

## Migraines and Headaches in Children — Causes and Medications

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**Headache is common in both adults and children. Children of all age group report having some sort of acute and chronic attacks of headache. In children, it can be classified into primary or secondary to another cause. Primary headaches are similar to the adult group including migraine which is the most common, cluster headache and tension-type headache. Secondary headaches are caused by another lesion; infection, CNS tumors, hydrocephalus, cerebrovascular lesions, and trauma. The most common secondary headache is due to acute viral illness or respiratory infection.**



### A Migraine in Children

Migraines are **severe periodic attacks of pulsating headache associated with nausea, vomiting, and photophobia, that lasts for hours aggravated by activity and relieved by sleep.** In children, the migraine is not commonly preceded by an aura and is usually bilateral.

A migraine is **common in all pediatric age groups** and is the most common cause of a recurrent headache in children.

**Three phases of a migraine can be identified as well as migraine aura:**

1. The premonitory phase
2. The headache phase
3. The postdrome phase

It can be associated with some precursor syndromes including; **cyclical vomiting, benign paroxysmal torticollis, abdominal migraine, Alice in Wonderland syndrome, confusional migraine and benign paroxysmal vertigo of childhood**. A menstrual migraine develops in relation to menstrual bleeding in young girls due to a drop in estrogen and progesterone levels. It is also not associated with an aura.

#### Triggers can include:

- Food
- Chemicals
- Alcohol
- Drugs
- Lights/noise
- Psychosocial stress

## Premonitory phase

The premonitory phase **precedes a headache with hours or days**. The symptoms include fatigue, pallor, yawning, irritability, social withdrawal, sensitivity to light or sound, neck stiffness, increased appetite, and abnormal bowel habits.

## Aura

Migraines in children can be **less frequently associated with an aura** which develops gradually and resolves completely within a few hours.



**Image:** "This is an approximation of the zig-zag visual disturbance that I experience as a migraine aura. The picture hardly does it justice! In reality, it moves and vibrates, expanding and slowly fading away over the course of about 20 minutes." by Tehom - Own work. License: [Public Domain](#)

An aura is a **reversible neurological disturbance involving the visual, sensory, motor or speech functions**. The most common are visual aura or field scotoma, followed by sensory tingling in the hands, feet or face. The motor weakness of one side of the body before a migraine can be a sporadic or familial hemiplegic migraine.

Migraine with brainstem aura is a rare type of aura with associated brainstem dysfunction symptoms, including vertigo, tinnitus, dysarthria, diplopia, and bilateral Parasthesia but with no motor weakness.

A vestibular migraine is severe episodes of a headache associated with vertigo and

dizziness. A retinal migraine is a unilateral headache or periorbital preceded by unilateral visual loss or scintillation. The **aura of visual loss lasts for a few minutes followed by a headache** which also lasts less than one hour and resolves with a resolution of the retinal blindness.

## Headache phase

The headache phase is a **pulsatile bifrontal or a bitemporal headache that lasts for up to 2 hours** and can be noticed as pallor, lack of activity, vomiting, and sensitivity to light and sound. The patient prefers to stay in a dark, quiet room and avoid activities. Autonomic symptoms also exist in the form of lacrimation, conjunctival injection, ptosis, and flushing.

## Migraine postdrome

Patients fall into **exhaustion or euphoria following a headache**.

## Childhood Syndromes that are Precursors of a Migraine

### Cyclical vomiting syndrome

The cyclical vomiting syndrome is characterized by **repeated attacks of nausea and vomiting for hours** and maybe days associated with a migraine. Endocrinal and metabolic disorders have been triggering factors.

### Abdominal migraine

It is a common cause of chronic abdominal pain, especially when it comes to attacks. A positive family history of a migraine can be identified in many patients. It is **characterized by attacks of moderate to severe, dull, poorly localized abdominal pain** associated with a headache. There are no other clinical signs of gastrointestinal disease or metabolic causes and the child is completely normal in between the attacks.

### Benign paroxysmal vertigo (BPPV) of childhood

**Short attacks of vertigo accompanied by ataxia, vomiting, pallor, and nystagmus** in a healthy child. There is no headache but a future migraine may develop. The attacks resolve spontaneously with no residual effect. The family history of a migraine is common.

### Benign paroxysmal torticollis (BPT) of infancy

BPT is **characterized by acute attacks of torticollis with a tilt of the head to either side** that can last from minutes to days. Patients may develop migraine headaches and family history is also common.

## Chronic migraine

Patients present with recurrent attacks of a headache at least 15 days per month for 3 months. A headache may present daily with acute exacerbations associated with nausea, vomiting, and photophobia.

## Ophthalmologic migraine

This type of a migraine is **characterized by recurrent attacks of migraine with paralysis of one of the ipsilateral ocular cranial nerves** leading to ophthalmoplegia, diplopia, pupillary dilatation, and ptosis. A headache is usually prolonged and there is a latent period before the ophthalmoplegia. MRI shows thickening of the cisterna associated with the affected nerve.

