (less common)	From a substance or withdrawal	
	Infection	
	homoeostasis	
	Disorder of cranium, neck eye, ear, nose sinus, teeth, mouth or other structure	
	Psychiatric disorder	

- Migraines with and without auras
- Tension Headaches
- Trigeminal Autonomic Cephalalgias
- Other primary headaches

Primary Headaches

Old belief of migraine cause: Vascular theory

- Ischemia was induced by intracranial vasoconstriction and cause of aura
- Subsequent rebound vasodilation and activation of perivascular nociceptive nerves resulted in a headache.
- This theory was based on the following observations:
  - Extracranial vessels become distended and pulsatile during a migraine attack
  - Stimulation of intracranial vessels in an awake person induces headache

Heal your Headache by David Buchholz MD

- Old belief: Vascular theory (continued)
- Also vasoconstrictors (e.g., ergots) improve the headache, whereas vasodilators (e.g., nitroglycerin) provoke an attack. **BUT..**
  - **Didn't** explain the prodrome and associated features.
  - **Didn't** explain the efficacy of drugs used to treat migraines that have no effect on blood vessels
  - **25%** of patients have an aura
- Researchers found that intracranial blood flow patterns were inconsistent with the vascular theory.

Heal your Headache by David Buchholz MD

- **New evidence:**
- Series of neural and vascular events initiates migraine.
- Before the headache even begins
  - state of neuronal hyper-excitability in the cerebral cortex, especially in the occipital cortex
  - cortical spreading depression (CSD)
- CSD causes aura which develops into headache
- Trigeminal system activated=cranial vessel dilation-giving trigeminal distribution of pain

Heal your Headache by David Buchholz MD

- Swelling and inflammation of blood vessels
  - Can produce prodrome or aura
    - Severe localized pain
    - Nausea/vomiting
    - Photophobia or phonophobia
    - Visual disturburtances
    - Tearing
    - Congestion
    - loss of appetite/food cravings
    - Slurred speech/difficulty finding words
    - One sided or general weakness
    - Numbness and tingling

Heal your Headache by David Buchholz MD

Clinical features of Migraines

A) **At least five attacks** fulfilling criteria **B through D**

- B) **Headache attacks lasting 4 to 72 hours** (untreated/ unsuccessfully treated)
- C) Headache has at least **two** of the following 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)
- D) During headache at least **one** of the following:
  - **Nausea, vomiting**, or both
  - **Photophobia and phonophobia**
- E) Not better accounted for by another ICHD-3 diagnosis

Classic Migraine without aura ICHD-3 Criteria (reference b,c,d)

- A) At least **two** attacks fulfilling criterion 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 **two** of the following four characteristics:
  - At least **one** aura symptom spreads gradually over **≥5 minutes**, and/or **two** or more symptoms **occur in succession**
  - Each individual aura symptom lasts **5 to 60** minutes
  - At least **one** aura symptom is **unilateral**
  - The aura is **accompanied**, or followed within **60** minutes, by **headache**
- D) Not better accounted for by another ICHD-3 diagnosis, and transient ischemic attack has been excluded

Classic Migraine with Aura (ICHD-3)

(reference b,c,d)

When the aura includes motor weakness, the disorder is diagnosed as hemiplegic migraine

Mimics a stoke

- **Avoid** Triptans and DHE

When the aura symptoms arise from the brain stem, the diagnosis is migraine with brainstem aura

- Previously called "basilar-type" migraine
- Females> Males
- dysarthria, vertigo, tinnitus, hypacusis, diplopia, ataxia, decreased level of consciousness, visual and sensory features, aphasic
- Same treatment as classic migraine

(reference b,c,d)

- Do not have aura and are not true migraines
- No age/sex difference
- 30 minutes to 7 days
- "tight band around head"
- Not worse with activity
- No nausea/vomiting, photo/phono-phobia
- Treatment:
  - Stress management, biofeedback, hot showers, posture correction, acupuncture
  - Tricyclics, NSAIDS, ASA, Tylenol, muscle relaxers
  - Avoid narcotic, barbiturates
  - Triptans don't usually help (but we try them anyway)

Tension Headaches (reference b,c,d)

