

## What to do About the Child with Headaches

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Migraine is the most common cause of recurrent headache in children, and occurs in up to 15% of adolescent girls. Migraine can nearly always be diagnosed based on the history and examination (Table 1). The headache is more often bilateral in children than in adults. In addition, males are affected as often as females before puberty, probably because of the exacerbating

influence of hormones on migraine. A family history of migraine headache is present in two-thirds of children, but is often overlooked. Many parents with migraine emphatically deny that their headaches are migrainous in nature. Thus, it is important to also enquire carefully about the features of any headaches experienced by the parents in the past or present.

### Case 1: Mary's pain

Mary, 6, presented with a 6-week history of headaches, which were most severe on awakening, and had more recently woken her up from sleep. The headaches had become more frequent and more severe with time. There was no previous history of headache, but there was a family history of migraine. Her clinical exam was normal, and there was no papilledema.

#### How would you manage Mary?

Her case history highlights some important features. Her headaches were recent in onset, and were

becoming progressively more severe with time. Furthermore, they were worse immediately after awakening, and had woken her from sleep. These are features that should make one think about raised intracranial pressure as a possible cause of headaches (see box). Although she did not have papilledema, a computed tomography head scan was performed, which demonstrated a cerebellar astrocytoma associated with hydrocephalus.



It is important to look carefully for any of the characteristic clinical features of raised intracranial pressure in a child with headache, particularly if the headache is of recent onset. Also of interest in this case was the absence of papilledema. Although papilledema is present in most patients with raised intracranial pressure, it does not occur in all cases. The absence of papilledema should not be used to exclude raised intracranial pressure if the history is suggestive.

#### Clinical features of headaches due to raised intracranial pressure

- Vomiting, especially with morning headache
- Nocturnal, or wakening patient from sleep
- Worse if patient lies flat, coughs or sneezes
- Transient visual obscurations
- Papilledema
- Abnormal neurologic exam

## Case 2: John

John, 10, has a 3-year history of intermittent, bifrontal pounding headaches, associated with nausea, and occasionally with vomiting. He feels better after lying down in a quiet dark room. The headaches occurred only during the day. He had a history of motion sickness as a younger child. His parents had a history of chronic headaches suggestive of migraine. His exam demonstrated no abnormality.



### What is the cause of the headaches, and how would you manage John?

The history provides the major clues. John's headaches were pounding in nature and associated with nausea, and occasionally with vomiting. Their improvement, when he lay in a quiet dark room, suggest he probably had photophobia. Furthermore, there was a family history of migraine headache, and he had a history of motion sickness as a younger child. These features all suggest a diagnosis of migraine.

## Case 3: Britney

Britney is a 14-year-old teenager with a 4-year history of intermittent headaches with features suggestive of migraine. Over the past 3 months, she has had daily headaches that were diffuse and steady, and were not helped by acetaminophen, ibuprofen, or naproxen. They did not wake her up at night, but were present for most of the day. At times, they became more severe and had a pounding quality. Her neurologic exam was normal and fundal exam demonstrated no papilledema. Venous pulsations were normal.



### What is the differential diagnosis, and how would you manage Britney?

Britney was not abusing medication, but several stressors were identified, including bullying and teasing by a group of girls at school. In addition, her mother described Britney as a "worry wart" who had always worried more than most children about the ordinary stresses of life. Britney started seeing a child psychologist with an interest in symptom management, and the frequency and severity of her headaches reduced markedly without medication.

Table 1

### Criteria suggesting migraine

The presence of at least 3 criteria indicates the headache is probably a migraine.

- Unilateral pain
- Throbbing or pulsatile quality
- Nausea, vomiting, or abdominal pain
- Visual, sensory, or motor aura
- Complete relief after rest
- Migraine in a parent or sibling

Most parents bringing their child to the physician with a headache are worried about the possibility of a brain tumour. In John's case, he had the characteristic

features of migraine headache. In addition, it would be very unusual for raised pressure to cause only intermittent headaches over a period of three years. Recognition of the cause of the headache as migraine can usually be achieved by a careful clinical assessment, and provides a major relief to most parents.

