



# Management of Headaches in Children

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# Disclosures

- None





# Contents and Objectives

- Explain who I am, why I am here talking to you
- General approach to headaches in children
  - Types of headaches, diagnosis, management, treatment
- The headache pathway
- Guidelines and science on which it is based
- Suggestions for primary care providers seeing kids for headaches

# Who am I, and why are you listening to me?



- General child neurologist at RCHSD x 8 years
- Sees about 1/3<sup>rd</sup> headache patients, every day of the week
- Asked about 2 years ago to generate a clinical pathway to assist area pediatricians.
- With copious help from Dr. Whitney Edwards, the pathway was finished and distributed
  - Based upon AAN guidelines, experience
- It has been helpful in a handful of ways:
  - Reduced ED visits, reduced imaging studies, specialist referral
  - Several pediatricians have reported to me that they value the stepwise approach and various options for intervention that the pathway provides.



# Headaches are common

- Data from 5 retrospective studies published between 1977 and 1991 of 27,606 children found the prevalence of any type of headache to range from 37 to 51% in 7 year olds, gradually increasing to 57 to 82% by age 15 years.
- Pre-pubertal boys were also found to be more affected with headache than girls, whereas after puberty, headaches were found more commonly in females.
- --AAN Guideline on Evaluation of Headache in Children and Adolescents:  
<http://www.neurology.org/content/59/4/490.full#ref-1>



# Migraines are common too

- Prevalence of migraines in kids:
  - Ages 3-7 years: up to 3%
  - Ages 7-11 years: up to 11%
  - Over 11 years: up to 23%
- Prevalence of migraines among adults is up to 30%
  - WHO: <http://www.who.int/mediacentre/factsheets/fs277/en/>

# Main categories of Headache

## ■ Primary Headache

- Tension type HA
- Migraine
- TAC's
  - Cluster HA
- “Other” primary headaches
  - NDPH, Ice pick HA...



Continental Divide

## ■ Secondary Headache

- Tumor/Mass
- Vascular lesion
- Increased ICP due to other causes
- Post-ictal
- Paranasal sinus disease
- Other illnesses

# Time course/ presentation

## ■ Acute

- In otherwise healthy child, usually due to viral illness
- With focal neurological signs, can be intracranial hemorrhage
- Severe, with fever can be due to meningitis, hemorrhage

## ■ Acute, recurrent

- Attacks of headache separated by symptom-free intervals.
  - Migraine, Tension Type Headache, Cluster HA
  - Partial seizures, substance abuse, recurrent Trauma

## ■ Chronic, progressive

- Most ominous, can imply increased intracranial pressure
  - Tumor, hydrocephalus, IIH, chronic meningitis, abscess, SDH

## ■ Chronic, non progressive

- Over 3 months, >15 HA days/month

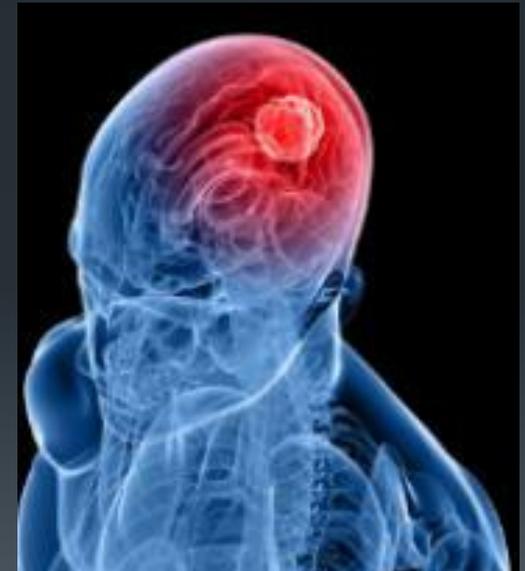
## ■ Mixed

- Usually Acute recurrent on top of chronic daily/ non progressive HA.



# Brain tumor Headache

- Incidence of brain tumors in children is 3 per 100,000 per yr
- *Chronic and progressive pattern*
- *AM or nocturnal onset/occurrence*
- *Pernicious vomiting*
- *Personality change*
- *Declining school performance*
- *Diplopia\**
- *Head tilt\**
- *Gait changes\**
  - *\*Focal neurological exam abnormalities*



# Characteristics of Secondary HA

- **Also known as “*red flags*”**
  - Any new/unexplained neurological exam abnormality
  - Constant, slowly increasing headache
  - Neurocutaneous syndrome
  - Age less than 3 years (+/-)
    - History is less complete, exam less reliable
  - +/- Sudden onset of headache
    - Acute “worst headache of life”
  - +/- Headache with exertion
  - +/- Headache on waking in morning or during night
  - +/- Posterior location
  - ++/- Presence of VP shunt



