Pediatric Headache: Consult and Referral Guidelines

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Disclosure Statement

- Upon disclosure, the speaker indicated that they did not have any relevant financial relationships to disclose

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Objectives

- Differentiate between different causes of primary headache disorders
- Discuss basic prevention and treatment for primary headaches
- Identify indications for ordering neuroimaging tests in headache patients

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16yo Female with Headache

- Frontal headache
- Throbbing quality
- “10/10”
- Needs to lay down in dark quiet room
- Occurring twice per week

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Pediatric Headache: Consult and Referral Guidelines

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Provider's initial evaluation may include:	Provider should instruct family on basic first line treatment for headaches including:	Provider may consider testing in patients who:	Providers may consider initiating referral to child neurology when:	Providers may instruct families to bring the following to the evaluation:
• Asking about common symptoms seen in primary headaches: –Tension headaches are diffuse, non-throbbing, mild to moderate severity headaches without significant worsening with activity, light or sounds sensitivity, or nausea –Migraine headaches are bifrontal or unilateral moderate to severe intensity headaches associated with a throbbing quality, worsening with activity, and light or sound sensitivity, nausea and/or vomiting –Migraine aura may occur before or during headaches lasting 5-60minutes and include sensations of visual changes (dark or bright spots or lines), sensory changes (tingling, numbness), or speech changes • Considering other common causes of headache: –Sinus headache –Post traumatic/concussive headache –Allergic rhinitis –Ophthalmologic problems –Depression	• Lifestyle modification for prevention of headaches including: – Hydration – goal ounces per day = weight in pounds to a max of 100 oz per day, none with caffeine or artificial sweeteners –Exercise at least 3 days per week for 30 minutes – Sleep per AAP guidelines with no more than two hours of variability in sleep or wake timing –Eat 3 healthy well balanced meals per day • Abortive therapy when child gets a headache includes: –Ibuprofen 10mg/kg per dose up to three days per week – 8-12oz fluid bolus with medication, sports drinks preferable in those without contraindications (obesity, diabetes) –Triptans may be considered up to twice weekly if no contraindication • Preventative therapy may be considered in those with frequent headaches and include cyproheptadine (max 0.25mg/kg/day) and amitriptyline (max 1mg/kg QHS)	• Patients with recurrent headache and a normal neurologic exam generally do not require additional testing. • Brain imaging studies are suggested for patients who have: – Headaches for less than 6 months duration not responding to lifestyle changes and first line treatment (ibuprofen, triptans, cyproheptadine), – Headaches associated with abnormal neurologic exam findings, especially papilledema, nystagmus, gait or motor changes – Absent family history of headache – Headaches associated with substantial confusion or emesis – Headaches that awaken a child from sleep repeatedly – A family history or disorders that predispose child to central nervous system lesions such as brain tumors or cerebral aneurysms • Specific testing for children with other systemic complaints including arthralgias, rash, sleep complaints	• Patients with a new severe headache of acute onset, headache with focal neurologic deficit or papilledema should be referred to the Emergency Department for neuroimaging • Recurrent headache that has been present for at least six months and is not responding to standard medical treatment including lifestyle modification and acute abortive treatment • Headache that is resulting in missed school days, worsening of school participation (declining grades, extracurricular activity limitation)	• A headache calendar for at least one month including dates of headaches, location, severity, associated symptoms, time at onset and resolution, activities preceding headaches including diet, and treatment provided • A complete list of medications used for headache treatment including doses and frequency of use. Include any abortive or preventative medications used. • Copies of testing done including other referrals, labs, imaging films/CDs (not just reports), and any other additional information that may be helpful.

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Provider's initial evaluation may include:

- Asking about common symptoms seen in primary headaches:
  - –Tension headaches are diffuse, non-throbbing, mild to moderate severity headaches without significant worsening with activity, light or sounds sensitivity, or nausea
  - –Migraine headaches are bifrontal or unilateral moderate to severe intensity headaches associated with a throbbing quality, worsening with activity, and light or sound sensitivity, nausea and/or vomiting
  - –Migraine aura may occur before or during headaches lasting 5-60minutes and include sensations of visual changes (dark or bright spots or lines), sensory changes (tingling, numbness), or speech changes
- Considering other common causes of headache:
  - –Sinus headache
  - –Post traumatic/concussive headache
  - –Allergic rhinitis
  - –Ophthalmologic problems
  - –Depression

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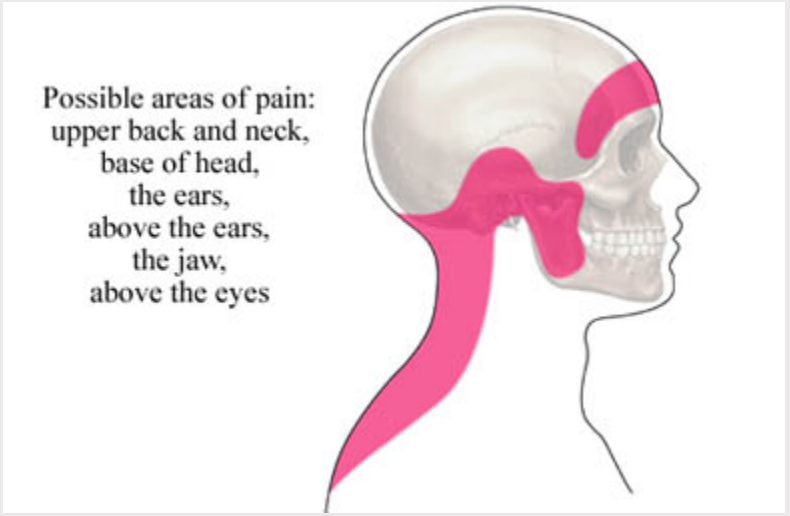
Tension Type Headache - The "Anti-Migraine"

