



## Complete Summary

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### GUIDELINE TITLE

Special treatment situations: pediatric migraine. Standards of care for headache diagnosis and treatment.

### BIBLIOGRAPHIC SOURCE(S)

Pearlman E. Special treatment situations: pediatric migraine. In: Standards of care for headache diagnosis and treatment. Chicago (IL): National Headache Foundation; 2004. p. 98-107. [6 references]

### GUIDELINE STATUS

This is the current release of the guideline.

## \*\* REGULATORY ALERT \*\*

### FDA WARNING/REGULATORY ALERT

**Note from the National Guideline Clearinghouse:** This guideline references a drug(s) for which important revised regulatory information has been released.

- [June 15, 2005, COX-2 Selective \(includes Bextra, Celebrex, and Vioxx\) and Non-Selective Non-Steroidal Anti-Inflammatory Drugs \(NSAIDs\)](#): Labeling revised to include a boxed warning and a Medication Guide, highlighting the potential for increased risk of cardiovascular (CV) events and life-threatening gastrointestinal (GI) bleeding.
- [April 7, 2005, Bextra \(valdecoxib\), Cox-2 inhibitors, Celebrex \(celecoxib\), Non-steroidal anti-inflammatory drugs \(NSAIDs\) \(prescription and OTC, including ibuprofen and naproxen\)](#): Bextra (valdecoxib) withdrawn from the market and labels for other Cox-2 inhibitors and NSAIDs revised to include a boxed warning and a Medication Guide, highlighting the potential for increased risk of cardiovascular (CV) events and life-threatening gastrointestinal (GI) bleeding.

### Additional Notices

- [May 2, 2007, Antidepressant drugs](#): Update to the existing black box warning on the prescribing information on all antidepressant medications to include warnings about the increased risks of suicidal thinking and behavior in young adults ages 18 to 24 years old during the first one to two months of treatment.
- [July 19, 2006, Triptans](#): Healthcare professionals and consumers of new safety information regarding taking triptans together with selective serotonin

- reuptake inhibitors (SSRIs) and selective serotonin/norepinephrine reuptake inhibitors (SNRIs).
- [April 25, 2005, Promethazine HCl \(marketed as Phenergan and generic products\)](#): Breathing problems, some causing death, have been reported when the drug was used in children less than two years old.

## COMPLETE SUMMARY CONTENT

\*\* REGULATORY ALERT \*\*

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## SCOPE

### DISEASE/CONDITION(S)

Migraine

### GUIDELINE CATEGORY

Diagnosis

Evaluation

Management

Prevention

Treatment

### CLINICAL SPECIALTY

Family Practice

Internal Medicine

Neurology

Pediatrics

### INTENDED USERS

Health Care Providers

Physicians

### GUIDELINE OBJECTIVE(S)

- To improve the medical treatment of headache

- To provide recommendations for the evaluation, diagnosis, and treatment of pediatric migraine
- To help physicians and other health care professionals to:
  - Rule out secondary headache and establish a primary headache diagnosis
  - Design a treatment plan, combining nonpharmacologic with pharmacologic approaches as necessary to:
    - Minimize symptomatology
    - Reduce disability
    - Improve quality of life

## **TARGET POPULATION**

Children and adolescents with migraine

## **INTERVENTIONS AND PRACTICES CONSIDERED**

### **Evaluation and Diagnosis**

1. Thorough evaluation and physical history
2. Patient interview
3. Administration of headache-specific questionnaire
4. Electroencephalography (EEG)
5. Magnetic resonance imaging/angiography (MRI/MRA)

### **Nonpharmacologic Treatment**

1. Regulating sleep, diet, and exercise
2. Stress management
3. Stress-reduction techniques (e.g., biofeedback)
4. Physical modalities (e.g., massage or physical therapy)

### **Acute Treatment**

1. Acetaminophen
2. Ibuprofen
3. Sumatriptan (tablets or nasal spray)
4. Rizatriptan (tablets)
5. Zolmitriptan (tablets)

### **Rescue Treatment**

1. Antiemetics
  - Promethazine
  - Metoclopramide
2. Nonsteroidal anti-inflammatory drugs (NSAIDs)

### **Prophylaxis**

1. Antihistamines
  - Cyproheptadine

2. Antihypertensives
  - Propranolol
  - Verapamil
3. Anticonvulsants
  - Divalproex
  - Topiramate
  - Gabapentin
4. Nonsteroidal anti-inflammatory drugs
  - Naproxen
5. Tricyclic antidepressants
  - Amitriptyline
  - Nortriptyline

