

HEADACHES

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Goals

Top 5 reason for ED visits

- ▶ Distinguish primary from secondary headaches, and old and new headaches
- ▶ Primary Headaches-Migraines, Tension, Cluster.
- ▶ Treatments
- ▶ Learn Red Flags for worrisome headaches
- ▶ Know when to refer patients for further evaluation
- ▶ Recognize indications for Neuroimaging –danger signs and secondary cause
- ▶ Thunderclap Headaches

First Distinguish Old and New Headache

- ▶ Old headaches are usually benign
- ▶ New headaches are often benign, but must exclude serious causes
- ▶ A new headache is:
 - ▶ – Any headache of recent onset
 - ▶ – A change in the pattern or character of a chronic headache
- ▶ A change in severity is not a new headache.
- ▶ The longer a headache has been present, the more likely it is benign.

Primary versus Secondary Headache

- ▶ Primary headaches (90%)
 - ▶ Migraine, Tension-Type and Cluster
- ▶ Secondary headache
 - ▶ Medication-induced headache, Cervicogenic Headache, Chronic sinusitis, exertional or sexual headaches, TMJ dysfunction
 - ▶ Hypertension emergencies, neurologic disorder, post traumatic headache, intra-cranial process or infections.



Take a Headache history

- ▶ Pain character, location, onset, duration, radiation.
- ▶ Aura, Change in vision.
- ▶ Associated symptoms, precipitating and relieving factors
- ▶ Family history of headaches/migraines
- ▶ Frequency, number of HA/month
- ▶ Association with trauma, environmental factors, change in general health, work or lifestyle, method of birth control, sleep, weight, diet. Related to food/alcohol, menses, exogenous hormones.
- ▶ Response to any previous treatments.



Physical Exam

- ▶ Vital signs(fever ,high BP)
- ▶ Sinus exam (tenderness)
- ▶ Pupillary exam, fundoscopy(optic discs for papilledema)
- ▶ Head and spine and neck exam(rigidity, muscle tension, bruits)
- ▶ Screening neuro exam to exclude intracranial pathology-cranial nerves, motor and sensory test, Gait exam- toe and heel, tandem gait, Romberg, cerebellar tests, reflexes, facial symmetry, mental status testing.



Fundus Examination

“An honest neurologist would admit that the most useful function of an ophthalmoscope is to provide a quiet time in the consultation, during which he may dwell upon the implications of the history just obtained. On a few occasions each year, his ruminations will be interrupted by the appearance of gross papilledema in a patient who appears surprisingly well.”

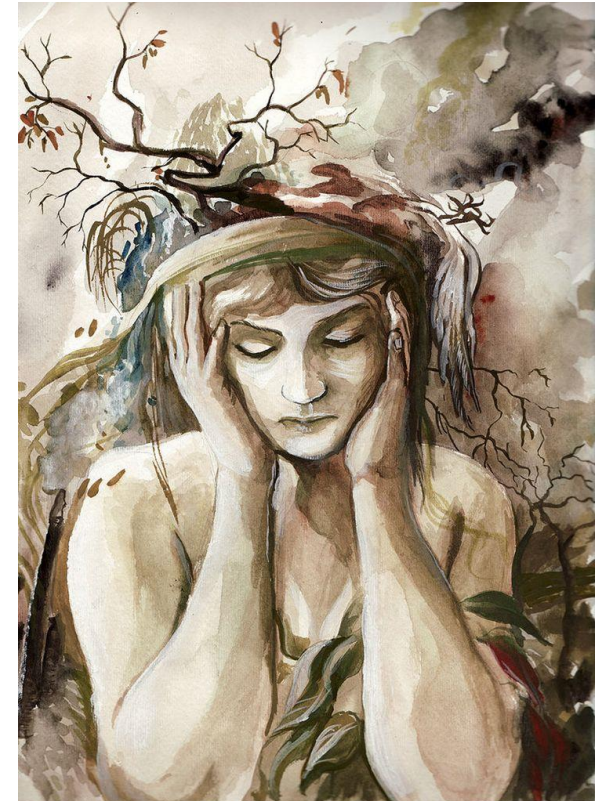
The Lancet 1976



Source: Usatine RP, Smith MA, Mayeaux EJ, Chumley HS: The Color Atlas of Family Medicine, Second Edition: www.accessmedicine.com
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Migraine

- ▶ Most chronic headaches are migraine or tension-type.
- ▶ Migraine is less common but results in more disability and lost work days.
- ▶ A correct diagnosis minimizes unnecessary work-ups and leads to effective treatment.
- ▶ 12% of general population
- ▶ Three times as prevalent in women as in men.
- ▶ Migraine is a clinical diagnosis.
- ▶ The more historical features present, the more confident one can be in diagnosis.
- ▶ Exam and imaging are normal.