ICHD-II Classification

- **Headache lasting from 30 minutes to 7 days**
- **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
- **Both of the following:**
  - No nausea or vomiting (anorexia may occur)
  - No more than one of photophobia or phonophobia



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Headache Attributable to Sinusitis

ICHD-II Classification

- **Frontal headache with pain in face, ears or teeth**
- **Clinical, endoscopic, CT/MRI evidence**
  - Purulence in the nasal cavity, nasal obstruction, hyposmia/anosmia and/or fever.
- **Headache and facial pain develop simultaneously**
- **Headache and/or facial pain resolve within 7 days after treatment**

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So What is the Definition of Pediatric Migraine?

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Migraine Definition In Pediatrics

- International Classification of Headache Disorders, 2nd Revision (ICHD-II)
- Pediatric Modifiers
- Ask Child, Not Parent
- Open ended questioning
- Imply characteristic based on behavior or draw them

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Unilateral or Bifrontal Location

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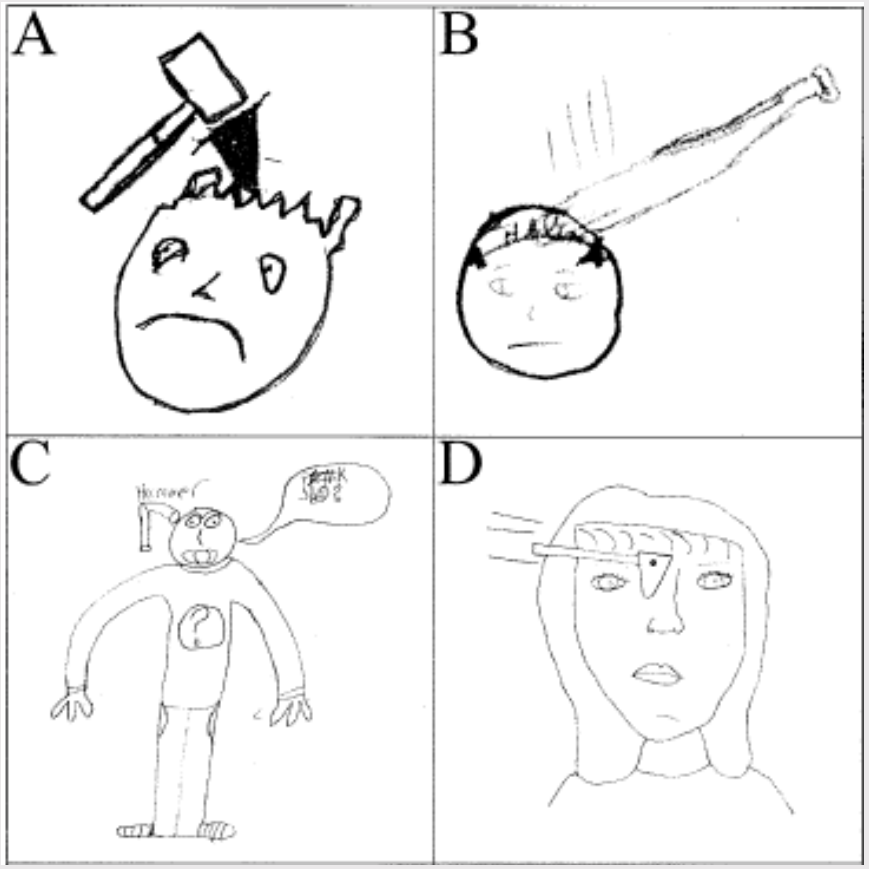
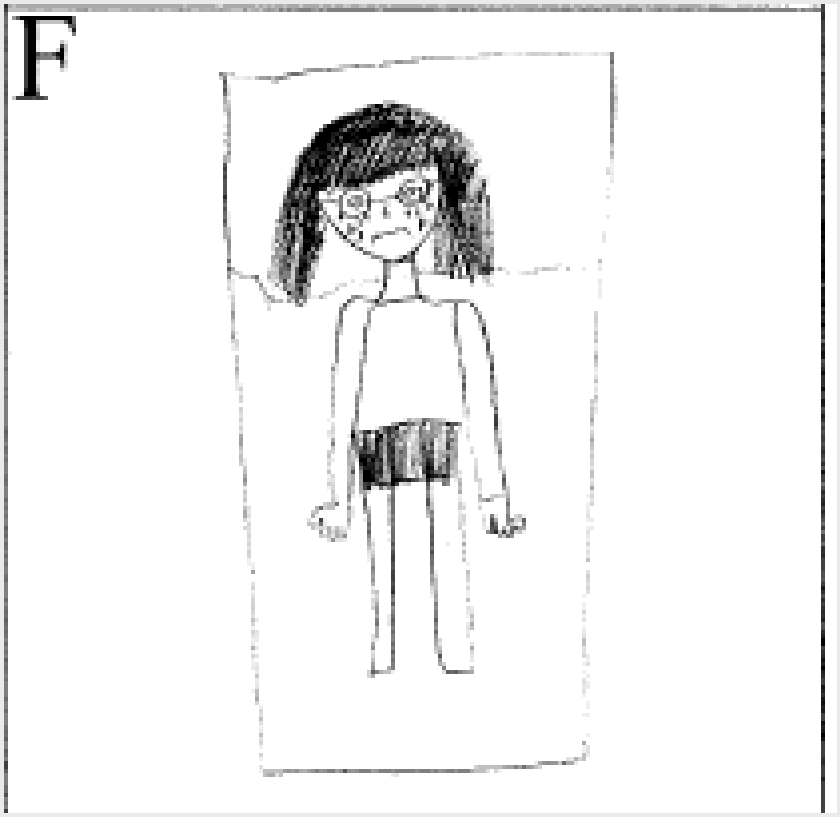
Moderate to Severe Intensity

