Approach to the child with headache

Authors
Daniel J Bonthius, MD, PhD
Andrew G Lee, MD

Section Editors
Jan E Drutz, MD
Marc C Patterson, MD, FRACP

Deputy Editor
Mary M Torchia, MD

Disclosures

All topics are updated as new evidence becomes available and our peer review process is complete.
Literature review current through: Mar 2014. | **This topic last updated:** Dec 8, 2013.

INTRODUCTION — Headache (pain located above the orbitomeatal line) is a common complaint in children and adolescents. The frequency increases with increasing age, and the etiologies range from anxiety regarding school issues to life-threatening infections and brain tumors (table 1). Children who complain of headache usually are brought to medical attention by their parents, who seek reassurance that the headaches are not a sign of a brain tumor or other serious illness. A thorough history, physical and neurologic examination, and appropriate diagnostic testing (if indicated) will usually enable the clinician to distinguish a benign primary headache from a more serious disease with a secondary headache.

An overview of the causes, evaluation, and management of headache in children will be presented here. The emergent evaluation of headache in children, specific primary headache syndromes in children, and headache related to exertion are discussed separately:

- (See "Emergent evaluation of headache in children".)
- (See "Classification of migraine in children".)
- (See "Pathophysiology, clinical features, and diagnosis of migraine in children".)
- (See "Management of migraine headache in children".)
- (See "Tension-type headache in children".)
- (See "Exertional headache".)

EPIDEMIOLOGY — Headaches are common in children [1-3]. In a systematic review of 50 population based studies, nearly 60 percent of children reported having had headaches over periods of time (ranging from one month to "lifetime") [3]. By age 18 years, more than 90 percent of children report having had a headache [1].

Frequent and severe headaches also are common in children. In the United States, approximately 20 percent of children aged 4 to 18 years report having had frequent or severe headaches (including migraine) in the past 12 months [4]. The prevalence of frequent and severe headaches increases with increasing age from 4.5 percent among children 4 to <6 years to 27.4 percent among children 16 to 18 years [4]. In a population-based study, 1.5 percent of middle-school students (age 12 to 14 years) had chronic daily headache [5]. (See 'Chronic daily headache' below.)

The prevalence of headaches among boys and girls is similar before 12 years of age (approximately 10 percent) [4]. After age 12 years, the prevalence is increased in girls (approximately 28 to 36 percent versus 20 percent) [2,4].

Headaches occur more often during the first 12 months after school entry and in children who have a family history of headaches in first- or second-degree relatives [6-8]. Children who have headaches are more likely to have multiple medical problems, physical symptoms, psychiatric symptoms, and headache in adulthood [4,9,10].

The epidemiology of migraine and tension-type headaches in children is discussed separately. (See "Pathophysiology, clinical features, and diagnosis of migraine in children", section on 'Epidemiology' and "Tension-type headache in children", section on 'Epidemiology'.)

ETIOLOGY — Headache in children and adolescents may be due to a primary headache syndrome (ie, migraine headache, tension-type headache, cluster headache (table 2)) or secondary to an underlying medical condition. Secondary headaches usually are related to an acute febrile illness (eg, upper respiratory infection, influenza) but may be due to central nervous system infection or space-occupying lesion.

Childhood headaches rarely are caused by a serious underlying disorder [11]. The most common headache etiologies vary depending upon the setting in which the child is evaluated. Most children who present to pediatric emergency departments with acute headache have a viral illness or an upper respiratory infection as the cause of their headache, although more serious conditions occasionally are diagnosed [12,13]. (See "Emergent evaluation of headache in children", section on 'Causes'.)

In the primary care setting, primary headaches, psychosocial (eg, family or school problems) etiologies, and infectious etiologies are most common [14-16]. In a historical cohort of 48,575 children aged 5 to 17 years who were seen by primary care providers for complaint of headache, 19 percent were diagnosed with primary headache at the time of presentation, 1.1 percent were diagnosed with secondary headache, and 79.7 percent received no formal diagnosis (5.4 percent of these were diagnosed with primary headaches in the subsequent year) [16].

Primary headache — The most common primary headache syndromes in children are migraine headache, tension-type headache, and cluster headache (table 2). Chronic daily headache may evolve from migraine or tension-type headache.

Migraine headache — Migraine is the most frequent acute-recurrent headache syndrome in childhood. It is characterized by periodic episodes of headache accompanied by nausea, vomiting, abdominal pain, and desire to sleep (table 3A). Autonomic symptoms are essential to the diagnosis of migraine and include photophobia, phonophobia, nausea, and vomiting [17]. In children, particularly young children, the duration of headache may be as short as one hour [18,19], and the headache may be bilateral (bifrontal or bitemporal). Occipital headaches may have an organic cause and need to be investigated further. (See 'Worrisome findings' below.)

The clinical features, diagnosis, and management of migraine headaches in children are discussed separately. (See "Pathophysiology, clinical features, and diagnosis of migraine in children".)