- Cluster headaches
- Hemicrania Continua
- Paroxysmal Hemicranias-uncommon

Trigeminal Autonomic Cephalalgias

- Male>Female (4-5 times)
- Increase risk in smokers
- Sudden onset; very painful headache
- Lasting 15 minutes-3 hours.
-
- Comes in clusters for days and then usually gone for extended period of time
- Unilateral periorbital
- Rhinorrhea, tearing, red eye, ptosis-all on side of headache

Cluster Headaches (reference b,c,d)

- Treatment:
  - Acute:
    - High flow O2 through non-rebreather mask
    - IM, SQ or IN Triptans
    - SPG Blocks
  - Prophylactic:
    - Verapamil 80 mg BID to 240-960 mg/d
      - **First line-EKG first and with each increase of dosage**
    - Lithium 300 BID up to 600-1200 mg/d
    - Melatonin 10 mg QHS

Cluster Headaches (reference b,c,d)

- Unilateral, mild to moderate intensity
- Constant, unremitting
- No additional symptomology at mild to moderate
- At severe range:
  - Some symptoms are ipsilateral (photo/phonophobia)
  - Nausea and vomiting
  - Brief stabbing pain (ice pick-like)
  - Sensation of sand/grit in eye (on side of headache)
- Treatment-responsive to indomethacin
  - 300-500 mg/D (higher dose than FDA recommendation)
- Other treatments
  - Topiramate, melatonin, occipital nerve blocks or stimulators

Hemicrania Continua (reference b,c,d)

- New Daily Persistent Headaches
- Hypnic Headaches

Other Primary Headaches

- Criteria:
  - More than 3 months and criteria below
    - Headache daily, unremitting from onset
    - 2 of the following:
      - Bilateral
      - Pressing/tightening, non-pulsating
      - Mild to moderate
      - Not worsened with activity
    - No more than one of:
      - photophobia, phonophobia or mild nausea
      - No moderate or severe nausea or vomiting
  - Not attributed to any other disorder

(reference b,c,d)

New Daily Persistent Headaches

- New Daily Persistent Headache (cont)
  - Cervical spine hypermobility-predisposing factor?
  - Infection-inflammatory response?
  - Secondary causes of NDPH
    - Chronic Meningitis
    - Posttraumatic headache
    - Chronic subdural hematoma
    - Idiopathic intracranial hypertension
    - Spontaneous CSF leaks

- Usually female
- Recurrent attacks
- Only during sleep, wakes patient
- 10 days a month> 3 months
- Frontal, dull
- Nausea 20%
- Treatment:
  - Lithium, aspirin, ergots, indomethacin

Hypnic Headache: older patient, usually over 60, rare (reference b,c,d)

- Trauma
- Post Concussion
- Giant Cell Arteritis
- Cranial or cervical vascular disorders
- Substance or withdrawal of substance
- Estrogen-related headaches
- Medication overuse headaches
- Others

Secondary Causes of Headaches

- Physical:
  - Within 2 weeks of injury, TBI
  - Most resolve within 3 months
  - Can present as migraine, tension, cluster etc.. headache
  - Treatment: consider trigger point injections, physical therapy, acupuncture
- Emotional:
  - Can present as any type of headache
  - Treat underlying cause
  - Diagnosis only given after extensive negative testing and trials of medications are not effective.
  - History of emotional trauma, abuse, depression, anxiety

Trauma (emotional and physical)

(reference b,c,d)

- Developed within 7 days of head injury or regaining consciousness
- Persistent > 3 months
- Can include dizziness, fatigue, reduced ability to concentrate, psychomotor slowing, mild memory issues, insomnia, anxiety, personality changes, irritability
- Risk factors: Prior headaches, female, presence of co-morbid psychological disorders
- More research needed

(reference b,c,d)

Post Concussion Syndrome

- Associated with **polymyalgia rheumatic/jaw claudication**
- Over 50, usually 70-80, female>male
- Gradual onset of temporal, occipital pain and/or scalp tenderness
- May be associated with Low grade fever or weight loss
- Possible palpated thickened vessel

- **Can lead to blindness if not treated**
  - Anterior ischemic optic neuropathy

- Work-up ESR, CRP, fibrinogen >40 in 80%, biopsy
- Treat as soon as lab work back-**do not wait for biopsy**
- Prednisone 40-60 mg/day, gradual taper in 2-4 weeks
- Guide treatment by symptoms

