Faculty Disclosures

DAVID W. DODICK, MD, FAHS
Dr. Dodick has received consulting fees and/or honoraria from Alder Pharmaceuticals, Allergan, Inc., Amgen, Artaeus, Colucid, Eli Lilly, eNeura, Merck & Co., Inc., NuPathe, Supernus, Labrys, Autonomic Technologies, Toxix and SAGE (Editorial).

DONNA GUTERMAN, PHARM
Dr. Gutterman has received consulting fees and/or honoraria from NuPathe, Teva Pharmaceuticals, Dr. Reddy Pharmaceuticals.

Past 12 months

Learning Objectives

At the conclusion of this presentation, participants should be better able to:

• Remember and apply the steps to successful diagnosis of headache disorders
• Identify key steps to exclude secondary headache
• Define key headache syndromes based on headache days and attack duration
• Recognize other types of primary long-duration headache
Steps to Successful Treatment of Headache Disorders

1. Exclude secondary headache
2. Identify primary headache syndrome
3. Diagnose disorder in the syndromic group
4. Recognize comorbidities and exacerbating factors
5. Assess disability and attack characteristic
6. Review prior treatments, unmet needs, and treatment goals
7. Formulate a treatment plan

Clinical Case: Carol

Carol: Age 20 (1992)

Average 1 headache days per month, started at age 16 (1988)
Occurred on first day of menses
Managed with ibuprofen 400 mg/day
Carol: Age 20 - Details

<table>
<thead>
<tr>
<th>Frequency (attacks/month)</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premonitory</td>
<td>Irritability</td>
</tr>
<tr>
<td>Aura</td>
<td>No</td>
</tr>
<tr>
<td>Pain</td>
<td>Bilateral, pulsating, severe</td>
</tr>
<tr>
<td>Duration</td>
<td>≈ 2 hours</td>
</tr>
<tr>
<td>Associated symptoms</td>
<td>Nausea, photophobia</td>
</tr>
<tr>
<td>Treatment</td>
<td>Ibuprofen pm</td>
</tr>
<tr>
<td>Exam</td>
<td>WNL</td>
</tr>
<tr>
<td>Family History</td>
<td>Mother had migraine</td>
</tr>
<tr>
<td>Other</td>
<td>Menstrual only</td>
</tr>
<tr>
<td>Time to peak intensity</td>
<td>Fast, &lt;30 minutes</td>
</tr>
</tbody>
</table>

Carol: Age 25 (1997)

Headaches somewhat more frequent
Occur with menses and at other times of the month
Diagnosed with episodic migraine
Triptan prescribed

Carol: Age 25 — Details

<table>
<thead>
<tr>
<th>Frequency (attacks/month)</th>
<th>3-4 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premonitory</td>
<td>Irritability</td>
</tr>
<tr>
<td>Aura</td>
<td>No</td>
</tr>
<tr>
<td>Pain</td>
<td>Unilateral (R&gt;L), pulsating, severe</td>
</tr>
<tr>
<td>Duration</td>
<td>≈6 hours</td>
</tr>
<tr>
<td>Associated symptoms</td>
<td>Nausea, photophobia</td>
</tr>
<tr>
<td>Treatment</td>
<td>Ibuprofen 400 mg BID – TID day, 3-4 d/month</td>
</tr>
<tr>
<td>Exam</td>
<td>WNL</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Time to peak intensity</td>
<td>Slower, 30-60 minutes</td>
</tr>
</tbody>
</table>
Exclude secondary headache

Screen for red flags: SNOOP^4

Exclude Secondary Headache

History and examination

Screen for worrisome signs and symptoms
Look for atypical features

SNOOP^4

S • Systemic symptoms (fever, weight loss) or Secondary risk factors (HIV, cancer)
N • Neurologic symptoms or signs
O • Onset: abrupt, peak <1 min
O • Older: >50 (GCA; glaucoma, cardiac cephalalgia)
P • Previous headache history (new or change), Pattern Change
P • Postural, positional
P • Precipitated by Valsalva, exertion
P • Papilledema (pulsatile tinnitus, diplopia, transient visual obscurations)
P • Progressive (intractable)