Migraine headaches may be complicated by hemiplegia, ophthalmoplegia, tinnitus, vertigo, ataxia, weakness, confusion, and paresthesias [17]. Children who have complicated migraine headaches should be thoroughly evaluated because other diagnoses (eg, intracranial tumor, hemorrhage, ischemic stroke, or infection) must be excluded. (See 'Evaluation' below.)

Migraine "variants" traditionally include benign paroxysmal vertigo, cyclic vomiting, and abdominal migraine. Benign torticollis, comprised of recurrent, often short-lived, and spontaneously recovering attacks of head tilt in infants, also has been proposed as a variant of migraine [20,21]. (See "Classification of migraine in children", section on 'Episodic syndromes that may be associated with migraine' and "Acquired torticollis in children", section on 'Benign paroxysmal torticollis'.)

Tension-type headaches — Tension-type headaches are characterized by a bilateral pressing tightness that occurs anywhere on the cranium or suboccipital region (table 3B). The headache is non-throbbing, of mild to moderate intensity, and lasts from 30 minutes to several days. Tension headache may be associated with photophobia or phonophobia but usually is not accompanied by nausea or vomiting, nor aggravated by routine physical activity [17]. The overlap of some of these symptoms with those of migraine headache can make differentiation between the two headache types difficult [18]. Tension-type headaches in children are discussed separately. (See "Tension-type headache in children".)

Cluster headaches — Cluster headaches are always unilateral and usually frontal-periorbital in location (table 3C). The pain of cluster headaches is severe and lasts less than three hours. Cluster headaches usually are associated with ipsilateral autonomic findings, including lacrimation, rhinorrhea, ophthalmic injection, and occasionally a Horner syndrome (ipsilateral miosis, ptosis, and facial anhidrosis) [17].

Cluster headaches have been reported in children as young as three years of age, but they are rare in children younger than 10 years. They become more apparent between the ages of 10 and 20 years. Cluster headaches are discussed separately. (See "Cluster headache: Epidemiology, clinical features, and diagnosis", section on 'Clinical features'.)

Chronic daily headache — Chronic daily headache (CDH) is defined as headache that is present for more than 15 days a month for more than three months in the absence of detectable organic pathology [22]. CDH encompasses four subtypes of daily headache defined by the International Headache Society (IHS): chronic migraine, chronic tension-type headache, new daily persistent headache, and hemicrania continua [17]. (See "Overview of chronic daily headache", section on 'Subtypes'.)

CDH is a considerable problem in children. In a population-based study of middle school students (age 12 to 14 years), the overall prevalence was 1.5 percent [5]. CDH was more

common in girls than boys (2.4 versus 0.8 percent). Most of the adolescents with CDH had chronic tension-type headache or chronic migraine (66 and 7 percent, respectively) by IHS criteria. Most had headaches with features of migraine, although they did not satisfy IHS criteria for migraine, confirming the findings of a previous study [23].

Avoidance of analgesic overuse may be an important step in the prevention of CDH [24]. Medication overuse has been reported in 20 to 36 percent of adolescents with daily headache and is an independent predictor of CDH persistence [5,17,25-27]. Major depression is another independent predictor of CDH persistence [27].

Secondary headache — Secondary headaches are caused by an underlying medical problem [28]. Secondary headaches may provide a clue to a serious underlying condition that requires prompt intervention. Children with these conditions usually have other symptoms or signs to suggest intracranial pathology (table 4). (See 'Worrisome findings' below.)

Conditions that may cause secondary headache in children include [28]:

- Acute febrile illness (eg, influenza, upper respiratory infection, sinusitis). (See appropriate topic reviews.) Such infections are the most common cause of secondary headache in children [12,13]. If persistent headache is the dominant feature of sinusitis, neuroimaging may be indicated to exclude intracranial complications. (See "Acute bacterial rhinosinusitis in children: Clinical features and diagnosis", section on 'Complications'.)
- Head trauma (see "Intracranial epidural hematoma in children: Clinical features, evaluation, and management", section on 'Clinical features' and "Intracranial subdural hematoma in children: Clinical features, evaluation, and management", section on 'Clinical features')
- Medications (eg, oral contraceptives, glucocorticoids, selective serotonin reuptake inhibitors, serotonin-norepinephrine reuptake inhibitors, among others)
- Acute and severe systemic hypertension (may cause headache or be a response to increased intracranial pressure) (see "Evaluation of hypertension in children and adolescents", section on 'Initial evaluation')
- Acute or chronic meningitis (see "Bacterial meningitis in children older than one month: Clinical features and diagnosis", section on 'Clinical features' and "Viral meningitis: Clinical features and diagnosis in children", section on 'Clinical features')
- Brain tumor (see "Clinical manifestations and diagnosis of central nervous system tumors in children", section on 'Clinical manifestations')
- Idiopathic intracranial hypertension (see "Idiopathic intracranial hypertension (pseudotumor cerebri): Clinical features and diagnosis")
- Hydrocephalus (see "Hydrocephalus", section on 'Clinical features')
- Intracranial hemorrhage (sudden severe unilateral headache)

CLINICAL PRESENTATION — Young children respond to pain differently than older children and adolescents [29,30]. Headache pain may not be apparent to parents of younger children, who react by crying, rocking, or hiding. Chronic pain may cause developmental regression, anxiety, depression, and behavior problems and affect the child's ability to eat, sleep, or play. Older children are better able to perceive, localize, and remember pain. Emotional, behavioral, and personality factors become more important as the child enters adolescence. The variability in presentation in children of different ages may lead to difficulty when applying the standard headache diagnostic criteria (eg, International Headache Classification) [31].