Pounding or Throbbing



Decreased Activity



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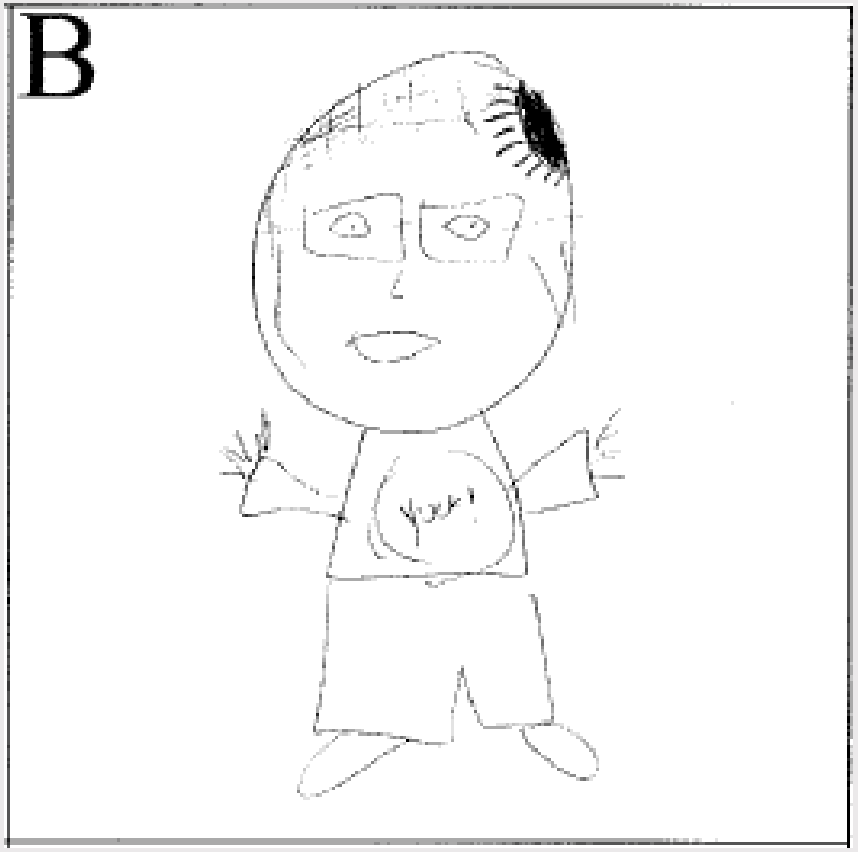
ICHD II Requires 2 Major Criteria

- Bifrontal or unilateral
- Throbbing or Pounding
- Moderate to Severe
- Worse with activity or Relief with rest

Nausea



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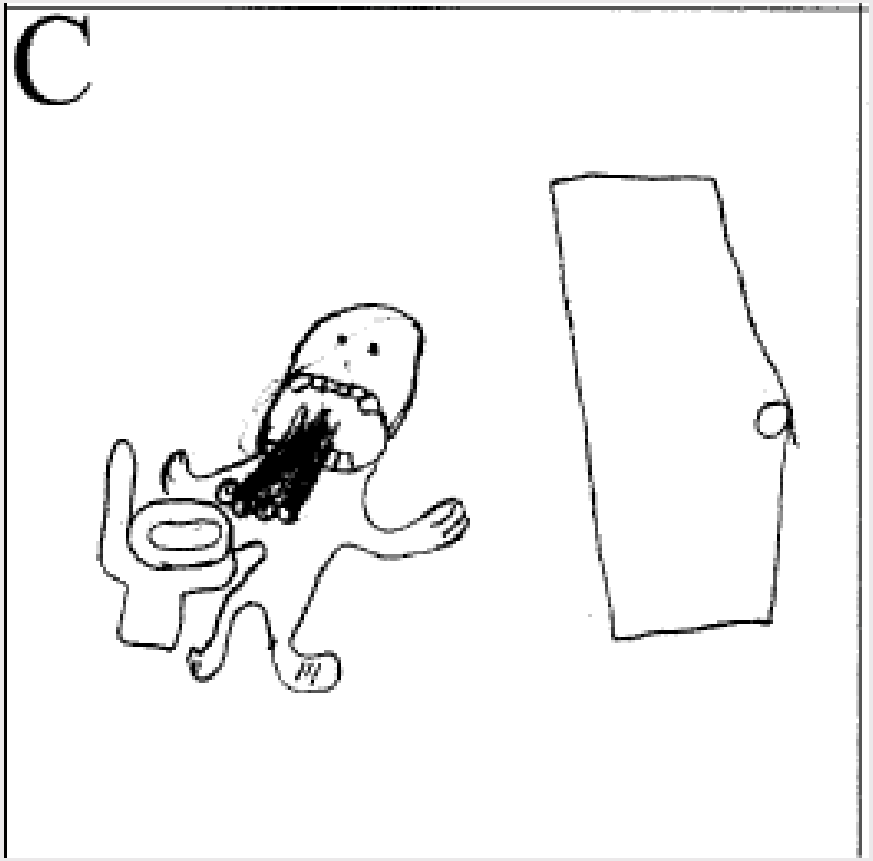
Vomiting