# Imaging

- From --AAN Guideline on Evaluation of Headache in Children and Adolescents:  
<http://www.neurology.org/content/59/4/490.full#ref-1>
- Data on 605 children out of 1275 who had:
  - Undergone neuroimaging
  - Been examined by a neurologist
- Found:
  - 14 (2.3%) with nervous system lesions that required surgical treatment.
    - **All 14 had definite abnormalities on exam**
    - **No patient with a normal exam had a lesion requiring surgical treatment**



# General approach to headaches in children and adolescents: History

- Location
  - Quality/character of pain
  - Onset
  - Severity
  - Timing/ Duration
  - Context
  - Associated symptoms
  - Modifying factors
  - Treatments
  - Impact
  - Perception (of why/what the problem is)
- ← *These are all basic things, but may not be known to the patient or family*
  - *Headache calendar or questionnaire can be VERY helpful*

# General approach to headaches in children and adolescents: History

- **Challenges can include:**
  - Vagueness and hyperbole:
    - *“Sometimes”*
    - *“All the time”* or *“constantly”*
    - *“A while”*
    - *“Now and then”*
    - *“I don’t know”*
    - *“Not really”*
    - *“Random”*
- Poor understanding of what often **triggers** headaches:
  - Stress
  - Dehydration
  - Missed meals
  - Poor sleep
  - Poor posture
  - Bright light/ heat
  - Caffeine dependence
  - Physical inactivity
  - Certain foods/ additives

# General approach to headaches in children and adolescents: History

- Other elements of history to gather:
  - Head injury/ concussion
  - Bruxism
  - Snoring
  - Stressors
  - Neck / Shoulder pain
  - FH of headache
  - Frequency of analgesic use, dosing



# General approach to headaches in children and adolescents: Exam

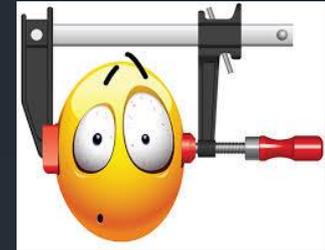
- OFC measurement, BP measurement
- Sinus tenderness
- TMJ clicks or pain
- Neck range of motion, shoulder muscle tenderness
- Mental status exam suggesting depression
- Optic disks
- Eye movements
- Pronator drift
- Ataxia
- Abnormal DTR's



# Diagnostic Criteria: Tension HA

- Episodic Tension Type Headache (TTH)
- A. At least 10 episodes occurring on more than 1, but fewer than 15, days per month for at least 3 months and fulfilling criteria B through D.
- B. Lasting 30 minutes to 7 days
- C. At least two of the following characteristics:
  - 1. Bilateral location
  - 2. Pressing or tightening, non-throbbing quality
  - 3. Mild or moderate intensity
  - 4. Not aggravated by routine physical activity, walking, stairs
- D. Both of the following:
  - No nausea or vomiting (though anorexia may occur)
  - Photophobia OR sonophobia (but not both)
- E. Not attributable to another structural or metabolic disorder.

# Tension Headache Pathophysiology



- TTH is common, though doesn't tend to inspire many researchers!
- Exact pathophysiology is not clear
- Prolonged nociceptive input from myofascial tissue, causing sensitization of central pain pathways
  - (Neurons get too sensitive, and pain is facilitated)

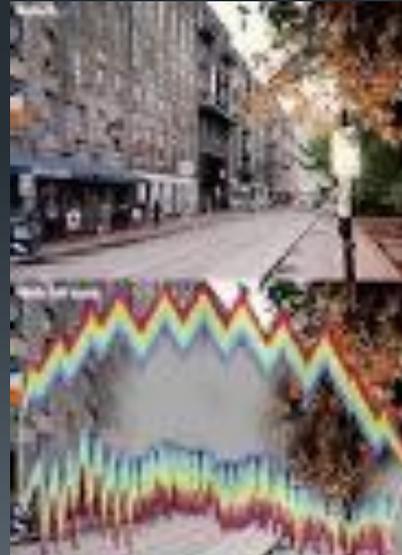
# Diagnostic Criteria: Migraine

## ■ Pediatric Migraine w/o Aura

- A. At least 5 attacks fulfilling criteria B through D.
- B. Headache lasts 1-72 hours
- C. Has at least 2 of the following:
  - Unilateral location OR bilateral frontotemporal (not occipital)
  - Pulsating quality
  - Moderate or severe pain
  - Aggravation by or causing avoidance of routine physical activity
- At least one of the following present during HA:
  - Nausea/Vomiting
  - Photophobia and sonophobia (may be inferred from behavior)
- D. Not attributed to another structural or metabolic disorder.