EVALUATION — The evaluation of headache in children includes a thorough history (table 5) and physical examination (table 6), with particular attention to the clinical features suggestive of intracranial infection or space-occupying lesion (table 4). The headache pattern helps to determine the etiology (table 1).

History — The headache history provides most of the necessary diagnostic information in the evaluation of childhood headaches (table 5). A thorough history helps to focus the physical examination and prevent unnecessary investigation and neuroimaging.

The history of headache for a child, particularly a child who is younger than 10 years of age, is best obtained with input from the parents. Nonetheless, the child should always be given the opportunity to describe his or her headache first. It is often useful to ask a child to “draw the headache,” particularly any visual symptoms. Children and adolescents frequently are able to identify specific circumstances that cause headache (eg, the return to school may precipitate tension-type headaches, riding in a car may precipitate migraine). Motion sickness precipitated by reading in a car is a common feature in migraine sufferers, and may be elicited as the sole symptom in some family members [10,32].

A diary in which the quality, location, severity, timing, precipitating and palliating factors, and associated features of the headache are recorded prospectively is a useful adjunct (table 7). A diary is not subject to recall error, may reveal a pattern that is typical for a certain type of headache (table 1), and provides important diagnostic information for children who are unwilling or unable to provide sufficient detail during the office interview [33,34].

Headache pattern — Using historical information, the examiner can classify the headache into one of the following patterns, which helps to determine the etiology (table 1) [29]:

- Acute
- Acute and recurrent
- Chronic and nonprogressive
- Chronic and progressive
- Mixed pattern (eg, chronic nonprogressive headaches with superimposed acute recurrent headaches)

Physical examination — The physical examination is usually normal in children with primary headaches (eg, migraine headache, tension-type headache). (See "Pathophysiology, clinical features, and diagnosis of migraine in children", section on 'Diagnosis' and "Tension-type headache in children", section on 'Examination'.)

In contrast, the physical examination is usually abnormal in children with secondary headaches, providing clues to the underlying diagnosis (eg, sinus tenderness in a child with sinusitis; fever and nuchal rigidity in a child with meningitis). In most cases of brain-tumor-induced headache, some aspect of the neurologic examination is abnormal. (See "Clinical manifestations and diagnosis of central nervous system tumors in children", section on 'Headache'.)

Depending upon the clinical situation, the physical examination of the child with headache may include (table 6):

- General appearance
- Vital signs, including temperature, blood pressure, and pulse
- Measurement of height, weight, and head circumference
- Auscultation of the neck, eyes, and head for bruit
- Examination and palpation of the head, neck, shoulders, and spine
- Visual field testing
- Funduscopy for papilledema and retinal hemorrhages
- Otoscopy for otitis media and hemotympanum
- Examination of the oropharynx for signs of infection, dental decay/abscess
- A functional neurologic examination including getting up from a seated position without any support; walking on tiptoes and heels; cranial nerve examination; tandem gait and Romberg test; and symmetry of motor, sensory, reflex, and cerebellar (coordination) tests
- Examination of the skin for signs of neurocutaneous disorders
- Examination of the spine for signs of occult dysraphism

Worrisome findings — Predictors for intracranial pathology (ie, space-occupying lesion or central nervous system infection) have been identified in small observational studies (table 4) [35-40]. It is particularly important to ask about and look for these symptoms and signs of increased intracranial pressure, intracranial infection, and progressive neurologic disease. The presence of findings is an indication for further evaluation and/or neuroimaging. (See "Elevated intracranial pressure (ICP) in children", section on 'Presentation'.)

Neuroimaging — Neuroimaging studies (eg, computed tomography [CT] or magnetic resonance imaging [MRI]) may detect a variety of disorders that cause secondary headache,

including:

- Congenital malformations
- Hydrocephalus
- Cranial infections and their sequelae
- Trauma and its sequelae
- Neoplasms
- Vascular disorders (such as arteriovenous malformations)

However, most children who present to primary care with headaches have primary or uncharacterized headaches and do not require neuroimaging [16]. Neuroimaging of children with headaches in the absence of neurologic abnormalities on examination and/or symptoms of neurologic abnormalities on history has a low yield of clinically significant findings (0.9 to 1.2 percent) [40-43]. Neuroimaging of such children may detect incidental findings that require additional evaluation or follow-up [41,42,44,45]. Other potential adverse effects of neuroimaging include radiation exposure, exposure to anesthesia if sedation is required, and false reassurance from an inadequate study [46].

