Assessment and Management of Migraine Headaches: Case based approach

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Northeast Regional Nurse Practitioner Conference
May 6th 130-245pm
DISCLOSURES

None of the planners or presenters of this session have disclosed any conflict or commercial interest
Objectives

• Using the International Classification of Headache Disorders – 3 Beta (ICHD-3 Beta) be able to identify the different migraine classifications and Medication Overuses Headache (MOH)
• Identify when it is appropriate to image the patient
• Be able to make a three tiered treatment plan
• Identify medications that contribute to MOH
CASE 1
16 y/o right handed female

With PMH headaches and asthma. She reports that she has been having a headache 1-2x per week for the last two years. They have increased to about 8 HA days per month.

The headache is described as having a throbbing quality, usually located on the left temporal and occipital regions, 10/10 in intensity. She usually has to go to bed to get relief. She reports no autonomic symptoms (tearing or rhinorrhea). She often feels nauseous and photophobic during an attack. She has a visual aura described as shimmering lights in her peripheral visual fields bilaterally 10 min prior to onset of headache, it can progress to obscure her visual field.

Normal Vitals, general and neurological examination

Medications: OCT, daily Ibuprofen
CASE 2
39 y/o female

Right handed female with PMH chronic sinusitis, headache, hypothyroidism, anxiety, fibromyalgia, TMJ, and allergies.

Patient started having headaches in elementary school. She reports that she started having worsening of HA 1 year ago- increasing in severity, which progressed to daily. She was dx with sinusitis and has had several courses of antibodies. She had imaging of the sinuses, sphenoid sinus cyst was found and she was sent to ENT. She was started on prednisone which decreased the headache severity, but she continued to have daily headache.

Her headaches varies in location they can be left sided and progress to wrap around to the base of the head. They can be b/l frontal and b/l occipital headache as well. When HA is mild - it has an aching in quality. Moderate pain is stabbing in quality and then for severe headache exacerbations have a throbbing quality. She has associated nausea, no vomiting, had photophobia, phonophobia and osmophobia (especially coffee).

She has not had a menstrual cycle in 3 years. She can recall having headaches during her periods. She denies having any autonomic sx, or sx of visual, sensory or motor aura.

MRI brain preformed with NAF, TSH and T4 are both normal

Vitals and physical examination are normal with bilateral occipital nerve tenderness to palpation.

Medications: Gabapentin 300/300/600, Tramadol 50mg - 2-3x per week for breakthrough pain, Ibuprofen - 3 x per week and Tylenol - 3x per week
Differential Diagnosis

- Migraine with aura
  - Episodic
  - Chronic
- Medication overuse headache
- New daily persistent headache
- Secondary headaches
  - Increased ICP
    - Pseudotumor cerebri
    - Venous sinus thrombosis
  - Post traumatic headache
ICHD3 Beta

1. Migraine
   1.1 Migraine without aura
   1.2 Migraine with aura
      1.2.1 Migraine with typical aura
         1.2.1.1 Typical aura with headache
         1.2.1.2 Typical aura without headache
      1.2.2 Migraine with brainstem aura
   1.2.3 Hemiplegic migraine
      1.2.3.1 Familial hemiplegic migraine (FHM)
         1.2.3.1.1 Familial hemiplegic migraine type 1 (FHM1)
         1.2.3.1.2 Familial hemiplegic migraine type 2 (FHM2)
         1.2.3.1.3 Familial hemiplegic migraine type 3 (FHM3)
         1.2.3.1.4 Familial hemiplegic migraine, other loci
      1.2.3.2 Sporadic hemiplegic migraine
   1.2.4 Retinal migraine

1.3 Chronic migraine

1.4 Complications of migraine
   1.4.1 Status migrainosus
   1.4.2 Persistent aura without infarction
   1.4.3 Migrainous infarction
   1.4.4 Migraine aura-triggered seizure