Usefulness of Children's Drawing in the Diagnosis of Headache

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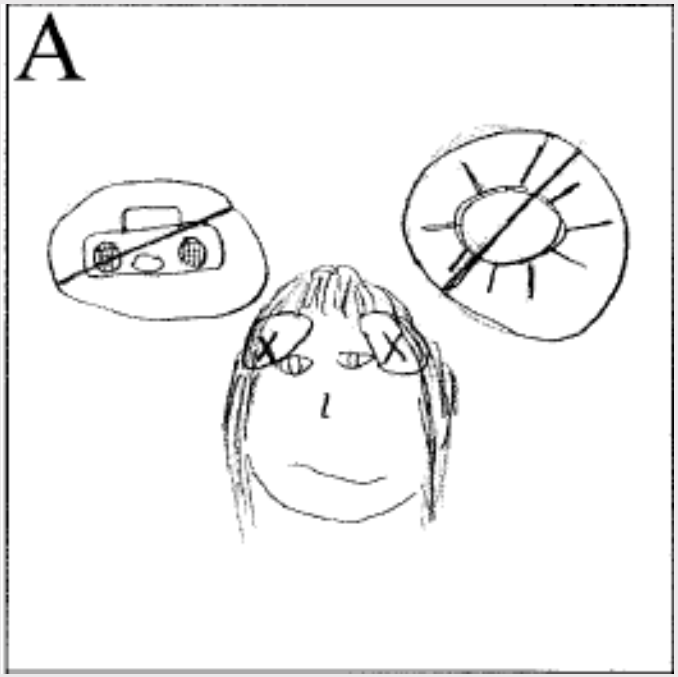
Photophobia



Usefulness of Children's Drawing in the Diagnosis of Headache. Pediatrics 2002;109;460-472

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Phonophobia

ICHD II Requires 1 Minor Criteria

- Nausea
- Vomiting
- Photophobia
- Phonophobia

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ICHD II Pediatric Modifiers for Migraine

- Pulsating means varying with the heartbeat
- Duration 1-72 hrs
- Occipital headache requires caution
  - Imaging is recommended
- Photophobia and/or phonophobia may be inferred from their behavior
  - Lying down in dark quiet room with a headache is diagnostic

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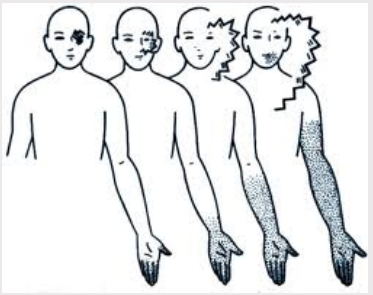
Migraine Aura