# Migraine aura

- Usually positive visual phenomena
- Can be negative (loss of vision)
- Can be paresthesia
- Can be weakness



# Complex Migraine & Variants

- **Migraine with other neurological signs or symptoms**
- Basilar
  - Symptoms of vertebrobasilar insufficiency
    - Vertigo
    - Ataxia
    - Diplopia
    - Dysarthria
- Hemiplegic/Hemisensory
  - CACNA1a
- Ophthalmoplegic / Retinal
  - Can involve loss of vision, must r/o ophthalmic causes
- Confusional
- *Cyclic Vomiting*
- *Benign Paroxysmal Vertigo*
- *Alice in Wonderland syndrome*
  - *Occur in children almost exclusively*



Lewis Carroll

# Migraine Pathophysiology

- This is also not *entirely* understood
- Pre-existing (interictal) state of neuronal hyper-excitability
  - Lower “threshold”
- Prodrome of symptoms such as fatigue, mental dullness, maybe food craving
- Cortical spreading depression (this is associated with aura)
  - 2-6 mm/min
- K<sup>+</sup> and Glutamate released, excitatory for trigeminal neurons
- Then, dural blood vessels are stimulated to release plasma proteins and pain-generating substances.
- The resultant state of sterile inflammation is accompanied by further vasodilation, producing pain.
- Cutaneous allodynia, some vascular motor changes
  - Mediated through trigeminal nerve, cervical nerves
- Pons/brainstem



# Chronic Tension Headache

- A disorder evolving from episodic tension-type headache, with daily or very frequent episodes of headache lasting minutes to days. The pain is typically bilateral, pressing or tightening in quality and of mild to moderate intensity, and it does not worsen with routine physical activity. There may be mild nausea, photophobia or phonophobia.
- Diagnostic criteria:
  - Headache occurring on  $\geq 15$  days per month on average for  $>3$  months ( $\geq 180$  days per year)<sup>1</sup> and fulfilling criteria B-D
  - B. Headache lasts hours or may be continuous
  - C. Headache has at least two of the following characteristics:
    - bilateral location
    - pressing/tightening (non-pulsating) quality
    - mild or moderate intensity
    - not aggravated by routine physical activity such as walking or climbing stairs
  - D. Both of the following:
    - no more than one of photophobia, sonophobia or mild nausea
    - neither moderate or severe nausea nor vomiting
  - Not attributed to another disorder

# Chronic Migraine

- Headache occurring on  $\geq 15$  days per month on average for  $>3$  months ( $\geq 180$  days per year)<sup>1</sup> and fulfilling criteria B-D
- Headache lasts hours or may be continuous
- At least 5 attacks<sup>1</sup> fulfilling criteria B-D
  - B. Headache attacks lasting 4-72 hours (untreated or unsuccessfully treated)
  - C. Headache has at least two of the following characteristics:
    - unilateral location
    - pulsating quality
    - moderate or severe pain intensity
    - aggravation by or causing avoidance of routine physical activity (eg, walking or climbing stairs)
  - D. During headache at least one of the following:
    - nausea and/or vomiting
    - photophobia and sonophobia
- Not attributed to another disorder

# Cluster Headache

## Trigeminal Autonomic Cephalalgia

- Not common in children, but good to know about:
- Attacks of severe, strictly unilateral pain which is orbital, supraorbital, temporal or in any combination of these sites, lasting 15-180 minutes and occurring from once every other day to 8 times a day. The attacks are associated with one or more of the following, all of which are ipsilateral: conjunctival injection, lacrimation, nasal congestion, rhinorrhoea, forehead and facial sweating, miosis, ptosis, eyelid edema. Most patients are restless or agitated during an attack.
- Diagnostic criteria:
- At least 5 attacks fulfilling criteria B-D
  - B. Severe or very severe unilateral orbital, supraorbital and/or temporal pain lasting 15-180 minutes if untreated
  - C. Headache is accompanied by at least one of the following:
    - ipsilateral conjunctival injection and/or lacrimation
    - ipsilateral nasal congestion and/or rhinorrhea
    - ipsilateral eyelid edema
    - ipsilateral forehead and facial sweating
    - ipsilateral miosis and/or ptosis
    - a sense of restlessness or agitation
  - D. Attacks have a frequency from one every other day to 8 per day
- Not attributed to another disorder

# New Daily Persistent Headache

(NDPH)

- **Previously used terms:**

Chronic headache with acute onset; de novo chronic headache.

- **Description:**

Persistent headache, daily from its onset which is clearly remembered. The pain lacks characteristic features, and may be migraine-like or tension-type-like, or have elements of both.

