Pediatric Headache Management

First Steps to Success

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Duke Pediatric CME-Hilton Head, SC
July 17, 2018

Disclosures

- Speaker's Bureau for Amgen

- We will be discussing medication usage that is considered off- label

Objectives

- After listening to this presentation, participants should be able to:
  - Select appropriate “First Steps” in the assessment and differential of headache complaints
  - Initiate “First Steps” in management plan
  - Educate parents on “First Steps” of ED treatment
  - Identify “First Steps” in collaboration with school and community

Challenges in Providing Headache Care

- Challenges:
  - PCP Visit duration (time);
  - Long wait times for neurology appts (access)
  - ? diagnosis of primary HA disorders
  - ? initial HA treatment

- Current Approaches:
  - **Evidence-Based guidelines** & diagnostic criteria
  - **Use of Algorithm/pathway** to standardize HA diagnosis and treatment
    - Correct diagnosis
    - Appropriate imaging and labs
    - Home/School management

ICHD-3 Diagnostic Criteria
Primary & Secondary Headache

First Migraine Difficult to Diagnose!

PRIMARY

- Migraine Migraine with/wo aura
- Tension-type
- Chronic Daily HA & NDPH

SECONDARY

- Attributable to another cause

The International Classification of Headache Disorders, 3-beta. *Cephalalgia*. 2013; 33(9):629-808.

Less Common Primary Headaches:

Vestibular Migraine

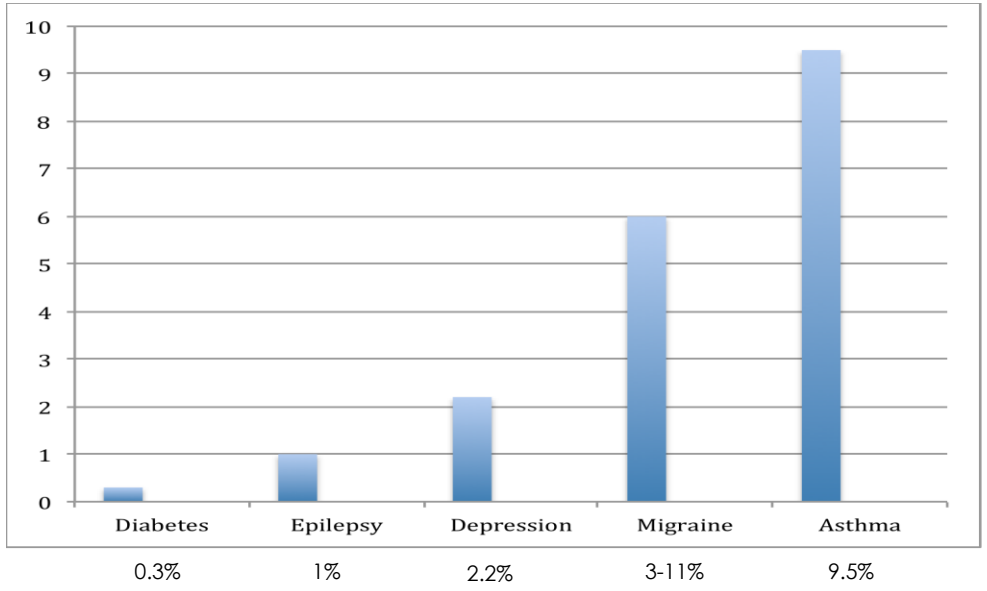
- **Vestibular migraine**
  - Patients with history of migraine headaches
  - Episodes of vertigo +/- typical migraine symptoms
  - Duration of seconds to minutes
  - Nystagmus typically present during episode
  - MRI and MRA; audiometry if hearing loss, aural fullness, or tinnitus

Retinal Migraine

- **Retinal migraine**
  - Sudden loss of vision or perception of bright light or scintillations in one eye
  - Gradual spread lasting 5-60 minutes
  - Typically precedes ipsilateral periorbital headache
  - Ophthalmology and MRI