Life History of Migraine Patient

- ▶ Infancy
 - ▶ “Colicky” baby
 - ▶ Recurrent childhood vomiting attacks predict 3-fold increase in migraines as adult
- ▶ Childhood
 - ▶ Car sickness
- ▶ Adolescence
 - ▶ Onset usually in teens or early 20's
 - ▶ Average age of onset 16
- ▶ Family history
 - ▶ Present in 60% of patients.

Migraine Precipitants

- ▶ Caffeine withdrawal
 - ▶ Common cause of weekend headaches
- ▶ Sleep deprivation or oversleeping
- ▶ Menses
- ▶ Strong odors, perfume
- ▶ Weather change
- ▶ Foods
 - ▶ Red wine, chocolate, cheese, MSG, aspartame
- ▶ Missing a meal
- ▶ Stress (80%)
 - ▶ Headache often after stressful period



Historical Features of Migraine

- ▶ Throbbing pain
- ▶ Unilateral
- ▶ Nausea, Vomitting
- ▶ Photophobia
- ▶ Phonophobia
- ▶ Exacerbation by physical activity
- ▶ Duration between 4 and 72 hours
- ▶ POUND



Three Types of Migraine Headaches

- ▶ Migraine without aura (common)
- ▶ Migraine with aura (classic)
- ▶ Migraine with typical aura (complicated)

Typical Migraine has 4 Phases:

Prodrome

Aura

Headache

Postdrome

Migraine without Aura

- ▶ Common migraine
- ▶ Two-thirds of all migraineurs
- ▶ Prodrome of difficulty concentrating, irritability may last for one day before migraine
- ▶ Often, but not always, centered around eye or temple

Migraine with Aura

- ▶ Classic migraine
- ▶ Aura usually lasts 20 minutes (4-60 minutes)
- ▶ Time course is an important clue
- ▶ 85% of all aura are visual
 - ▶ Scintillating scotoma
 - ▶ Zigzags
 - ▶ Hemianopsia
 - ▶ Scotoma
 - ▶ Distortions of vision (Alice in Wonderland effect)
- ▶ Headache occurs as aura ending, or experience headache during the aura or may not occur at all



Migraine with Typical Aura

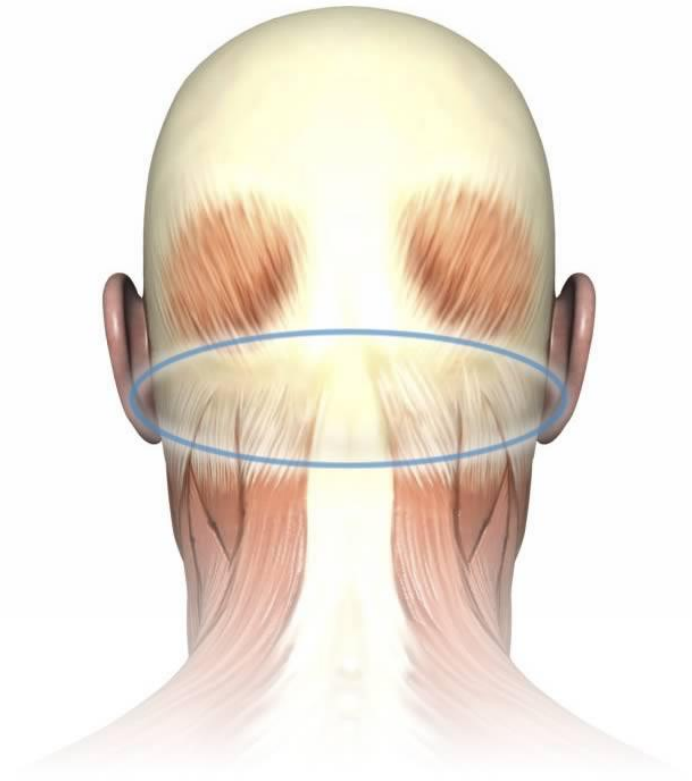
- ▶ Complicated migraine
- ▶ Same as classic migraine except:
- ▶ Aura also includes complex neurologic features:
 - ▶ Unilateral paresthesias
 - ▶ Unilateral weakness
 - ▶ Aphasia
 - ▶ Diplopia
- ▶ Neurologic features may outlast headache
- ▶ Status Migrainosus is debilitating migraine HA lasting for more than 72 hrs.