Visual

- Sensory



- Speech

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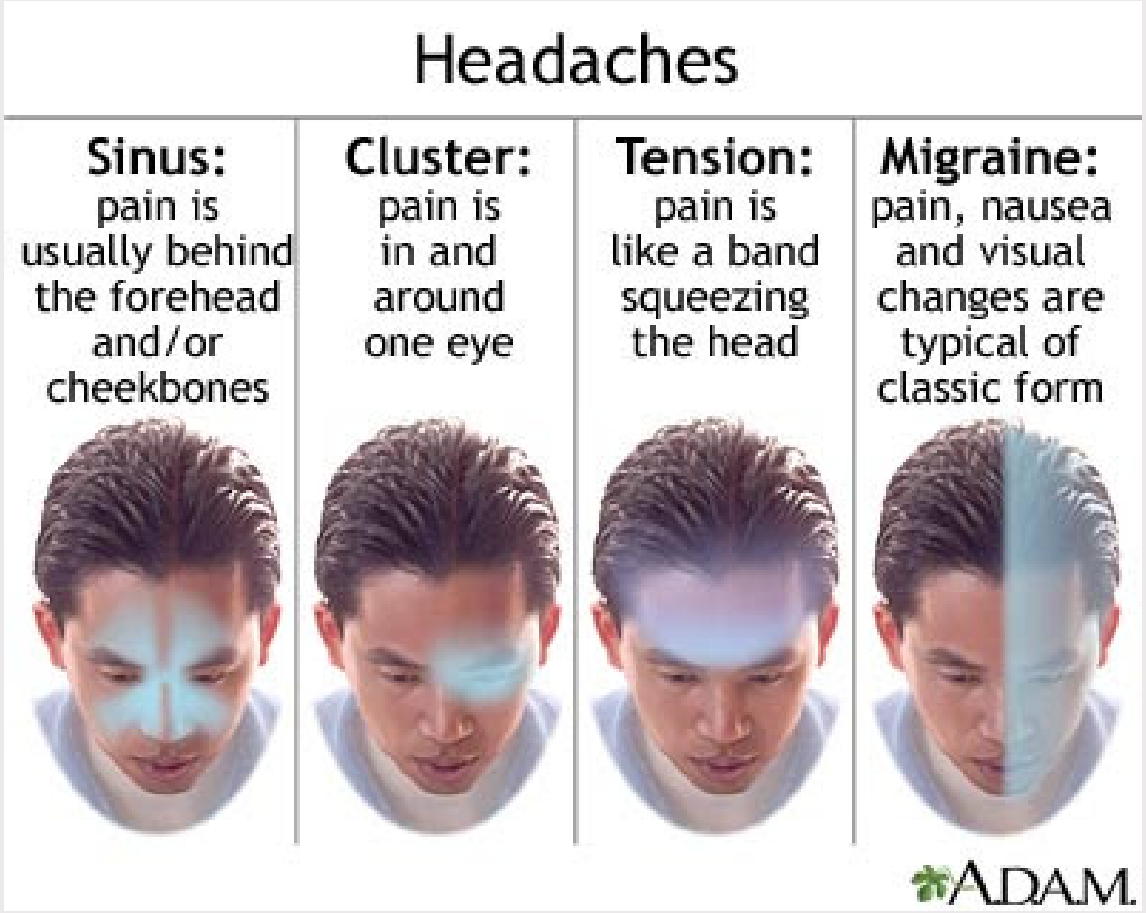
Headaches By Location



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Pediatric Headache: Consult and Referral Guidelines

Provider should instruct family on basic first line treatment for headaches including:

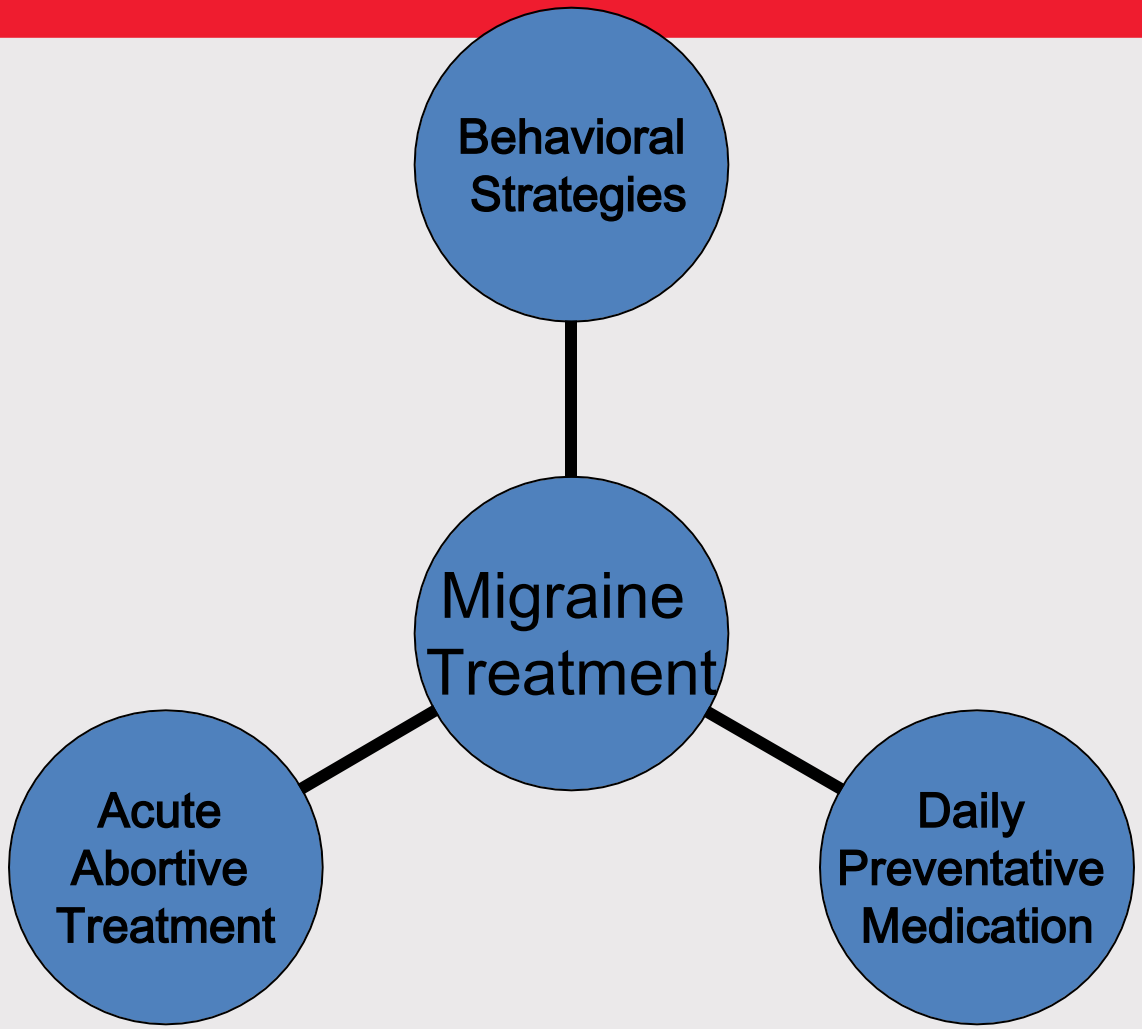
- Lifestyle modification for prevention of headaches including:
  - – Hydration – goal ounces per day = weight in pounds to a max of 100 oz per day, none with caffeine or artificial sweeteners
  - –Exercise at least 3 days per week for 30 minutes
  - – Sleep per AAP guidelines with no more than two hours of variability in sleep or wake timing
  - –Eat 3 healthy well balanced meals per day
- Abortive therapy when child gets a headache includes:
  - –Ibuprofen 10mg/kg per dose up to three days per week
  - – 8-12oz fluid bolus with medication, sports drinks preferable in those without contraindications (obesity, diabetes)
  - –Triptans may be considered up to twice weekly if no contraindication
- Preventative therapy may be considered in those with frequent headaches and include cyproheptadine (max 0.25mg/kg/day) and amitriptyline (max 1mg/kg QHS)