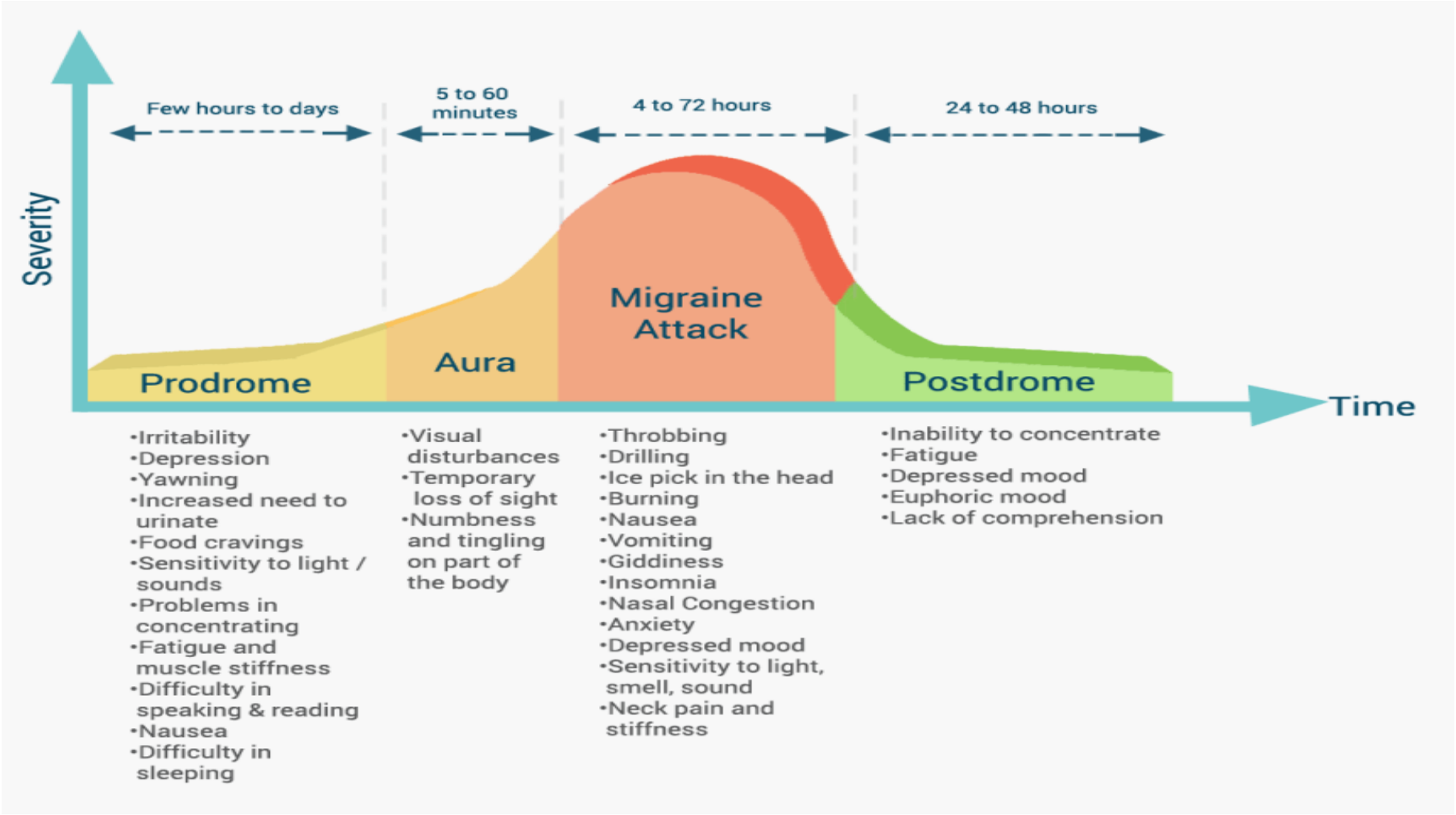
Childhood Migraine Headache

- 3-11% school-aged children 5-12y
- Chronic health problem resulting in disability
  - 8% of children with CMH miss at +6 days/year



CDC, 2013; 2011 National Health Interview Survey Data; Epilepsy Foundation, 2012; Childhealthdata.org, 2011, 2016

Migraine Headache- The BIG Picture



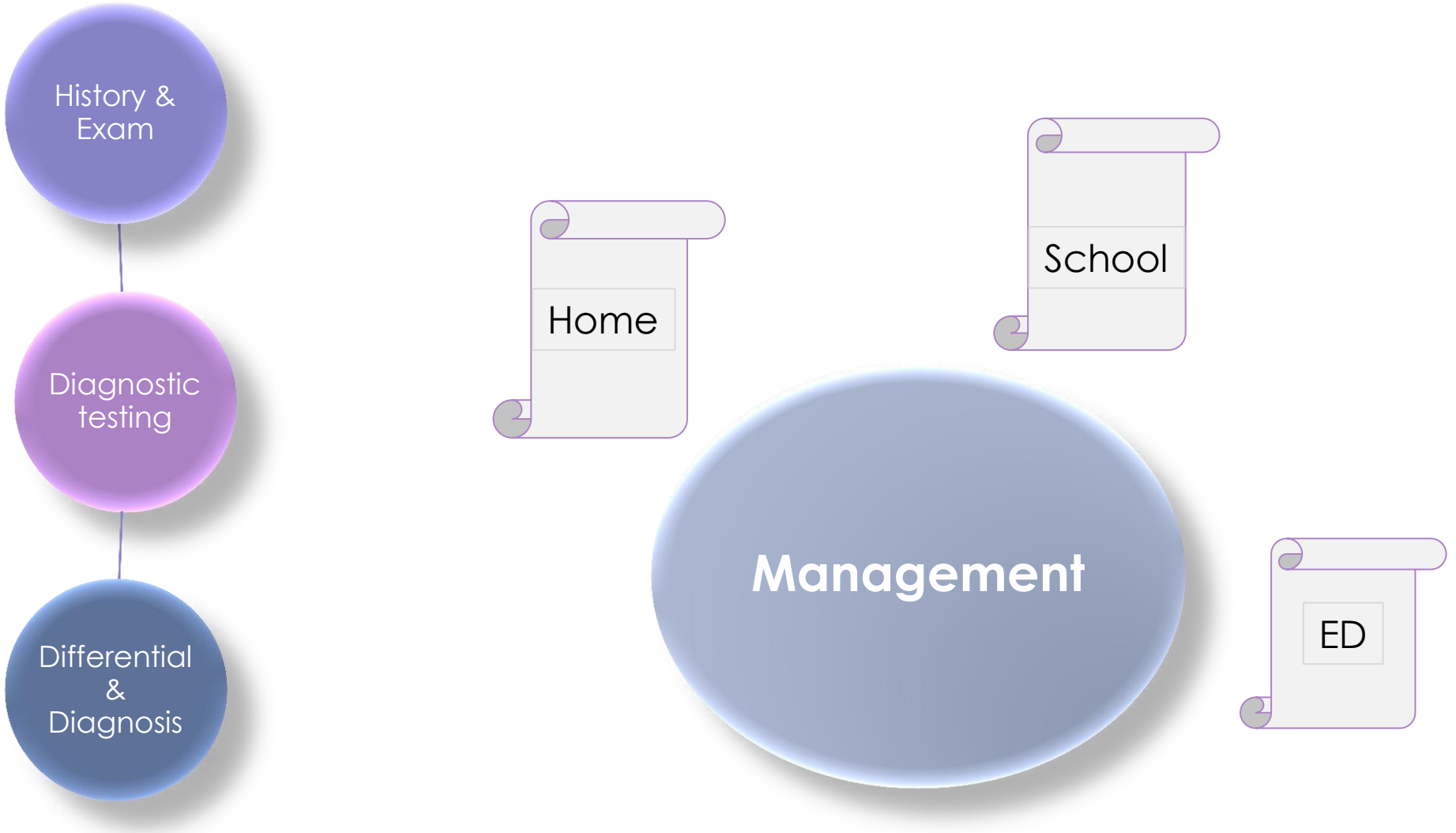
Pediatric Migraine Variants

- Cyclic vomiting
- Abdominal migraine
- Benign paroxysmal vertigo of childhood
- Benign torticollis
- Confusional migraine

The International Classification of Headache Disorders, 3-beta. *Cephalalgia*. 2013; 33(9):629-808.

Case #1-

First Steps in Kid's Headache Care



First Steps in Assessment

Pre-visit Information:

Headache disability

Headache Tracking

Lifestyle History

PedMIDAS

Headache Disability.

The following questions try to assess how much the headaches are affecting day-to-day activity. Your answers should be based on the last three months. There are no "right" or "wrong" answers so please put down your best guess.

