

# MIGRAINE HEADACHE: DIAGNOSIS AND TREATMENT

**Daniel P Fosmire MD**

**Overlake Neuroscience Institute**

**425.635.6560**

- ▶ **How are migraine headaches diagnosed?: IHS Criteria**
- ▶ **Know the abortive and preventative treatment options for migraine and how to use them**
- ▶ **Recognize the importance of lifestyle changes to improve migraine frequency using a migraine diary and identifying migraine triggers**

## LECTURE OBJECTIVES

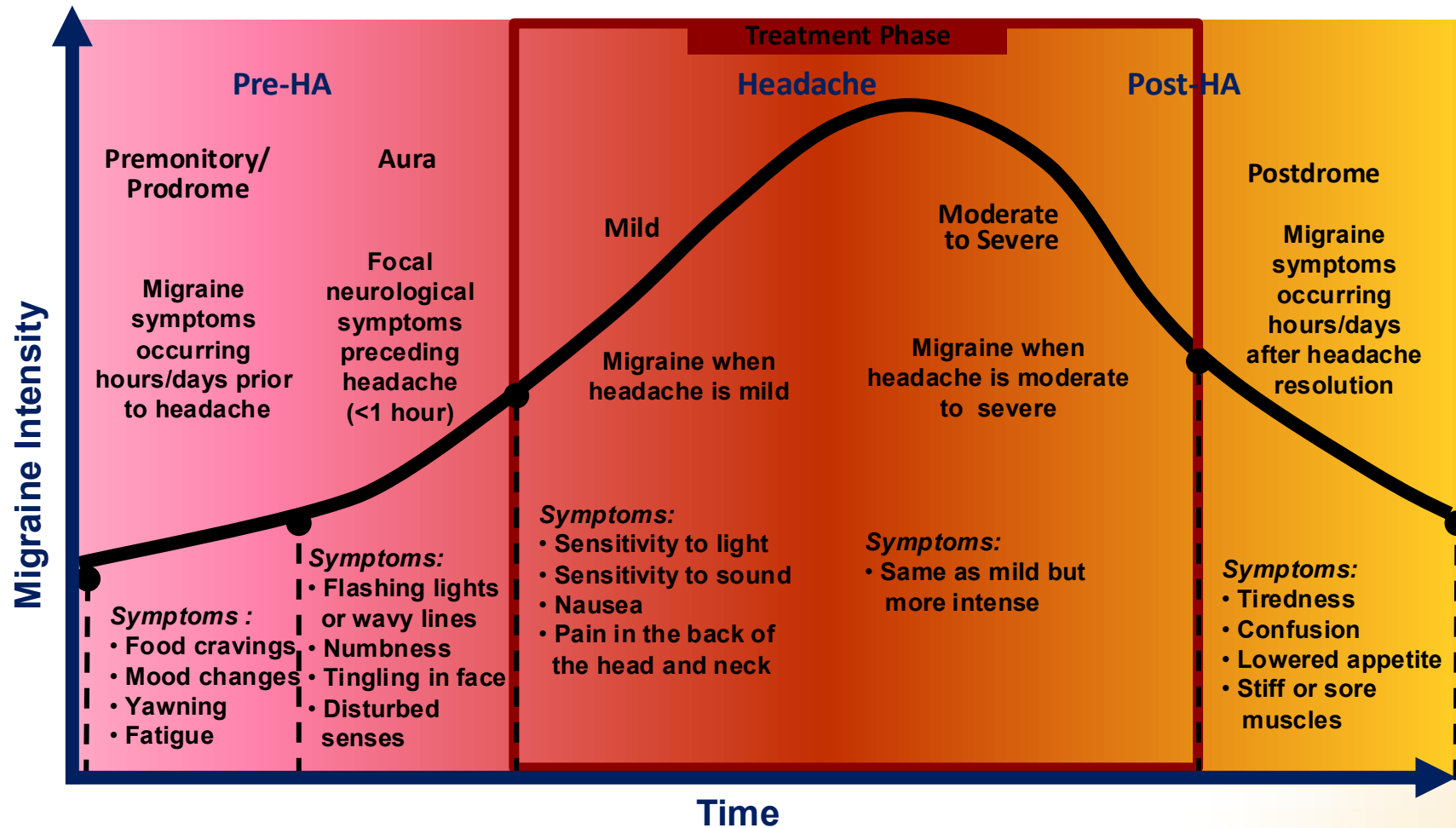
- ▶ 12% of population with migraine headaches
- ▶ 18% of women
- ▶ 6% of men
- ▶ Up to 30% of women in their mid-30's suffer from migraine
- ▶ About 1 in 4 families has a migraine sufferer