Indications — Decisions regarding neuroimaging in children with headaches should be made on a case-by-case basis [46]. Children who have features worrisome for an intracranial process (table 4) generally should undergo neuroimaging with CT or MRI. The level of urgency is determined by the status of the patient and the speed with which the situation is evolving [14]. (See 'Which imaging study?' below.)

The American Academy of Neurology (AAN) and the American College of Radiology (ACR) have developed guidelines for neuroimaging in children with headache [40,41]. In addition, the multidisciplinary US Headache Consortium provides guidelines that are not specific for children [46].

Neuroimaging for children with acute head trauma, suspected infection (eg, sinusitis, meningitis, encephalitis), or other obvious cause is discussed separately. (See appropriate topic reviews.)

Indications for neuroimaging in children (3 to 18 years) with recurrent headaches that are not associated with acute trauma, fever, or other obvious provocative cause may include (but are not limited to) [40,41,46]:

- Abnormal neurologic examination and/or seizures
- Recent onset of severe headache
- Change in type or character of headache (for children with recurrent or chronic headaches)
- Suspicion of meningitis, encephalitis, or sinusitis with intracranial extension
- Severe headache in a child with underlying disease process that predisposes to intracranial pathology (eg, immune deficiency, sickle cell disease, neurofibromatosis, history of neoplasm, coagulopathy, hypertension)

Neuroimaging generally is not indicated for children with chronic nonprogressive headaches and no signs or symptoms of neurologic dysfunction or increased intracranial pressure [40,41,46]. Neuroimaging also usually is not indicated for children with migraine headaches who lack neurologic abnormalities. However, it may be difficult to differentiate early migraine episodes from headache secondary to a space-occupying lesion because the International Headache Society criteria for migraine headache will not have been met (table 3A) [40]. Neuroimaging often is warranted in children who have complicated migraines or atypical migraine features, or do not fulfill the strict criteria for migraine [40,46].

The yield of neuroimaging in detecting clinically significant intracranial abnormalities in children without neurologic abnormalities is extremely low. In a systematic review of six studies in which 605 of 1275 children with recurrent headaches underwent neuroimaging, imaging abnormalities were found in 97 children (16 percent) [35,40,47-51]. However, in 79 of these children, the abnormalities did not require further intervention. Among the remaining 18 children, 14 had lesions requiring surgery (10 tumors, three vascular malformations, one arachnoid cyst with mass effect), and four had lesions that required medical treatment. All of the children who had surgically treatable lesions had abnormal findings on neurologic examination, including papilledema, abnormal eye movements, or motor or gait dysfunction.

Which imaging study? — The AAN practice parameter, ACR appropriateness criteria, and Headache Consortium guidelines do not make a specific recommendation for MRI or CT in patients who require neuroimaging [40,41,46]. Head CT without contrast is typically performed in acute situations in which hemorrhage is suspected or rapid diagnosis of a space-occupying lesion is necessary. In nonacute situations, the increased risk of radiation-induced tumors associated with CT imaging in children is an important factor in selecting the imaging modality [52]. (See "Approach to neuroimaging in children", section on 'Computed tomography'.)

MRI usually is preferred in nonacute situations (or if there is persistent concern despite a normal head CT scan) because MRI demonstrates sellar lesions, craniocervical junction lesions, posterior fossa lesions, white matter abnormalities, and congenital anomalies more accurately than does CT. However, MRI may require sedation and is more expensive and time-consuming than is CT. (See "Approach to neuroimaging in children", section on 'Magnetic resonance imaging'.)

CT angiography or MR angiography may be indicated if subarachnoid blood or parenchymal blood is identified on initial CT, MRI, or lumbar puncture [41]. (See 'Lumbar puncture' below.)

Laboratory evaluation — Laboratory testing rarely is helpful in the evaluation of childhood headache [34,40,53]. The AAN practice parameter indicates that the evidence is insufficient to support any recommendation regarding the value of routine laboratory studies or lumbar puncture in the evaluation of recurrent headache in children [40]. However, laboratory testing may be indicated if the history and/or physical examination suggest that the headaches are secondary to an underlying condition.

Lumbar puncture — Lumbar puncture (LP) generally should be performed in children in whom intracranial infection, subarachnoid hemorrhage, or idiopathic intracranial hypertension (pseudotumor cerebri) is suspected. Neuroimaging typically is performed before LP because LP is contraindicated in patients with space-occupying lesions. However, in patients in whom bacterial meningitis is suspected, the risks of delaying the LP and administration of antibiotics while awaiting neuroimaging must be considered. (See "Lumbar puncture: Indications, contraindications, technique, and complications in children", section on 'Indications' and "Lumbar puncture: Indications, contraindications, technique, and complications in children", section on 'Contraindications'.)