When To Image

- ▶ First or worst headache (ICH, SAH, CNS infection)
- ▶ Recent significant change in pattern, frequency, severity of HA.
- ▶ Focal neurological exam
- ▶ Headache always on same side (r/o AVM)
- ▶ New onset of HA after age 50 (brain tumor or GCA)
- ▶ New onset HA in pts with cancer (mets) or HIV (opportunistic infection)
- ▶ Assoc. symptoms/signs - fever, stiff neck, papilledema, personality change
- ▶ Exertional or sexual HA
- ▶ Head CT sufficient

Tension-Type Headaches

- ▶ Most common type of old or primary headache
- ▶ Dull, non-throbbing
- ▶ Bilateral
- ▶ Temporal and occipital: “bandlike”, pressure or tightness
- ▶ No focal neurologic features
- ▶ No nausea
- ▶ Lasts from 30 minutes to 1 week
- ▶ Often precipitated by emotional stress. Pt may remain active.
- ▶ Anxiety or depression may be present. Consider if daily headaches.



Cluster Headache

- ▶ Unilateral
- ▶ Pain deep, excruciating, continuous crescendo in minutes.
- ▶ Duration 15 mins to 3 hours, patient remains active.
- ▶ Ipsilateral lacrimation and redness of eye, stuffy nose, runny nose, sweating.
- ▶ Focal neurological symptoms rare
- ▶ Sensitivity to alcohol.

Worrisome Headaches: Red Flags "**SNOOP**"

- ▶ **S**ystemic symptoms (fever, weight loss) or
Secondary risk factors (Pregnancy, HIV, h/o malignancy)
- ▶ **N**eurologic symptoms or abnormal signs (eye pain, visual loss, confusion, impaired alertness or consciousness, seizures, meningismus, papilledema)
- ▶ **O**nset: sudden (thunderclap) Older: new onset and progressive headache, especially in patients > 50 y.o. (giant cell arteritis)
- ▶ **O**ther: Head trauma, illicit drug use, toxic exposure, exertion or sexual activity
- ▶ **P**revious headache history: first or worst headache or different (change in attack frequency, severity or clinical features)

Characteristics of HA with serious pathology

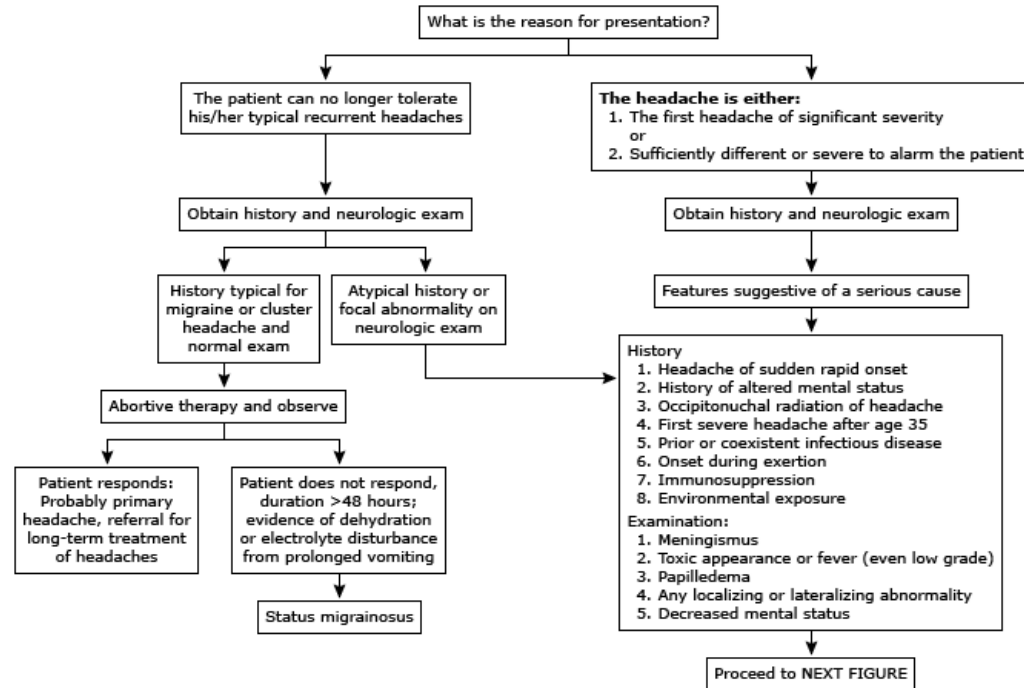
History

- Explosive onset and severe at onset
- No similar Headaches in the past
- Concomitant Infection
- Altered mental status
- Headache with exertion
- Age over 50
- Immunosuppression