5 Minute Examination of Headache Patients

Vitals

• Blood pressure
• Temperature
• BMI

Head and Neck

Palpate

• Skull base (greater and lesser occipital nerves)
• Supraorbital and auriculo temporal nerves
• Trigeminal (perioral pain or pain on eye movement
• TMs
• Temporal arteries (over age 60)
• Cervical paraspinous muscles
• Paranasal sinuses

Focused Neurological Examination

Talk to patients—mental status
Watch them walk
Cranial nerves

• Fundal
• Visual fields
• Ocular motility
• Facial sensation and symmetry
• Palate/tongue
Reflexes

• DTRs
• Plantar responses
Other as needed per history of present illness and patient symptoms
Carol – Age 25

- Normal examination
- Family history of migraine
- No red flags

Identify the Primary Headache Syndrome

Based on headache days and attack duration

1. Exclude secondary headache
2. Identify primary headache syndrome

Complete history and examination

Screen for red flags: SNOOP

1. Exclude secondary headache
2. Identify primary headache syndrome

Episodic
- <15 headache days/month
- Short Duration: ≤4 hours
- Long Duration: >4 hours

Chronic
- ≥15 headache days/month
- Short Duration: ≤4 hours
- Long Duration: >4 hours
Steps to Diagnosing Headache Disorders

1. Exclude secondary headache
   - Complete history and examination
   - Screen for red flags: SNOOP

2. Identify primary headache syndrome
   - Episodic (≤15 headache days/month)
   - Chronic (>15 headache days/month)

3. Diagnose specific headache disorder
   - Migraine
     - Probable Migraine
     - Chronic Migraine
   - Chronic Tension-type Headache
   - Hemicrania Continua

Headache Classification Committee of the International Headache Society (IHS)

The International Classification of Headache Disorders, 3rd edition (beta version)

Copyright

Translations

The International Headache Society expressly permits translations of all or parts of ICHD-3 beta for purposes of field testing and/or education, but will not endorse them. Endorsements may be given by members national societies, where they exist, such endorsement should be sought. All translations are required to be registered with the International Headache Society. Before authorizing any translation, prospective translators should notify the Society.
### ICHD-III β Diagnostic Criteria for Migraine and Tension-type Headache

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Migraine</th>
<th>Tension-type Headache</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Variable</td>
<td>Variable</td>
</tr>
<tr>
<td>Duration*</td>
<td>4–72 hours**</td>
<td>30 minutes–7 days</td>
</tr>
<tr>
<td>Location</td>
<td>Unilateral (40% bilateral)</td>
<td>Bilateral</td>
</tr>
<tr>
<td>Description</td>
<td>Pulsating (60% non-pulsating)</td>
<td>Pressing/tightening (non-pulsating)</td>
</tr>
<tr>
<td>Intensity</td>
<td>Moderate-severe</td>
<td>Mild-moderate</td>
</tr>
<tr>
<td>Effect of routine physical activity</td>
<td>Aggravated by or cause avoidance of</td>
<td>Not aggravated by</td>
</tr>
<tr>
<td>Nausea or vomiting</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Photophobia or phonophobia</td>
<td>One or Both</td>
<td>No more than one</td>
</tr>
<tr>
<td>Atributable</td>
<td>Not attributable to another disorder</td>
<td>Not attributable to another disorder</td>
</tr>
</tbody>
</table>

*Untreated or unsuccessfully treated **2-72 hours in children


### Carol’s Symptoms at age 25

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Migraine</th>
<th>Carol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Variable</td>
<td>3-4/month</td>
</tr>
<tr>
<td>Duration</td>
<td>4–72 hours</td>
<td>≥8 hours</td>
</tr>
<tr>
<td>Location</td>
<td>Unilateral</td>
<td>Unilateral (R&gt;L)</td>
</tr>
<tr>
<td>Description</td>
<td>Pulsating</td>
<td>Pulsating</td>
</tr>
<tr>
<td>Intensity</td>
<td>Moderate-severe</td>
<td>Severe</td>
</tr>
<tr>
<td>Effect of routine physical activity</td>
<td>Aggravated by or cause avoidance of</td>
<td>No</td>
</tr>
<tr>
<td>Nausea or vomiting</td>
<td>Yes</td>
<td>Nausea</td>
</tr>
<tr>
<td>Photophobia or phonophobia</td>
<td>One or both</td>
<td>Photophobia</td>
</tr>
<tr>
<td>Aura</td>
<td>With or without</td>
<td>Without</td>
</tr>
<tr>
<td>Atributable</td>
<td>Not attributable to another disorder</td>
<td>Not attributable to another disorder</td>
</tr>
</tbody>
</table>