Patients in whom idiopathic intracranial hypertension is suspected may require reassurance or sedation before undergoing the lumbar puncture, because an accurate opening pressure measurement is crucial to the diagnosis. (See "Idiopathic intracranial hypertension (pseudotumor cerebri): Clinical features and diagnosis", section on 'Lumbar puncture'.)

Other tests — Other tests should be performed as indicated to evaluate suspected underlying medical conditions. These tests should be tailored to evaluate conditions suggested by information from the history and examination. Examples include [14]:

- Complete blood count with differential and erythrocyte sedimentation rate (if infection, vasculitis, or malignancy is suspected)
- Serum or urine toxicology screens (if acute intoxication is suspected)
- Thyroid function tests (if thyroid dysfunction is suspected hypothyroidism) (see "Clinical manifestations and diagnosis of hyperthyroidism in children and adolescents", section on 'Diagnostic evaluation' and "Acquired hypothyroidism in childhood and adolescence", section on 'Diagnosis')

Electroencephalography — Electroencephalography is not recommended in the routine evaluation of a child with recurrent headaches [40]. It is unlikely to be useful in determining the cause or distinguishing migraine from other types of headache.

DIAGNOSIS — The diagnosis of primary headache disorders is made clinically, based upon the criteria of the International Headache Society [17]:

- Migraine headache (table 3A) (see 'Migraine headache' above)
- Tension-type headache (table 3B) (see 'Tension-type headaches' above)
- Cluster headache (table 3C) (see 'Cluster headaches' above)

The diagnosis of chronic daily headache is also made clinically in children with headache on more than 15 days a month for more than three months in the absence of detectable organic pathology [22]. (See 'Chronic daily headache' above.)

The diagnosis of secondary headaches depends upon identification of the underlying condition. (See 'Secondary headache' above.)

MANAGEMENT — The management of recurrent and chronic headache in children and adolescents depends upon the underlying etiology. The management of migraine headache and tension-type headaches is discussed separately. (See "Management of migraine headache in children" and "Tension-type headache in children", section on 'Treatment'.)

The discussion below provides general strategies for the management of chronic headaches in children and adolescents (whether or not they meet criteria for a primary headache syndrome or chronic daily headache). It is critical to address excessive school absence and overuse of over-the-counter analgesic medications (eg, acetaminophen, ibuprofen, naproxen) [14,24,54]. Analgesic agents should probably not be given more than two days per week to avoid the risk of medication-overuse headache [52,55,56].

Treatment of chronic headaches requires a systematic approach over several months through which the child returns to normal activities of daily living [57]. Specific measures may include [54,58]:

- Providing realistic expectations (ie, the frequency and severity of the headaches may decrease over weeks to months of therapy, but the headaches may continue) (see 'Outcome' below)
- Return to school for children who have been absent; if necessary, they can go to the school nurse or office once daily for 15 minutes when headache pain peaks
- Avoidance of headache triggers (eg, lack of sleep, inadequate hydration)
- Daily exercise for 20 to 30 minutes
- Addressing comorbid sleep problems (eg, delayed sleep onset, frequent night waking), mood problems, and/or anxiety

Additional nonpharmacologic approaches may include electrophysiologic-guided biofeedback, guided imagery, physical therapy, acupuncture, hypnosis, meditation, massage, and counseling or psychologic consultation [14,55,59].

Medications are an adjunct to nonpharmacologic treatments. “Rescue” analgesic medications should be used judiciously; the benefit of early relief must be balanced with the risk of developing chronic daily headaches if rescue medications are used more than twice per week. Prophylactic agents may be necessary for children with headaches more than four times per month or headaches that adversely affect the child’s activities [55].

Treatment of chronic headaches related to medication overuse consists of discontinuation of analgesic medications. An observational study suggests that daily preventive agents may not be necessary or beneficial when analgesics are discontinued for medication-overuse headache in children and adolescents [60].

INDICATIONS FOR REFERRAL — Primary care providers usually can manage children and adolescents with acute recurrent and chronic nonprogressive headaches. Indications for referral may include [14,61]:

- Secondary headache requiring specialist management (eg, space-occupying lesions, idiopathic intracranial hypertension)
- Headaches associated with mood disturbance or anxiety
- Uncertain diagnosis
- Headaches refractory to primary care management
- Chronic daily headache (the primary care provider should know the plan and help with its implementation)

OUTCOME — Headache that begins in childhood often changes in its characteristics with time and may remit or improve. In one study, 100 children and adolescents with headache were seen eight years after the initial visit [62]. Remission occurred in 44 percent of children with tension headache and 28 percent of children with migraine headache. Migraine without aura persisted in the same form in 44 percent and became episodic tension headache in 26 percent. Episodic tension headache persisted in the same form in 26 percent and changed to migraine without aura in 11 percent. Psychiatric comorbidity at the initial visit was associated with worsening or unchanged clinical status at follow-up [63].

In another long-term study of 103 children with chronic daily headache (CDH), CDH persisted in 25 percent at two years and 12 percent at eight years [64]. Early onset was associated with a protracted disease course.