Physical Exam

- Neurologic Abnormality
- Decrease Level of Consciousness
- Meningismus
- Toxic Appearance
- Papilledema

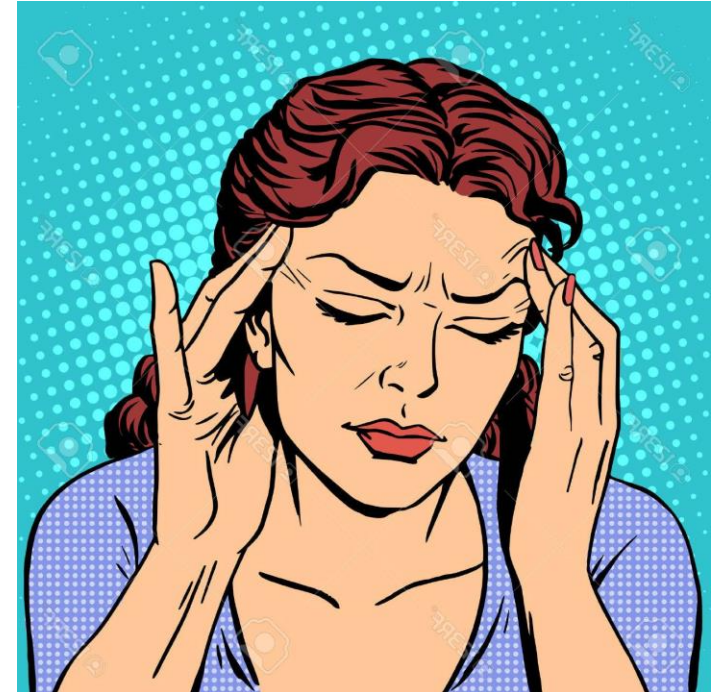
Management of Headache in the Urgent Care



ER

Treatment of Migraine

- ▶ Lifestyle advice to minimize triggers for all patients
- ▶ Abortive therapy at onset of migraine
- ▶ Preventive therapy for patients with frequent and/or disabling migraines
- ▶ Consider complementary and physical treatments for patients with poor Rx response or based on patient preference



Patient Education: Avoid Migraine Triggers

- ▶ Tailor recommendations based on headache diary
- ▶ Regular meal and sleep pattern
- ▶ Avoid oversleeping, skipping meals
- ▶ Limit caffeine intake < 2 drinks /day
- ▶ Avoid offending foods
 - ▶ Cheese, red wine, MSG, chocolate, alcohol most common offenders
- ▶ Regular exercise



Abortive Migraine Treatments: General Classes

- ▶ Nonspecific
 - ▶ NSAIDs
 - ▶ Combination analgesics
 - ▶ Neuroleptics/antiemetics
- ▶ Specific
 - ▶ Ergotamine/DHE
 - ▶ Triptans

Abortive Treatment: NSAIDs

- ▶ Recommended first-line abortive therapy for most patients
- ▶ Ibuprofen, naproxen, diclofenac most extensively studied
- ▶ Tylenol+NSAID
- ▶ Indomethacin PR 50mg helpful in N/V pts
- ▶ Toradol 60mg IM or 30mg IV
- ▶ If first doesn't work, try another
- ▶ Treatment of choice for menstrual migraines



Abortive Treatment: Triptans

- ▶ Serotonin (5HT1) agonists
- ▶ Side effects
 - ▶ Pain at injection site
 - ▶ Flushing
 - ▶ Chest or jaw pressure
 - ▶ Nausea and bad taste (intranasal form)
- ▶ Some patients respond better to one triptan than another
- ▶ Try at least two before giving up...
- ▶ Sumatriptan+Naproxen combo
- ▶ Nasal spray Sumatriptan and Zolmitriptan.SQ Sumatriptan for N/V pts
- ▶ Maxalt ODT Age 6 and up .weight based dosing.