1.5 Probable migraine
   1.5.1 Probable migraine without aura
   1.5.2 Probable migraine with aura

1.6 Episodic syndromes that may be associated with migraine
   1.6.1 Recurrent gastrointestinal disturbance
      1.6.1.1 Cyclical vomiting syndrome
      1.6.1.2 Abdominal migraine
   1.6.2 Benign paroxysmal vertigo
   1.6.3 Benign paroxysmal torticollis
RED Flags: SNOOPS

- **S**ystemic symptoms (fever, weight loss) or **S**econdary risk factors (cancer, HIV)
- **N**eurologic symptoms or abnormal signs
- **O**nset: sudden
- **O**lder: new onset and/or progressive headache
- **P**revious headache history (if HA is first, different, or changing)
Migraine without Aura

A. At least 5 attacks fulfilling criteria B-D
B. Headache attacks lasting 4-72 h (untreated or unsuccessfully treated)
C. Headache has ≥2 of the following characteristics:
   1. unilateral location
   2. pulsating quality
   3. moderate or severe pain intensity
   4. aggravation by or causing avoidance of routine physical activity (eg, walking, climbing stairs)
D. During headache ≥1 of the following:
   1. nausea and/or vomiting
   2. photophobia and phonophobia
E. Not better accounted for by another ICHD-3 diagnosis

ICHD-3 beta. Cephalgia 2013; 33: 629-808
Migraine with Aura

A. At least 2 attacks fulfilling criteria B and C
B. ≥1 of the following fully reversible aura symptoms:
   1. visual; 2. sensory; 3. speech and/or language; 4. motor; 5. brainstem; 6. retinal
C. ≥2 of the following 4 characteristics:
   1. ≥1 aura symptom spreads gradually over ≥5 min, and/or ≥2 symptoms occur in succession
   2. each individual aura symptom lasts 5-60 min
   3. ≥1 aura symptom is unilateral
   4. aura accompanied or followed in <60 min by headache
D. Not better accounted for by another ICHD-3 diagnosis, and TIA excluded

ICHD-3 beta. Cephalgia 2013; 33: 629-808
Chronic vs Episodic Migraine

- Chronic Migraine
  - \( \geq 15 \) headache days per month

- Episodic Migraine
  - \(< 15 \) headache days per month
# Headache Calendar

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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</table>

1 = Mild Headache  
2 = Moderate Headache  
3 = Severe Headache  

**Medications:**

Patient name: ______________________________
DOB: ____________  
MRN: ______________

__________ (month)
Medication Overuse Headache

A. Headache occurring on ≥15 d/mo in a patient with a pre-existing headache disorder
B. Regular overuse for >3 mo of one or more drugs that can be taken for acute and/or symptomatic treatment of headache
C. Not better accounted for by another ICHD-3 diagnosis

ICHD-3 beta. Cephalgia 2013; 33: 629-808
Work-up

• Labs:
  • TSH (for chronic headaches)

• Imaging:
  • MRI brain with contrast
  • No indication for imaging in Episodic Migraine
  • Changes in headache – SNOOPS
  • Chronic Headache
Choosing Wisely Campaign

1. Don’t perform neuroimaging studies in patients with stable headaches that meet criteria for migraine.
   Numerous evidence-based guidelines agree that the risk of intracranial disease is not elevated in migraine. However, not all severe headaches are migraine. To avoid missing patients with more serious headaches, a migraine diagnosis should be made after a careful clinical history and an examination that documents the absence of any neurologic findings such as papilledema. Diagnostic criteria for migraine are contained in the International Classification of Headache Disorders.

2. Don’t perform computed tomography (CT) imaging for headache when magnetic resonance imaging (MRI) is available, except in emergency settings.
   When neuroimaging for headache is indicated, MRI is preferred over CT, except in emergency settings where hemorrhage, acute stroke or head trauma are suspected. MRI is more sensitive than CT for the detection of neoplasm, vascular disease, posterior fossa and cervicomedullary lesions and high and low intracranial pressure disorders. CT of the head is associated with substantial radiation exposure which may elevate the risk of later cancers, while there are no known biologic risks from MRI.

