Prevent, Treat, Repeat: Getting Ahead of Migraines

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• **Presenter:** Jennifer Bestard

• **Relationships that may introduce potential bias and/or conflict of interest:**
  - **Grants/Research Support:** Jennifer Bestard has received grants from Allergan and Tribute to provide CME lectures on headache.
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  - **Other:** N/A
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Presentation Outline

• **Migraine backgrounder:**
  - Assessment, diagnosis and identification of migraine

• **Treatment options for acute migraine**
  - Pharmacologic and non-pharmacologic

• **When should prevention be started?**
  - 15 or more headache days per month
Steps to Diagnosing Headache Disorders

**STEP 01**
Exclude secondary headache

**STEP 02**
Identify primary headache syndrome based on attack frequency and duration

**STEP 03**
Diagnose specific headache disorder
### Case Vignette (Sara)

<table>
<thead>
<tr>
<th>Initial Consult</th>
<th>25-year-old female who presents to her primary care doctor with a four year history of headache</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Two attacks per month</td>
</tr>
<tr>
<td>Prodrome</td>
<td>Dysphoric mood</td>
</tr>
<tr>
<td>Aura</td>
<td>Zig-zag lines and a graying of vision in a visual field</td>
</tr>
<tr>
<td>Pain</td>
<td>Unilateral (R&gt;L) throbbing severe pain lasting 24 hours untreated</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Nausea, photophobia, unable to function</td>
</tr>
<tr>
<td>Treatment</td>
<td>Excedrin Migraine up to six per day</td>
</tr>
<tr>
<td>Exam</td>
<td>WNL (within normal limits)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>?</td>
</tr>
</tbody>
</table>
Primary or Secondary Headache?

Step 1: Detailed History and Examination

Red Flags?

- Yes → Evaluate for Secondary Headache
- No → Diagnose Primary Headache Disorder

Any unusual features?
## Red Flags in Headache: “SNOOP”

<table>
<thead>
<tr>
<th>S</th>
<th>Systemic signs or symptoms</th>
<th>Fever, weight loss, malignancy, HIV, meningismus, pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Neurologic signs or symptoms</td>
<td>Papilledema, hemiparesis, hemi-sensory loss, diplopia, dysarthria</td>
</tr>
<tr>
<td>O</td>
<td>Onset</td>
<td>“Worst headache of life” (thunderclap)</td>
</tr>
<tr>
<td>O</td>
<td>Older</td>
<td>New headache at age ≥50</td>
</tr>
<tr>
<td>P</td>
<td>Progression of existing headache disorder</td>
<td>Change in quality, frequency, or location</td>
</tr>
</tbody>
</table>

Sara has a Primary Headache Disorder

- Sara has no headache alarms
- Four year history, lack of alarms and normal exam, additional work-up is not necessary
Categorize Into One of Three Groups

Step 2

Primary Headaches

Assess frequency and duration for each headache type

Divide into headache syndromes

1. Short Duration < 4hr duration
2. Episodic (Long Duration) ≥ 4hr duration ≤ 15 days/month
3. Chronic Daily Headache ≥ 4hr duration ≥ 15 days/month
Diagnose the Specific Disorder Within the Category

- Migraine vs. tension type headache
- Tension type headache is the most common primary headache
- Migraine is the leading headache disorder that causes patients to seek treatment
Diagnostic Criteria

Migraine without Aura:

A. At least five attacks fulfilling criteria B-D

B. Headache attacks lasting 4-72 hr

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 (e.g., walking, climbing stairs)

D. During headache ≥1 of the following:
   1. Nausea and/or vomiting
   2. Photophobia and phonophobia

E. Not attributed to another disorder

Sara has “Classic Migraine”

Migraine with Aura

• Complex array of symptoms reflecting focal cortical or brainstem dysfunction

• Gradual evolution: 5-20 minutes (<60 minutes)

• May or may not be associated with headache

• Visual > sensory >, language, brainstem >motor*
Diagnosed Migraine: “Tip of the Iceberg”