Triptans: More Alike Than Different

Drug	Onset of Action	Min Interval b/nD	Max Dose/24 hrs
Almotriptan	30-60 min	2 hours	25 mg
Eletriptan	30-60 min	2 hours	80 mg
Frovatriptan	2 hours	2 hours	7.5 mg
Naratriptan	1-3 hours	4 hours	5 mg
Rizatriptan	30-60 min	2 hours	30 mg
Sumatriptan Tab	30-60 min	2 hours	200 mg
- Nasal Spray	10-15 min	2 hours	40 mg
- SC Injection	10 min	1 hour	12 mg
Zolmitriptan-Tab	30-60 min	2 hours	10 mg
- Nasal Spray	10-15 min	2 hours	10 mg

Triptan Contraindications

- ▶ CAD risk factors
- ▶ Pregnancy
- ▶ Ischemic heart disease/Prinzmetal's angina.
- ▶ Ischemic stroke
- ▶ Uncontrolled hypertension
- ▶ MAOI
- ▶ Use within 24 hrs of ergot or different triptan
- ▶ Hemiplegic or basilar migraine.

Abortive Treatments: Anti-Emetics are Underutilized

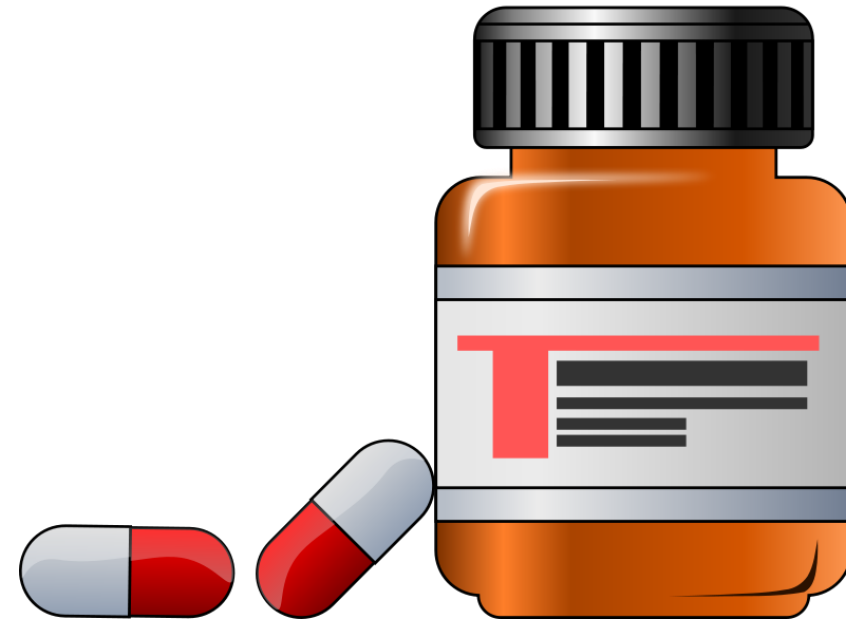
- ▶ Particularly useful when nausea is a major feature
- ▶ Useful when nausea prevents use of PO analgesics. Can be used as monotherapy as they also reduce pain besides being antiemetic.
- ▶ Metoclopramide (Reglan)
 - ▶ PO, IM, IV. 10mg
- ▶ Prochlorperazine (Compazine)
 - ▶ PO, PR, IV. 10mg
 - ▶ Both IV Reglan and IV compazine given with IV Benadryl in ER to prevent dystonic reactions.
- ▶ Prochlorperazine is superior to metoclopramide and potentially to other common 1st line Rx's, SQ Imitrex and dilaudid IV

Other Abortive Treatments

- ▶ Midrin
 - ▶ Third-line agent
- ▶ Acetaminophen, ASA, and caffeine (AAC =Excedrin Migraine)
- ▶ Butalbital
 - ▶ Best avoided due to risk of drug-induced rebound headaches and habituation
 - ▶ Consider in patients with very infrequent headaches requiring only occasional use
- ▶ Opiates (Butorphanol, oral opiates)
 - ▶ Last resort

Abortive Treatment of Migraines: Recommendations

- ▶ NSAIDs for mild to moderate migraine
- ▶ Triptan for moderate to severe migraine
- ▶ Consider PR prochlorperazine
- ▶ Third-line options:
 - ▶ DHE nasal
 - ▶ Midrin
- ▶ If nausea limits the use of PO meds:
 - ▶ PR prochlorperazine or indomethacin
 - ▶ Intranasal sumatriptan, zolmitriptan or DHE
 - ▶ SC sumatriptan



Indications for Preventive Therapy

- ▶ More than 2 migraines per week
- ▶ Headache-related disability for ≥ 3 days per month
- ▶ Duration > 48 hours
- ▶ Acute migraine treatments are ineffective or overused
- ▶ Attacks produce severe disability
- ▶ Prolonged aura (> 1 hour), complex aura, or migrainous infarction
- ▶ Patient preference

Medication Overuse HA

- ▶ Increased risk with opioids, butalbital, excedrinAAC
- ▶ Decreased risk with NSAID
- ▶ Limit acute med use to 10 days/month and 15day/ month with ASA/Tylenol/NSAID
- ▶ Avoid opioids in acute rx- tolerance/dep/addiction/OD
- ▶ If opioids given first line rx ,pt more likely to return to ER within 7 days of original visit.