1. **How many full school days of school were missed in the last 3 months due to headaches?** _____

2. **How many partial days of school were missed in the last 3 months due to headaches (do not include full days counted in the first question)?** _____

3. **How many days in the last 3 months did you function at less than half your ability in school because of a headache (do not include days counted in the first two questions)?** _____

4. **How many days were you not able to do things at home (i.e., chores, homework, etc.) due to a headache?** _____

5. **How many days did you not participate in other activities due to headaches (i.e., play, go out, sports, etc.)?** _____

6. **How many days did you participate in these activities, but functioned at less than half your ability (do not include days counted in the 5th question)?** _____

Total PedMIDAS Score _____

Headache Frequency _____

Headache Severity _____

Cincinnati Children's

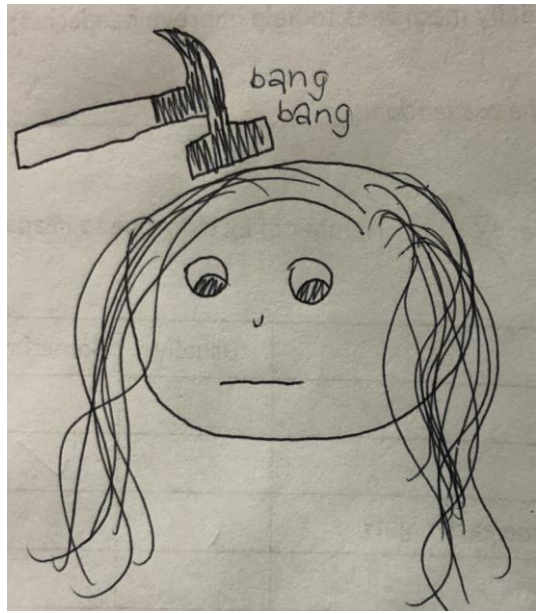
PedMIDAS Score Range	Disability Grade
0 to 10	Little to none
11 to 30	Mild
31 to 50	Moderate
Greater than 50	Severe

iHeadache

Headache History

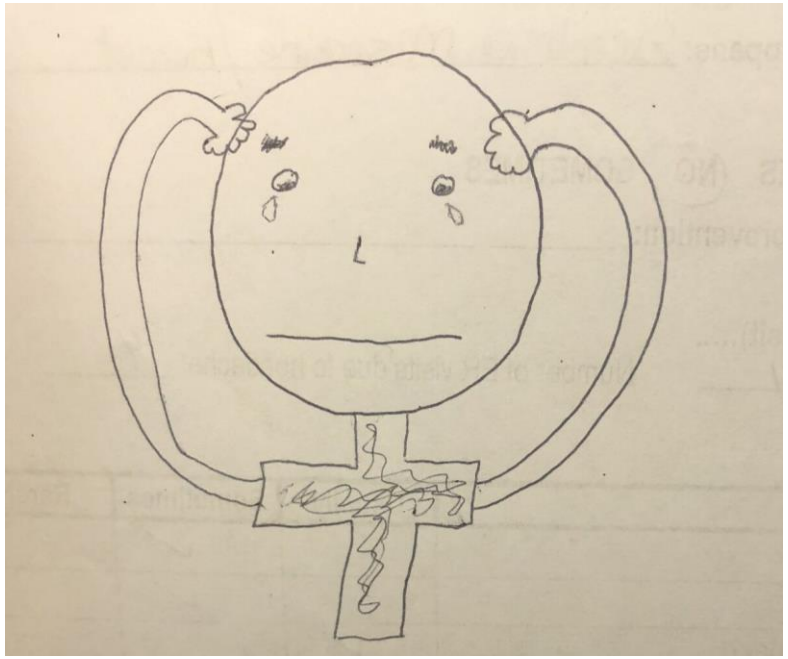
- Onset/ Chronicity
- Timing
- Quality
- Location
- Duration
- Triggers
- Associated Symptoms
- Aggravating Factors
- Alleviating Factors
- Medication History
- Psychosocial Factors
- PMH/FMH

Red Flags: History



- Worst headache of their life
- First-morning or positional headaches, especially with vomiting
- During sleep, especially with vomiting
- Occipital location
- Atypical or change in pattern (without obvious stressors)
- Accelerating course (increasing frequency or severity)
- Recurrent severe headaches refractory to treatment
- Worse with exertion, especially in post-pubertal children

Red Flags: History



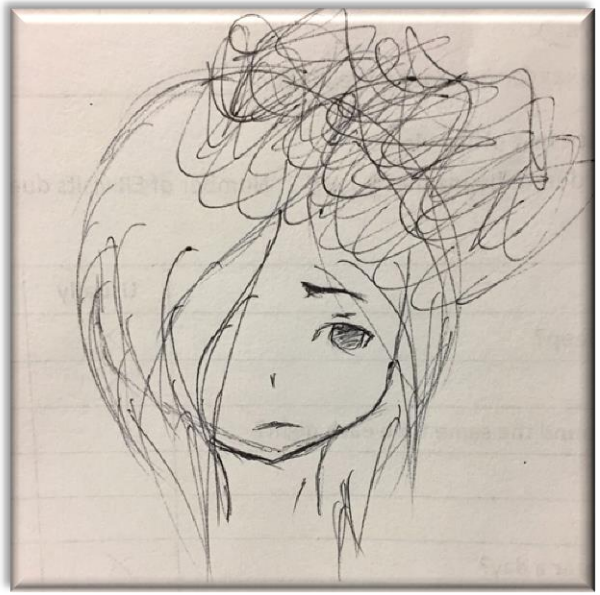
- Associated neurological deficits (hemiparesis, ophthalmoparesis, seizures)
- Confusion/altered consciousness
- Sudden, complete loss of vision
- Diplopia
- Focal weakness
- New onset seizures
- Personality changes
- Abrupt decline in school performance
- Paresthesias/tingling

Sorting out Co-Morbidities

- **Idiopathic intracranial Hypertension**
  - Medications: doxycycline, growth hormone, OCP, steroids
- **(ENT)Chronic sinusitis**
- **(ENT) OSA**
  - Snoring, nighttime waking
  - Obesity
  - First-morning HA that improves throughout the day

