Headache Evaluation & Treatment
2014

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Objectives

- Describe the features of common headache disorders, so that appropriate treatment can be initiated.
- Differentiate primary and secondary headaches
- Recognize the clinical features of migraine, chronic migraine, cluster headache, and trigeminal neuralgia. Distinguish between these headache disorders.
- Identify the preventive and acute treatment options for migraine.
- Review forthcoming treatments for migraine
Clinical presentation of headaches

- **Primary**
  - Migraine
  - Tension-type
  - Cluster
  - Other

- **Secondary**
  - Infection
  - Hemorrhage
  - Increased ICP
  - Brain tumor
“SSNOOPPP”

**S**ystemic symptoms (fever, weight loss) or

**S**econdary risk factors (HIV, systemic cancer)

**N**eurologic symptoms or signs (focal, or altered mental status)

**O**nset: sudden, abrupt, split-second

**O**lder: new onset and progressive headache, especially in middle-age > 50 (arteritis)

**P**revious headache history: first headache or different (change in attack frequency, severity or clinical features)

**P**ostural
When is imaging indicated?

In patients with recurrent migraine, and normal exam, neither CT nor MRI is warranted except in cases with:
- Recent substantial change in headache pattern
- History of seizures
- Focal neurological symptoms or signs

In patients with non-migraine headache, CT or MRI should be considered on a case by case basis

Consensus expert opinion
- MRI is more sensitive
- Use CT if looking for acute blood

Report of Quality Standards Subcommittee of AAN. *Neurology.*
### Nonacute headache/ Normal neuro exam

<table>
<thead>
<tr>
<th>Headache type (# of studies)</th>
<th>n</th>
<th>Significant abnormality on neuro-imaging</th>
<th>Prevalence (%)</th>
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</thead>
<tbody>
<tr>
<td>MIGRAINE (11)</td>
<td>1086</td>
<td>2</td>
<td>0.18</td>
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<tr>
<td>TTH (2)</td>
<td>83</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>UNSPECIFIED (10)</td>
<td>2788</td>
<td>49</td>
<td>1.8</td>
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</table>

<table>
<thead>
<tr>
<th>Vascular</th>
<th>Tumor</th>
<th>Infectious</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>Venous sinus thrombosis</td>
<td>Posterior fossa lesion (tumor, Chiari malformation)</td>
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<tr>
<td>Arterial dissection</td>
<td>Infiltrative CNS glioma</td>
<td>Encephalitis</td>
<td>Idiopathic intracranial hypertension</td>
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<tr>
<td>CNS vasculitis</td>
<td>Pituitary tumor/apoplexy</td>
<td>Meningitis</td>
<td>Low-pressure headache syndrome (CSF leak)</td>
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<tr>
<td>Temporal arteritis</td>
<td>Leptomeningeal cancer</td>
<td>Sinusitis (Sphenoid)</td>
<td>Isodense subdural</td>
</tr>
</tbody>
</table>
Lumbar puncture

- The first unusually severe headache
- Thunderclap headache with normal head CT
- Subacute progressive headache
- Headache with fever, confusion, meningismus, or seizures
- High or low CSF pressure suspected (even if papilledema is absent.)

Acute:
- Subarachnoid hemorrhage
- Meningoencephalitis
- High or low pressure

Subacute:
- Fungal or Lyme infection
- Vasculitis
- Neurosarcoid
- Leptomeningeal disease
Primary Headaches
Case Scenario

- 36-year-old man, computer programmer, married with 2 children

- Has severe, stabbing pain behind his right eye

- Headaches accompanied by lacrimation and nasal congestion

- Pain lasts 30 to 45 minutes; attacks occur daily and nightly for several weeks, then stop for months at a time
Show you tube video
http://www.youtube.com/watch?v=RAOqWOVO-y0s&feature=channel&list=UL
Cluster headache

- Relatively uncommon
- More prevalent in men than in women
- Genetic predisposition
- Attack frequency: 1 every other day to 8 daily
- Clusters usually last 2 weeks - 3 months
- Circadian and annual periodicity
Cluster headache: pain

- Severe
- Unilateral
- Short: 15 - 180 minutes (untreated)
- Orbital, suborbital, or temporal pain
- Unilateral autonomic features
  - Lacrimation
  - Congestion
  - Rhinorrhea
  - Horner’s

