# Pediatric Headaches

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## Disclosure

- I have no relevant financial relationships with the manufacturers(s) of any commercial products(s) and/or provider of commercial services discussed in this CME activity
- I do not intend to discuss an unapproved/investigative use of a commercial product/device in my presentation.

## Program Objectives

- Identify and triage red flags for pediatric headaches
- Select appropriate imaging modalities and other neurodiagnostic studies when indicated
- Begin first-line prophylactic and abortive therapies

## Why is this important?

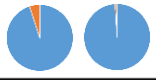
- Headaches represent a major neurological disability
- Child neurology remains an underserved subspecialty
- Some secondary headaches are neurological emergencies
- Evidence-based clinical practice guidelines are available

## Primary vs. Secondary Headaches

- Primary: no particular underlying cause
  - Migraines, tension-type, trigeminal autonomic cephalgias
- Secondary: clear underlying reason
  - Concussion, pseudotumor cerebrii, infection, epilepsy, medications, seasonal allergies, vision problems, bruxism/snoring, aneurysms, Chiari, substances, hypertension

## Epidemiology

- Headaches at some point:
  - 50% of 7 year olds, 80% of 15 year olds
- Primary headache disorders
  - 5% of 5 year olds, 10% of 10 year olds, 15% of 15 year olds and adults
- <5% of all headaches are due to a serious underlying etiology
- <1% of brain tumors present with headache ALONE
  - The majority will have 5+ abnormalities on neurological examination



Victor et al Cephalalgia 2010

## History and Physical

- HPI: location, onset, duration, frequency, intensity, character, associated symptoms, alleviating/aggravating factors, timing, position
  - Photo-/phonophobia, nausea, vomiting, visual changes, paresthesias, weakness
- Review of systems
- Past medical history
- Family history
- Social history
- Headache hygiene

## History and Physical

- General, HEENT, abdomen, skin, psychiatric
- Neurological examination:
  - Mental status
  - Cranial nerves including fundoscopic examination
  - Motor
  - Sensory
  - Reflexes
  - Coordination
  - Gait

## History and Physical Red Flags

- HPI:
  - Thunderclap, sudden change in previous pattern, positional quality, any subjective neurological symptoms, awakening out of sleep, early morning emesis
  - <6 years of age + neurological symptoms and/or occipital location
  - <3 years of age
- ROS: systemic signs, seizures, apnea
- PMH: epilepsy, sickle cell disease, closed head injury, malignancy
- FH: aneurysms, epilepsy
- SH: nonaccidental trauma

## History and Physical Red Flags

- Altered mental status
- New articulation error or other aphasia
- Anisocoria, eso/exotropia, diplopia, visual field deficit, papilledema, ptosis, nystagmus
- Facial droop, loss of hearing or tinnitus, vertigo, asymmetric palatal rise, uvula deviation, tongue deviation
- Weakness, pronator drift, dermatomal paresthesia, hyperreflexia, dysmetria, ataxia
- Falls

## Neuroimaging

- Not needed if stable pattern for 6 months
  - If normal neurodevelopmental history and examination
- Counseling families
- Who, what, where, when, how?
- MRI > CT
- Incidentalomas: 10%
  - Cerebellar ectopia, arachnoid cysts, pineal cysts, paranasal sinus disease, white matter lesions, developmental venous anomalies, Virchow Robin spaces

Bashir et al Neurology 2013

## Primary Headache Disorders

- Migraine
  - with or without aura, with or without status migrainosus, variants
  - Chronic vs. episodic
  - Intractability
- Tension-type
- Trigeminal autonomic cephalgias
  - Examples: cluster, SUNA/SUNCT, hemicranias continua, paroxysmal hemicrania
- Others
  - Ex: cough, coital, exercise-induced, nummular, hypnic, cold-stimulus, etc.