- *New daily persistent headache (NDPH) is unique in that headache is daily from onset, and very soon unremitting, typically occurring in individuals without a prior headache history. Patients with this disorder invariably recall and can accurately describe such an onset; if they cannot do so, another diagnosis should be made.*

- **Diagnostic criteria:**

A. Persistent headache fulfilling criteria B and C

B. Distinct and clearly-remembered onset, with pain becoming continuous and unremitting within 24 hr

C. Present for >3 months

- Not better accounted for by another ICHD-3 diagnosis.

# The Headache Pathway



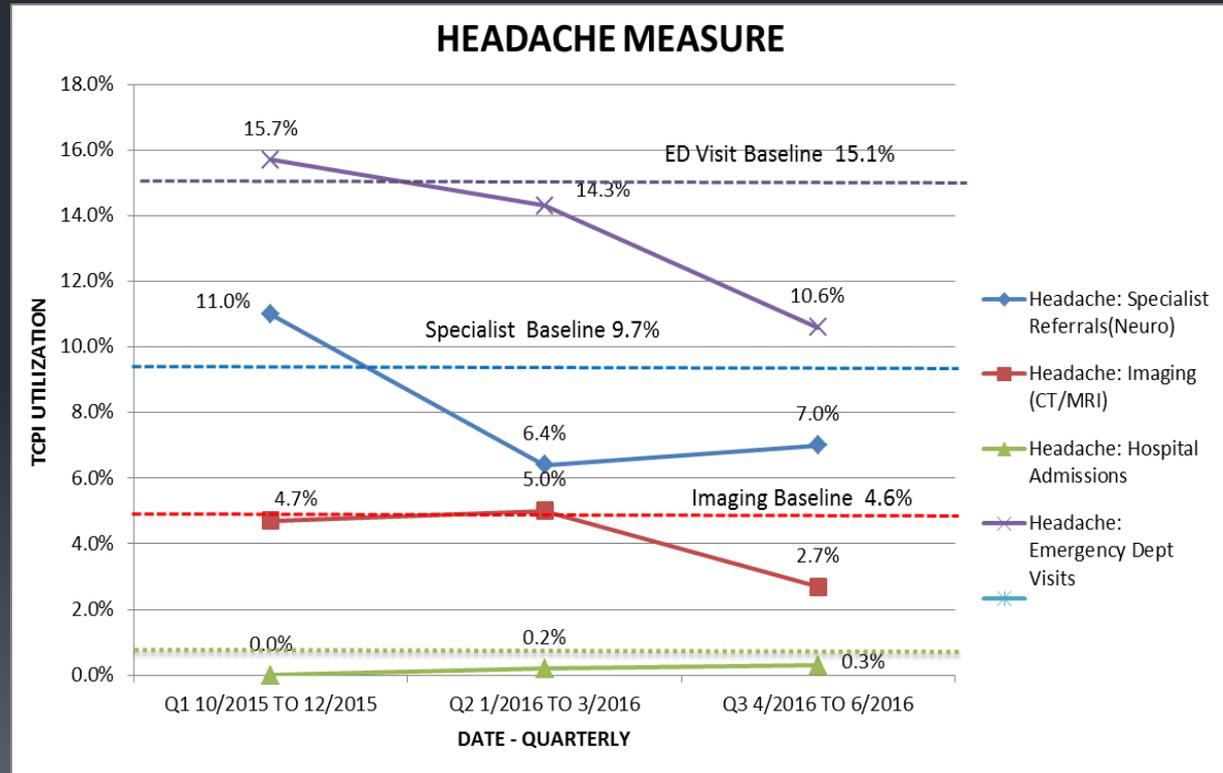
- Developed with considerable help from Dr. Whitney Edwards, and in conjunction with a number of insightful pediatricians in the Children's Primary Medical Group
- Intended to help identify secondary headaches
  - What needs imaging, additional testing, referral
- Intended to give physicians a detailed, step-wise algorithm or structured approach to children with headaches
  - Including correct diagnoses, treatment
- Intended to improve the pre-referral care, referral pattern, and overall healthcare utilization (Specialist, ED, Admission)

# Utilization Management – Care at the Right Time and Right Place

In a project to improve access to Neurology, CPMG partnered with the RCSSD Division of Neurology to implement a multi-pronged approach that included:

- Analyzing Neurology referral patterns;
- Developing a comprehensive algorithm for the primary care evaluation and management of headaches;
- Providing education, including a 6-hour free CME event taught by Neurologists for community-based PCPs, and a Fireside Chat on Headaches;
- Instituting an authorization requirement for non-emergent imaging for headache; and
- Mandating a neurology headache form PCPs must complete for review by the Division prior to appointments being scheduled.