Diagnosed

Males 29%  Females 41%

Undiagnosed

Males 71%  Females 59%

Migraine: Additional Features

- Predictable timing around menstruation or ovulation
- Stereotypical prodromal symptoms
- Characteristic triggers
- Abatement with sleep
- Positive family history
- Childhood precursors (motion sickness, episodic vomiting/vertigo)
- Osmophobia

Three-Item ID Migraine Screener *

During the last three months, did you have any of the following with your headaches:

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes / No</th>
</tr>
</thead>
<tbody>
<tr>
<td>You felt <strong>nauseated or sick</strong> to your stomach when you had a headache?</td>
<td>Yes □ No □</td>
</tr>
<tr>
<td><strong>Light bothered you</strong> (a lot more than when you don’t have headaches?)</td>
<td>Yes □ No □</td>
</tr>
<tr>
<td>Your headaches <strong>limited your ability</strong> to work, study or do what you need to do for at least one day?</td>
<td>Yes □ No □</td>
</tr>
</tbody>
</table>

* An affirmative response on 2 of 3 questions yields a sensitivity and specificity of 81% and 75%, respectively.

Migraine: A Common Episodic Headache Disorder

Neurologic disorder
• Strong genetic component (up to 50%)

Global prevalence: >10%
• Women: 15%–17%
• Men: 6%–9%

Two major subtypes
• Without aura (~75%)
• With aura (~25%)

Burden
• Among the world’s 20 most disabling diseases (WHO)
• **Affects 3 million women and 1 million men in Canada**
  ➢ An Angus Reid poll suggests that the cost of migraine in the workplace is approximately $500 million annually

Prevalence of Migraine and Tension-type Headache in Various Settings

![Graph showing prevalence of migraine and tension-type headache]

- Population: Migraine 12%, Tension-Type Headache 40%
- Waiting Room: Migraine 75%, Tension-Type Headache 16%

Migraine is Often Misdiagnosed

† Inaccurate diagnosis received by migraine patients

Tension-Type Headache

A. At least 5 attacks fulfilling criteria B-D

B. Headache attacks lasting 30 min – 7 days (untreated or unsuccessfully treated)

C. Headache has ≥2 of the following characteristics:
   - **Bilateral** location
   - Pressure **non pulsating** quality
   - **Mild** to moderate pain intensity
   - **Not aggravated** by or causing avoidance of routine physical activity

D. During headache ≥1 of the following:
   - **No** nausea or vomiting
   - Photophobia or phonophobia but **not both**

E. Not attributed to another disorder

Headache Classification Subcommittee of the International Headache Society, 2004
Why is Migraine Frequently Mistaken for Sinus Headache?

- Pain is often located over the sinuses
- Migraine is frequently triggered by weather changes
- Tearing and nasal congestion are common during attacks
- Sinus medication may help migraine
The Art and Science of Evaluating and Treating Migraine

Planning and Management Strategies
What might be your preliminary treatment recommendation for her?
Non-pharmacologic approaches

- Trigger identification and management
  - Identify triggers by history
  - Headache diaries
- Education and enhance self-efficacy
- Sleep, exercise, diet and caffeine
- Biofeedback and cognitive behavioural treatment
Headache Journal

[Calendar with dates marked with x]
# Medication Classes in Acute Migraine Treatment

## Health Canada-Approved Prescription Medications

<table>
<thead>
<tr>
<th>Medication Class</th>
<th>Approved Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Triptans</strong></td>
<td>naratriptan, almotriptan, frovatriptan, sumatriptan, rizatriptan, eletriptan, zolmitriptan</td>
</tr>
<tr>
<td><strong>Ergots</strong></td>
<td>ergotamine tartrate, dihydroergotamine</td>
</tr>
<tr>
<td><strong>NSAID</strong></td>
<td>diclofenac potassium for oral solution (CAMBIA)</td>
</tr>
</tbody>
</table>

### Other Medications Used in Migraine Treatment

- No other prescription medications have met the criteria for Health Canada approval for treatment of acute migraine

## Other Medications Used in Migraine Treatment

- **NSAIDs**
- **Opioids**
- **Barbiturates**

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Principles of Acute Treatments