3. Don’t recommend prolongation or frequent use of over-the-counter (OTC) pain medications for headache.
   OTC medications are appropriate treatment for occasional headaches if they work reliably without intolerable side effects. Frequent use (especially of caffeine-containing medications) can lead to an increase in headaches, known as medication overuse headache (MOH). To avoid this, OTC medication should be limited to no more than two days per week. In addition to MOH, prolonged overuse of acetaminophen can cause liver damage, while overuse of nonsteroidal anti-inflammatory drugs can lead to gastrointestinal bleeding.
Migraine Management

- 3-4 tiered system
  - Eliminate medications that are contributing to Medication overuse Headache
  - Prophylactic medications:
  - Abortive treatments:
    - Mild to moderate headache:
    - Severe Headache
  - Rescue:
Eliminate medications causing Medication Overuse Headache

• Opiates
• Narcotic medication
• Short acting over the counter medications
  • Tylenol
  • Ibuprofen
  • Excedrin
• Fioricet
• Fiorinal
• Tramadol/Ultram
Migraine Management

• 3-4 tiered system
  • Eliminate medications that are contributing to Medication overuse Headache
  • Prophylactic medications:
  • Abortive treatments:
    • Mild to moderate headache:
    • Severe Headache
  • Rescue:
Prophylactic Management for Episodic Migraine

- Level A evidence:
  - AEDs
    - Topiramate (Topamax)
    - Valproate (Depakote)
  - Beta-blocker
    - Metoprolol
    - Propranalol
    - Timolol
  - Triptan
    - Frovatriptan

## Table 1  Classification of migraine preventive therapies (available in the United States)

<table>
<thead>
<tr>
<th>Level A: Medications with established efficacy (≥2 Class I trials)</th>
<th>Level B: Medications are probably effective (1 Class I or 2 Class II studies)</th>
<th>Level C: Medications are possibly effective (1 Class II study)</th>
<th>Level U: Inadequate or conflicting data to support or refute medication use</th>
<th>Other: Medications that are established as possibly or probably ineffective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiepileptic drugs</td>
<td>Antidepressants/SSRI/SSNRI/TCA</td>
<td>ACE inhibitors</td>
<td>Carbonic anhydrase inhibitor</td>
<td>Established as not effective</td>
</tr>
<tr>
<td>Divalproex sodium</td>
<td>Amitriptyline</td>
<td>Angiotensin receptor blockers</td>
<td>Acetazolamide</td>
<td>Antiepileptic drugs</td>
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<tr>
<td>Sodium valproate</td>
<td>Venlafaxine</td>
<td>Candesartan</td>
<td>Antithrombotics</td>
<td>Lamotrigine</td>
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<tr>
<td>Topiramate</td>
<td>β-Blockers</td>
<td>α-Agonists</td>
<td>Atenolol.a</td>
<td>Clomipramine.a</td>
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<tr>
<td>β-Blockers</td>
<td>β-Blockers</td>
<td>Clonidine.a</td>
<td>Guanfacine.a</td>
<td>Picotamide</td>
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<td>Metoprolol</td>
<td>Nadolol.a</td>
<td>Coumadin</td>
<td>Possibly not effective</td>
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<tr>
<td>Propranolol</td>
<td>Triptans (MRM³)</td>
<td>Antiepileptic drugs</td>
<td>Antidepressants</td>
<td></td>
</tr>
<tr>
<td>Timolol.a</td>
<td>Naratriptan.b</td>
<td>Carbamazepine.a</td>
<td>Fluvoxamine.a</td>
<td></td>
</tr>
<tr>
<td>Triptans (MRM³)</td>
<td>Zolmitriptan.b</td>
<td>β-Blockers</td>
<td>Fluoxetine</td>
<td></td>
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<tr>
<td>Frovatriptan.b</td>
<td>Nebivolol</td>
<td>β-Blockers</td>
<td>gabapentin</td>
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<tr>
<td>Antihistamines</td>
<td>TCAs</td>
<td>Antiepileptic drugs</td>
<td>Antihistamines</td>
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<tr>
<td>Cyproheptadine</td>
<td>Protriptyline.ª</td>
<td>Antihistamines</td>
<td>Antiinflammatory drugs</td>
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<tr>
<td>β-Blockers</td>
<td>Bisoprolol.a</td>
<td>Antiinflammatory drugs</td>
<td>Bisoprolol.a</td>
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<tr>
<td>Ca++ blockers</td>
<td>Nicardipine.a</td>
<td>Antiinflammatory drugs</td>
<td>Verapamil</td>
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<tr>
<td>Nifedipine.a</td>
<td>Nimodipine</td>
<td>Antiinflammatory drugs</td>
<td>Direct vascular smooth muscle relaxant</td>
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<tr>
<td>Nimodipine</td>
<td>Verapamil</td>
<td>Antiinflammatory drugs</td>
<td>Cyclandelate</td>
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</tbody>
</table>