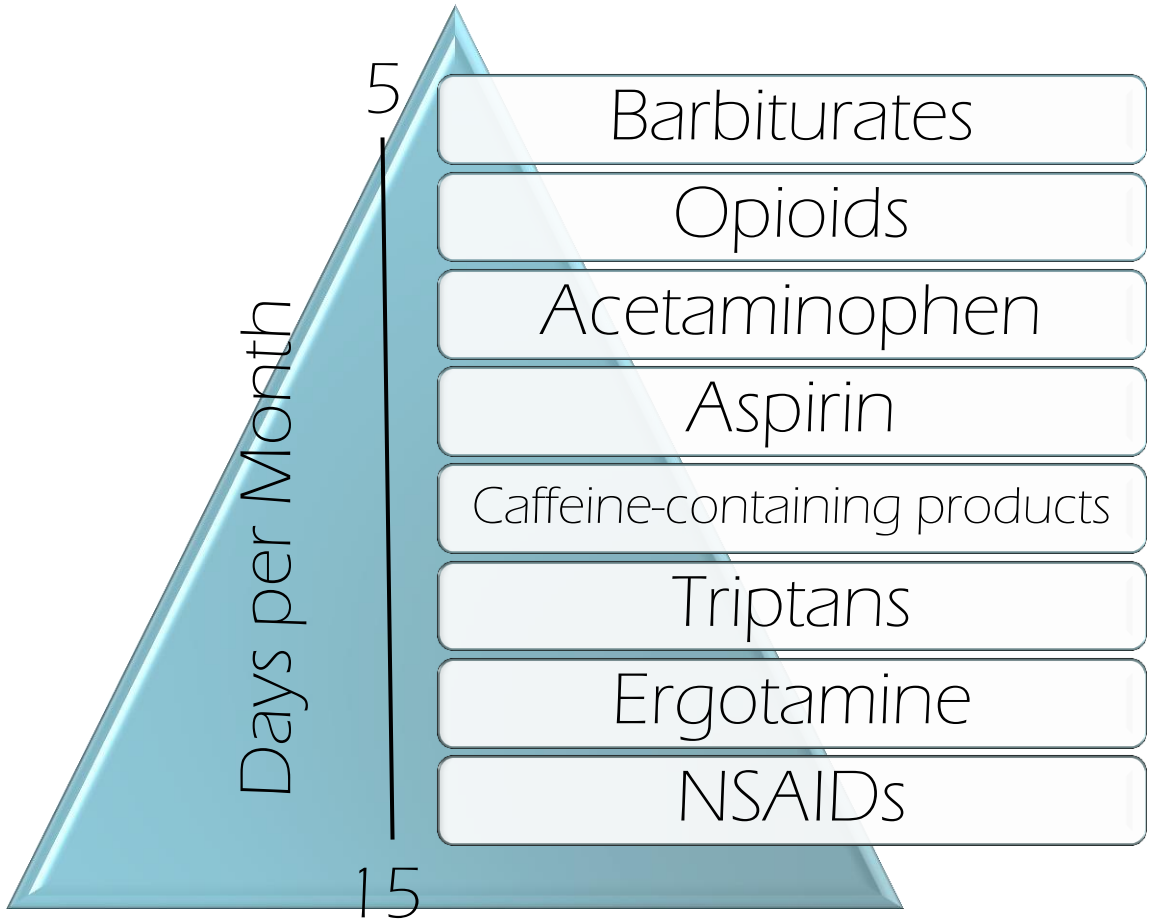
Sorting out Co-Morbidities

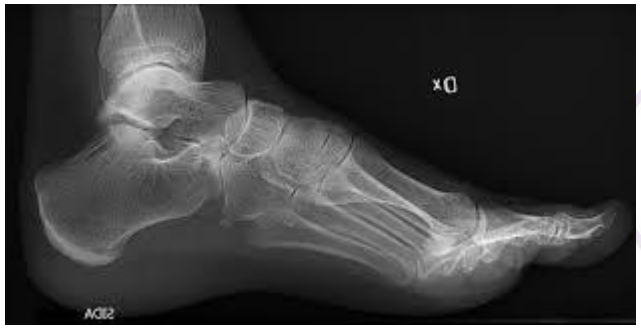
- **Depression and anxiety**
  - Use screening tools for psychiatric comorbidities (PSC, PHQ, GAD-7)
- **Autonomic dysfunction (POTS, EDS)**
  - Orthostatic VS
- **Nutritional deficiencies**
  - Ferritin, vitamin D
- **Dental**
  - Bruxism
  - TMD



Medication Overuse Headache

- Dull, lingering low-grade daily or near daily headache
- When rescue medication becomes part of the problem instead of the solution
  - Triptans ≤10 days/month
  - NSAIDs ≤ 15 days/month





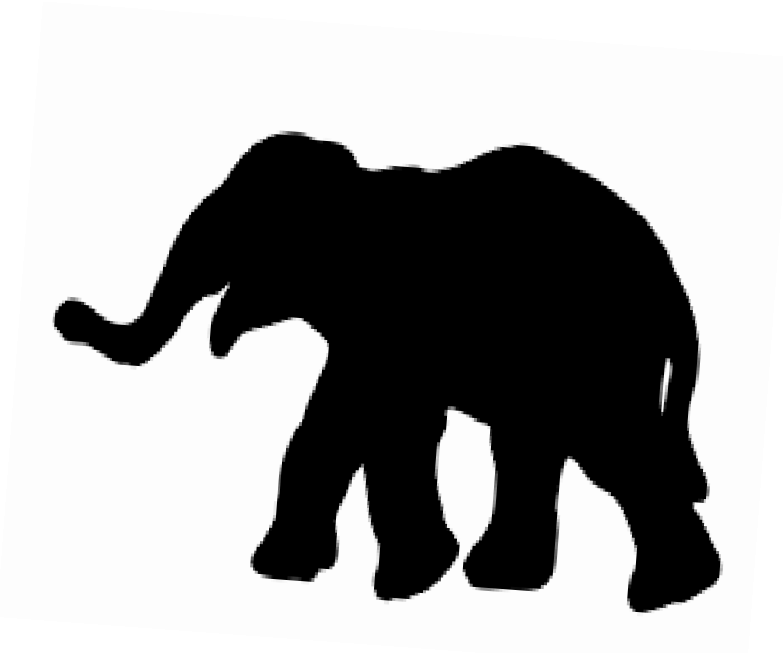
First Steps in Diagnostics

American Academy of Neurology Practice Guidelines

- **Practice parameter: Evaluation of children and adolescents with recurrent headaches**

- **Report of the Quality Standards Subcommittee of the American Academy of Neurology and the Practice Committee of the Child Neurology Society**
- D.W. Lewis, MD; S. Ashwal, MD; G. Dahl, BS; D. Dorbad, MD; D. Hirtz, MD; A. Prensky, MD; and I. Jarjour, MD

To Image or Not to Image? That is the Question



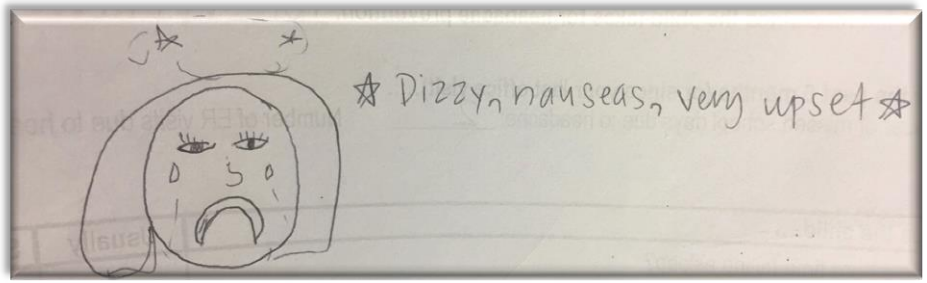
Hayes, Palais, Bartel, Booth, Iyer, et al, ACR Appropriateness Criteria Headache-Child, Journal of the American College of Radiology, 2018)