Cluster headache - treatment

- Acute symptomatic
  - Oxygen, 7 – 12 L/min for 15 – 20 mins
  - Sumatriptan injection
  - DHE IM, IV or nasal spray

- Preventative
  - Lithium
  - Verapamil
  - Methysergide
  - Corticosteroids
  - Topiramate
Cranial neuralgias

- Categorized separately from primary or secondary headaches
- Stabbing or constant pain
- Trigeminal neuralgia is the most common
  - Brief unilateral stabs of pain
  - Distribution of one or more divisions of CN V
  - Triggered by minor stimulation
  - Patient is asymptomatic between paroxysms of pain
Trigeminal neuralgia diagnostic criteria

- Paroxysmal brief attacks of pain
- Pain has at least one of the following characteristics:
  - Intense, sharp, superficial or stabbing
  - Precipitated from trigger areas or by trigger factors
- Attacks are stereotyped in the individual patient
- There is no clinically evident neurological deficit
- Not attributed to another disorder
Trigeminal neuralgia--treatment

- Obtain MRI to look for lesion impinging on the trigeminal nerve

- Preventive therapy
  - Carbamazepine
  - Gabapentin (high dose is often needed)
  - Baclofen
  - Tricyclic antidepressants

- Surgical treatments
  - Decompression
  - Ablation procedures on the trigeminal ganglion
Case Scenario

- 27-year-old woman, administrative assistant
- Experiences throbbing headache in left temple with nausea and vomiting
- Headache generally lasts 12 to 24 hours
- NSAIDs are usually effective for the headache, but nausea and vomiting cause her to miss time from work
IHS criteria for migraine without aura

- Recurrent attacks (at least 5) lasting 4 - 72 hours

- At least 2 of the following
  - Unilateral
  - Pulsating quality of pain
  - Moderate/severe intensity
  - Aggravated by routine activity

- At least 1 of the following
  - Nausea and/or vomiting
  - Photophobia/phonophobia

- Rule out organic disease
Migraine with aura

- Also called “Classic Migraine”
- The aura is very distinctive from other types of headaches
- 15 - 20% of all migraineurs suffer from migraine with aura
- Gradual onset over minutes
- Persists for 20 - 60 minutes
1 in 6 American women
1 in 11 men
Up to 90% of patients have a family history of migraine

Lipton & Stewart. Neurology. 1993;43(suppl 3):S6-10
Reported quality of life is worse for migraine than for other chronic conditions.
Acute migraine medications

Nonspecific
- NSAIDs
- Combination analgesics
- Opioids
- Neuroleptics/antiemetics
- Corticosteroids

Specific
- Ergotamine/DHE
- Triptans
Acute therapies for migraine

GROUP 1: Substantial empirical evidence and pronounced clinical benefit

OTC Analgesics
- Aspirin
- Acetaminophen, aspirin, plus caffeine

Migraine Specific Meds

Triptans
- DHE
  - SC, IM, IN, IV (plus antiemetic)

Nonspecific Rx Meds
- Butorphanol IN
- Ibuprofen
- Naproxen sodium
- Prochlorperazine IV

Silberstein et al, AAN evidence based guideline for migraine headache, Neurology, 55, 754-762, 2000
Selective 5HT-1B/1D agonists – site of action is the interface between trigeminal nerve endings and blood vessel walls

Relative to nonspecific therapies, as a class they provide:
- Rapid onset of action
- High efficacy
- Favorable side effect profile

Adverse events and contraindications
Triptans: treatment choices

- **Sumatriptan (Imitrex)**
  - Tablet
  - Nasal Spray Subcut. Injection

- **Zolmitriptan (Zomig)**
  - Tablet Orally dissolving tablet
  - Nasal spray

- **Rizatriptan (Maxalt)**
  - Tablet Orally dissolving tablet

Available as tablets only:

- **Naratriptan (Amerge)**
- **Almotriptan (Axert)**
- **Frovatriptan (Frova)**
- **Eletriptan (Relpax)**
- **Sumatratiptan + naprosyn (Treximet)**
Acute treatment principles

- Treat early in attack
- Use correct dose and formulation
- Use a maximum of 2-3 days a week
- Everyone needs acute treatment
- Add on preventive therapy in selected patients
# Lifestyle issues