Abbreviations: ACE = angiotensin-converting-enzyme; MRM = menstrually related migraine; SSRI = selective serotonin-norepinephrine reuptake inhibitor; SSNRI = selective serotonin reuptake inhibitor; TCA = tricyclic antidepressant.

ª Classification based on original guideline and new evidence not found for this report.

b For short-term prophylaxis of MRM.
Prophylactic Management for Episodic Migraine

- Topamax
- Onabotulinumtoxin A

Herbal Medication for Migraine

- Magnesium Oxide 250-500mg BID
- Riboflavin (B2) 200mg BID

- We are NO longer recommending the use of BUTTERBUR (*Petasites hybridus*)
  - SE Hepatitis
  - Liver failure requiring transplantation
Migraine Management

• 3-4 tiered system
  • Eliminate medications that are contributing to Medication overuse Headache
  • Prophylactic medications:
  • Abortive treatments:
    • Mild to moderate headache:
    • Severe Headache
  • Rescue:
Abortive treatments

- Mild to Moderate Headaches
  - Naproxen sodium 550mg BID PRN
    - Not Naprosyn 500mg
  - Vistaril 25mg BID PRN

- Severe Headache
  - Triptans – in the absence of contraindications
<table>
<thead>
<tr>
<th>Generic</th>
<th>Brand Name</th>
<th>Route</th>
<th>Dose</th>
<th>Max 24 hour dose (mg)</th>
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<tbody>
<tr>
<td>Sumatriptan</td>
<td>Imitrex</td>
<td>SQ injection</td>
<td>6</td>
<td>12</td>
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<td></td>
<td></td>
<td>Tablet</td>
<td>25, 50, <strong>100</strong></td>
<td>200</td>
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<tr>
<td></td>
<td>Zecuity</td>
<td>Nasal Spray</td>
<td>5, 20</td>
<td>40</td>
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<tr>
<td>Zolmitriptan</td>
<td>Zomig</td>
<td>Tablet</td>
<td><strong>2.5, 5</strong></td>
<td><strong>10</strong></td>
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<tr>
<td>Zomig ZMT</td>
<td></td>
<td>Melt</td>
<td>2.5, 5</td>
<td>10</td>
</tr>
<tr>
<td>Zomig Nasal spray</td>
<td></td>
<td>Nasal Spray</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Rizatriptan (6 y/o – 5mg only)</td>
<td>Maxalt</td>
<td>Tablet</td>
<td><strong>5, 10</strong> (5 if on Propranolol)</td>
<td>30 (15 if on Propranolol)</td>
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<tr>
<td>Almotriptan (12 y/o)</td>
<td>Axert</td>
<td>Tablet</td>
<td>12.5</td>
<td>25</td>
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<tr>
<td>Eletriptan</td>
<td>Relpax</td>
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<td>20, <strong>40</strong></td>
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</table>
Migraine Management