## Diagnosis of a Migraine in Children

A migraine headache in children and adults is a clinical diagnosis. There are no specific neuroimaging, laboratory tests, EEG or lumbar puncture that are indicated for the diagnosis of a headache. Migraine in children should be **suspected based on the clinical data and family history** as many children are unable to specify symptoms of a migraine.

## Clinical presentation

Infants	Young children	Adolescents
Pallor	Vomiting	Gradual onset
Decreased activity	Light/noise sensitive	Throbbing
Vomiting	Bitemporal	Unitemporal

**Note:** Clinical presentation of migraines includes photophobia/phonophobia, and it worsens with activity. It lasts around 1 - 72 hours and it includes an aura, which is less common in young children (only 30%) and is characterized by visual spots, colored lights, and complex images.

## Management of Children with a Migraine

### Preventive therapy

It aims to the prevention of acute attacks in children with frequent, severe, disabling migraines that are resistant to abortive therapy. There is a **strong correlation between diet, fluid intake, sleep and stress to the development of migraine attacks**. This therapy consists of regular adequate sleep, exercise, healthy diet, adequate fluid intake and the avoidance of triggering factors.

Some medications have been used for prevention for up to 6 - 12 months. These medications include **cyproheptadine, valproate, amitriptyline, propranolol, riboflavin, and topiramate**. The choice of medication depends largely on comorbid conditions: valproate is helpful in children with epilepsy, while topiramate is useful in obese patients and amitriptyline is useful for the treatment of depression.

Menstrual migraine is best prevented with a dose of **non-steroidal anti-inflammatory drugs**, one or two days prior to menstruation.

## Management of acute attacks

**Non-steroidal anti-inflammatory drugs and acetaminophen** are considered the first choice abortive therapy for acute attacks. Oral or rectal anti-emetics can be used for the treatment of associated nausea and vomiting. Triptans e.g. sumatriptan is deferred for a severe headache that is resisting to analgesics. Other agents are helpful for resistant severe cases, including metoclopramide, diphenhydramine, dihydroergotamine, valproic acid, and prochlorperazine.

**Note:** The therapy of migraines include Ibuprofen early in a headache, Sumatriptan nasal spray in children > 12 years and other medications like promethazine, prochlorperazine, etc.

## A headache in Children

### Cluster headache

Is a **severe brief attack of a frontal headache** associated with autonomic symptoms of lacrimation, nasal congestion, conjunctival injection, and honor syndrome. A headache is similar to the adult type lasting for minutes to a few hours and recurring in clusters.

### A tension headache (a stress headache)

Is a **diffuse non-throbbing headache of varying severity** that is similar to a migraine. It can be associated with nausea, photophobia, and phonophobia. When in doubt, migraine diagnosis comes in priority over a tension headache.

## Conclusion tension-type and cluster headache

Tension-type headache	Cluster headache
<ul style="list-style-type: none"><li>• Diffuse location, non-throbbing</li><li>• Not worse with activity, no nausea or vomiting<ul style="list-style-type: none"><li>• Lasts 30 mins to 7 days</li><li>• Mechanism is unclear</li></ul></li><li>• Treat with ibuprofen, topiramate if refractory</li></ul>	<ul style="list-style-type: none"><li>• Rare in children under 10</li><li>• Usually unilateral and frontal-periorbital<ul style="list-style-type: none"><li>• Trigeminal distribution</li></ul></li><li>• Short, multiple in a short period of time (cluster) <b>Therapy</b></li><li>• First-line treatment: Oxygen therapy and triptans</li><li>• Other medications: Ergotamine, ocreotide</li></ul>

## Secondary headaches

### Acute febrile illness

Is the most common cause due to viral illness and rhinosinusitis.

### Medications

Medications can produce a secondary headache as a medication side effect or analgesics overuse headaches.

**A headache due to refractive error** which indicates visual examination and refractive correction.

Other causes of secondary headaches include **trauma**, **intracranial hemorrhage**,

## brain tumor, [meningitis](#), and [hydrocephalus](#).

**Note:** Pathology of a secondary headache in children include intracranial infection, increased ICP (Cushing's triad, ICP is from too much on one of the tissues in the skull, a headache diary can help: if morning headaches, consider mass), analgesic abuse (NSAIDs used chronically can cause a headache nonresponsive to NSAIDs!).

Diagnosis of the cause can be achieved with **neuroimaging and laboratory studies** and management differs according to the cause.

## Historical clues

- A morning or a nocturnal headache
- Morning vomiting
- Severe pain at the onset of a headache (AVM, aneurysm, etc.)
- Fixed location or occipital location
- A headache in a child with a VP shunt
- Lethargy, confusion
- Vomiting
- A headache before seizures

## Physical exam clues

- Hypertension and bradycardia
- Papilledema
- Nuchal rigidity
- Cranial nerve palsy
- Focal neurologic exam
- Ash leaf spots
- Macrocephaly

## References

[Pediatric headache](#) via [emedicine.medscape.com](http://emedicine.medscape.com)

[Headache in children: Approach to evaluation and general management strategies](#) via [uptodate.com](http://uptodate.com)

[Children's Headache Disorders](#) via National Headache Foundation, on [headaches.org](http://headaches.org)

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