(reference b)

Giant Cell Arteritis

- TIA or ischemic stroke
- Non-trauma intracranial hemorrhage
- Unruptured vascular malformation
- Cervical carotid or vertebral artery dissection
- Cerebral Venous Thrombosis
- Acute intracranial arterial disorder

Cranial or cervical vascular disorder

- **Subarachnoid hemorrhage-Most Common**
- Reversible cerebral vasoconstriction syndrome
- Cerebral venous sinus thrombosis
- Cervical Artery dissection
- Ischemic Stroke
- Acute hypertensive Crisis and others

- **Sudden severe headache-rapid intensity (max 1 minute)**
  - But can not be differentiated by intensity
  - Can be only symptom/or neurological

- **Emergent Brain CT without contrast after H&P**
  - If Brain CT non-diagnostic: LP and Brain MRI w/contrast
  - Consider non-invasive vascular imaging of head and neck (MRA, CTA, MRV, CTV

- **Treat underlying cause**

(reference b,c,d)

Thunderclap Headache

- Primary Cough Headache
- Primary Exercise Headache-high altitude and/or hot weather, weight lifters
- Primary Headache associated with sexual activity
- Primary Stabbing Headache
  - "ice pick", few seconds, no other symptoms
- Cold Stimuli Headache
  - Ingestion of cold stimulus, "brain-freeze"
  - External application of cold stimulus
- External-Pressure Headache
  - Traction, external pressure (hat, helmet), ponytail, weaves
- Nummular Headache
  - Often chronic, small circumscribed area, absence of structural lesion

(reference b)

- Nitric oxide
- Carbon Monoxide
- Alcohol
- Additives (MSG)
- Cocaine
- Histamines
- Hormones-testosterone and estrogen (withdrawal of OCPs or testosterone/estrogen replacement)
- Opioids
- Stimulants-ADD drugs, weight reduction drugs, Caffeine
  - Caffeine-cause rebound headaches, not used anymore

(reference b)

Substance or withdrawal of substance

- Right before or during cycle or during withdrawal of estrogen
- Treatment-same as other headaches
- Prevention:
  - OCPs
  - IUD
  - NSAIDS or triptans 2-3 days before cycle, continue into cycle
  - Increased risk of stroke in migraines with aura
    - If aura OCP's should be avoided or used with caution

Estrogen Related Headache (reference b,c,d)

- Patients with preexisting headache disorder
- Headache changes from focal pain to a holocephalic
- History of taking pain medications (including NSAID and Tylenol, Triptans) over 10 days a month/more than 3 months
- Increase sensitivity of nervous system
- Treatment:
  - No acute medications for 4-6 weeks.

Medication overuse headaches

(reference b,c,d)

- **Infections-intracranial**
  - meningitis, fungal, brain abscess
- **Infections-Systemic**
  - Bacterial, viral
- **Homoeostasis**
  - Hypoxia/hypercapnia-high altitude/airplane travel, diving, sleep apnea
  - Dialysis
  - Hypertension
  - Hypothyroid
  - Fasting
  - More…..

(reference b)

• Cranial bones
  • Lesion
	• Nose/Sinus
	  • Acute/chronic rhinosinusitis

• Neck
  • Cervicogenic headache
  • Retropharyngeal tendonitis
  • Dystonia
	• Teeth/Jaw
	  • TMJ

	• Ears
	  • Inflammatory
	  • neoplastic

Disorders of the cranium, neck, ear, nose, sinus, teeth, mouth or other structure

b) HIS Classification ICHD-3 Beta

- Somatization
- Psychotic

- Evidence is scarce
- Some correlation to depression/anxiety/stress-related disorders/PTSD

- Some evidence that presence of co-morbid conditions
  - Worsen course of migraines
  - Increase in tension type migraines

Psychiatric disorder

(reference b)

- Trigeminal neuralgia
  - Classic
  - Painful
    - Acute herpes zoster
    - Post-herpetic trigeminal neuralgia
    - Attributed to MS plaque
    - Attributed to space taking lesion
- Glossopharyngeal neuralgia
- Occipital neuralgia
- Optic neuritis
- More