- 3-4 tiered system
  - Eliminate medications that are contributing to Medication overuse Headache
  - Prophylactic medications:
  - Abortive treatments:
    - Mild to moderate headache:
    - Severe Headache
  - Rescue:
Rescue

• With Nausea
  • Phenergan 25-50 mg suppository

• No Nausea
  • Valium 5mg PO
New medications:

- Ionophoretic patch
  - Zecuity 6.5mg/4 hours

- Coming soon
  - Sumatriptan - Onzatra 22mg
Devices- FDA approved

- Cefaly
  - Prophylactic - **Level B**, probably effective, based on 1 RCT
  - Acute management ??
- Spring TSM
  - Prophylactic - **Level U**, 4 RCTs with conflicting data:
  - Acute management (single pulse)- **Level B**, Probably Effective, based on one Class 1 study, *but it is FDA approved already*
### Research

- Calcitonin gene-related peptide (CGRP) monoclonal antibodies 4 coming out and starting Phase 3 trials shortly

<table>
<thead>
<tr>
<th>Compound</th>
<th>Ab to</th>
<th>Route of Administration</th>
<th>Indication</th>
<th>Product of Monoclonal Ab</th>
<th>Ig subtype</th>
<th>Amgen</th>
<th>Teva/Labrys</th>
<th>Lilly/Arteaus</th>
<th>Alder</th>
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<tr>
<td>AMG-334</td>
<td>CGRP receptor</td>
<td>SQ monthly</td>
<td>EM, CM</td>
<td>Murine, Chinese hamster ovary</td>
<td>IgG2 antagonist receptor</td>
<td>AMgen</td>
<td>LBR-101</td>
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<td>High frequency EM</td>
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<td>Labrys</td>
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<td>IV, 1 dose</td>
<td>EM, CM</td>
<td>Yeasy (Pichia Pastoris)</td>
<td>IgG1</td>
<td>Lilly</td>
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</table>

- *Calcitonin gene-related peptide (CGRP) monoclonal antibodies 4 coming out and starting Phase 3 trials shortly*
AMGEN sponsored

• Observational prophylactic medication study
• One study visit
TEVA – Zecuity Patch

- for 12-17 y/o
16 y/o right handed female

With PMH headaches and asthma. She reports that she has been having a **headache 1-2x per week for the last two years**. They have increased to about **8 HA days per month**.

The headache is described as having a **throbbing quality**, usually located on the left temporal and occipital regions, 10/10 in intensity. She usually has to go to bed to get relief. She reports no autonomic symptoms (tearing or rhinorrhea). She often feels **nauseous and photophobic** during an attack. She has a **visual aura** described as shimmering lights in her peripheral visual fields bilaterally 10 min prior to onset of headache, it can progress to obscure her visual field.

Normal Vitals, general and neurological examination

Medications: OCT, **daily Ibuprofen**
Episodic vs Chronic

- Episodic < 15 HA days per month
- Chronic ≥ 15 HA days per month

**Episodic**
- 4 HA days per month
  - Consider use of prophylactic medication
  - Triptan medication should be prescribed (in the absence of contraindication)
  - Remember route is important
  - PO for patients w/o nausea or vomiting predominance
  - NS, SQ, or iontophoretic patch for those with nausea and/or vomiting

**Chronic**
- Use of prophylactic medications is recommended
  - Botox
  - Topamax
- Longer acting abortive medications should be considered
  - Migranal Nasal spray
  - DHE injections
Attack Frequency at baseline predicts CDH at follow-up

Estrogens and Stroke Risk

- **2 fold increased risk of stroke** in patients with Migraine with Aura
- Adding Estrogen to the patient’s regimen increases the stroke risk **6 fold**
- Patients who smoke, use estrogen contraceptives and have migraine with aura have a **9 fold increased risk of stroke**
Assessment and Plan