Goals of Migraine Treatment

Quality of life in paediatric migraine: characterization of age-related effects using PedsQL 4.0. Cephalalgia 2004;24:120–7.

1. Reduction of headache frequency, severity, duration, and disability
2. Reduction of reliance on poorly tolerated, ineffective, or unwanted acute pharmacotherapies
3. Improvement in the quality of life
4. Avoidance of acute headache medication escalation
5. Education and enablement of patients to manage their disease to enhance personal control of their migraine
6. Reduction of headache-related distress and psychologic symptoms

Treatment Arms in Migraine



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Steps To Meeting Treatment Goals

Practice Parameter: Pharmacological treatment of migraine headache in children and adolescents. Neurology 2004;63;2215-2224

1. **Use migraine-specific agents as needed.**
2. **Use of non-oral route for medications.**
3. **Antiemetics if nausea prominent.**
4. **Design a self-administered rescue plan.**
5. **Avoid medication-overuse headache.**

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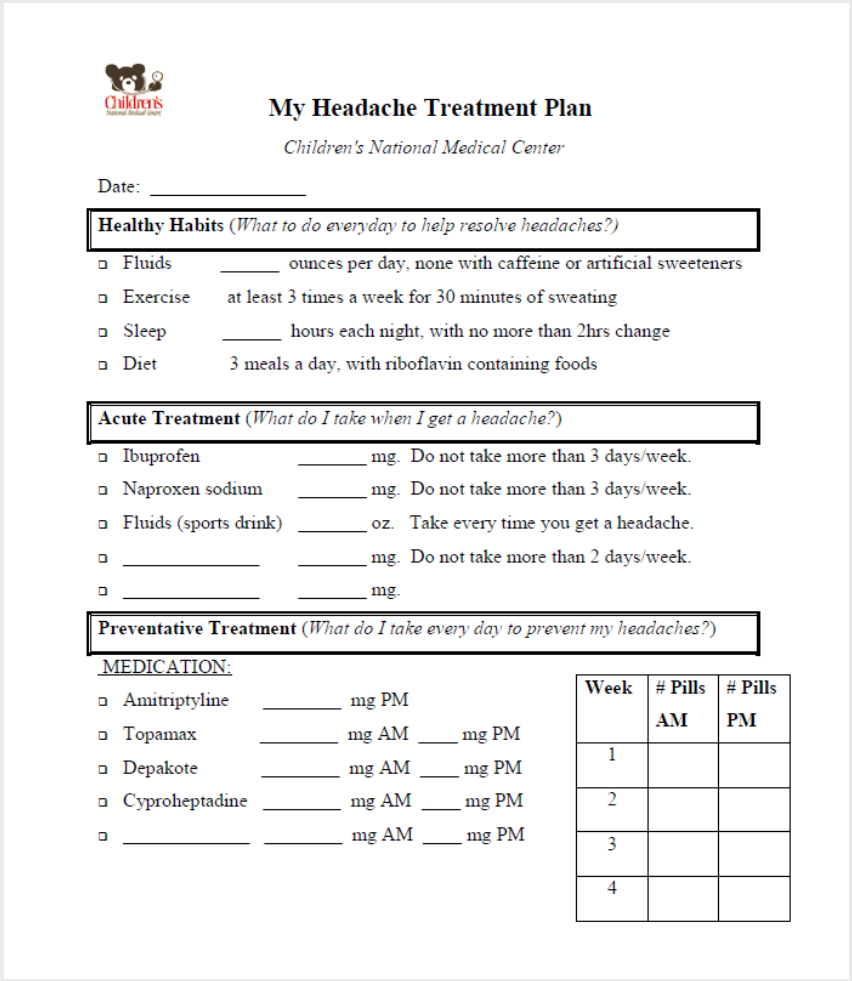
Comprehensive Headache Treatment Plan