Case #2-

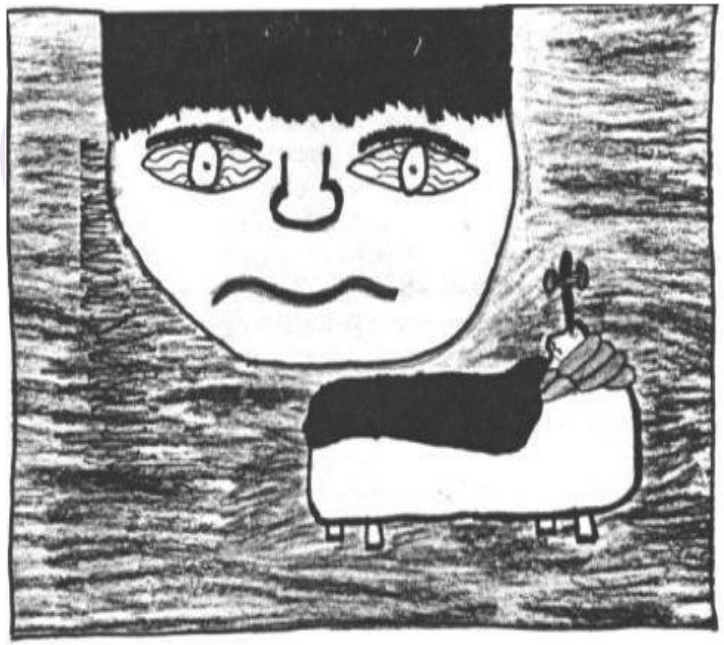
First Steps in Management

First Steps:Rescue Treatment

- Early
- Specific
- Comprehensive
- Appropriate



Nonspecific Treatment



- Ibuprofen
- diphenhydramine
- ondansetron
- caffeinated beverage
- extra water

Ok for migraine or non-migrainous headache

Rescue Treatment: Triptans

Tablets	• *Sumatriptan (Imitrex) • Zolmitriptan (Zomig) • Naratriptan (Amerge) • *Rizatriptan (Maxalt) • *Almotriptan (Axert) • Eletriptan (Relpax) • Frovatriptan (Frova)
ODT	• Rizatriptan (Maxalt) • Zolmitriptan (Zomig)
Intranasal	• Sumatriptan (Imitrex) • Zolmitriptan (Zomig)
SQ Injection	• Sumatriptan (Imitrex)

SUMATRIPTAN/NAPROXEN SODIUM: 12-17y (10mg/60mg tablet)

Rescue Treatment: Antiemetics

- **Promethazine (Phenergan)**
  - Tablet, rectal suppository, oral solution; can be compounded into gel
- **Prochlorperazine (Compazine)**
  - Tablet, rectal suppository
  - Give with diphenhydramine (Benadryl) to avoid dystonic reaction and induce sleep
- **Ondansetron (Zofran)**
  - Tablet, ODT
- **Metoclopramide (Reglan)**
  - Tablet, oral solution, ODT
- **Hydroxyzine (Vistaril, Atarax)**
  - Tablet, capsule, oral solution

Consider Prophylactic Medications When…

- Frequent Disabling attacks>4/month
- Acute medications -insufficient or ineffective
- Contraindication for using abortive medication
- Overuse of acute medication

First Steps- Prophylactic Medications

Pearls for Prophylaxis

- **cyproheptadine (Periactin);** max dose 16 mg/24 hr
- **amitriptyline (Elavil);** max 2 mg/kg or 75 mg daily. Obtain EKG
- **topiramate (Topamax);** max dose 400 mg/24 hours
- **propanolol (Inderal);** max 16 mg/kg/24 hr
- **divalproex (Depakote);** max dose 1000 mg/day

Headache Prophylaxis: General Principles

- Low and slow
- Adequate trial of 3 months necessary to determine efficacy
- Set realistic goals
  - 50% change over 3 months
  - Reduction in frequency, severity, and/or duration
  - Improved response to rescue treatment
  - Migraine: ≤4/month, functional within about an hour
  - NOT complete headache freedom, but improved QOL

Silberstein, S (2015). Preventive migraine treatment. Continuum, 12(4).

Headache Prophylaxis: OnabotulinumtoxinA Botox

- **Indicated for chronic migraine**
  - >15 headache days/month, >8 migraine, for >3 months
  - 31 injections, need at least 2 rounds (separated by 90 days)
  - Have to fail > 2 preventive medications
  - 100-unit dose
  - > 11 years old
  - Retrospective data

Ahmed et al 2010; Kabbouche et al 2012

Integrative Medicine in Headache Care

- **HA= Biopsychosocial phenomenon**
  - Best addressed with holistic approach & multidisciplinary strategies (EBP)
- Examples
  - Acupuncture
  - Biofeedback
  - Relaxation & Stress coping skills
  - Nutraceuticals/supplements
- Use of CAM & integrative therapies as high as 76% in some populations
- Integrative medicine may prevent MOH & Chronification of HA
- Increase patient self-care & empowerment to improve own health

Esparham, Herbert, Peirzchalski, Tran, Dilts, Boorigie, Wingert, Connel & Bickel, Pediatric Headache Clinic Model: implementation of Integrative Therapies in Practice, *Children*, 2018.

Integrative Medicine

- **Riboflavin (vitamin B2)**
  - AE: bright yellow urine, frequent urination, diarrhea (rare)
  - Dosing: 200-400mg/day with best evidence (divided or as single dose)
- **Magnesium**
  - AE: diarrhea
  - Dosing: 100-400mg BID
  - Chelated preparations are better absorbed
- **Feverfew**
  - Not recommended in children or adolescents

- **Butterbur in purified form (Petasites)**
  - Petadolex brand is the only one with demonstrated safety- now concerns for hepatotoxicity
- **Coenzyme Q10**
  - AE: GI upset, rash (AE are rare)
  - Dosing: 100mg/day
  - Expensive

CAM therapies

- CBT
- Biofeedback
- Mindfulness
- Acupuncture
- Vitamins & Supplements
- Proprietary-Migravent; Migralief
- Yoga

Headache
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ISSN 0017-8748
doi: 10.1111/head.13016
Published by Wiley Periodicals, Inc.