- Treat underlying cause

(reference b)

Painful cranial neuropathies/other facial pains

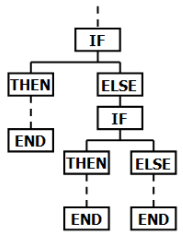
Consider ordering:

- Labs include:
  - CBC
    - Anemia can cause dizziness, headaches
  - TSH
    - Case by case, depends on symptoms
  - Vitamin D levels
    - Vitamin D deficiency reported to be related to headaches, mood, pain and absorption of magnesium

(reference b,c,)

- Indication for MRI, CT Scan, other testing
  - Unexplained abnormal finding on exam
  - Atypical headache symptoms
  - First or Worst headache
  - Change in pattern, frequency, severity
  - New symptoms
  - Headache not responding to treatment
  - New onset migraines after age 50
  - New onset of migraines in high risk patient
  - Associated symptoms: fever, stiff neck, papilledema, cognitive impairment, personality change

(reference b,c,)



What else could it be?

- Rule out allergy, infection, structural abnormality
- Swelling of blood vessels causes:
  - Congestion
  - Pressure
  - Stuffiness
  - Post-nasal drip
  - Pain
- Triggers can be smells, smoke, chemicals

- Heal your Headache by David Buchholz MD

Sinus Headache or Migraine?

- Beware of rebound with nasal sprays
  - constrict blood vessels
- Chronic nature of problem indicates migraine
  - Pain alone, clear nasal discharge could indicate migraine
  - But fever, purulent nasal discharge indicates infection
- Structural abnormality
  - Obstruction could allow bacteria to overgrow-cause headache
  - Usually not intermittent pain

Heal your Headache by David Buchholz MD

Sinus Headache or Migraine?

- Majority of adults have degeneration of spine on MRI
  - Most are asymptomatic and don't have migraines
  - Except for facet disease, most symptoms in upper extremities
  - Doesn't go uphill
- Cause of both neck and head pain can be migraine
  - Migraines=swollen blood vessels
  - Meningeal blood vessel inflammation causes neck stiffness/pain
  - Especially with flexion of neck
- Tricky because the cervical disease could trigger a migraine-secondary cause
- Cervical surgery aimed to relieve migraines is wrong target
  - Only for weakness or radiating arm pain

Cervical spine disease or migraine?

Heal your Headache by David Buchholz MD

- Preventative Medication
  - Vitamins/minerals, Seizure, blood pressure, antidepressant meds
- Acute Medication
  - Take as soon as headache begins
- Rescue Medications/Treatments
  - Acute medication didn't work… now what?
- Other

Headache Treatment Options

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- Magnesium oxide 500mg or Magnesium glycinate 400 mg
  - a day or with acute medication
- Coenzyme Q10 200mg
  - twice daily or 400mg once a day.
- Riboflavin (Vitamin B2) 400mg
  - a day.
- Vit D3 50,000u a week

Preventatives

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- 3 headache days a month=preventative medication.
- The medications that could be used for prevention
  - recommended supplements of magnesium, CoQ10 and Riboflavin
  - antidepressant class (example: amitriptyline, protriptyline)
  - anti-seizure class (example: gabapentin, topiramate, zonisamide)
  - beta blockers (example: metoprolol, propranolol)

Preventatives

(reference b,c,d)

Medication	Weight change	Labs
Antidepressants:		
amitriptyline	**+++**	**none**
nortriptyline	**++**	**none**
Protriptyline	**-**	**none**
Venlafaxine	**Neutral or -**	**none**
duloxetine	**Neutral or -**	**none**
Anticonvulsants		
Divalproex sodium	**+++**	**yearly**
gabapentin	**+**	**none**
lamotrigine	**Neutral**	**none**
topiramate	**- -**	**none**

Preventatives

(reference b,c,)

Medication	Weight change	Labs
Beta Blockers		
metoprolol	+	none
propranolol	+	none
Calcium Channel Blockers		
Verapamil (Cluster headache)	+	None (EKG upon initiation and q 6 months)
ARBs		
candesartan	**neutral**	none
Supplements		
Magnesium 500mg (adjust for GI) CoQ10 400 mg Riboflavin 400 mg Vitamin D3 (test first)	**neutral**	none