Preventive Therapy: Beta Blockers

- ▶ Most commonly used prophylaxis
- ▶ Avoid if history of CHF, asthma, diabetes (relative contraindication), depression
- ▶ Propranolol best studied
 - ▶ 80-240 mg daily
- ▶ Timolol, atenolol, metoprolol also effective
- ▶ Begin low dose, may need to push to full beta blockade (i.e. HR in 50's)
- ▶ Follow bp, HR

Preventive Therapy of Migraines: Topiramate

- ▶ Efficacy similar to propranolol
- ▶ Side effects are common and may result in discontinuation
 - ▶ Paresthesias
 - ▶ Fatigue, poor concentration
 - ▶ Weight loss
 - ▶ Acute angle closure glaucoma (rare)
- ▶ Limit maximum dose to 50 mg bid
- ▶ First-line option but much more expensive

Botulinum Toxin

- ▶ Botulinum toxin pericranial injections:
 - ▶ Ineffective for episodic migraine
 - ▶ Ineffective for chronic tension-type headache
 - ▶ Effective for chronic migraine and chronic daily headache
 - ▶ FDA-approved for chronic (not episodic) migraine in 2010
 - ▶ Treat every 12 weeks

Complementary Migraine Prevention

- ▶ Coenzyme Q 100 mg tid
- ▶ Magnesium citrate 300 mg daily
- ▶ Riboflavin 200 mg bid
- ▶ Petasites 50-75 mg bid
 - ▶ Extract of butterbur plant
 - ▶ Established Efficacy
- ▶ MIG-99
 - ▶ Extract of feverfew plant



Menstrual Migraine

- ▶ Occurs 2 days before through 3 days after onset of menstrual bleeding.
- ▶ Involves 70% of females with migraines
- ▶ Related to very low estrogen environment during menses.
- ▶ Treatment :NSAID Naproxen 500mg BID 7 days prior, take for 13 days.
- ▶ Triptan Frova 2.5 mg QD or BID two days prior for 6 days
- ▶ OCPS
- ▶ Mag 120mg TID .15th day of cycle until next menses.
- ▶ Prevention: propranolol, Topamax, premenstrual estradiol patches

Tension – Type Headaches: Treatment

- ▶ Less gratifying than treatment of migraines
- ▶ Stress reduction or biofeedback may be helpful
- ▶ Psychiatric evaluation in selected patients
- ▶ Physical therapy for tender points
- ▶ Consider TMJ or cervicogenic components to headache
- ▶ ASA or NSAIDS are mainstay
- ▶ Acetaminophen effective in some patients
- ▶ Preventive Treatment 1st line: Amitriptyline/Nortriptyline. 2nd line: Venlafaxine, Tizanidine, Mirtazapine.



America Headache Society

Choosing Wisely 2014

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

Miscellaneous

- ▶ Pregnancy : New HA may be due to migraine or tension type. Could be pre eclampsia, post dural puncture HA, Cerebral venous thrombosis.
- ▶ Pre- eclampsia must be ruled out in every pregnant women over 20 weeks of gestation with HA.
- ▶ TBI: HA in 25-78% pts following mild traumatic brain injury. Migraine and tension type predominate.
- ▶ Sinus : Acute or chronic sinusitis uncommon cause of recurrent HA. Prominence of sinus symptoms leads to misdiagnosis of sinus HA. 88% of these pts fulfilled criteria for migraine and 8% for tension type (observational study 3000 pts)
- ▶ HA with sudden unilat vision loss - optic neuritis. Visual field defect - pituitary mass. NV, seeing halos, increased IOP - ANAG.
- ▶ HA with fever: meningitis, encephalitis, brain abscess (IC infection) HIV (systemic), Rhinosinusitis, SAH.