# MIGRAINE PREVALENCE

- ▶ A CHRONIC, RECURRENT NEUROVASCULAR DISORDER
- ▶ Chronic because it is a biological disorder
- ▶ Recurrent since by diagnostic criteria there must be at least 5 headaches with similar characteristics and associated symptoms usually with identifiable triggers
- ▶ Neurovascular since it is a disorder of the sensory nerve endings and blood vessels in the brain where chemicals (CGRP, kinins, substance P) are released from nerve endings in the brain that result in a sterile inflammation of blood vessels and secondarily turn on migraine pain centers in the brain (trigeminal nucleus caudalis)

## WHAT IS A MIGRAINE HEADACHE ?

# PHASES OF A MIGRAINE ATTACK



Adapted from Cady RK. *Headache*. 2008;48(9):1415-1416.

Headache Classification Subcommittee of the International Headache Society. *Cephalalgia*. 2004;24(suppl 1):117-118.

Cady RK. Diagnosis and treatment of migraine. *Clinical Cornerstone*. 1999;1(6):21-32.

[http://www.nlm.nih.gov/ disorders/headache/detail\\_headache.htm](http://www.nlm.nih.gov/ disorders/headache/detail_headache.htm)  
 Accessed December 7, 2009.



- ▶ CGRP is a 37 amino acid neuropeptide discovered in 1982
- ▶ CGRP and its receptors are widely distributed in peripheral and central nerve pain pathways such as the periaqueductal grey and the spinal trigeminal nucleus where it can modulate neurogenic inflammation/pain inputs
- ▶ A highly potent blood vessel dilator released from sensory nerves with receptors on the middle meningeal artery middle cerebral artery, pial and superficial temporal arteries
- ▶ Involved in migraine as well as somatic pain (joint and low back pain), visceral pain (endometriosis, pancreatitis), inflammatory and neuropathic pain (CRPS)
- ▶ Triggers a migraine attack 3-4 hours after intravenous infusion

## CALCITONIN GENE RELATED PEPTIDE

- ▶ **OBTAINING A GOOD HISTORY IS THE KEY TO DIAGNOSIS**
- ▶ **SPECIFIC DIAGNOSTIC CRITERIA FOR MIGRAINE**
- ▶ **LOOKING FOR CLUES THAT POINT TOWARD THE DIAGNOSIS**

**HOW IS A MIGRAINE DIAGNOSED?**

## HEADACHE QUESTIONNAIRE

When did you first start having headaches? \_\_\_\_\_

How frequent are they? \_\_\_\_\_ times per week **More than one per day?** (circle) Yes No

Do they tend to occur at a specific time of day? Yes No

If Yes, when \_\_\_\_\_

How long do they last? \_\_\_\_\_ minutes \_\_\_\_\_ hours \_\_\_\_\_ days

Do they improve with sleep? Yes No Do they awaken you from sleep? Yes No

From onset of pain, how long until the headache peaks in intensity? \_\_\_\_\_

How severe are the headaches? At minimum? (scale of 1-10) \_\_\_\_\_ At most? (scale of 1-10?) \_\_\_\_\_

Where is your headache located? \_\_\_\_\_

Is it always in the same area? Yes No

Is there a prodrome (an early symptom) that tells you a headache is coming? Yes No

Example: Yawning, food craving, personality changes or fatigue If Yes, specify: \_\_\_\_\_