The management of migraine headaches should address the treatment of acute symptoms and the prevention of further headaches.

### *How are acute symptoms managed?*

Sleep is often the most effective treatment for a migraine headache. Where this is not feasible, the use of simple medications can be very effective (Table 2). When nausea and vomiting are prominent symptoms,

Table 2

## Drug dosages used in children with acute migraine pain

<u>Class</u>	<u>Drug</u>	<u>Dose</u>	<u>Comment</u>
Antiemetics	Promethazine	0.25-0.5 mg/kg, every 6 hours	p.o./i.v./i.m. maximum 25 mg/dose
	Metoclopramide	0.15 mg/kg, every 6 hours	p.o./i.v.
	Chlorpromazine	0.4-1.0 mg/kg, every 6 hours	i.m. maximum 40 mg/24h
Simple analgesics	Acetaminophen	20 mg/kg, every 6 hours	p.o. maximum 75 mg/kg/24 hours; and < 4 g/24 hours in children ≥ 12 years
	Ibuprofen	10 mg/kg, every 6 hours	p.o. maximum 30 mg/kg/24 hours; and p.o. maximum 1,200 mg/day in children > 12 years
Triptans	Sumatriptan	6 mg/dose 25 mg/dose	subcutaneously in the adolescent p.o.
	Zolmitriptan	10-20 mg 2.5-5 mg/dose	nasal spray p.o. adolescent

p.o.: Orally  
i.v.: Intravenously  
i.m. Intramuscularly  
p.r.: By way of the rectum

an antiemetic is often the most effective therapy. The sedative effect of these drugs may also help. When



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headache is the most prominent feature, a simple analgesic is the most useful first approach. It is important to appreciate that autonomic dysfunction of the gut is common in migraine, often manifesting as nausea or vomiting, and that oral absorption of medications is compromised when this occurs. Consequently, it is important to take any oral medication as soon as possible after the onset of the headache. In some patients, nausea or vomiting may be so severe that the oral route is not feasible. It is important also to appreciate that the dosages used in the initial management of an acute headache are larger than normally recommended for that drug in children. This is because the recommended dosage reflects the fact that many of these drugs are also antipyretics, and may be used every four to six hours over several days. In contrast, a child with migraine requires a much larger first dose, although the daily recommended dosage should not be exceeded. The role of triptans is less well-established in children than in

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Table 3

## Factors known to precipitate migraine

### MODIFIABLE

#### Emotional stress

#### Physical stress

- Exercise
- Fatigue
- Hunger
- Lack of sleep or oversleeping

#### External stimuli

- Loud noise
- Bright or flickering light
- High altitude
- Dietary (chocolate, cheese, oranges, monosodium glutamate)

#### Hormonal

- Oral contraceptive use

### FIXED

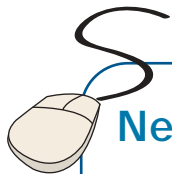
#### Climate changes

#### Menstruation

## Take-home message



- Headaches are common in children.
- The ability to take a good history is the key to making a diagnosis.
- Nearly all patients with headaches due to raised intracranial pressure have particular clinical features that suggest that diagnosis.
- The most common cause of intermittent headaches is migraine, and that diagnosis is established by recognizing the characteristic clinical features.
- The management of migraine involves both the treatment of the acute headache and the development of a strategy to reduce the frequency of further headaches.
- Daily headaches are usually either the result of overuse of medication, or are a manifestation of stress, often occurring in the child with migraine.