1. Stratified care
2. Early intervention
3. Use correct dose and formulation
4. Treat at least two or three attacks before judging acute medications
5. Use a maximum of 2-3 days / week
6. Use preventive therapy in selected patients
Define the needs: clinical judgment
Stepped care within attacks: according to immediate effect

- **Low**
  - OTC analgesics

- **Moderate**
  - Combination OTC
  - Prescription NSAIDS
  - Triptans

- **High**
  - Triptans (Ergots)
  - Opioids (rarely)
## Follow-up Visits

<table>
<thead>
<tr>
<th>Review outcome measures (diaries, MIDAS, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess efficacy, adverse effects, and satisfaction with current regimen</td>
</tr>
<tr>
<td>If treatment is not working, find out why?</td>
</tr>
</tbody>
</table>

### Consider:

- Primary failure
- Effects take to long
- Poor consistency
- Recurrence
- Adverse events
- Interfering medications
- Expectations unrealistically high

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Sara – Age 35

- Working full-time as a social worker
- Married with 3 kids under age 6
- Headache frequency has increased very gradually over the last 3 years
- Headaches are now occurring about 3-4 days per week
- Otherwise well, no change in headache characteristics, no new meds
What is the Diagnosis?

How Would You Manage Sara’s Headaches?
Chronic Migraine

Chronic migraine:

- HA on $\geq 15$ days/mt for $>3$ mts
- $\geq 8$ days fulfilling criteria for migraine with or without aura, responding to migraine-specific medications, or recognized by patient as migraine
- Not better accounted for by another ICHD-3 beta diagnosis
Preventive Treatment:

When?

• When patient has \( \geq 15 \) headache days per month
• When \( \geq 4 \) severe attacks per month poorly controlled with symptomatic medication
• When symptomatic medication needs to be used more than 2-3 days a week
• Special situations preclude the use of effective acute medications

For how long?

• 3 month minimum trial
• If helpful, consider reduction and cessation after 12-18 months
Goals of Chronic Migraine Therapy

Reduce (1 or more of):
- Headache frequency
- Duration
- Severity
- Medication requirements
- Headache-related disability

What to expect?
- 50% obtain a reduction of ≥50% in the frequency of attacks in the second or third month of use

Monotherapy vs. Polytherapy?
- Monotherapy preferred but polytherapy may be necessary
Preventive Medications

- **Antidepressants**
  - TCAs (i.e. amitriptyline, nortriptyline)

- **Beta blockers**
  - Propranolol, Nadolol

- **Anticonvulsants**
  - Topiramate
  - Divalproex
  - Gabapentin

- **Calcium channel blockers**
  - Verapamil
  - Flunarizine

- **Interventional**
  - Botulinum toxin A (BOTOX)
  - ? Nerve blocks

- **Miscellaneous**
  - Pizotifen (Sandomigran)
  - Angiotensin II receptor antagonist ?

- **“Natural” Options**
  - Riboflavin, feverfew, magnesium
• **Migraines** are the most common headache-type leading to medical attention (occurs in pediatric and adult population).

• Acute migraine management requires *stratified care* which may include OTC, NSAIDS and/or triptan and/or anti-emetic.

• **Lifestyle strategies** are critical for preventing migraine headaches and patients should be constantly reminded about them.

• When migraines are too frequent/disabling, consider *prophylactic therapy* (start low, go slow, and persist).

• Watch out for *medication overuse* headache and, when present, aggressively manage.
The Art and Science of Evaluating and Treating Migraine

THANK YOU
Medication overuse (MOH)*

- ≥15 HA days/mt in a patient with a pre-existing HA disorder
- Regular overuse for >3 mts of ≥1 acute meds
- Not better accounted for by another ICHD-3β diagnosis

*Also called transformed migraine, rebound headache
# Classification of MOH

**ICDH-3 Beta Diagnostic Criteria: Fulfills criteria for MOH plus...**

<table>
<thead>
<tr>
<th>Overuse (≥15 days/mt for &gt;3 months) of:</th>
<th>Overuse (≥10 days/mt for &gt;3 months) of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen</td>
<td>Ergotamines</td>
</tr>
<tr>
<td>ASA</td>
<td>Triptans</td>
</tr>
<tr>
<td>Other NSAIDs</td>
<td>Opioids</td>
</tr>
<tr>
<td></td>
<td>Combination analgesics</td>
</tr>
<tr>
<td></td>
<td>Combinations of ergotamine, triptans, simple analgesics, NSAIDs and/or opioids</td>
</tr>
</tbody>
</table>