### Exclude Secondary Headache

1. Complete history and examination
2. Screen for red flags: SNOOP
3. Identify Primary Headache Syndrome
   - Episodic ≤5 headache days/month
   - Chronic >15 headache days/month
4. Diagnose Specific Headache Disorder
   - Chronic Migraine
   - Chronic Tension-type Headache
   - New Daily Persistent Headache
   - Hemicrania Continua
Carol’s Diagnosis age 25:
Episodic Migraine without Aura

Carol’s Recent History

Carol:  Age 39  (2011)

Numerous work and family stressors with gradual increase in headaches
  Severe headaches 4-5 days monthly
    (triptan)
  Moderate headaches 7-8 days monthly
    (ibuprofen)
**Carol: Age 39 - Details**

<table>
<thead>
<tr>
<th>Frequency (attacks/month)</th>
<th>11-13 headache days/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premontory</td>
<td>Irritability, yawning, chocolate craving</td>
</tr>
<tr>
<td>Aura</td>
<td>No</td>
</tr>
<tr>
<td>Pain</td>
<td>Unilateral (R&gt;L), pulsating, severe</td>
</tr>
<tr>
<td>Duration</td>
<td>8-20 hours</td>
</tr>
<tr>
<td>Associated symptoms</td>
<td>Frequent nausea (80%, most marked with severe attacks), photophobia</td>
</tr>
<tr>
<td>Treatment</td>
<td>Ibuprofen 400 mg/day 11-13 d/month Oral triptan 4-5 days/month</td>
</tr>
<tr>
<td>Exam</td>
<td>WNL</td>
</tr>
<tr>
<td>Family History</td>
<td>Mother had migraine</td>
</tr>
<tr>
<td>Other</td>
<td>Depression, anxiety, low back pain</td>
</tr>
</tbody>
</table>

**Carol: Age 41 (2013)**

Recent divorce with continued work stress

Severe headaches 10 days monthly. Has to remove earrings and glasses, scalp tenderness during migraine (tripatan + butalbital combinations)

Moderate headaches 12 days monthly (ibuprofen + butalbital combinations)

Symptoms of anxiety, depression per history and screening questionnaires

Low back pain

**Carol 2013: Age 41 - Details**

<table>
<thead>
<tr>
<th>Frequency (attacks/month)</th>
<th>10 severe + 12 less severe headache days/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premontory</td>
<td>Irritability, yawning, chocolate craving</td>
</tr>
<tr>
<td>Aura</td>
<td>No</td>
</tr>
<tr>
<td>Pain</td>
<td>Unilateral (R&gt;L), pulsating, severe</td>
</tr>
<tr>
<td>Duration</td>
<td>8-20 hours</td>
</tr>
<tr>
<td>Associated symptoms</td>
<td>Frequent nausea, photophobia, allodynia</td>
</tr>
<tr>
<td>Treatment</td>
<td>Ibuprofen 400 mg/day, 12 days/month Oral triptan 9 days/month Butalbital combinations 21 days/month</td>
</tr>
<tr>
<td>Exam</td>
<td>WNL</td>
</tr>
<tr>
<td>Family History</td>
<td>Mother had migraine</td>
</tr>
<tr>
<td>Other</td>
<td>Depression, anxiety, low back pain, divorce</td>
</tr>
</tbody>
</table>
Steps to Diagnosing Headache Disorders (Carol in 2013)

1. Exclude secondary headache

Exclude Secondary Headache

History and examination

SNOOP4 — Yes? — Evaluate for Secondary Headache

Screen for red flags: SNOOP

S: Systemic symptoms (tumor, weight loss) or Secondary risk factors (HIV, cancer)
H: Neurologic symptoms or signs
O: Ocular symptoms, paraesthesia
O: Other: (OC, VEDS, Ehlers-Danlos, cardiac palpitations)
N: Normal neurologic examination
P: Previous headache history (new or change), Pattern change
P: Postural postural
P: Precipitated by vasovagal, menopause
P: Pulsatile (pulsasilo dizziness, diplopia, transient visual obscurations)
P: Progressive (in head/face)
Progressive Headache

When is diagnostic testing necessary?
Not always
Consider a therapeutic trial

What is an adequate workup?
Neuroimaging?
Lumbar puncture?
Laboratory testing?