My Headache Treatment Plan

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Date: _____

Healthy Habits (*What to do everyday to help resolve headaches?*)

- ▫ Fluids _____ ounces per day, none with caffeine or artificial sweeteners
- ▫ Exercise at least 3 times a week for 30 minutes of sweating
- ▫ Sleep _____ hours each night, with no more than 2hrs change
- ▫ Diet 3 meals a day, with riboflavin containing foods

Acute Treatment (*What do I take when I get a headache?*)

- ▫ Ibuprofen _____ mg. Do not take more than 3 days/week.
- ▫ Naproxen sodium _____ mg. Do not take more than 3 days/week.
- ▫ Fluids (sports drink) _____ oz. Take every time you get a headache.
- ▫ _____ _____ mg. Do not take more than 2 days/week.
- ▫ _____ _____ mg.

Preventative Treatment (*What do I take every day to prevent my headaches?*)

MEDICATION:

- ▫ Amitriptyline _____ mg PM
- ▫ Topamax _____ mg AM ____ mg PM
- ▫ Depakote _____ mg AM ____ mg PM
- ▫ Cyproheptadine _____ mg AM ____ mg PM
- ▫ _____ _____ mg AM ____ mg PM

Week	# Pills AM	# Pills PM
1		
2		
3		
4		

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Treatment for All Patients with Migraine

Abortive Therapy

- NSAIDS
  - Ibuprofen 10mg/kg/dose AT ONSET
  - 12oz sports drink
  - Max 3d/wk
- Triptans
  - Nasal Spray
    - Zolmitriptan or Sumatriptan
  - Oral
    - Zolmitriptan, Rizatriptan, Almotriptan
  - 12oz sports drink
  - Max 2d/wk

Lifestyle Modification

- Hydrate
  - 1-2x maintenance
  - NO CAFFEINE EVER
  - Sports Drinks = D5W
- Sleep
  - ≥ 8 hours sleep per night
  - no variability > 2 hrs
- Diet
  - 3 meals per day
  - Snacks PRN
- Regular exercise

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Avoid Medication Overuse Headache

- Misuse of medications/caffeine
  - NSAIDS/Analgesics ≥ 15 days/month
  - Triptans ≥ 10 days/month
- Gradual increase headache frequency
  - ≥15 headaches per month
- Low dose daily use worse than high dose
- Treatment is withdraw of medications/caffeine
  - 2 months off offending agent

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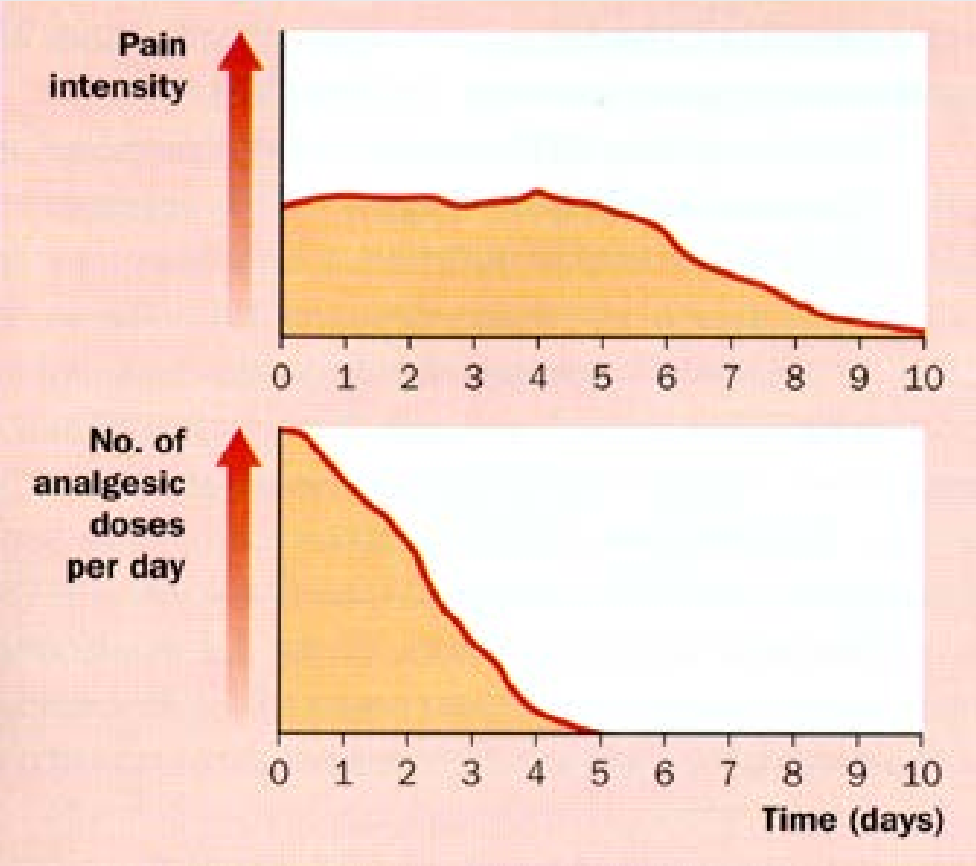
Medication Overuse