## Net Readings

1. National Headache Foundation  
[www.headaches.org](http://www.headaches.org)
2. The Public School Parent's Network  
[www.psparents.net/Headaches.htm](http://www.psparents.net/Headaches.htm)
3. Family Practice Notebook  
[www.fpnotebook.com/NEU167.htm](http://www.fpnotebook.com/NEU167.htm)
4. American Council for Headache Education  
[www.achenet.org/kids/children.php](http://www.achenet.org/kids/children.php)

adults. Sumatriptan administered by nasal spray has been demonstrated to be effective in children over four, but the effectiveness of oral and subcutaneous sumatriptan has not been demonstrated in children.<sup>1</sup> Sumatriptan appears to be well-tolerated whichever route of administration is used.

## How are migraines prevented?

The approach to prevention should involve an attempt to identify factors that may be exacerbating the headaches (Table 3). Stress is a very important provoking factor in children, and is often underestimated. Important stressors in children include a family history of long-term illness, parental marital difficulties, problems with other family members, fear of failure in school, fear of teachers, bullying, and teasing.<sup>2</sup> Management of stress and avoidance of other preventable precipitating factors should be the initial approach to the prevention of recurrent migraine headaches.

Prophylactic medication is usually required in only a minority of children with migraine headaches. Most studies have involved adults, and only flunarizine and propranolol have been demonstrated in placebo-controlled studies to be effective in the prevention of migraine headaches in children.<sup>3</sup> Table 4 lists medica-

Table 4

## Oral drugs used in the prevention of migraines

<u>Drugs</u>	<u>Dosage</u>	<u>Comment</u>
<b>Amitriptyline</b>	0.5-1.5 mg/kg h.s., maximum 50 mg/24 hours	
<b>Cyproheptadine</b>	0.25-0.5 mg/kg/24 hours in divided doses, maximum 12 mg/24 hours	Sedation and weight gain may limit use.
<b>Propranolol</b>	0.5-1.0 mg/kg/24 hours in divided doses, maximum 4 mg/kg/24 hours	Reactive airways disease and diabetes are contraindications. Depression is not uncommon. Usually considered in children older than 7 years with severe headaches.
<b>Riboflavin</b>	400 mg h.s.	Shown to be effective in one double-blind controlled study in adults. Many parents feel more comfortable using a vitamin rather than a "drug".
<b>Flunarazine</b> <b>Antiepileptic drugs</b>	5-7.5 mg/day	Carbamazepine, valproic acid, gabapentin and topiramate have been demonstrated to be effective in the prevention of migraine in adults.

h.s.: Half-strength

tions that have been used, and dosages that are appropriate in children.

Chronic daily headaches in the child are usually either a manifestation of stress, often in the child with migraine, or are rebound headaches related to analgesic abuse.

Rebound headaches occur in patients with a primary headache disorder who use increasingly frequent doses of medication for a period longer than three months. Patients develop tolerance to the acute medications, and prophylactic medications are rarely effective. The mechanism of rebound headaches is not well-understood, but withdrawal of the acute medications is effective, although this must be carried out gradually. Ensuring that simple analgesics are not used more often than two days each week can prevent the development of rebound headaches. [CME](#)

## References

1. Major PW, Grubisa HSI, Thie NMR: Triptans for treatment of acute pediatric migraine: A systematic literature review. *Pediatr Neurol* 2003; 29(5):425-9.
2. Anttila P, Metsähonkala L, Helenius H, et al: Predisposing and provoking factors in childhood headache. *Headache* 2000; 40(5): 351-6.
3. Victor S, Ryan S: Drugs for preventing migraine headaches in children. *Cochrane Database of Syst Review* 2003; 4:CD002761.

## Suggested Readings

1. Maytal J, Young M, Shecter ABA, et al: Pediatric migraine and the International Headache Society (IHS) criteria. *Neurology* 1997; 48(3):602-7.
2. Pryse-Phillips WEM, Dodick DW: Guidelines for the diagnosis and management of migraine in clinical practice. *Can Med Ass J* 1997; 156(9):1273.

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