## Risk factors/triggers
- Hormonal changes
- Chronobiologic changes
- Foods & additives –
  - Alcohol
  - Drugs
- Sensory input
- Stress
- Trauma
- Weather changes
- Dehydration

## Protective Factors
- Regular sleep
- Regular meals
- Regular exercise
- Biofeedback/stress reduction
- Healthy lifestyle
- Avoidance of “prn” medication overuse
FDA-approved migraine preventatives

- Topiramate 2004
- Divalproex sodium (Depakote®) 1996
- Timolol (Blocadren®) 1990
- Propranolol (Inderal®) 1979
- Methysergide (Sansert®) 1962
2012 AAN evidence-based guidelines

- Effective for episodic migraine prevention
  - Divalproex sodium, sodium valproate
  - Topiramate
  - Metoprolol, propranolol, timolol
  - Frovatriptan (menstrual migraine)

- NSAIDs, probably effective
  - Ibuprofen, ketoprofen, naproxen, fenoprofen

- Supplements
  - Butterbur - effective in 2 studies
  - Feverfew, magnesium, riboflavin, and subcutaneous histamine are probably effective

Neurology 2012;78:1337-1345 and 1346-1353
# Treatment and comorbid conditions

<table>
<thead>
<tr>
<th>DRUG</th>
<th>EFFICACY*</th>
<th>SIDE EFFECTS*</th>
<th>COMORBID CONDITION</th>
<th>RELATIVE CONTRAINDICATION</th>
<th>RELATIVE INDICATION</th>
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<tbody>
<tr>
<td>Anticonvulsants</td>
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<tr>
<td>Divalproex</td>
<td>4+</td>
<td>2+</td>
<td>Liver disease, bleeding disorders, overweight, pregnancy</td>
<td>Mania, epilepsy, anxiety disorders</td>
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<tr>
<td>Topiramate</td>
<td>4+</td>
<td>2+</td>
<td>Kidney stones, underweight, pregnancy</td>
<td>Epilepsy, obesity</td>
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<tr>
<td>Gabapentin</td>
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<td>2+</td>
<td>ESRD, pregnancy</td>
<td>Epilepsy, neuropathy, pain</td>
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<td>Antidepressants</td>
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<tr>
<td>TCAs</td>
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<td>2+</td>
<td>Mania, urinary retention, heart block, tachycardia</td>
<td>Pain, depression, anxiety disorders, insomnia</td>
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<tr>
<td>SSRIs</td>
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<td>1+</td>
<td>Mania</td>
<td>Depression, OCD</td>
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## Preventive treatment

<table>
<thead>
<tr>
<th>DRUG</th>
<th>EFFICACY*</th>
<th>SIDE EFFECTS*</th>
<th>RELATIVE CONTRAINDICATION</th>
<th>RELATIVE INDICATION</th>
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</thead>
<tbody>
<tr>
<td>Calcium channel blockers</td>
<td>2+</td>
<td>1+</td>
<td>Constipation, hypotension</td>
<td>Migraine with aura, HTN, angina, asthma</td>
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<tr>
<td>Verapamil</td>
<td>2+</td>
<td>1+</td>
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<td></td>
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<tr>
<td>Beta-Blockers</td>
<td>4+</td>
<td>2+</td>
<td>Asthma, depression, CHF, Raynaud's disease, diabetes</td>
<td>HTN, angina</td>
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</tbody>
</table>

### COMORBID CONDITION
- Migraine with aura, HTN, angina, asthma
- Constipation, hypotension

### SIDE EFFECTS*
- 1+
- 2+
- 4+

### EFFICACY*
- 1+
- 2+
- 4+

### RELATIVE CONTRAINDICATION
- Asthma, depression, CHF, Raynaud's disease, diabetes
- HTN, angina
## Preventive treatment - supplements

<table>
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<tr>
<th>SUPPLEMENT</th>
<th>EFFICACY*</th>
<th>SIDE EFFECTS*</th>
<th>RELATIVE INDICATION</th>
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<tr>
<td>Butterbur</td>
<td>2+</td>
<td>1+</td>
<td>Preference for supplement</td>
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<td>Other</td>
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<td></td>
<td></td>
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<tr>
<td>Riboflavin</td>
<td>2+</td>
<td>1+</td>
<td>Preference for natural products, pregnancy</td>
</tr>
<tr>
<td>Magnesium</td>
<td>2+</td>
<td>2+</td>
<td>Preference for natural products, pregnancy</td>
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</table>

*On a scale of 0 to 4
Case Scenario

- 37 year old woman with history of severe headaches in her teens and twenties

- 7 month history of daily mild to moderate bifrontal headache, waxing and waning in intensity. Most of the time she is able to continue her activities.