RESOURCES

- The American Committee for Headache Education (www.achenet.org/) provides information and resources for patients and providers.
- The American Headache Society (www.americanheadachesociety.org/) provides resources for clinicians.
- The National Headache Foundation (www.headaches.org) provides information and resources for patients and providers.

INFORMATION FOR PATIENTS — UpToDate offers two types of patient education materials, “The Basics” and “Beyond the Basics.” The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on “patient info” and the keyword(s) of interest.)

- Basics topic (see "Patient information: Headaches in children (The Basics)" and "Patient information: Migraine headaches in children (The Basics)")
- Beyond the Basics topics (see "Patient information: Headache in children (Beyond the Basics)")

SUMMARY

- Approximately 20 percent of children aged 4 to 18 years report having had frequent or severe headaches in the past 12 months. (See 'Epidemiology' above.)
- Headache in children and adolescents may be due to a primary headache syndrome (ie, migraine headache, tension-type headache, cluster headache (table 2)) or secondary to an underlying medical condition. Secondary headaches usually are related to fever or infection (eg, upper respiratory infection, influenza), but may be due to central nervous system infection or space-occupying lesion. (See 'Etiology' above.)
- The evaluation of headache in children includes a thorough history (table 5) and physical examination (table 6), with particular emphasis on clinical features suggestive of intracranial pathology (table 4). The headache pattern helps to determine the etiology (table 1). (See 'Evaluation' above.)
- Neuroimaging (head computed tomography without contrast or magnetic resonance imaging without contrast) should be performed in children with headache and neurologic signs or symptoms suggestive of intracranial pathology (table 4). (See 'Neuroimaging' above.)
- Routine laboratory evaluation usually is not necessary for children with recurrent or chronic headaches. The laboratory evaluation for secondary headache should be tailored to evaluate conditions suggested by information from the history and examination. (See 'Laboratory evaluation' above.)
- The diagnosis of primary headache disorders is made clinically, based upon the criteria of the International Headache Society (table 3A-C). The diagnosis of chronic daily headache also is made clinically (headache on >15 days per month for >3 months in the absence of detectable organic pathology). The diagnosis of secondary headaches depends upon identification of the underlying condition. (See 'Diagnosis' above.)
- The treatment of chronic headaches requires a systematic approach over several months through which the child returns to normal activities of daily living. It is critical to address excessive school absence and overuse of over-the-counter analgesic medications. (See 'Management' above.)

REFERENCES

1. Barea LM, Tannhauser M, Rotta NT. An epidemiologic study of headache among children and adolescents of southern Brazil. Cephalalgia 1996; 16:545.
2. Zwart JA, Dyb G, Holmen TL, et al. The prevalence of migraine and tension-type headaches among adolescents in Norway. The Nord-Trøndelag Health Study (Head-HUNT-Youth), a large population-based epidemiological study. Cephalalgia 2004; 24:373.