Do you have a visual warning (aura) that tells you a headache is coming? Yes No

If yes, how long does the aura last? \_\_\_\_\_

Has there been a change in the headache character or aura? Yes No

**What are the associated symptoms?** (please circle the symptoms you have with the headache)

|                              |                                |                             |
|------------------------------|--------------------------------|-----------------------------|
| Nausea- immediate or delayed | Vomiting- immediate or delayed | Lack of coordination        |
| Sensitivity to light         | Sensitivity to sound           | Tingling/Numbness           |
| Drooping of one eyelid       | Tearing from one eye           | Stuffy nose/nasal discharge |
| Sensitivity to odors         | Imbalance                      | Confusion Other: _____      |

**Have you noticed that specific things can trigger your headache?** (circle)

|                              |                |                         |                    |         |
|------------------------------|----------------|-------------------------|--------------------|---------|
| Odors                        | Foods          | Alcohol (like red wine) | Bright lights      | Fatigue |
| Too much or too little sleep | Missing a meal | Stress                  | Changes in weather |         |
| Menstrual cycle              |                |                         |                    |         |

Is there any family history of migraine headaches? \_\_\_\_\_

**What medications have been tried to stop the headache once it began?** (circle)

|                   |          |                   |          |               |        |
|-------------------|----------|-------------------|----------|---------------|--------|
| Ibuprofen (Advil) | Tylenol  | Naprosyn (Aleve)  | Excedrin | Degongestants |        |
| Cafergot          | Wigraine | Ercaf             | Imitrex  | DHE-45        | Maxalt |
| Zomig             | Amerge   | Fiorinal/Fioricet | Other    | _____         |        |

**Have any preventative medications that are taken daily been tried?** (circle)

|                        |                          |                            |         |
|------------------------|--------------------------|----------------------------|---------|
| Propranolol (Inderal)  | Amitriptyline (Elavil)   | Nortriptyline (Pamelor)    | Lithium |
| Methysergide (Sansert) | Valproic Acid (Depakote) | Cyproheptadine (Periactin) |         |
| Fluoxetine (Prozac)    | Gabapentin (Neurontin)   | Verapamil (Calan)          |         |

How long did you use this medication? \_\_\_\_\_

Did side effects prevent continued use of these medications? \_\_\_\_\_

Was the dose of the preventative medication increased if it was ineffective? \_\_\_\_\_

Has there been any recent change in your medications? Yes No

Does exertion worsen the headache? Yes No

Did you have motion sickness as a child? Yes No

Is your head pain (circle) throbbing, pressure-like, vice-like, stabbing, or \_\_\_\_\_

# MIGRAINE DIAGNOSTIC CRITERIA

- ▶ **IHS/ICHD-3 Criteria updated in 2018 to provide specific diagnostic criteria for headaches**
  - ▶ **Migraine with aura**
  - ▶ **Migraine without aura**
- ▶ **Limited guidelines**
  - ▶ **Designed for clinical research *not* clinical practice**
  - ▶ **Do not recognize important variation of migraine and other headache types**

- ▶ **A) At least 5 attacks fulfilling B-D**
- ▶ **B) Each attack lasts 2-72 hours (untreated or unsuccessfully treated)**
- ▶ **C) At least 2 of the following 4: Unilateral, pulsatile, moderate to severe intensity, aggravated by or avoidance of routine activity**
- ▶ **D) During an attack at least one of the following symptoms: -nausea or vomiting ; photophobia and phonophobia ,or osmophobia**
- ▶ **E) Not better accounted for by another ICHD-3 disorder**

**DIAGNOSIS OF MIGRAINE:  
ICHD CRITERIA**



- ▶ **Unilateral**
- ▶ **Pulsatile**
- ▶ **Nausea**
- ▶ **Photophobia (light sensitivity) and phonophobia (sound sensitivity) or osmophobia (smell sensitivity)**