ICHD: International Classification of Headache Disorders; MOH: medication overuse headache; ASA: acetylsalicylic acid; NSAID: nonsteroidal anti-inflammatory drug.
## BIMOH (Brief Intervention for MOH)

<table>
<thead>
<tr>
<th>Question</th>
<th>Scoring</th>
<th>0 = never/almost never</th>
<th>1 = sometimes</th>
<th>2 = often</th>
<th>3 = always/nearly always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think your use of HA medication was out of control?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the prospect of missing a dose make you anxious or worried?</td>
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<td></td>
</tr>
<tr>
<td>Did you worry about your use of your HA medication?</td>
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<td></td>
</tr>
<tr>
<td>Did you wish you could stop?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How difficult would you find it to stop or go without your HA medication?</td>
<td></td>
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</tr>
</tbody>
</table>

**Cut-off scores for risk of MOH**

- ≥5 for women
- ≥4 for men

HA: headache; MOH: medication overuse headache
Quick 2-question screen for MOH

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you take a treatment for attacks on ≥10 days/month?</td>
</tr>
<tr>
<td>2</td>
<td>Is this intake on a regular basis?</td>
</tr>
</tbody>
</table>

- Sensitivity 95.2%, specificity 80%
- Advantages:
  - Simple
  - Quick
  - Low cost
Established CM With MOH: Treatment Strategies

- Wean overused medication(s)
- Encourage use of non-pharmacological approaches
- Switch to effective preventive treatment and place limits on acute meds
- Education

MOH: medication overuse headache; CM: chronic migraine
References:


2. Aurora SK, Kori SH, Barrodale P, *et al.* Gastric stasis in migraine: more than just a paroxysmal abnormality during a migraine attack. Gastric stasis in migraine: more than just a paroxysmal abnormality during a migraine attack. *Headache* 2006;46(1):57-63.


37. Rapoport AM. Acute Treatment of Migraine: established and Emerging Therapies. *Headache* 2012;52;S2:60-64.


Assessing Treatment Success

- Severity of disability (MIDAS or HIT-6)
- Duration, intensity, and frequency of attacks
- Use of medical resources:
  - Second dose
  - Rescue medication
  - Emergent care / clinic visits
- Incidence of adverse events
- Level of patient satisfaction

Recurrence

Return of episodic headache during the same attack following acute treatment

- **Prevention:**
  - Treat early, add NSAID
  - Use long-duration triptan or DHE

- **Treatment:**
  - Repeat initial acute headache drug which is almost always effective

Rebound

Recurring headache induced by repetitive and chronic overuse of acute headache medication

- Prevention:
  - Limit frequency and dose of medications

- Treatment:
  - Withdrawal and washout of overused medication; consider using preventives

Mechanism of Cutaneous Allodynia

- Activation of the trigeminovascular system (TGVS) → release of substance P, calcitonin gene-related peptide (CGRP), and neurokinins by V (trigeminal) ganglion → neurogenic inflammation in dura → vasodilatation of meningeal vessels, plasma extravasation, and mast cell degranulation

- Neurogenic inflammation may activate/sensitize meningeal V nociceptors

- Central sensitization occurs when there is sustained firing of sensitized meningeal nociceptors → activation/sensitization of 2nd order central trigeminovascular (TV) neurons → reduced pain threshold and cutaneous allodynia
Non-pharmacological Therapies

Behavioural Treatments Include:

- Stress management / relaxation training
- Regular diet and sleep
- Trigger identification and avoidance
- Avoidance of excessive over-the-counter medications
- Cognitive / behavioural management therapy etc.

Physical Treatments Include:

- Natural remedies / complementary medicines
- Acupuncture
- Transcutaneous electrical nerve stimulation
- Occlusal adjustment
- Cervical manipulation