Comfort Signs that . . .

A Chronic Headache Condition
Is NOT always a Secondary Headache

Long duration of illness
26 years (since 1988)

Typical clinical features
Migraine
(nausea, photophobia, pulsating, moderate-severe pain)

Family history of similar primary headache
Yes

Typical treatment response
Yes (triptans and ibuprofen)

Normal neurological examination
Yes

Menstrual exacerbations
Yes

Progression to CM with medication overuse
Yes

Imaging/Testing Is Likely NOT necessary

Carol's comfort signs

Comfort Signs that . . .

<table>
<thead>
<tr>
<th>Long duration of illness</th>
<th>26 years (since 1988)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical clinical features</td>
<td>Migraine (nausea, photophobia, pulsating, moderate-severe pain)</td>
</tr>
<tr>
<td>Family history of similar primary headache</td>
<td>Yes</td>
</tr>
<tr>
<td>Typical treatment response</td>
<td>Yes (triptans and ibuprofen)</td>
</tr>
<tr>
<td>Normal neurological examination</td>
<td>Yes</td>
</tr>
<tr>
<td>Menstrual exacerbations</td>
<td>Yes</td>
</tr>
<tr>
<td>Progression to CM with medication overuse</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Diagnosing Migraine ARS Question 1**

When episodic migraine (<15 days/month) progresses to a more frequent headache condition (≥15 days/month), the most common diagnosis is:

A. Mixed migraine and chronic tension-type headache
B. Hemicrania continua
C. Medication overuse headache
D. Chronic migraine
E. Chronic migraine and medication overuse headache

**When EM Progresses. . .**

CM is the most likely diagnosis

In the general migraine population:

| EM | 2.5% per year | CM |

**Steps to Diagnosing Headache Disorders (Carol in 2013)**

1. Exclude secondary headache
2. Identify primary headache syndrome

Based on headache days and attack duration
### Long-Duration, Chronic Headaches

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Chronic Migraine</th>
<th>Chronic Tension-Type</th>
<th>New Daily Persistent Headache</th>
<th>Hemicrania Continua</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td>≥15 days/month</td>
<td>≥15 days/month</td>
<td>≥15 days/month</td>
<td>≥15 days/month</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>4–72 hours; constant or intermittent</td>
<td>2–72 hours; constant or intermittent</td>
<td>Constant or intermittent</td>
<td>Continuous</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>Like migraine; throbbing</td>
<td>Like tension-type; lightening</td>
<td>Like migraine or TTH; pressure</td>
<td>Hemicranial; steady ache; some throbbing</td>
</tr>
<tr>
<td><strong>Associated symptoms</strong></td>
<td>Nausea, photophobia, phonophobia</td>
<td>None</td>
<td>Variable</td>
<td>Ipsilateral, autonomic features</td>
</tr>
<tr>
<td><strong>Treatment response</strong></td>
<td>Variable</td>
<td>Variable</td>
<td>Variable</td>
<td>Indomethacin</td>
</tr>
</tbody>
</table>


### Confirming Carol’s Diagnosis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>ICHD-III Criteria for CM</th>
<th>Carol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency (attacks/month)</strong></td>
<td>≥15 headache days/month</td>
<td>10 severe, 12 less severe headache days/month</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>Like migraine; throbbing</td>
<td>Unilateral (R&gt;L), Pulsating, Severe</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>4–72 hours; constant or intermittent</td>
<td>8–20 hours</td>
</tr>
<tr>
<td><strong>Associated symptoms</strong></td>
<td>Nausea, photophobia, phonophobia</td>
<td>Frequent nausea, phonophobia</td>
</tr>
<tr>
<td><strong>Treatment response</strong></td>
<td>Variable</td>
<td>Inconsistent with Ibuprofen, oral triptan and butalbital</td>
</tr>
</tbody>
</table>


---

1. **Exclude Secondary Headache**
   - Complete history and examination
     - Screen for red flags: SNOOP

2. **Identify Primary Headache Syndrome**
   - Episodic: ≤15 headache days/month
   - Chronic: ≥15 headache days/month
   - Short Duration: ≤4 hours
   - Long Duration: >4 hours