## Pathophysiology

- Cortical spreading depression theory
- Electrical changes
- Chemical disturbances
- Vascular tone changes
- Histaminergic response

## Migraines

- Most common
- Moderate-severe pain
- Unilateral or bilateral
- Throbbing, pounding, pulsating
- Aggravated by physical exertion
- Last for hours
- Associated photo- and phonophobia, nausea and vomiting
- With (15%) or without (85%) aura

## Tension-type

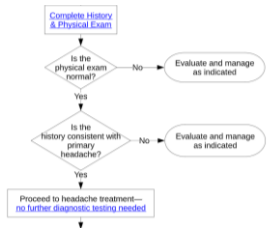
- Mild-moderate pain
- Bilateral
- Non-throbbing (squeezing, pressure, pushing)
- Not necessarily worse with physical exertion ?better
- Variable duration, generally shorter
- Associated photo- or phonophobia, nausea or vomiting

## Abortive Medications

- 60% of children are never prescribed a medication
- 1/5 are given a narcotic
- Take at symptom onset, no more than 2-3 times per week
- NSAIDs
- Antiemetics
- Triptans
- Steroids
- Antiepileptic drugs
- Nerve blocks: supraorbital, temporoauricular, greater occipital

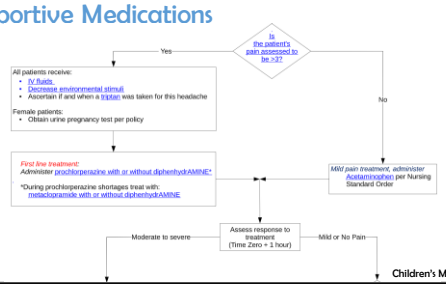
Gould et al AAN 2013

## Abortive Medications



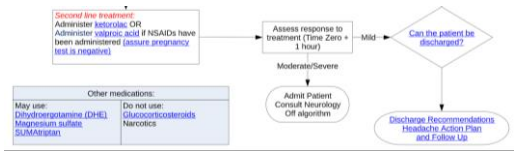

Children's Mercy 2016

## Abortive Medications




Children's Mercy 2016

## Abortive Medications




Children's Mercy 2016

## Preventative Medications

- >4 headache days per month
- Not responding to abortives
- Accompanying neurological symptoms
- Marked occupational impairment
- Goal: decrease severity and intensity
  - <10% achieve complete headache-freedom

## Preventative Medications

- Magnesium
- Riboflavin (vitamin B2)
- Topiramate, valproic acid
- Amitriptyline, nortriptyline, SSRIs
- Beta blockers
- Cyproheptadine
- Indomethacin
- Tizanidine
- Others: botulinum toxin injections, CGRP-antagonists

Powers et al NEJM 2017

## Preventative Medications

| Level | Recommendation |
|---|---|
| Level B | Clinicians should inform patients and caregivers that in clinical trials of preventive treatments for pediatric migraine placebo was effective and the majority of preventive medications were not superior to placebo. |
| Level B | Acknowledging the limitations of currently available evidence, clinicians should engage in shared decision making regarding the use of short-term treatment trials (a minimum of 2 months) for those who could benefit from preventive treatment. |
| Level B | Clinicians should discuss the evidence for amitriptyline combined with CBT for migraine prevention, inform them of the potential side effects of amitriptyline including risk of suicide, and work with families to identify providers who can offer this type of treatment.[1] |
| Level B | Clinicians should discuss the evidence for topiramate for migraine prevention in children and adolescents and its side effects in this population. |
| Level B | Clinicians should discuss the evidence for propranolol for migraine prevention and its side effects in children and adolescents. |

Oskoui et al Neurology 2019

## Non-pharmacological Treatments

- Transcutaneous electrical stimulation
- Acupuncture, acupressure
- Neurobiofeedback
- Massage
- Physical therapy
- Aromatherapy
- Cognitive behavioral therapy

## When to Refer

- Any red flags
- Not responding to interventions
- Phone consultation
- Telemedicine services
- Outreach clinics

Questions?

Thank You!