Review Article

A Systematic Review and Meta-Analysis of the Efficacy of Cognitive Behavioral Therapy for the Management of Pediatric Migraine

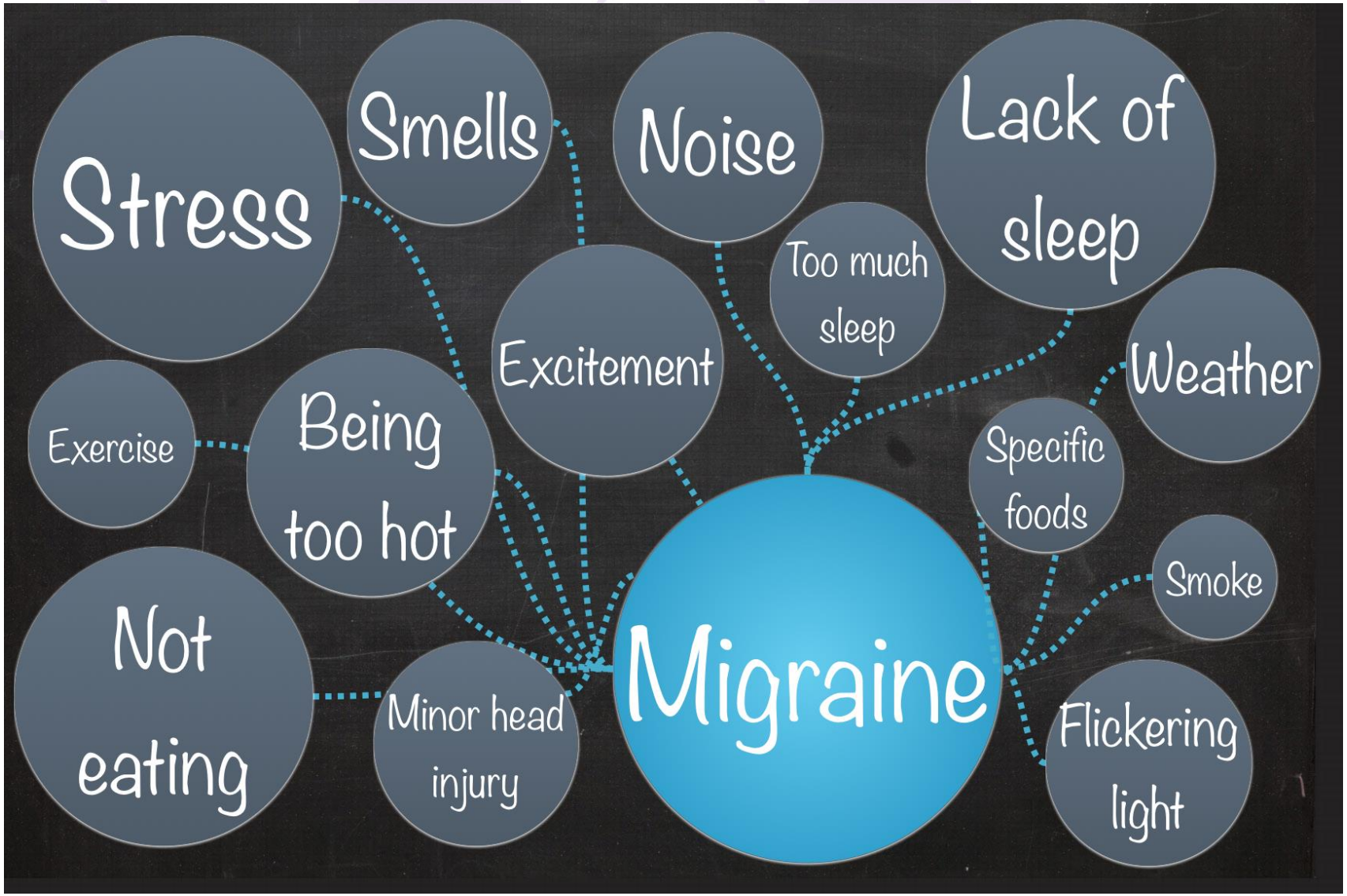
Qin Xiang Ng, MBBS; Nandini Venkatanarayanan, BMedSci, BMBS; Lakshmi Kumar, MBBS

Lifestyle Behaviors

- Hydration- goal in oz/day = weight (lbs) to a max of 100 oz/day (NO caffeine/artificial sweeteners)
- Night time sleep:
  - 10 to 12 hours (elementary)
  - 9 hours (teenagers)
  - No more than 2 hours variability in sleep or wake pattern (AAP guidelines)
- Eat regular meals
- Recognize trigger foods- caffeine, cheddar cheese, chocolate, red meat, dairy products, vinegar, foods with sodium nitrate; MSG
- Recognize other triggers: over-exertion, stress, loud noise, intense emotion/anger, excitement, weather changes, strong odors, secondhand smoke, chemical fumes, motion or travel, medication, hormone changes & menstrual cycles
- MOH
- SCREEN TIME