• Work-up
  • No labs or imaging needed at this time – all typical migraine sx
• For HA prophylaxis (considerations)
  • Amitriptyline – if trouble sleeping
  • Propranolol – for pts w/o h/o asthma, helps with tremors and performance anxiety as well
  • Topamax – if weight loss is desired, caution us in patients with TBI, contraindicated in patients with h/o renal stones
• For mild to moderate headache symptoms
  • Naproxen sodium 550mg BID PRN
  • Vistaril 25 mg BID PRN (may cause sedation)
• For severe headache
  • Zolmatriptan Nasal spray
39 y/o female

Right handed female with PMH chronic sinusitis, headache, hypothyroidism, anxiety, fibromyalgia, TMJ, and allergies.

Patient started having headaches in elementary school. She reports that she started having worsening of HA 1 year ago- increasing in severity, which progressed to daily. She was dx with sinusitis and has had several courses of antibodies. She had imaging of the sinuses, sphenoid sinus cyst was found and she was sent to ENT. She was started on prednisone which decreased the headache severity, but she continued to have daily headache.

Her headaches varies in location they can be left sided and progress to wrap around to the base of the head. They can be b/l frontal and b/l occipital headache as well. When HA is mild - it has an aching in quality. Moderate pain is stabbing in quality and then for severe headache exacerbations have a throbbing quality. She has associated nausea, no vomiting, had photophobia, phonophobia and osmophobia (especially coffee).

She has not had a menstrual cycles in 3 years. She can recall having headaches during her periods. She denies having any autonomic sx, or sx of visual, sensory or motor aura.

MRI brain preformed with NAF, TSH and T4 are both normal
Vitals and physical examination are normal with bilateral occipital nerve tenderness to palpation.
Medications: Gabapentin 300/300/600, Tramadol 50mg - 2-3x per week for breakthrough pain, Ibuprofen - 3 x per week and Tylenol - 3x per week
Assessment and Plan

• Work-up:
  • Thyroid function studies
  • MRI brain with and without contrast
• Medication overuse Headache
  • Discontinue over the counter medications
• Chronic Migraine without aura
  • Prophylactic medication
    • Topamax
  • Mild to moderate headaches
    • Naproxen sodium 550mg BID PRN
    • Vistaril 25mg BIR PRN (can be sedating)
• Severe headaches
  • Migranal nasal spray (limit use to 2 days per wk)
f/u 2 months later:

- Patient d/c use of over the counter medications
- Started Topamax
- Headache Calendar
  - Started Topamax Nov
    - 4 HA free days at the end of the month
  - December - 4 HA days
    - 9 Dec - back of the head, neck and temporal triggered by Graduate school stress
    - 15 December - stress (Vistaril and naproxen worked within 1-1.5 hours)
    - 23 December (no noted trigger) (Vistaril and naproxen worked within 1-1.5 hours)
    - 30 December (no trigger) (Vistaril and naproxen worked within 1-1.5 hours)
  - Jan - 5 HA days (Vistaril and naproxen worked within 1-1.5 hours)
Future Headache Meetings and Resources

- American Headache Society
  - [http://www.americanheadachesociety.org/](http://www.americanheadachesociety.org/)
  - Next Meeting
    - 58th annual scientific meeting June 9-10th 2016, San Diego California
    - November 17-20, 2016, Scottsdale Arizona

- Headache Cooperative of New England
  - [http://www.hacoop.org/professionals.html](http://www.hacoop.org/professionals.html)
  - Next Meeting
    - Saturday, November 2016. The 16th Annual Headache Cooperative of New England (HCNE) Boston Headache Symposium, at the Tufts University School of Dental Medicine, Boston, MA
    - March or April 2017. HCNE Annual Stowe Headache Symposium, Topnotch Inn, Stowe, VT
THANK YOU FOR YOUR TIME AND ATTENTION

Questions???