3. Abu-Arafeh I, Razak S, Sivaraman B, Graham C. Prevalence of headache and migraine in children and adolescents: a systematic review of population-based studies. Dev Med Child Neurol 2010; 52:1088.
4. Lateef TM, Merikangas KR, He J, et al. Headache in a national sample of American children: prevalence and comorbidity. J Child Neurol 2009; 24:536.
5. Wang SJ, Fuh JL, Lu SR, Juang KD. Chronic daily headache in adolescents: prevalence, impact, and medication overuse. Neurology 2006; 66:193.
6. Aromaa M, Rautava P, Sillanpää M, et al. Familial occurrence of headache. Cephalalgia 1999; 19 Suppl 25:49.
7. Russell MB, Ostergaard S, Bendtsen L, Olesen J. Familial occurrence of chronic tension-type headache. Cephalalgia 1999; 19:207.
8. Anttila P, Metsähonkala L, Sillanpää M. School start and occurrence of headache. Pediatrics 1999; 103:e80.
9. Fearon P, Hotopf M. Relation between headache in childhood and physical and psychiatric symptoms in adulthood: national birth cohort study. BMJ 2001; 322:1145.
10. Aromaa M, Sillanpää ML, Rautava P, Helenius H. Childhood headache at school entry: a controlled clinical study. Neurology 1998; 50:1729.
11. Abu-Arafeh I, Macleod S. Serious neurological disorders in children with chronic headache. Arch Dis Child 2005; 90:937.
12. Kan L, Nagelberg J, Maytal J. Headaches in a pediatric emergency department: etiology, imaging, and treatment. Headache 2000; 40:25.
13. Burton LJ, Quinn B, Pratt-Cheney JL, Pourani M. Headache etiology in a pediatric emergency department. Pediatr Emerg Care 1997; 13:1.
14. Strasburger VC, Brown RT, Braverman PK, et al. Headache. In: Adolescent Medicine A Handbook for Primary Care, Lippincott Williams & Wilkins, Philadelphia 2006. p.25.
15. van der Wouden JC, van der Pas P, Bruijnzeels MA, et al. Headache in children in Dutch general practice. Cephalalgia 1999; 19:147.
16. Kernick D, Stapley S, Campbell J, Hamilton W. What happens to new-onset headache in children that present to primary care? A case-cohort study using electronic primary care records. Cephalalgia 2009; 29:1311.
17. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders: 2nd edition. Cephalalgia 2004; 24 Suppl 1:9.
18. Zebenholzer K, Wöber C, Kienbacher C, Wöber-Bingöl C. Migrainous disorder and headache of the tension-type not fulfilling the criteria: a follow-up study in children and adolescents. Cephalalgia 2000; 20:611.
19. Abu-Arafeh I, Callaghan M. Short migraine attacks of less than 2 h duration in children and adolescents. Cephalalgia 2004; 24:333.
20. Cohen HA, Nussinovitch M, Ashkenasi A, et al. Benign paroxysmal torticollis in infancy. Pediatr Neurol 1993; 9:488.
21. Hanukoglu A, Somekh E, Fried D. Benign paroxysmal torticollis in infancy. Clin Pediatr (Phila) 1984; 23:272.
22. Dodick DW. Clinical practice. Chronic daily headache. N Engl J Med 2006; 354:158.
23. Koenig MA, Gladstein J, McCarter RJ, et al. Chronic daily headache in children and adolescents presenting to tertiary headache clinics. Headache 2002; 42:491.
24. Hershey AD, Lipton RB. Adolescents get as well as they give: population perspectives on chronic daily headaches. Neurology 2006; 66:160.
25. Cuvellier JC, Couttenier F, Joriot-Chekaf S, Vallée L. Chronic daily headache in French children and adolescents. Pediatr Neurol 2008; 38:93.
26. Dyb G, Holmen TL, Zwart JA. Analgesic overuse among adolescents with headache: the Head-HUNT-Youth Study. Neurology 2006; 66:198.
27. Wang SJ, Fuh JL, Lu SR, Juang KD. Outcomes and predictors of chronic daily headache in adolescents: a 2-year longitudinal study. Neurology 2007; 68:591.
28. Lewis DW, Koch T. Headache evaluation in children and adolescents: when to worry? When to scan? Pediatr Ann 2010; 39:399.
29. Rothner AD. The evaluation of headaches in children and adolescents. Semin Pediatr Neurol 1995; 2:109.
30. Schechter NL. Recurrent pains in children: an overview and an approach. Pediatr Clin North Am 1984; 31:949.
31. Olesen J. International Headache Society classification and diagnostic criteria in children: a proposal for revision. Dev Med Child Neurol 1997; 39:138.
32. Welborn CA. Pediatric migraine. Emerg Med Clin North Am 1997; 15:625.
33. van den Brink M, Bandell-Hoekstra EN, Abu-Saad HH. The occurrence of recall bias in pediatric headache: a comparison of questionnaire and diary data. Headache 2001; 41:11.
34. Singh BV, Roach ES. Diagnosis and management of headache in children. Pediatr Rev 1998; 19:132.
35. Medina LS, 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.
36. Lewis DW, Qureshi F. Acute headache in children and adolescents presenting to the emergency department. Headache 2000; 40:200.
37. Abe T, Matsumoto K, Kuwazawa J, et al. Headache associated with pituitary adenomas. Headache 1998; 38:782.
38. Pfund Z, Szapáry L, Jászberényi O, et al. Headache in intracranial tumors. Cephalalgia 1999; 19:787.
39. Honig PJ, Charney EB. Children with brain tumor headaches. Distinguishing features. Am J Dis Child 1982; 136:121.
40. Lewis DW, Ashwal S, Dahl G, et al. 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. Neurology 2002; 59:490.
41. Prince JS, Gunderman R, Coley BD, et al. Expert Panel on Pediatric Imaging. ACR Appropriateness Criteria. Headache -- child. American College of Radiology, Reston, VA, 2008. http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonPediatricImaging/HeadacheChildDoc3.aspx (Accessed on March 17, 2011).
42. Sempere AP, Porta-Etessam J, Medrano V, et al. Neuroimaging in the evaluation of patients with non-acute headache. Cephalalgia 2005; 25:30.
43. Rho YI, Chung HJ, Suh ES, et al. The role of neuroimaging in children and adolescents with recurrent headaches--multicenter study. Headache 2011; 51:403.
44. Graf WD, Kayyali HR, Abdelmoity AT, et al. Incidental neuroimaging findings in nonacute headache. J Child Neurol 2010; 25:1182.
45. Schwedt TJ, Guo Y, Rothner AD. "Benign" imaging abnormalities in children and adolescents with headache. Headache 2006; 46:387.
46. US Headache Consortium. Evidence-based guidelines in the primary care setting: Neuroimaging in patients with nonacute headache, 2000. www.aan.com/professionals/practice/pdfs/gl0088.pdf (Accessed on March 23, 2011).
47. Chu ML, Shinnar S. Headaches in children younger than 7 years of age. Arch Neurol 1992; 49:79.
48. Maytal J, Bienkowski RS, Patel M, Eviatar L. The value of brain imaging in children with headaches. Pediatrics 1995; 96:413.
49. Dooley JM, Camfield PR, O'Neill M, Vohra A. The value of CT scans for children with headaches. Can J Neurol Sci 1990; 17:309.
50. Wöber-Bingöl C, Wöber C, Prayer D, et al. Magnetic resonance imaging for recurrent headache in childhood and adolescence. Headache 1996; 36:83.
51. Lewis DW, Dorbad D. The utility of neuroimaging in the evaluation of children with migraine or chronic daily headache who have normal neurological examinations. Headache 2000; 40:629.
52. Choosing Wisely. American Headache Society. Five things physicians and patients should question. www.choosingwisely.org/wp-content/uploads/2013/11/AHS-5things-List_112013.pdf (Accessed on December 08, 2013).
53. Rothner AD. Headaches in children and adolescents. Child Adolesc Psychiatr Clin N Am 1999; 8:727.
54. Mack KJ. An approach to children with chronic daily headache. Dev Med Child Neurol 2006; 48:997.
55. Newton RW. Childhood headache. Arch Dis Child Educ Pract Ed 2008; 93:105.
56. Symon DN. Twelve cases of analgesic headache. Arch Dis Child 1998; 78:555.
57. Rosenblum RK, Fisher PG. A guide to children with acute and chronic headaches. J Pediatr Health Care 2001; 15:229.
58. Fisher PG. Systematic approach needed in managing chronic headaches. AAP News 2006; 27:10.
59. Eccleston C, Palermo TM, de C Williams AC, et al. Psychological therapies for the management of chronic and recurrent pain in children and adolescents. Cochrane Database Syst Rev 2012; 12:CD003968.
60. Kossoff EH, Mankad DN. Medication-overuse headache in children: is initial preventive therapy necessary? J Child Neurol 2006; 21:45.
61. Gladstein J, Mack KJ. Common presentations of chronic daily headache in adolescents. Pediatr Ann 2010; 39:424.
62. Guidetti V, Galli F. Evolution of headache in childhood and adolescence: an 8-year follow-up. Cephalalgia 1998; 18:449.
63. Guidetti V, Galli F, Fabrizi P, et al. Headache and psychiatric comorbidity: clinical aspects and outcome in an 8-year follow-up study. Cephalalgia 1998; 18:455.