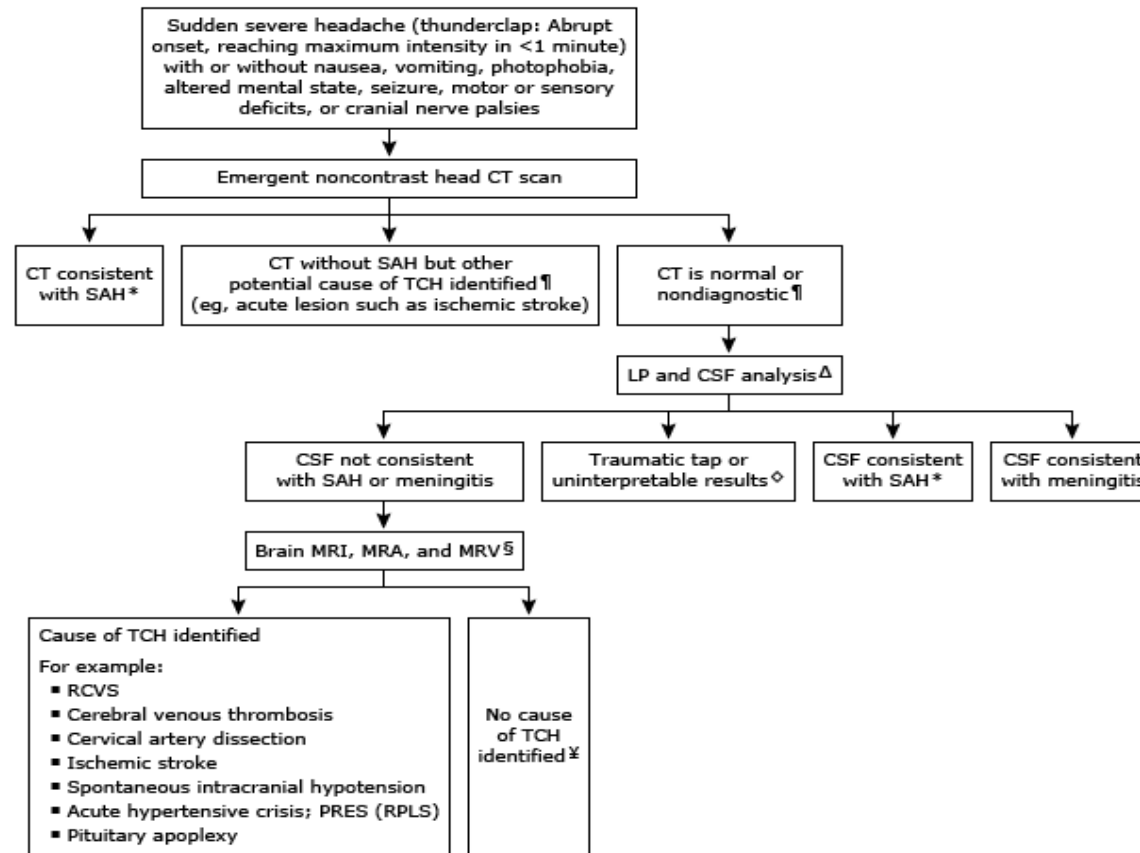
Thunderclap Headache(TCH)

- ▶ Severe HA of sudden onset that reaches its maximum intensity within One minute or less of onset. Clap of thunder”.
- ▶ May be accompanied by fever ,meningismus, AMS, SZ, motor or sensory deficits, cranial nerve palsies.
- ▶ Etiology: Most common: SAH. (Aneurysmal rupture).Others: carotid and vertebral artery dissection(recent minor trauma),cerebral infection, ICH, cerebral venous thrombosis(postpartum),acute hypertensive crisis, ischemic stroke.
- ▶ TCH must be considered and treated as medical emergency.
- ▶ All pts with TCH should be evaluated for SAH.

TCH

- ▶ All pts with TCH should have a Head CT without contrast.
- ▶ LP urgently if head CT does not reveal cause opening pressure and csf analysis.
- ▶ All pts with nondiagnostic Head CT and LP should have Brain MRI with contrast and MRA of head and neck arteries or CTA and cerebral venous and sinus imaging MRV or CTV to look for other causes of TCH.
- ▶ Mgmt of TCH depends on underlying etiology.