The project also sought to provide care at the most appropriate, timely setting for patients. For example, with the support of the Neurologists, PCPs can implement key steps to manage headaches in accordance with an evidence-based Clinical Guideline that Neurologists utilize. As a result, the 3<sup>rd</sup> next available appointment for Neurology was reduced from 68 days in 2015 to 24 days in 2016.



# Headache Algorithm

**Consider Imaging**

- Historical information
  - Presence of a VP shunt
  - Diagnosis of neurofibromatosis or tuberous sclerosis
  - Immunosuppressed child
- Indications for Imaging**
  - Atypical presentation
    - Dizziness
    - Double vision
    - Vertigo
    - Lack of coordination
    - Confusion
  - Abnormal neurological exam finding, such as, but not limited to:
    - Abnormal eye movements and/or nystagmus
    - Motor or gait dysfunction or hemiplegia
    - Unilateral ptosis or complete 3<sup>rd</sup> nerve palsy
  - Concern for increased intracranial pressure
    - Papilledema
  - Awakening from sleep with headache or vomiting
  - Chronic progressive or persistently posterior headaches

**\*\*\*Imaging is NOT indicated for simple migraines.\*\*\***

**Abnormal Neurologic exam?**  
**Abnormal findings:**

- Abnormal eye movements and/or nystagmus
- Motor or gait dysfunction/hemiplegia
- Unilateral ptosis or complete 3<sup>rd</sup> nerve palsy

• Urgent MRI with and without contrast (requires prior auth)  
 • Urgent Neuro referral (requires Urgent Neurology form)

**Headache Hygiene**

- Regular bedtime & awakening time
- Regular daily exercise
- Low Tyramine Diet (see attached)**
- Good hydration
- Magnesium supplements, \*200mg daily (9-13 yo), 400mg daily (≥14 yo)
- Riboflavin 200-400mg QD (may take up to 3 mos for full effect)

Other indications for imaging? (See Indications for Imaging)

MRI with and without contrast (requires prior auth)

Screen adolescents for anxiety and depression with validated tools such as PHQ-9 & GAD-7

Using prescription or OTC analgesics 3 to 4 or more days per week?

On history, is there one or more of the following?

- Both Photophobia and Sonophobia
- Nausea/vomiting
- Pallor/dizziness

Probable Migraines

Probable analgesic overuse

Probable tension headaches

• Enforce or reinforce Headache Hygiene  
 • Abortive therapy at onset of headache:

- <10yo:
  - Ibuprofen 10mg/kg (max 800) with or without metoclopramide 5mg or Zofran 4mg
  - Maxalt 5mg x T, age 6 and up (Maxalt – MTL 5mg is an orally disintegrating tab)
  - Acetaminophen
- ≥10yo:
  - Ibuprofen 10mg/kg (max 800) with or without metoclopramide 10mg or Zofran 8mg
  - Acetaminophen
  - Imitrex 25mg tablet, or 5-20mg nasal spray
  - Excedrin Tension
  - Naproxen sodium 10mg/kg
- Headache diary
- F/u 4wks

**Stop analgesics**

- Prepare to feel worse x a couple of weeks
- Enforce or reinforce Headache Hygiene
- Non-Medical Interventions
- Headache diary
- Follow up 4wks

• Enforce or reinforce Headache Hygiene  
 • Non-Medical Interventions  
 • Stress management & relaxation training  
 • Daily exercise  
 • Headache diary  
 • Follow up 4wks

**Routine care**

Persisting?

**OTC analgesics**

- Ibuprofen
- Acetaminophen
- Naproxen sodium
- Up to 2 days per week

**Non-Medical Interventions**

- Ice pack
- Warm bath
- Nap in a cool, dark room
- Neck & back massage
- Take a walk

• If no improvement after 3-4wks, amitriptyline\*\* 10mg QHS, then  
 • If no improvement after 2-3wks, increase to 20mg QHS then to a max 50mg QD in children and 100mg QD in adolescents  
 OR  
 • 5-7yo: Periactin 2mg QD/BID  
 • 8-9yo: Periactin 4mg QD/BID  
 • Headache diary  
 • F/u: 4wks

More frequent than 4x/month?

Continue therapy

• 5-7yo: Periactin 2mg QD/BID  
 • 8-9yo: Periactin 4mg QD/BID  
 • If no improvement after 3-4wks, amitriptyline 10mg QHS  
 • If no improvement after 2-3wks, increase to 20mg QHS then to a max 50mg QD in children and 100mg QD in adolescents  
 • ≥10yo:  
 • Topiramate 25-100mg QD or BID  
 • If still no improvement after 3-4wks, change to Periactin  
 • Headache diary  
 • F/u 4wks

Improved?