**DIAGNOSIS OF MIGRAINE:  
SIMPLIFIED 2/4**



- ▶ **PRESENT IN ABOUT 15-20% OF MIGRAINE PATIENTS**
- ▶ **MECHANISM IS A SPREADING DEPRESSION OF BRAIN CELL ACTIVITY MOVING ACROSS THE SURFACE OF THE BRAIN (CORTICAL SPREADING DEPRESSION)**
- ▶ **VISUAL**
- ▶ **SENSORY**
- ▶ **LANGUAGE DYSFUNCTION**
- ▶ **SHOULD LAST LESS THAN 1 HOUR**
- ▶ **CAN OCCUR WITHOUT HEADACHE (ACEPHALGIC MIGRAINE)**

## **THE MIGRAINE AURA**

- Published in Headache 2004 By Tepper et al
- If a patient thought they had a migraine they were 99.5% correct
- 82% of patients felt to not have a migraine were determined by a 6 month diary to have migraine headaches
- Physicians relied too heavily on one or more signature features of migraine In diagnosing headache
- The correct diagnosis was made using symptoms of the most severe headache rather than the most frequent headache

## THE LANDMARK STUDY

**“The reproducible provocation of headache by stereotyped stimuli is probably the most useful way of approaching a clinical diagnosis of migraine”**