Acute Medications

Acute medications should be used in a stratified approach:

- **with prodrome/aura**: take NSAID or Tylenol.
- In 1-2 hours, repeat NSAID or Tylenol with triptan,
- repeat triptan if needed in 1-2 hours
- **If waking with headache**, take NSAID or Tylenol with triptan, repeat in two hours if needed

Do not prescribe acute pain medications or triptans more than 10 days a month (medication overuse headache)

(reference b,c,d,e)

Acute Medications

- acetaminophen-regular or extra strength
- Ibuprofen 600-800mg
- **Naproxen 500-550mg**
- Meloxicam 15 mg
- Diclofenac 75 mg
- Ketorolac 60 mg IM
- Any NSAID that works

- **Triptans:**
  - Sumitriptan (Imitrex)
  - Rizotriptan (Maxalt)
  - Frovatriptan (Frova)
  - Eletriptan (Relpax)
  - Zolmitriptan (Zomig)
  - Available PO/IM/IN
- Combo triptan and NSAID
- Muscle relaxers
- Antiemetics

Some Common Errors…

•Using any of these medications > 2 times per week run the risk of developing Medication Overuse Headaches (MOH)

- Fioricet (butalbital/acetaminophen/caffeine)
- Fiorinal (butalbital/aspirin/caffeine)
- Tylenol (acetaminophen)
- Excedrin Migraine (acetaminophen/aspirin/caffeine)
- Midrin (isometheptene/acetaminophen/dichloralphenazone)
- Trazadone
- Triptans (when overused)

Narcotics/Opiates:

- Vicodin/Norco (hydrocodone/acetaminophen)
- Percocet (oxycodone/acetaminophen)
- Percodan (oxycodone/aspirin)
- OxyContin (oxycodone)
- Stadol (butorphanol)
- MS-Contin (morphine)
- Dilaudid/Exalgo (hydromorphone)
- Opana (oxymorphone)
- Ultram (tramadol)
- Subutex/Butrans/Suboxone (buprenorphine)

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- Controversy regarding the butalbital combinations.
  - some saying a limited supply was ok
  - others sources did not think it was a good medication secondary to the caffeine properties.
  - caffeine cause rebound headache
  - sleep could be disturbed by the caffeine/butalbital
- Narcotics or tramadol are never recommended secondary to the addictive properties and the lack of effectiveness with these medications in headaches.

(reference b,c,)

Medication Overuse Headaches (MOH)

Common signs in individuals overusing pain medications

While taking pain medications on more than 2 days per week…	Headaches are becoming more intense, more frequent, and more difficult-to-treat
	My preventative medication is either not working, or no longer working
	I am needing increasing numbers and strengths of pain medications, emergency room trips, and hospitalizations

**American Migraine Foundation-Medication Overuse Headache: Navigating a Slippery Slope *Jonathan H. Smith MD* 72

- Increased sensitivity to stimuli-narcotics/tramadol
- Decreased response with continuous or repeated exposure to these meds.
- Discontinue acute medications for 6-8 weeks for MOH or hyperalgesia

Hyperalgesia

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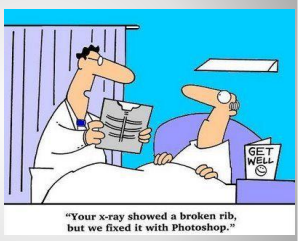
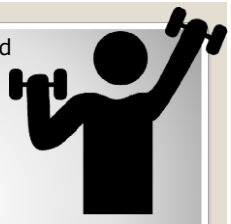
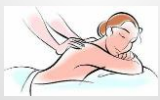


"Your x-ray showed a broken rib, but we fixed it with Photoshop."