• Non-Medical Interventions  
 • If on Periactin, change to amitriptyline as above  
 • If on Topiramate, increase dose or change to Periactin as above  
 • F/u 4 wks

Improved?

- Continue therapy
- Attempt to wean after 3 mos.

If child has failed the max doses & full courses of appropriate prophylaxis as above, refer to Neurology

• Continue therapy  
 • Attempt to wean after 3 mos if improved to 4 or fewer HA per month

Improved?

\* May cause diarrhea at high doses.  
 \*\* Amitriptyline is contraindicated in prolonged QT syndrome.



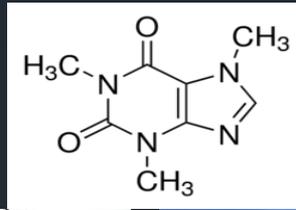
# Headache Management

- 1. Headache Hygiene
- 2. Abortive treatment
- 3. Preventative treatment



# Headache Management

- 1. Headache Hygiene
  - Physician educates, patient/family do
- 2. Abortive treatment
  - Mainly medications
- 3. Preventative treatment
  - Rx, Non-Rx, complementary/alternative



# Headache Hygiene

- Sleep
- Meals
- Caffeine
- Hydration
- Exercise
- Ergonomics/ Posture
- Stress
- Sunlight/ Heat
- Regular and adequate
- Don't skip
- Not late in day, rare is OK
- Number of bathroom visits?
- Regular, enjoyable
- Muscle strain → Headache
- Primary trigger for most
- Common trigger, sunglasses, shade

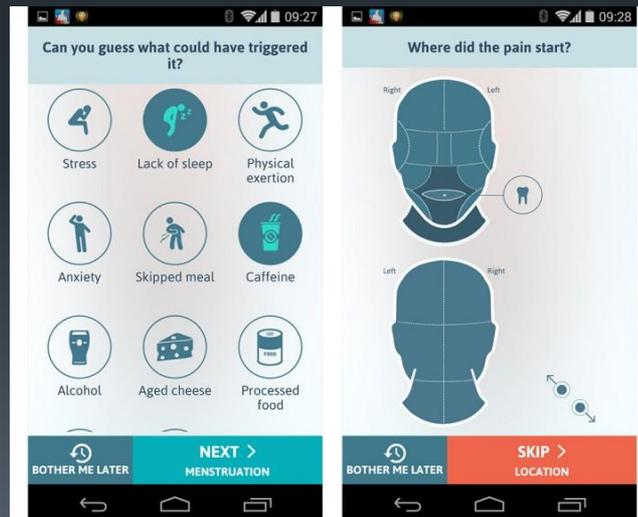
# Headache Hygiene:

## Trigger recognition/ avoidance

- Headache Calendars
  - Keep track of date, time of onset/ resolution, severity, other features, treatment used, context and suspected triggers
  - Help to define the issue for the patient and family, doctor too

- Smartphone Apps

- Migraine Buddy
- iHeadache
- Ecoheadache



# Headache Hygiene: Diet

- Dietary triggers (worth mentioning or asking about):

- Alcohol
- Caffeine
- Aged cheeses
- MSG
- Aspartame/ artificial sweeteners
- Nuts
- Chocolate
- Nitrites/nitrates
- Aromatic foods (bananas, strawberries)

- Consider trying the “low tyramine diet” →

- Tyramine – breakdown product of tyrosine, from foods that are fermented, aged, old
- <http://www.headaches.org/2007/10/25/low-tyramine-diet-for-migraine/>

- *If dietary trigger is suspected, best way to investigate or confirm is remove one at a time, keep a HA calendar*

**NATIONAL HEADACHE FOUNDATION**

**Low Tyramine Headache Diet**

Tyramine is produced in foods from the natural breakdown of the amino acid tyrosine. Tyramine is not added to foods. Tyramine levels increase in foods when they are aged, fermented, or stored for long periods of time, or are not fresh.