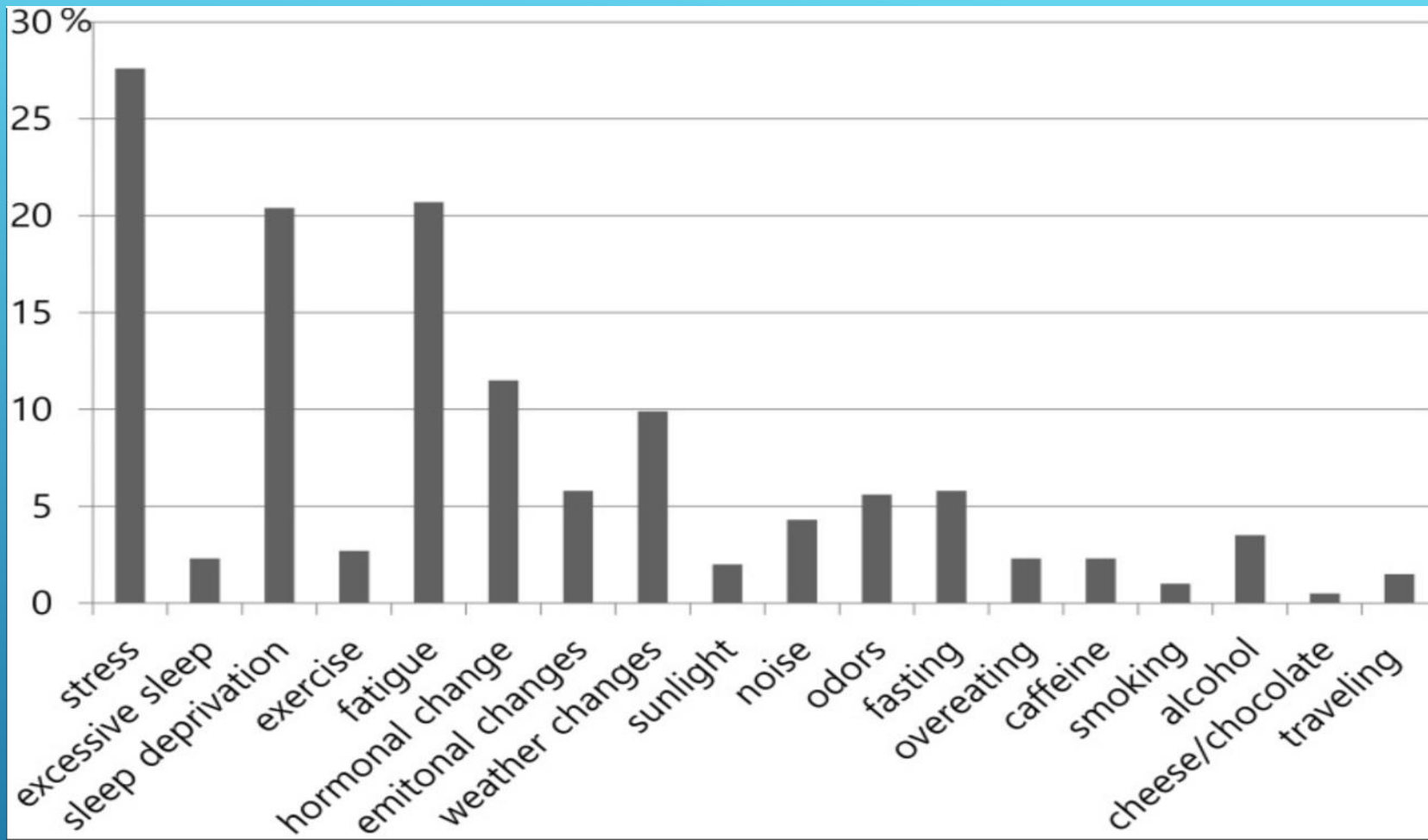
– Dr Neil Raskin

**HEADACHE HISTORY: TRIGGERS**

|  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|
| FOOD:  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Skipping Meals   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Dehydration  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Alcohol  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Excessive Caffeine / Lack of Caffeine                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| "Specialty" Coffee (Starbucks, Dutch Brothers, Etc.)           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Artificial Sweeteners  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Excessive Sweets / Sugar                                       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Chocolate  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Milk / Coffee Creamer  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Yogurt   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Cheese   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Sour Cream   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Lunch Meat   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Bacon  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Hot Dogs / Sausage   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Smoked or Pickled Meat / Fish                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Citrus (Oranges [OJ], Limes, Lemons, Pineapples, Etc.)         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Bananas  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Raspberries  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Avacados / Guacamole   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Onions   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Cabbage / Sauerkraut   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Tomatoes (pizza sauce, spaghetti sauce, etc.)                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Mushrooms  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Beans (burritos, chili, salads, etc.)                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Fresh bread (bagels, pizza, donuts, etc.)                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Nuts (peanuts, almonds, almond milk, etc.)                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Vinegar  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Salad Dressing   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Soy Products (milk, edamame, soy sauce, etc.)                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Monosodium Glutamate (MSG)                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Butylated hydroxytoluene / hydroxytoluene (BHA & BHT)          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| EXTERNAL ENVIRONMENT:  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Weather Fronts (Monsoon storm, dust storm, etc.)               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Flying   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Driving Associated with Altitude Change                        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Vacationing at High Altitude                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Smog / Pollution / "High Ozone" Day                            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Bright Light / Reflections (sunlight, fluorescent bulbs, etc.) |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Complex visual Patterns (ceiling fans, blinds, etc.)           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Heat (summer day, sauna, etc.)                                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Loud / High-Pitched Noises (traffic, music, tools, etc.)       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Perfumes/Cologne   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Scented Candles / Air Fresheners                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Cigarette/Cigar Smoke  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Gasoline/Diesel Fumes and Auto Exhaust                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Household/Car Cleaners   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| INTERNAL ENVIRONMENT:  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Lack of Sleep / Poor Sleep                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Prolonged Sleep or Napping                                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Running Late / Feeling Rushed                                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Change from Daily Routine                                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Argument with Family/Friend/Co-Worker                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Major Life Event (job change, death in family, etc.)           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Crying or Laughing   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Relaxation Time (weekend, vacation, etc.)                      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Exercise / Physical Exertion                                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| New Medication or Change to an Existing Medication             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Mid-Menstrual Period (Ovulation)                               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| Menstrual Period   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| CALENDAR DATE  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |  |  |
| DATE OF WEEK   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |

# MIGRAINE TRIGGERS: DR ERIC EROSS

## GLIACIN.COM (TOOLS)



# MIGRAINE TRIGGERS

- ▶ About 1/3<sup>rd</sup> of migraine patients can treat their migraines successfully with medications such as Naproxen, Ibuprofen or Excedrin which work by turning off production of inflammatory chemicals
- ▶ Opioid pain medications, or those containing Butalbital (Fioricet/Fiorinal) can result in increased risk of developing rebound headaches (medication overuse headaches) and can decrease the effectiveness of preventative medications
- ▶ Triptan medications are much less likely to result in medication overuse headaches
- ▶ Gepant medications are newer abortive options