## **MAJOR OUTCOMES CONSIDERED**

Not stated

## **METHODOLOGY**

### **METHODS USED TO COLLECT/SELECT EVIDENCE**

Searches of Electronic Databases

### **DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE**

Not stated

### **NUMBER OF SOURCE DOCUMENTS**

Not stated

### **METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE**

Expert Consensus

### **RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE**

Not applicable

### **METHODS USED TO ANALYZE THE EVIDENCE**

Review

### **DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE**

Not stated

### **METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Expert Consensus

## **DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS**

The guidelines presented in this monograph represent the consensus of an advisory panel of practitioners chosen by the National Headache Foundation (NHF) for their expertise. In addition to incorporating the US Headache Consortium's recommendations, their conclusions reflect clinical experience and the most recent medical literature.

## **RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

Not applicable

## **COST ANALYSIS**

A formal cost analysis was not performed and published cost analyses were not reviewed.

## **METHOD OF GUIDELINE VALIDATION**

Not stated

## **DESCRIPTION OF METHOD OF GUIDELINE VALIDATION**

Not applicable

# **RECOMMENDATIONS**

## **MAJOR RECOMMENDATIONS**

### **Pediatric Migraine**

#### **Evaluation and Diagnosis**

A thorough evaluation and physical history are essential to a correct diagnosis and ultimately to a successful treatment outcome. Non-headache-specific areas that should be covered during the patient interview include details of early childhood development, school function, past and present medical problems, past medication use for both headache and other disorders, and drug and alcohol use. Involving both the patients and the parents can be helpful when inquiring about anxiety, tension, and nervousness. Moreover, symptoms of depression should be explored, as should a family history of headaches or psychological or psychiatric disorders.

Next, practitioners should ask patients about their headaches. Rothner and Winner propose a format for asking headache-specific questions (see Table 10.1 of the original guideline document). A third set of questions, focused on symptoms of increased intracranial pressure or progressive neurologic disease

including ataxia, lethargy, seizures, visual disturbances, focal weakness, personality change, and loss of intellectual abilities may be helpful.

Red flags that require further exploration for potential serious headache etiology include:

- Headache severity that has increased dramatically
- Headache that awakens the child from sleep
- A change in an established headache pattern

As is the case with adult migraine, pediatric migraine is a clinical diagnosis made because of specific symptoms in the absence of other explanations for these symptoms. In the past, the same criteria for the diagnosis of adult migraine with and without aura established by the International Headache Society (IHS) in 1988 have been used for the diagnosis of pediatric migraine. Despite the recent revisions in the International Headache Society criteria, the concerns on pediatric headaches were not addressed. More recently, a number of pediatric headache specialists have published studies suggesting that these criteria are too restrictive for diagnosing migraine in children. The table below reviews the proposed criteria, with changes from the adult criteria in bold type.

<b>Proposed Criteria for Pediatric Migraine</b>	
<b>Pediatric Migraine Without Aura</b>	<b>Pediatric Migraine with Aura</b>
A. At least 5 attacks fulfilling B-D	A. At least 2 attacks fulfilling B
<b>B. Headache attack lasting 1-48 hours</b>	B. At least 3 of the following: <ul style="list-style-type: none"> <li>• 1 or more fully reversible aura symptoms indicating focal cortical and/or brainstem dysfunction</li> <li>• At least 1 aura developing gradually over more than 4 minutes, or 2 or more symptoms occurring in succession</li> <li>• No auras lasting more than 60 minutes</li> </ul>
C. During the headache, at least 2 of the following: <ul style="list-style-type: none"> <li>• Bilateral (frontal/temporal) or unilateral location</li> <li>• Pulsating quality</li> <li>• Moderate to severe intensity</li> <li>• Aggravation by routine activity</li> </ul>	
D. During the headache, at least 1 of the following: <ul style="list-style-type: none"> <li>• Nausea and/or vomiting</li> </ul>	

<b>Proposed Criteria for Pediatric Migraine</b>	
<b>Pediatric Migraine Without Aura</b>	<b>Pediatric Migraine with Aura</b>
<ul style="list-style-type: none"> <li>• Photophobia and/or phonophobia</li> </ul>	

\*Changes from the adult criteria are in bold type.

In addition, children may experience other specific syndromes that are felt to represent childhood migraine variants. These disorders have neurologic symptoms and signs often not accompanied by headache and thus require diagnostic testing, such as imaging and electroencephalogram (EEG), to rule out ischemic and epileptic events. The table below outlines these disorders and their differential diagnosis.