3. **Diagnose Specific Headache Disorder**
   - Migraine
   - Probable Migraine
   - Tension-type
   - New Daily Persistent Headache
   - Hemicrania Continua

**Chronic Migraine**

Chronic migraine previously has been called all of the following except:

A. Transformed migraine
B. Tension-vascular headache
C. Chronic daily headache
D. Status migrainosus

ICHID-IIβ Diagnostic Criteria for CM

A. Headache ≥15 days/month for ≥3 months
B. Patient had ≥5 attacks fulfilling ICHD-II migraine diagnosis, with/wo aura
C. On ≥8 days per month, for 3 months headache fulfills criteria for one or more of the following:
   1. Meets criteria for ICHD3 migraine with/wo aura
   2. Believed by the patient to be migraine at onset
   3. Relieved by a triptan or ergot derivative
   • In the comment section, phenotype can be the same, with or without medication overuse, diagnose ICHD3 CM or MOH after wean

Highlights of the Updated Classification

ICHID-II criteria not practical in the clinical setting

Excluded many patients with a history of migraine who did not have daily migraine, and had headache more than half the time or who had aura

Proposed revisions endorsed in ICHD-II-R (2006) as an appendix to ICHD-II

≥15 headache days/month, with ≥8 migraine days/month for ≥3 months

Criteria revised in ICHD-III, which proposes:

MOH and CM can be diagnosed together initially

Patients who have suffered ≥5 migraines with aura previously also qualify for this diagnosis

Challenges in Diagnosing CM

- Accurate count of headache days over a 3-month period often requires use of headache diary
  - May not be available
  - Diary may not include new ICHD-III criteria
- Accurate assessment of reversible symptoms or migraine associated symptoms/features may require headache diary
- Medication overuse is often prevalent (50% of patients) but not always recognized.
  - Medication diaries may not be available


Clinical Pearl

On how many days in the last month did you have other

Add It Up!

<table>
<thead>
<tr>
<th>Days with Headache</th>
<th>Headache-free Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>First ask… On how many days in the last month did you have headache?</td>
<td>12</td>
</tr>
<tr>
<td>Then ask… On how many days in the last month were you free of headache for the entire day?</td>
<td>+8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

So, Carol. . . can we talk about those other 10 days?
Diagnosing Migraine ARS Question 3

According to the ICHD-III-B, all of the following statements about medication overuse headache are TRUE except:

A. Regular overuse for >3 months of ≥1 acute/symptomatic medication
B. Intake of acute medications on ≥8 day/months for >3 months
C. Ergotamine, triptans, opioids, or combination analgesic medications on ≥10 days/month
D. Headache present on ≥15 days/month in a patient with pre-existing headache disorder

Acute Medication Overuse

A diagnosis of “Medication-overuse Headache” (MOH) is NOT synonymous with medication overuse

• Acute medication overuse is arbitrarily defined by days of medication taking
• MOH is headache attributed to the overuse of medications

Medication Overuse Headache

Frequent Attacks

Acute Therapy

Treatment involves discontinuing or limiting the overused medication(s) and initiation of preventive therapy

ICH-DIII β MOH

**New Diagnostic Criteria**

A. Headache* ≥15 days/month in a patient with pre-existing headache disorder
B. Regular overuse for >3 months of ≥1 acute/symptomatic treatment
   1. Simple analgesics for ≥15 days/month
   2. Ergotamine, triptans, opioids, or combination analgesic medications (caffeine) on ≥10 days/month
   3. Any combination of simple analgesics, ergotamine, triptans, combination analgesics, and/or opioids on ≥15 days/month on a regular basis without overuse of any single class alone

*If attributed to substance withdrawal, sub-classify as caffeine withdrawal headache; opioid withdrawal headache; estrogen withdrawal headache
• Butalbital associated with MOH at 5d/mo, opioids at 2d/week in AMPP
**Summary**

Distinguishing primary from secondary headache disorders is first priority

- Beware of red flags
- Majority have primary headache
- Majority have migraine

Distinguishing episodic from chronic

- Majority of primary chronic headaches are CM
- Warn patients of risk factors for progression and systemic risks of medication overuse
- Ask about completely headache free days
- ~50% of CM is associated with acute medication overuse