Case #3-

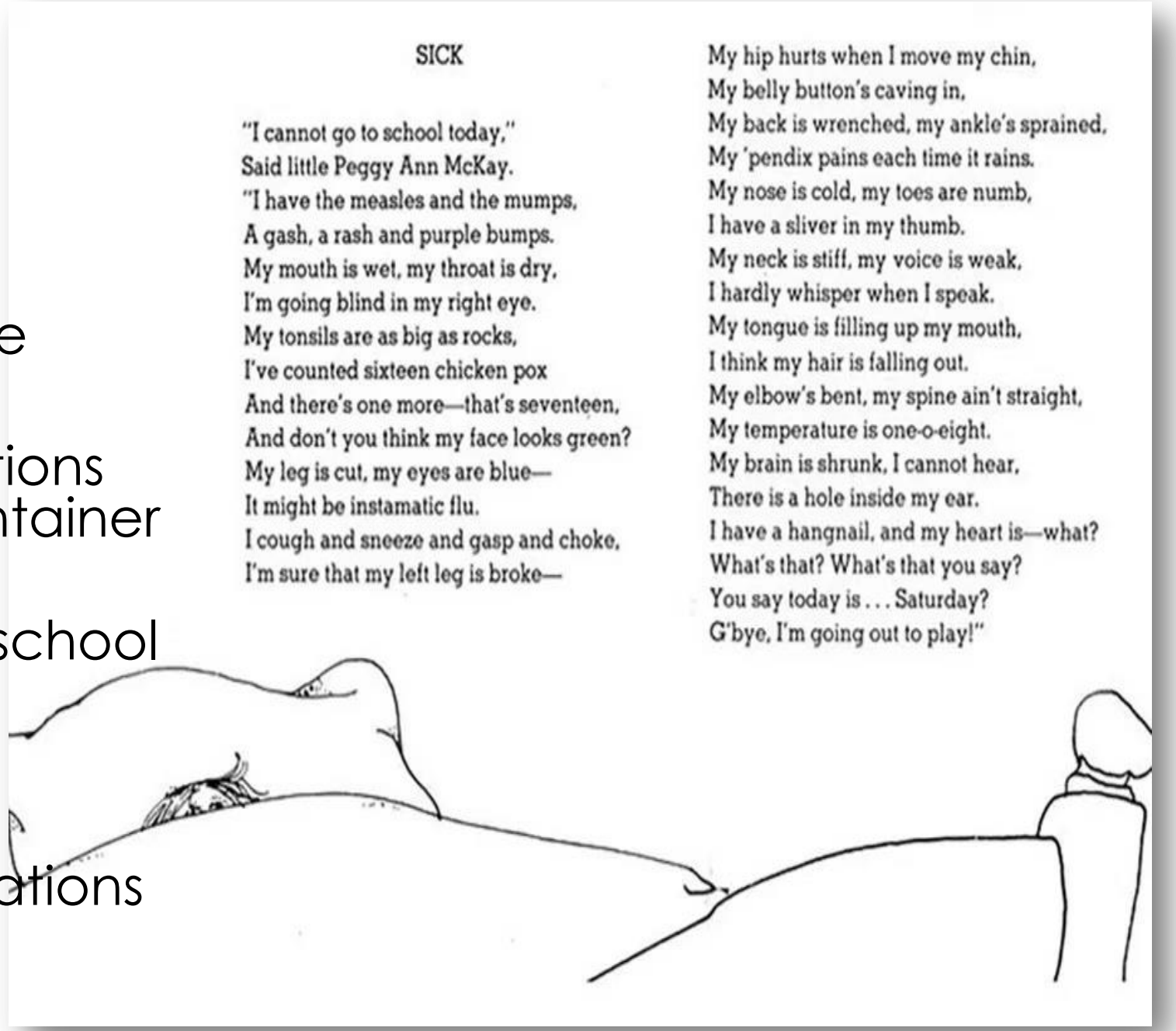
Trigger Avoidance



First Steps at School

Headaches and School

- Promote school attendance
  - *"It's ok to feel ok."*
- Write Rx for rescue medications so they have a labeled container at school
- Team approach with PCP, school nurse, parents
- School Letters for water, bathroom and medication
- 504 plan for school modifications
- Avoid homebound



SICK

"I cannot go to school today,"
Said little Peggy Ann McKay.
"I have the measles and the mumps,
A gash, a rash and purple bumps.
My mouth is wet, my throat is dry,
I'm going blind in my right eye.
My tonsils are as big as rocks,
I've counted sixteen chicken pox
And there's one more—that's seventeen,
And don't you think my face looks green?
My leg is cut, my eyes are blue—
It might be instamatic flu.
I cough and sneeze and gasp and choke,
I'm sure that my left leg is broke—
My hip hurts when I move my chin,
My belly button's caving in,
My back is wrenched, my ankle's sprained,
My 'pendix pains each time it rains.
My nose is cold, my toes are numb,
I have a sliver in my thumb.
My neck is stiff, my voice is weak,
I hardly whisper when I speak.
My tongue is filling up my mouth,
I think my hair is falling out.
My elbow's bent, my spine ain't straight,
My temperature is one-o-eight.
My brain is shrunk, I cannot hear,
There is a hole inside my ear.
I have a hangnail, and my heart is—what?
What's that? What's that you say?
You say today is . . . Saturday?
G'bye, I'm going out to play!"

The MAP (MAESTRO=.map)

Migraine Action Plan (MAP) for:_____

Ask the following questions. If all answers are "NO" follow the directions for "Headache (NOT a Migraine)". Otherwise follow the directions for "MIGRAINE"

- Does your headache get worse when you move?
- Does your headache make you very sensitive to sounds or light?
- Since your headache started do you have nausea (feel like you might throw up)?
- Since your headache started have you vomited (thrown up)?

MIGRAINE

1. Record on Headache Record
2. Give Medications Right Away

a) For Pain: _____

b) For Nausea and/or Vomiting:

_____

c) Additional: _____

3. Offer a non-caffeine drink.
4. Allow _____ to rest in a quiet dark place 30-60 minutes.
5. Other Comfort Measures:

_____

6. Contact Parent to inform about migraine & care given.
7. After 60 minutes, if migraine is resolved, can return to activities. If not, needs to go home.

HEADACHE (NOT a Migraine)

1. Record on Headache Record
2. Give Medication

a) For Pain:

_____

3. Take Temperature.
4. Call Parent to discuss next step (home or return to activities).

I approve of the medications listed above in the treatment of _____'s headaches.

_____ _____
Health Care Provider Date

I have read this page and understand that this form will be placed in the school notebook for health concerns and a copy will be given to my child's teachers.

_____ _____
Signature of Parent(s) Date

_____ _____
Signature of Principal Date

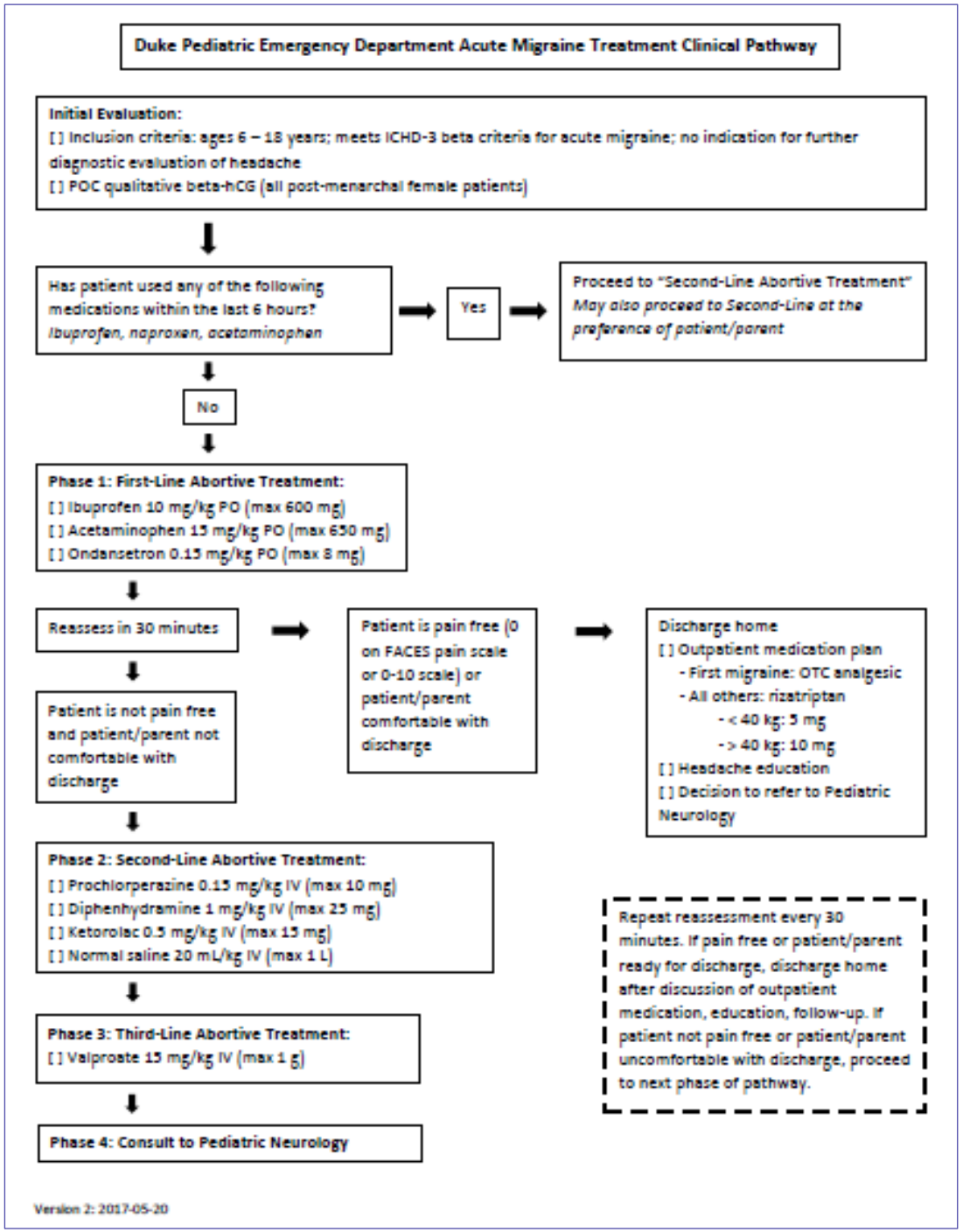
_____ _____
Signature of School Nurse Date