The differential diagnosis of typical migraine without aura is limited. Numerous studies have indicated that neuroimaging and electrodiagnostic testing are of little value. In migrainous headaches that occur out of sleep or that are present upon awakening, EEG may be of help in ruling out migraines associated with nocturnal epilepsy. Severe sinusitis and processes causing increased intracranial pressure may present with morning headaches associated with nausea and or vomiting.

The differential diagnosis of migraine with aura includes epilepsy and vascular lesions. Depending on the type of migraine aura encountered, sleep-deprived EEG and magnetic resonance imaging/angiography (MRI/MRA) may be helpful.

<b>Childhood Migraine Variants</b>			
<b>DISORDER</b>	<b>SYMPTOMS</b>	<b>EVIDENCE FOR MIGRAINOUS BASIS</b>	<b>DIFFERENTIAL DIAGNOSIS</b>
Paroxysmal torticollis	Attacks of isolated head tilt or attacks associated with vertigo and or vomiting lasting hours to days	Family history of migraine	<ul style="list-style-type: none"> <li>• Idiopathic torsion dystonia</li> <li>• Epilepsy</li> <li>• Posterior fossa pathology</li> </ul>
Benign paroxysmal vertigo	Attacks of unsteadiness associated with nystagmus/vomiting followed by sleep	Family history of migraine, subsequent development of migraine	<ul style="list-style-type: none"> <li>• Epilepsy</li> <li>• Central nervous system (CNS) neoplasm</li> </ul>
Cyclic vomiting	Attacks of protracted vomiting occurring 1 to 4 times per hour for 1 hour to 5 days. Attacks are stereotypic.	Family history of migraine, response to antimigraine agents, subsequent development of migraine	<ul style="list-style-type: none"> <li>• Urea cycle disorder</li> <li>• Epilepsy</li> <li>• Gastrointestinal disorder</li> </ul>
Abdominal	Attacks of abdominal pain	Family history	<ul style="list-style-type: none"> <li>• Gastrointestinal</li> </ul>

<b>Childhood Migraine Variants</b>			
<b>DISORDER</b>	<b>SYMPTOMS</b>	<b>EVIDENCE FOR MIGRAINOUS BASIS</b>	<b>DIFFERENTIAL DIAGNOSIS</b>
migraine	lasting 1 to 72 hours (untreated or unsuccessfully treated). The pain is midline, of dull quality, and moderate or severe intensity. Also have 2 of the following: anorexia, nausea, vomiting, pallor	of migraine, response to antimigraine agents, subsequent development of migraine	disorder
Confusional migraine	Episodes of disorientation/combativeness sometimes followed by headache	History of migraine in patient	<ul style="list-style-type: none"> <li>• Epilepsy</li> <li>• Drug use</li> <li>• Central nervous system ischemia</li> </ul>

### **Nonpharmacologic Treatment**

Treatment of migraine in children and adolescents should begin with the same general interventions that one would consider with adults, including regulating sleep, diet, and exercise. Stress management is also important but differs between children and adults. Children experience stress related to school as a chronic stressor as opposed to the episodic acute stressors experienced by adults. Children are also stressed by homework, extracurricular activities, and peer relationships. Awareness of these factors can lead to lifestyle changes that can improve headache. In addition to simple stress identification, children and adolescents over the age of 10 respond very well to formal stress-reduction techniques, such as biofeedback. Many children carry heavy backpacks that can cause muscle strain and spasm in neck and shoulder muscles. This can exacerbate headache and can be treated with physical modalities such as massage or physical therapy.

### **Acute Treatment**

Treatment of an acute migraine attack should begin as soon as the child recognizes that he or she is experiencing a migraine. This may require educating the child, the parent, and the school about the benefits of early intervention. Written permission and prescriptions may be necessary for children to receive medication at school. It is also important to maintain a diary to review the response to interventions, as well as to demonstrate patterns not previously noticed.

Nonspecific therapies such as acetaminophen and ibuprofen may be considered as initial acute therapies, but they should not be continued if they are ineffective. Appropriate doses based on weight must be used. If there is a lack of response, migraine-specific therapies should be considered early in the treatment algorithm. There is a large body of evidence demonstrating the safety of triptans in adolescents over 12 years of age. Large multicenter trials have evaluated the safety and tolerability of sumatriptan tablets, sumatriptan nasal spray, rizatriptan

tablets, and zolmitriptan tablets. These medications are very well tolerated among adolescents and have not been associated with serious adverse events. The same screening process for cardiovascular risks should be undertaken in children and adolescents as with adults in determining the appropriateness of triptan use. Table 10.4 of the original guideline document lists acute medications with dosage ranges for the medications that have undergone clinical trials for the acute treatment of migraine in children and adolescents. Each triptan treatment can be repeated in 1 to 2 hours if there is a partial response, with a maximum of 3 doses in 24 hours.