- About twice per week the headache pain becomes throbbing and severe, with associated nausea, photophobia and photobilia, and she feels she has to lie down to try and sleep.
She has been taking 8 – 10 over-the-counter analgesic tablets per day for the past 6 months.
Medication overuse

- Analgesic overuse plays a role in 80% of chronic daily headaches

- Female > male (3.5:1)

- Risk factors
  - Simple analgesics: > 5 days / week
  - Triptans / combination analgesics: > 3 days / week
  - Opioids / ergotamine: > 2 days / week

Adapted from Diener C & Dahlof K. The Headaches
Chronic migraine

- Daily or almost daily (> 15 days/month) head pain for > 3 months

- Average headache duration of > 4 hours per day (untreated)

- Sometimes called “transformed migraine”
  - Episodic migraine “transformed” into a chronic waxing and waning headache
  - Frequently analgesic overuse is the agent of “transformation”

- At least one:
  - History of episodic migraine (IHS)
  - History of increasing headache frequency with decreasing average severity of migrainous features over > 3 months
  - Headache at some time meets IHS criteria for migraine
Chronic Migraine

- Therapy
  - Give preventive medication(s)
  - Wean off “prn” medications
  - Consider onabotulinumtoxin A
    - Reduced mean frequency of headache days by 8.4 days per month
      (compared with placebo 6.6 days)
    - Repeat injections are needed about every 3 months

Dodick et al., *Headache* 2010;50:921-936
What to do when all else fails?

- Make sure your diagnosis is correct

- Work on lifestyle factors
  - Sleep
  - Mood
  - Hydration
  - Gradual caffeine reduction
  - Exercise (walking)
  - Diet/weight loss

- Review preventive options

- Do *not* keep escalating the “prn” meds
What to do when all else fails?

- Consider a supplement
  - Magnesium citrate 400 mg daily
  - Riboflavin 400 mg daily
  - Butterbur 75 mg BID

- Consider injections
  - Botulinum toxin
  - Occipital nerve block
A new FDA-approved device
Cerena TMS

- Transcranial magnetic stimulator
- FDA approved in December, 2013, but not yet marketed in U.S.
- Randomized controlled clinical trial of 201 patients with moderate – severe migraine with auras preceding at least 30% of their migraines.
Cerena study results

- Of the study subjects, 113 recorded treating a migraine at least once when pain was present.

- 38% of subjects who used the device were pain-free two hours after using it, compared to 17% of controls.

- After 24 hours, nearly 38% of the active device users were pain-free compared to 10% of the controls.
Caveats and side effects

- It cannot be used in people who have implanted devices (pacemaker, VNS, etc.)

- There were 7 adverse events in 5 subjects (9.43%) of the Cerena group and 11 reported in 7 subjects (11.67%) of the sham group.

- Events possibly related to the use of the device include dizziness (N=2). Other reported events included sinusitis, aphasia, and vertigo (N=1 each). No seizures were reported.
Other devices in development

Cefaly® Anti-migraine Device

Rated 5 stars (out of 29 reviews)

Item #283776

Your Price $249.99

Shipping & Handling Included

Add to Cart

The estimated delivery time will be approximately 7 - 10 business days from the time of order.

Add to Wish List

Print this Page

Developed in Europe, the Cefaly® is a medical device that relieves migraine pain without the use of drugs and medication. It uses TENS technology to stimulate the pain centre of the brain telling it to produce more endorphins to relieve the migraine. When used on a regular basis, studies have shown that it may reduce the frequency and intensity of migraines.
Summary

- The appropriate headache diagnosis must be made before a treatment can be selected.
- History and exam help to differentiate primary and secondary headaches.
- Migraine is the most common primary headache disorder.
- Effective options for acute treatment include the triptans, which are serotonin 1B/D agonists.
- Numerous choices for preventive migraine therapy are available.