First Steps in ED Referral

- To the ED if:
  - Worst HA ever (HA is different)
  - HA episodic medications not effective(tried for 24 hours)
  - HA associated with concerning symptoms
  - Parental Concern
  - ED plan should in place

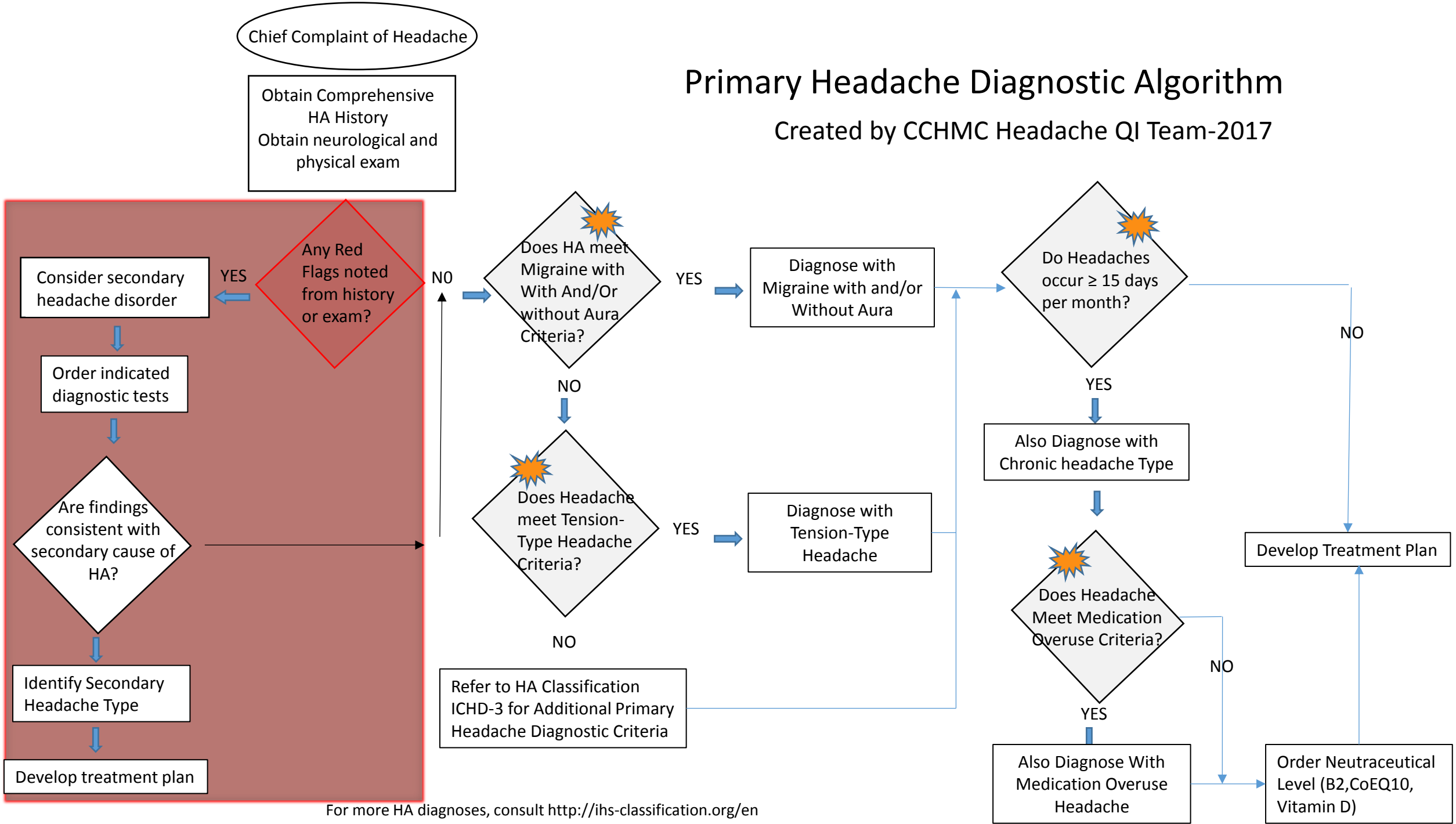
Status Migrainosus

ED Pediatric HA Clinical Pathway



Primary Headache Diagnostic Algorithm

Created by CCHMC Headache QI Team-2017



For more HA diagnoses, consult http://ihs-classification.org/en

First Steps to Referral

- Red Flags in the History
- Red Flags in Physical Exam
- Significant Abnormality on Radiologic Evaluation
- Initial First Steps not effective
- Significant disability r/t Headaches

In a Perfect World….

- ED and Primary Care Pathways in Development
- Goals:
  - Standardized , Consistent Care
  - Improved ED Utilization
  - Increased access to specialty HA care

"For prevention, it is essential to prescribe a sound rhythm in life, for work and rest, mealtimes, and sleep." *Dr. Bo Bille*

The End

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