### **Rescue Treatment**

Similar to adult therapy, it is important to include rescue medications for children and adolescents, as they may not have a complete response to acute treatment every time. A good rescue plan can often keep children out of the emergency room. Rescue medications can include antiemetics such as promethazine or metoclopramide along with a nonsteroidal anti-inflammatory drug (NSAID) if not used for acute therapy. These will help with nausea and vomiting, may work directly on migraine, and will cause drowsiness to induce sleep.

### **Prophylaxis**

Prophylaxis should be considered for patients who consistently experience frequent migraines (at least 1 per week) or who experience migraines less frequently but also experience frequent, less severe headaches that may impair their activities and/or affect their quality of life. Patients should be included in the decision making about the need for prophylaxis and the type, determined on the basis of comorbid medical conditions and side effect profile. For example, competitive athletes and individuals with asthma should avoid beta-blockers, while patients with comorbid epilepsy may want to consider anticonvulsants as migraine prophylaxis.

Many agents that are found useful in adult migraine may also have a role in pediatric migraine. Generally, lower dosages are commenced and these dosages are titrated. Prophylactics can take 1 to 2 months before full efficacy is established, so adequate trials must be attempted. Table 10.5 of the original guideline document outlines the categories of commonly used preventive medications, possible dosing ranges, side effects, and contraindications.

The length of prophylactic treatment should be tailored to the patient. Avoiding discontinuation of preventives during the school year is advisable. Many patients are successfully tapered after 3 to 6 months of improved headache frequency. Patients do not have to be completely migraine-free to consider tapering. Abortive agents should nearly always be provided in addition to prophylactic agents, as the patient may still experience migraines, even on an effective preventive agent.

**Note:** On October 15, 2004, the U.S. Food and Drug Administration (FDA) directed manufacturers of all antidepressant drugs to revise the labeling for their products to include a boxed warning and expanded warning statements that alert health care providers to an increased risk of suicidality (suicidal thinking and behavior) in children and adolescents being treated with these agents, and to include additional information about the results of pediatric studies. FDA also

informed these manufacturers that it has determined that a Patient Medication Guide (MedGuide), which will be given to patients receiving the drugs to advise them of the risk and precautions that can be taken, is appropriate for these drug products. For more information visit the [FDA Web site](#).

### **CLINICAL ALGORITHM(S)**

None provided

## **EVIDENCE SUPPORTING THE RECOMMENDATIONS**

### **TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS**

The type of evidence supporting the recommendations is not specifically stated.

In addition to incorporating the US Headache Consortium's recommendations, the conclusions reflect clinical experience and the most recent medical literature.

## **BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS**

### **POTENTIAL BENEFITS**

Minimized symptomatology, reduced disability, and improved quality of life in pediatric migraine

### **POTENTIAL HARMS**

- Side effects of sumatriptan, rizatriptan, and zolmitriptan include flushing, chest tightness, and somnolence.
- Side effects of cyproheptadine include drowsiness and weight gain.
- Side effects of propranolol include exercise intolerance and depression.
- Side effects of verapamil include dizziness and nausea.
- Side effects of divalproex include gastrointestinal upset, tremor, weight gain, alopecia, and dizziness.
- Side effects of topiramate include cognitive slowing, paresthesias, decreased appetite. Rare side effects include acute glaucoma and renal stones.
- Side effects of gabapentin include weight gain and dizziness.
- Side effects of naproxen include gastrointestinal irritation/bleeding and renal dysfunction.
- Side effects of amitriptyline include drowsiness and dizziness.
- Side effects of nortriptyline include dry mouth and weight gain.

## **CONTRAINDICATIONS**

### **CONTRAINDICATIONS**

- Acetaminophen is contraindicated in patients with acetaminophen allergy.
- Ibuprofen is contraindicated in patients with ibuprofen allergy.

- Sumatriptan, rizatriptan, and zolmitriptan are contraindicated in patients with complicated migraine and those with cardiovascular risk factors.
- Cyproheptadine is contraindicated in patients with cyproheptadine allergy.
- Propranolol is contraindicated in patients with Wolff-Parkinson-White (WPW) syndrome.
- Verapamil is contraindicated in patients with Wolff-Parkinson-White syndrome and atrioventricular (A-V) block.
- Divalproex is contraindicated in patients with hepatic disease.
- Topiramate is contraindicated in patients with renal stones and in patients with glaucoma.
- Gabapentin is contraindicated in patients with allergy.
- Naproxen is contraindicated in patients with ulcers and in those with renal disease.
- Amitriptyline is contraindicated in patients with prolonged QT interval.
- Nortriptyline is contraindicated in patients with glaucoma.