More options

- Physical therapy should include the neck and shoulders
- Exercise
- Dry Needling
- Spinal manipulation
- Manual therapy
- Massage
- HEP





Physical Therapy

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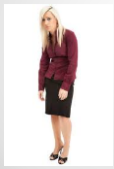
- Migraine slouch
  - Shoulders forward
  - Increases pain
  - Another reason for PT



Ergonomics

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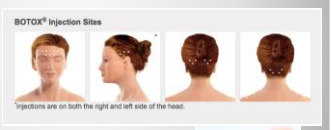
- TENS Units
- Acupuncture
- Cefaly
- Botox



Other Treatments

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- Alternate treatments for pain
  - avoid medication overuse.
  - topical medication (diclofenac topical)
  - TENS unit could be used to address the knee pain, tight upper trapezius muscles, other
- Lifestyle and dietary changes are essential.
  - fluctuations in blood sugar from sporadic meals are known to be a trigger for migraines.
  - exercises (walking is fine) 3-5 days a week.
  - Sleep study should be considered
    - snoring, waking with headache
  - **Stop all caffeine**

(reference b,c,d)

Caffeine Content	
Double Espresso (2 oz.)	45-100 mg
Brewed coffee (8 oz.)	60-120 mg
Instant coffee (8 oz.)	70 mg
Decaf coffee (8 oz.)	1-5 mg
Tea-Black (8 oz.)	45mg
Tea-green (8 oz.)	20 mg
Tea-White (8 oz.)	15 mg
Coca-Cola (12 oz. can)	34 mg
Pepsi (12 oz. can)	38 mg.
Root Beer (12 oz. can)	22 mg
Noncola Beverage (12 oz.)	0 mg
Chocolate milk (8 oz)	4 mg
Dark Chocolate (1 oz)	20 mg
Milk Chocolate (1 oz)	6 mg
Coffee Fudge frozen yogurt (8 oz)	85 mg

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Headache Diary

- How many headache per month/how severe
- Triggers, things that made them better or worse

- Apps on iPhone or Androids
- Regular calendar
- Spiral notebook

- In other words, anything to give us an accurate account of number of migraines.
- Bonus-if we get accurate intensity or other factors

- Consider doing serial testing:
  - HIT-6 Headache Impact Test (done at each visit)
  - HDI Headache Disability Index-when considering FMLA
  - MIDAS-Migraine Disability Assessment Test-when considering disability
  - MoCA-Montreal Cognitive Assessment-when assessing memory, cognition

Headache Hygiene

Get Regular Sleep	•Go to bed and wake up at regular times each day •Do not sleep excessively on the weekends and too little on the weekdays •Most adults need approximately 6-8 hours of sleep per night
Eat Regular Meals	•Low blood sugar can trigger a headache •Eat regular meals three times each day including protein, fruits, vegetables and carbohydrates •Too much sugar may lead to a rapid increase in blood sugar followed by a rapid decline in blood sugar, which can trigger a headache
Get Moderate Amounts of Routine Exercise	•Moderate exercise three to five times each week will help reduce stress and keep you physically fit •Too much exercise or inconsistent patterns of exercise may trigger headache
Drink Plenty of Water	•A normal adult should drink plenty of water throughout the day •Dehydration may cause headaches
Limit Caffeine, Alcohol and other Drugs	•Caffeine is a stimulant and caffeine withdrawal may cause headaches when blood levels of caffeine taper •Alcohol may be a trigger for headaches and alcohol in moderation may reduce the number of headaches
Reduce Stress	•Stress may lead to an increase in headache •Relaxation and stress management may help reduce headaches

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- Recognize the red flags
- Take a **good history**, pay attention to family history, timing of headache, location of headache, circumstances that start headache, triggers, prodrome and aura.
- Headache diary is valuable tool to assess progress and identify triggers/prodrome/aura
- Start simple with preventatives. Magnesium 500 mg, CoQ10 400 mg, and Riboflavin 400 mg is a good place to start, but takes up to 3 months to help. Add other meds for refractory cases.
- Treat acute headache early, thoroughly and aggressively
- Limit PPI-linked to dementia, osteoporosis and migraines

(reference a,b,c,d)

Important

- Refer to Neurology:
  - Botox or more specialized treatments:
  - Cranial nerve blocks, SPG blocks,
  - Refractory headaches
  - Specialty Tests:
    - MRA for arterial lesion or MRV for venous lesions
    - Usually after a MRI
- OB/Gyn for IUD or OCPs

(reference b,c,d)

- Melinda Moore Gottschalk PA-C MPAS
- melindagpac@gmail.com

- Recommend buying "Pocket Neurology" published by Wolters Kluwer
  - Everything about neurology in this guide with signs, symptoms and treatment options

Questions?