Food Group	Allowed	Use With Caution	Avoid
<b>Meat, Fish, Poultry, Eggs</b>	Freshly purchased and prepared meats, fish, and poultry  Eggs Tuna fish, firm salad (with allowed vegetables)	Beef or sausage for dogs, commercial sausage, ham, any luncheon meats with nitrites or nitrate added  Meats with benzoin or added casing	Aged, dried, fermented, salted, smoked, or pickled meats; Peppers, salami, and sausage  Non fresh meat or fish, pickled herring
<b>Dairy</b>	Milk, when 2% or skim  Cheese: American, cottage, feta, goat, cream cheese, ricotta, Swiss, or not processed	Yogurt, buttermilk, sour cream, 1% cup per day  "Parmesan" or Romano as a garnish only, or on pizza	Aged cheese, blue, brick, brie, cheddar, Swiss, Roquefort, salami, ricotta, parmesan, persimone, provolone, etc.
<b>Breads, Cereals, Pasta</b>	Commercially prepared yeast  Product prepared with baking powder, biscuits, pancakes, coffee cakes, etc.  All cooked and dry cereals  All pasta: spaghetti, tortellini, (allowed ingredients, macaroni, and egg noodles)	Homemade yeast leavened breads and/or cakes  Sourdough breads	Any with a mold or ingredient  Sourdough breads
<b>Vegetables</b>	Asparagus, artichoke, beets, carrots, spinach, pumpkin, tomatoes, squash, zucchini, broccoli, potatoes, onions cooked in food, Chinese and pickles, water beans, soy beans, soy rice or vegetable oil	Raw onion	Shy peas, Bush or Broad beans, lima beans, pinto and chickpeas  Fermented soy products like miso, soy sauce, and teriyaki sauce
<b>Fruits</b>	Apple, apricot, banana, cherry, guava, peaches, any rice or vegetable oil	Lime, lemon (1/4 cup per day from main group). Citrus orange, grapefruit, kiwifruit, pineapple, apricot  Avocado, banana, fig, raisin, chestnut, peach, pear, plum, and almond	
<b>Nuts and Seeds</b>			All nuts: pecans, peanut butter, sunflower seeds, sesame seeds, walnuts, pistachio

530 N. Oakton, Suite 217, Chicago, IL 60610-3142 Tel: Fax: (800) 523-5332 Fax: (312) 431-9341 www.headaches.org

# Headache Abortive Treatment

- Tension Headaches
  - Rest
  - Hydration
  - Ibuprofen (10 mg/kg)
  - Acetaminophen (15 mg/kg)
  - Naproxen (5-6 mg/kg)
  - Combination medicine
    - Excedrin



# Headache Abortive Treatment

## ■ Migraine

### ■ Ibuprofen (10 mg/kg)

- In 4-16 year-olds 68% effective vs 37% placebo



### ■ Acetaminophen (15 mg/kg)

- In 4-16 year-olds 54% effective vs 37% placebo

- Hamalainen ML, Hoppu K, Valkeila E, et al. Ibuprofen or acetaminophen for the acute treatment of migraine in children: a double-blind, randomized, placebo-controlled, crossover study. *Neurology*. 1997; 48: 102–107.

### ■ Sumatriptan (oral 25, 50, 100 mg / nasal spray)

- Efficacy range from 30-85% effective, 20 mg nasal spray showing most efficacy (4-16 yrs)

- Ueberall MA. Intranasal sumatriptan for the acute treatment of migraine in children. *Neurology*. 1999; 52: 1507–1510.
- Winner P, Rothner AD, Saper J, et al. A randomized, double-blind, placebo-controlled study of sumatriptan nasal spray in the treatment of acute migraine in adolescents. *Pediatrics*. 2000; 106: 989–997.

- <http://www.neurology.org/content/63/12/2215.full>

# Headache Abortive Treatment

## Migraine- other options

- Excedrin
  - Extra-Strength and Migraine are the same thing:
    - 250 mg ASA/ 250 mg APAP/ 65 mg caffeine
    - Tension headache- 0 ASA
- Anti-emetics
  - Reglan
  - Dramamine
  - Ondansetron – variable
- Prednisone burst
  - 40/30/20/10 over 4d
- Intravenous
  - *Included for completeness*
    - Toradol/Reglan/Benadryl
      - “Migraine cocktail”
    - IVF bolus
    - Bolus dose of Valproate
    - Prednisone
    - DHE

# Analgesic Overuse

- A significant issue for many patients
- “Rebound headache”
- May be one of the main factors leading to chronic headache
- The International Headache Society, American Migraine Society:
  - Simple analgesics (Ibuprofen, APAP) > 15d per month
  - Triptans > 10d per month
  - For 3m or more
- Effects of this may be seen earlier than 3 months
- Treatment consists to stopping the analgesic
  - Best done with a taper over about 1 week





# Preventative Treatments

- Less “druggy”
  - Riboflavin (Vit B2) 200 mg twice a day
  - Magnesium (various preps)
    - Titrate to GI side effects
  - Feverfew
  - Butterbur
  - Combination tablets (Migralief)
  - Melatonin
- Rx’s
  - Tricyclics
    - Amitriptyline/ Nortriptyline
  - Anticonvulsants
    - Topiramate, Valproate, GBP
  - Cyproheptadine
  - Course of NSAIDs
  - Beta blockers
  - Calcium channel blockers