Evaluation of Thunderclap HA



Giant Cell Arteritis

- ▶ Chronic vasculitis of large and medium sized vessels
- ▶ Older patient >50 yo
- ▶ Temporal HA
- ▶ Visual symptoms transient monocular visual loss or diplopia
- ▶ Scalp tenderness, jaw claudication, tender or beaded temporal arteries
- ▶ Polymyalgia rheumatica symptoms may be present
- ▶ ESR screening test
- ▶ Medical Emergency: immediate corticosteroids & elective biopsy within 5 days

NEW MIGRAINE RX: Lasmiditan

- ▶ Serotonin 5-HT₁ receptor agonist.
- ▶ Indication: Acute treatment of migraine in adults, for patients with relative contraindications to triptans due to cardiovascular risk factors
- ▶ Dose: initial dose of lasmiditan is 50 mg taken once; no benefit with taking a second dose for the same migraine attack. With subsequent attacks, the dose may be increased to 100 mg- 200 mg as needed, but no more than one dose/24 hours
- ▶ SE: Dizziness(CNS depression), paresthesia, somnolence, fatigue, nausea, serotonin syndrome(may occur also when taken with SSRI, SNRI, TRIPTANS, TCA).
- ▶ Dizziness with lasmiditan is dose-dependent .
- ▶ The drug may cause driving impairment, and patients should not drive a motor vehicle, operate machinery, or engage in potentially hazardous activities for at least 8 hours after taking lasmiditan

PARENTERAL DEXAMETHASONE

- ▶ When added to standard acute or abortive migraine therapy, a single dose of parenteral dexamethasone (10 to 24 mg) reduces the rate of early headache recurrence for patients treated in ED or clinic.
- ▶ Avoid frequent use of adjunctive dexamethasone for headache due to increase in the risk of glucocorticoid toxicity
- ▶ Dexamethasone provided no additional benefit for immediate relief of headache.
- ▶ Adjunctive treatment of acute migraine with oral Prednisone was not found to be beneficial for prevention of recurrent headache

CGRP Antagonists

- ▶ Calcitonin-gene related peptide (CGRP) activity appears to mediate trigeminovascular pain transmission and vasodilatory neurogenic inflammation in migraine
- ▶ Large molecules in the form of monoclonal antibodies directed against the CGRP receptor are given by injection for migraine prevention. (FDA approved in 2018)
- ▶ Small-molecule CGRP antagonists ("gepants") are oral options available for the acute treatment of migraine in patients with either insufficient response or contraindication (eg, coronary artery disease) to treatment with triptans.
- ▶ Not first line for prevention as increased cost.
- ▶ used in pts who have marked disability from frequent migraines, who cannot tolerate or benefit from other treatments, who have difficulty complying with daily prevention pills.
- ▶ CI= in women who are pregnant or likely to become pregnant and individuals with or at high risk for cardiovascular disease (CGRP is cardioprotective),

CGRP Antagonists Continued

Injectable CGRP Antagonists:

- ▶ Erenumab: Recommended Dose 70 mg subcutaneous injection once monthly in the abdomen, thigh, or upper arm. The dose can be increased to 140 mg once monthly if needed.

SE: Injection site reactions , constipation and hypertension,

Number of migraine days per month was reduced by 3.2 in the 70 mg group, 3.7 in the 140 mg group

- ▶ Fremanezumab: Recommended dose is 225 mg once monthly or 675 mg (given as three consecutive injections of 225 mg each) every three months administered subcutaneously in the abdomen, thigh, or upper arm.

SE: Injection site reactions.

Number of migraine days per month decreased by 1.5 in the fremanezumab monthly dose group and by 1.3 days in the single higher dose group.

CGRP Antagonists Continued

- ▶ Galcanezumab: Loading dose of 240 mg, given as two consecutive doses of 120 mg each, followed by monthly doses of 120 mg, administered subcutaneously in the thigh, upper arm, or buttocks

SE: Injection site reactions

Number of migraine days per month decreased by 4.7 and 4.6 for the galcanezumab 120 and 240 mg groups

- ▶ Eptinezumab: 100 mg given as an IV infusion over approximately 30 minutes every three months [[55](#)]. The label notes that some patients may benefit from a 300 mg dose.

SE: upper respiratory tract infections, hypersensitivity, and fatigue.

Number of migraine days per month decreased by 4

Oral Gepants

Two oral options available for the acute treatment of migraine in patients with either insufficient response or contraindication (eg, coronary artery disease) to treatment with triptans.

- ▶ Ubrogepant (UBRELVY):FDA approved in Dec 2019. Dose 50-100mg single dose. Repeat in 2hrs. Max 200mg/day.

Side effects: Nausea, sleepiness,dry mouth.Cannot take with CYP3A4 inhibitors like biaxin and ketoconazole

- ▶ Rimegepant (NURTEC ODT):FDA approved in Feb 2020.Dose:75mg single dose/24 hrs.

Side effects : Nausea

G.O.A.T.