## ABORTIVE THERAPY

- ▶ **Triptans decrease CGRP release at the blood vessel (5HT1B receptor) and at the nerve ending (5HT1D receptor)**
- ▶ **“EARLY IS LESS”**
- ▶ **TRIPTAN SENSATIONS: 10% of patients may feel chest pressure, jaw/throat tightness, fatigue, nausea, dizziness, skin sensitivity**
- ▶ **Triptan sensations can begin 30 minutes after dose and last up to 1 hour**
- ▶ **Triptan sensations are NOT cardiac related and not an allergic reaction to the medication, cause is not completely known**

## **TRIPTAN MEDICATIONS: ABORTIVE THERAPY**

- ▶ **Sumatriptan: TABLET, NASAL SPRAY, INJECTION**
- ▶ **Rizatriptan**
- ▶ **Zolmitriptan: TABLET AND NASAL SPRAY**
- ▶ **Almotriptan**
- ▶ **Eletriptan**
- ▶ **Frovatriptan**
- ▶ **Naratriptan**

# **TRIPTAN ABORTIVE THERAPY**

- ▶ Rimegepant and Ubrogepant work by blocking the receptor for CGRP
- ▶ Side effects can include dry mouth and sedation and are an alternative to triptan medications for patients with intolerable side effects or coronary artery disease

## GEPANT ABORTIVE THERAPY

- ▶ ANTICONVULSANT MEDICATIONS
- ▶ ANTI-HYPERTENSIVE MEDICATIONS
- ▶ TRICYCLIC ANTIDEPRESSANTS
- ▶ CGRP Monoclonal Antibody therapies
- ▶ GEPANT (ATOGEANT)
- ▶ BOTOX
- ▶ NON PRESCRIPTION OPTIONS
- ▶ The oral therapies are presumed to work by decreasing brain cell hyperexcitability
- ▶ 26% of patients would benefit from preventative therapy, but only 13% are being treated with them

# MIGRAINE PREVENTION OPTIONS

- ▶ A new treatment option for migraine prevention based upon current understanding of the neurovascular model of migraine
- ▶ Can be thought of as an immunization resulting in passive immunity to CGRP
- ▶ Subcutaneous injection
- ▶ Intravenous infusion

## ANTI-CGRP MONOCLONAL ANTIBODY THERAPIES

- ▶ Erenumab-aooe Mechanism of action is to block the CGRP receptor and alter cellular function
- ▶ Humanized immunoglobulin G2 (IgG2) monoclonal antibody
- ▶ Produced using recombinant DNA technology in CHO cells

## ANTI-CGRP MONOCLONCAL ANTIBODY THERAPIES

- ▶ Humanized mouse-sourced amino acid monoclonal antibodies: the zumabs
- ▶ CGRP anti-ligand : binders, neutralization, or ligand blocker therapy agents
- ▶ Equivalent of a passive immunization with an anti-ligand-antibody
- ▶ Galcanezumab-gnlm
- ▶ Fremanezumab-vfrm
- ▶ Eptinezumab

## ANTI-CGRP MONOCLONAL ANTIBODY THERAPIES

- ▶ America Headache Society Consensus Statement : Headache 2019  
Volume 59, Number 1
- ▶ 4-7 migraine headache days per month, failure of 2 oral preventative medications, and at least moderate disability
- ▶ 8-14 migraine headache days per month and failure of 2 oral medications
- ▶ Chronic migraine and failure of 2 oral medications or inability to tolerate or inadequate response to Botox
- ▶ Variable restriction for prior authorization between insurance plans and multiple attempts needing to be made by office staff for PA