## QUALIFYING STATEMENTS

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Drug therapy is constantly evolving as new research, clinical trials, case reports, and opinions are published. Many of the drugs recommended in these guidelines are not approved by the US Food and Drug Administration (FDA) for treatment of headache, nor are they necessarily the same as those therapies recommended by the manufacturer for labeled indications. Their use in headache, however, may be supported by the scientific literature and by the authors' clinical experiences. While efforts have been made to ensure accuracy, the authors and publisher do not assume responsibility for the consistent updating of available information for these guidelines nor for any errors or omissions, nor for any consequences thereof. The onus is on the practitioner to evaluate recommendations in light of the clinical condition of the patient and recent medical literature. The authors advise the practitioner to consult other sources, especially the manufacturers' warnings and precautions, before prescribing any drug with which they are unfamiliar. Practitioners are also advised that while these guidelines will address the needs of many patients, there will be circumstances calling for exceptions to these recommendations.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

### IMPLEMENTATION TOOLS

Chart Documentation/Checklists/Forms  
 Foreign Language Translations  
 Patient Resources  
 Slide Presentation

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better  
Living with Illness  
Staying Healthy

### IOM DOMAIN

Effectiveness  
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Pearlman E. Special treatment situations: pediatric migraine. In: Standards of care for headache diagnosis and treatment. Chicago (IL): National Headache Foundation; 2004. p. 98-107. [6 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2004

### GUIDELINE DEVELOPER(S)

National Headache Foundation - Private Nonprofit Organization

### SOURCE(S) OF FUNDING

National Headache Foundation

### GUIDELINE COMMITTEE

Not stated

### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

*Author:* Eric Pearlman, MD

## **FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

Not stated

## **GUIDELINE STATUS**

This is the current release of the guideline.

## **GUIDELINE AVAILABILITY**

Electronic copies: None available

Print copies: Available from the National Headache Foundation, 820 N. Orleans, Suite 218, Chicago, IL 60610; Phone: (888) NHF-5552; Web address: [www.headaches.org](http://www.headaches.org)

## **AVAILABILITY OF COMPANION DOCUMENTS**

The following are available:

- The complete headache chart. Chicago (IL): National Headache Foundation (NHF); 2 p. Electronic copies available in Portable Document Format (PDF) from the [National Headache Foundation Web site](http://www.headaches.org)
- National Headache Foundation fact sheet. Chicago (IL): National Headache Foundation (NHF); 2004 Oct. 2 p. Electronic copies available in Portable Document Format (PDF) from the [National Headache Foundation Web site](http://www.headaches.org).

Print copies: Available from the National Headache Foundation, 820 N. Orleans, Suite 218, Chicago, IL 60610; Phone: (888) NHF-5552; Web address: [www.headaches.org](http://www.headaches.org)

## **PATIENT RESOURCES**

The National Headache Foundation (NHF) has created a variety of educational resources for patients, including informative brochures, a patient diary for migraines, Power Point presentations, and patient guides; many of these resources are available in both Spanish and English. Some of these items are available as print copies for purchase through the [NHF online store](http://www.headaches.org). Electronic versions of other resources are available through the consumer education section of the [NHF Web site](http://www.headaches.org).

Print copies: Available from the National Headache Foundation, 820 N. Orleans, Suite 218, Chicago, IL 60610; Phone: (888) NHF-5552; Web address: [www.headaches.org](http://www.headaches.org).

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the

authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

## **NGC STATUS**

This NGC summary was completed by ECRI on April 12, 2005. The information was verified by the guideline developer on April 26, 2005. This summary was updated by ECRI on June 16, 2005, following the U.S. Food and Drug Administration advisory on COX-2 selective and non-selective non-steroidal anti-inflammatory drugs (NSAIDs). This summary was updated by ECRI on August 15, 2005, following the U.S. Food and Drug Administration (FDA) advisory on antidepressant medications. This summary was updated by ECRI on May 31, 2006 following the FDA advisory on Promethazine HCl. This summary was updated by ECRI on August 29, 2006, following the U.S. Food and Drug Administration advisory on Triptans, SSRIs, and SNRIs. This summary was updated by ECRI Institute on November 9, 2007, following the U.S. Food and Drug Administration advisory on Antidepressant drugs.

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