# Preventative Treatments

## ▪ Tension Headache

### ▪ Amitriptyline

- Avoid in patients with long QT or cardiac conduction problems
- Dose of 5 to 25 mg initially, QHS
- May increase slowly to max of 100 mg per night
- Occasionally given in 2 divided doses
- AE: sleepiness, lightheadedness, dry mouth, mood changes

## ▪ Migraine

### ▪ Amitriptyline

### ▪ Topiramate

- 25-100 mg BID
- AE: reduced appetite, slowed cognition, glaucoma, paresthesias

### ▪ Cyproheptadine

- Liquid 2mg/5 mL, 4 mg tabs
- Dose 1-4 mg QHS or BID
- AE: increases appetite, tired

# What about the CHAMP study?

- Childhood and Adolescent Migraine Prevention
  - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3637406/>
  - Hershey et al. [Headache. 2013 May; 53\(5\): 799–816.](#)
- NIH-funded, multicenter, double blind, placebo controlled
- Children 8-17 years
- Episodic or Chronic migraine, with or w/o aura
- Average headache frequency was 11.4 +/- 6 days per month
- Dose of Amitriptyline 1 mg/kg per day, Topiramate 2 mg/kg/d
  - Higher than we often use in clinical practice (esp Amitriptyline)
- Efficacy = relative reduction of 50% or more in # HA days/m
  - Amitriptyline: 52%
  - Topiramate: 55%
  - **Placebo: 61%**
    - Significantly more side effects in Rx vs placebo

# Our reaction to CHAMP?

- A bit embarrassed, maybe
- But, we still try prescription medications
  - They will work for some kids
  - Side effects can be therapeutic (Elavil – sleep)
- About a 50% chance that something will help
- Move more quickly to something else
  - PT, massage, psychology, other Rx
- Spend more time focusing on headache hygiene and triggers
- Emphasizing psychological aspects of treatment
  - Positive attitude





# Suggestions for PCP seeing kids with headaches

- You are busy
- Many kids on the schedule
- Many topics to cover
- Headaches may come up as a “by the way” type of complaint, or a primary concern.
- Basic set of screening questions/ history
- Basic exam items
- Basic counseling items
- Follow-up



# Limited Time?

Basic Screening – Looking for “red flags”

- Get a sense of HA type:
  - Location
  - Intensity
  - Associated symptoms
- Get a sense of time course:
  - Onset
  - Frequency
  - Duration
  - Inciting factor/ event?
- Exam:
  - BP
  - Extra-ocular movements
  - Fundoscopic exam
  - Deltoid, triceps, hip flexor, dorsiflexors
  - Finger-to-object, to nose
  - Reflexes
  - Gait, including tandem

# Limited Time?

## Basic Counseling and “Homework”



- Headache Calendar
  - Ask to include:
    - Start/Stop time
    - Severity
    - Location
    - Other symptoms
    - Treatment
    - Suspected trigger?
  - Headache Hygiene
    - EPIC dot phrase or handout
  - Appropriate abortive meds, dose, frequency of use
- Schedule follow-up visit dedicated to headaches in 2-6 weeks
  - Bring headache calendar
  - Bring medications
  - Go over what has been learned about triggers, alleviating/exacerbating factors, medications
  - Consult headache pathway (if needed)



# Other Observations for Headache Care

- It may be helpful to ‘walk through’ the headache pathway with patients or parents
- The re-visit AFTER they’ve done the “homework” to understand their headache burden is often MUCH easier
- Good documentation is important (as always)
  - HPI, ROS, Physical Exam
    - For your own follow up
    - For referral



# When is it definitely time to refer?

- For headaches that are more likely secondary headaches
  - Due to a potentially ominous cause
    - Headaches with papilledema require urgent imaging
    - Headaches with new focal signs, no prior history of complex migraine may require emergent evaluation (in ED)
- For refractory headaches, not improving with treatment
  - See bottom of headache pathway
- For “other” headache types, not consistent with migraine or tension headaches
  - TAC
  - New Daily Persistent Headache (NDPH)
- When neurological exam is unclear or questionable

# Summary:

- Headaches are common
- Migraines are also common
- Most headaches can be divided into primary or secondary based upon:
  - Time course/ history
  - Exam
- Diagnostic criteria are helpful
- History can be challenging, but details are important
  - Both in diagnosis and in follow-up





# Summary:

- Treatment options are fairly numerous, even if not all are shown to be robustly effective
  - A large part of treatment may be psychological
- Some or much of treatment is non-Rx
- Treatment may include a reduction in analgesic use
- Reassurance about diagnosis of primary headache is useful

# Summary:

- Finally, a BIG part of good headache management is helping the patient and family understand their headaches, triggers, and alleviating factors to:
  - Empower the patient and family
  - Help to outline and reinforce a plan of action
  - Create a positive outlook



# Thank You!



# UC San Diego