## ANTI-CGRP MONOCLONAL ANTIBODY THERAPIES: ACCESS TO CARE

- ▶ Difference in how long the therapy lasts (half life) varies from 21 days for Aimovig to 25-45 days for the zumabs
- ▶ Effective dose and dose administration varies between patients (bioavailability)
- ▶ Fremanezumab did not block blood vessel dilation in research animal caused by an induced cortical spreading depression , which is the cause of migraine aura and thought to be the cause of migraine headache by some researchers
- ▶ “There is more than one truth to migraine pathophysiology, and it is unlikely that no one theory will explain all types of migraine or the mechanism of action of antimigraine drugs”

## ANTI-CGRP MONOCLONAL ANTIBODY THERAPIES: FAILURES

- ▶ TOPIRAMATE
- ▶ DIVALPROIC ACID
- ▶ GABAPENTIN

# ANTICONVULSANT MEDICATIONS

- ▶ BETA BLOCKERS: Propranolol, Timolol, Metoprolol
- ▶ CALCIUM CHANNEL BLOCKERS : Verapamil, Diltiazem, Amlodipine
- ▶ ARB: Candesartan

# ANTI-HYPERTENSIVE MEDICATIONS

AMITRIPTYLINE

NORTRIPTYLINE

PROTRIPTYLINE

TRICYCLIC ANTIDEPRESSANTS

A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, set against a blue gradient background.

- ▶ Venlafaxine
- ▶ Duloxetine

# SEROTONIN-NOREPINEPHRINE REUPTAKE INHIBITORS

- ▶ **Chronic migraine is defined as 15 or more headache days per month of which at least 8 headache days per month meet criteria for migraine without/with aura**
- ▶ **PREEMPT trial published in Cephalgia 2010 proved efficacy of onabotulinum toxin A for chronic migraine patients**
- ▶ **31 injection sites per treatment every 12 weeks injected into specific muscles in the head and neck where it enters sensory nerve endings**
- ▶ **Proposed mechanism is INHIBITING PAIN-RELATED NEUROTRANSMITTER RELEASE (CGRP, Glutamate, Substance P) from sensory neurons which in turn reduces peripheral and central sensitization (migraine generator in brainstem)**

## **BOTOX FOR CHRONIC MIGRAINE**

- ▶ VITAMIN B2 (Riboflavin) 400 mg daily
- ▶ CHELATED MAGNESIUM as tolerated 500-750 mg daily
- ▶ BUTTERBUR: 75 mg twice daily
- ▶ BOSWELLIA: brand name Gliacin 375mg three times daily
- ▶ FEVERFEW: 250 mg daily
- ▶ CO Q 10: 100mg three times daily
- ▶ MigreLief: contains Magnesium, Vitamin B2 and Feverfew

## NON PRESCRIPTION OPTIONS



## **GOOD:**

A headache with a stable pattern, definite headache trigger ( like being associated with menstrual cycle), may improve with sleep, meets the International Headache Society (IHS) criteria for primary headache but which simply does not respond to the usual treatments

## **BAD:**

A headache with a dramatic change from the usual headache character including thunderclap onset, progressive head pain from onset, or following head/neck trauma, when associated with fever, stiff neck or confusion, or if new symptoms like weakness, numbness or speech difficulties with headache

# **ARE YOU A GOOD WITCH OR A BAD WITCH?**

- ▶ **Migraine with or without aura**
- ▶ **Tension Headache**
- ▶ **Cluster headache**
- ▶ **Hemicrania continua**

## **THE GOOD HEADACHE: PRIMARY HEADACHE**



- ▶ Systemic: History of malignancy, immunosuppression, HIV or complaints of fever, chills, night sweats, myalgias, weight loss, jaw claudication
- ▶ Neurologic: Neurologic symptoms including change behavior or personality, diplopia, transient visual loss, pulsatile tinnitus, weakness, sensory loss, ataxia
- ▶ Onset (sudden) : thunderclap headache
- ▶ Onset (age): new onset after the age of 50
- ▶ Pattern change : progressive or change in headache character, ppt by Valsalva, postural aggravation
- ▶ Papilledema
- ▶ Pregnancy
- ▶ Phenotype of rare headache: Exercise induced, cough headache, coital headache, hypnic headache