Silberstein, Lipton, and Goadsby, 1998



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Indications for Migraine Prophylaxis

1) At least 3-4 severe migraines per month

2) Migraines that limit daily activities
   - Missing school, extracurricular activities
   - Adverse effect on grades, ability to pay attention
   - Disrupting sleep
   - Secondary psychiatric symptoms – depression

3) Migraines with interfering neurologic signs
   - Visual loss
   - Weakness
   - Confusion
   - Vertigo

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Recommendations for preventive therapy of migraine in children and adolescents.

Neurology 2004; 63:2215-2224

1. Flunarizine is probably effective

2. Insufficient evidence for **cyproheptadine, amitriptyline, divalproex sodium, topiramate, or levetiracetam**

3. Conflicting evidence for propranolol or trazodone

4. Pizotifen, nimodipine, and clonidine not recommended

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Utilize Side Effects to Advantage

- Amitriptyline – sleep problems
  - Effective 5mg to 1mg/kg max
  - Available in 10mg and 25mg tabs
- Cyproheptadine – younger child, underweight
  - Effective 1mg HS to 0.25mg/kg divided BID max
  - Available in 2mg/5ml suspension and 4mg tabs
- Topiramate – obesity
- Valproic acid – rapid relief, underweight
- Beta-blocker – POTS, hypertension

Avoid Harmful Side Effects

- Amitriptyline – cardiac rhythm problems, hypertension
- Cyproheptadine – obesity
- Topiramate – kidney stones, underweight
- Valproic acid – obesity, liver dysfunction, teenage female/PCOS
- Beta-blocker – asthma, depression

Pediatric Headache: Consult and Referral Guidelines

Provider may consider testing in patients who:

- Patients with recurrent headache and a normal neurologic exam generally do not require additional testing.
- Brain imaging studies are suggested for patients who have:
  - Headaches for less than 6 months duration not responding to lifestyle changes and standard first line treatment (ibuprofen, triptans, cyproheptadine),
  - Headaches associated with abnormal neurologic exam findings, especially papilledema, nystagmus, gait or motor changes
  - Absent family history of headache
  - Headaches associated with substantial confusion or emesis
  - Headaches that awaken a child from sleep repeatedly
  - A family history or disorders that predispose child to central nervous system lesions such as brain tumors or cerebral aneurysms
- Specific testing for children with other systemic complaints including arthralgias, rash, sleep complaints

Does the patient require neuroimaging to rule out secondary causes of headache?

- **MRI findings in 315 children, ages 3 to 20 who had headaches.**
- **The neurologic examinations were abnormal in 89 patients (28%).**
- **Thirteen (4%) had surgical space-occupying lesions**
  - **All had abnormal exams.**

- **Medina S, Pinter JD, Zurakowski D, et al. Children with headache: clinical predictors of surgical space-occupying lesions and the role of neuroimaging.Radiology 1997;202:819–24.**

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Recommendations for MRI in Headache

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- Headaches for less than 6 months duration not responding to lifestyle changes and first line medications
- Headaches associated with abnormal neurologic exam findings, especially papilledema, nystagmus, gait or motor changes
- Absent family history of headache
- Headaches associated with substantial confusion or emesis
- Headaches that awaken a child from sleep repeatedly
- A family history or disorders that predispose child to central nervous system lesions such as brain tumors or cerebral aneurysms

Adapted from **Medina S, Pinter JD, Zurakowski D, et al. Radiology 1997;202:819–24**

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Providers may consider initiating referral to child neurology when:	Providers may instruct families to bring the following to the evaluation:
• Patients with a new severe headache of acute onset, headache with focal neurologic deficit or papilledema should be referred to the Emergency Department for neuroimaging • Recurrent headache that has been present for at least six months and is not responding to standard medical treatment including lifestyle modification and acute abortive treatment • Headache that is resulting in missed school days, worsening of school participation (declining grades, extracurricular activity limitation)	• A headache calendar for at least one month including dates of headaches, location, severity, associated symptoms, time at onset and resolution, activities preceding headaches including diet, and treatment provided • A complete list of medications used for headache treatment including doses and frequency of use. Include any abortive or preventative medications used. • Copies of testing done including other referrals, labs, imaging films/CDs (not just reports), and any other additional information that may be helpful.

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Back to Our 16yo Female with Headache

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Headaches Improved in Frequency

- Now having one headache per month responding well to ibuprofen

- You Should:
  - Review Headache Treatment Plan

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Headaches Are More Frequent

- Headaches now 3-4 days per week and missing school

- You Should:
  - Refer back to Neurology for possible prophylaxis
  - No need MRI if normal exam

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Conclusions

- Consider common causes of headache
- Begin basic lifestyle changes and abortive treatment for primary headache disorders
- Consider MRI in patients with atypical history or abnormal exam findings
- Refer to neurology when headaches are not responding to first line management or resulting in morbidity