# SNOOPPP

- ▶ **Subarachnoid hemorrhage**
- ▶ **Encephalitis**
- ▶ **Meningitis**
- ▶ **Ruptured Arteriovenous Malformation**
- ▶ **Brain tumor**
- ▶ **Intracranial Hemorrhage**
- ▶ **Carotid/Vertebral Dissection**
- ▶ **Sagittal Sinus Occlusion**

## SECONDARY HEADACHES: THUNDERCLAP

- ▶ **Waiting until you know it is a migraine**
- ▶ **Waiting until you get home from work to take medication**
- ▶ **Using a triptan this is not present in intracranial circulation before the migraine reaches it peak**
- ▶ **Delaying the use of the medication due to concerns about side effects or running out of your medication**

**FAILURE TO RESPOND TO TREATMENT**

# CUTANEOUS ALLODYNIA

- ▶ **Cutaneous allodynia is pain resulting from non-noxious stimuli to the skin**
- ▶ **Sign of central sensitization of trigeminal pain pathways**



Jon Hedley-White Professor of Anesthesia at Harvard Medical School

A leading researcher in understanding migraine headaches and improving treatment

Changed the treatment paradigm for triptan medications

Developed the concept of cutaneous allodynia as a marker for efficacy of triptan medications for aborting migraine headaches

Chosen to throw out the ceremonial first pitch at Fenway Park for his fundraising efforts for migraine research

DR. RAMI BURSTEIN

- ▶ **A critical tool in understanding migraines for the patient and the physician**
- ▶ **Can help to identify migraine triggers that can potentially be avoided**
- ▶ **Can help determine if preventative therapies are working**
- ▶ **Applications available on Smart Phones for migraine diaries**
- ▶ **Can help watch for increased frequency of headaches that may result in transformation from episodic to chronic migraine**

**THE HEADACHE DIARY**

- ▶ i Headache
- ▶ Headache Diary Pro
- ▶ Headache Diary (ecoHeadache)
- ▶ Migraine Buddy
- ▶ Migraine Coach

# HEADACHE DIARY

- ▶ 29 year old woman who developed migraines occurring daily or every other day after being in front of computer studying for 8 hours per day for months, began taking Ibuprofen daily. Saw Neurologist, MRI brain normal, headaches were not responding to Nortriptyline or Rizatriptan

LIFESTYLE CHANGES TO IMPROVE  
MIGRAINE HEADACHES

- ▶ STARTED EACH DAY DRINKING 4 GLASSES OF WATER
- ▶ HIGH PROTEIN FOODS IN MORNING
- ▶ DID NOT SKIP MEALS IN DAYTIME (taking breaks from work)
- ▶ YOGA 3 DAYS PER WEEK
- ▶ WORKOUT IN GYM 4 DAYS PER WEEK
- ▶ MEDITATION (another option could be biofeedback)
- ▶ MAGNESIUM AND VITAMIN B2
- ▶ ACUPUNCTURE TREATMENT WEEKLY (another option massage therapy)

## LIFESTYLE CHANGES

- ▶ 68 year old woman followed for many years for migraine, using Rizatriptan as abortive therapy
- ▶ Had treatment that dramatically improved chronic hip pain, and was able to begin exercising regularly
- ▶ Changed diet including stopping eating sugar and went on gluten free diet
- ▶ Taking Boswellia 3 times daily
- ▶ Now entirely migraine headache free
- ▶ May have stiff neck and mild headache in morning once per month, treats with hot shower and stretching exercises

## LIFESTYLE CHANGES TO IMPROVE MIGRAINE HEADACHES

- ▶ **Use the headache diary to identify migraine triggers**
- ▶ **Maximize stability in your life, especially during vulnerable times: regular sleep, regular meals/hydration, avoid food triggers, stress relief/taking breaks**
- ▶ **Exercise aerobically 5 days or more per week**
- ▶ **Keep abortive medications with you, treat early**
- ▶ **Take preventative medications faithfully**
- ▶ **Stockpile medications during periods of few headaches**
- ▶ **Establish an emergency treatment plan**

**GAINING CONTROL OF MIGRAINES**

**THANK YOU**