64. Wang SJ, Fuh JL, Lu SR. Chronic daily headache in adolescents: an 8-year follow-up study. Neurology 2009; 73:416.

Topic 2842 Version 9.0

GRAPHICS

Etiologic classification of headache in children

Acute
Localized
Associated with URI (sinusitis, otitis media) or viral infection (influenza)
Post-traumatic
Related to oral cavity (dental abscess, TMJ dysfunction)
Brain abscess
First migraine
Generalized
Fever
Systemic infection (influenza)
Central nervous system infection (meningitis, viral encephalitis)
Hypertension, hypertensive encephalopathy
Intracranial hemorrhage
Exertional
First migraine headache
Trauma
Toxins (eg, carbon monoxide), medications (eg, amphetamines, oral contraceptives), or illicit substances
Acute and recurrent
Migraine headache
Cluster headache
Chronic and non-progressive
Tension-type headache
Psychiatric (depression, school phobia)
Post-traumatic, postconcussive
Medication overuse
Chronic and progressive
Idiopathic intracranial hypertension
Space-occupying lesion (tumor, abscess, hemorrhage, hydrocephalus, vascular malformation)
Post-traumatic, postconcussive

URI: upper respiratory infection; TMJ: temporomandibular joint.

Adapted from:

1. *Morton L. Headache. In: Clinical Handbook of Pediatrics, Schwartz MW (Ed), Williams and Wilkins, Baltimore 1995, p.316.*
2. *Rothner DA. Headache in adolescence. Adolescent Health Update. 2006; 18:1.*
3. *Strasburger VC, Brown RT, Braverman PK, et al. Headache. In: Adolescent Medicine A Handbook for Primary Care, Lippincott Williams & Wilkins, Philadelphia 2006. p.25.*

Graphic 54034 Version 6.0

Characteristics of common headache syndromes in children and adolescents

Symptom	Migraine headache	Tension headache	Cluster headache
Location	Commonly bilateral in young children; in adolescents and young adults, unilateral in 60 to 70 percent and bifrontal or global in 30 percent	Bilateral	Always unilateral, usually begins around the eye or temple
Characteristics	Gradual in onset, crescendo pattern; pulsating; moderate or severe intensity; aggravated by routine physical activity	Pressure or tightness that waxes and wanes	Pain begins quickly, reaches a crescendo within minutes; pain is deep, continuous, excruciating, and explosive in quality
Patient appearance	Patient prefers to rest in a dark, quiet room	Patient may remain active or may need to rest	Patient remains active
Duration	1 to 72 hours	Variable	30 minutes to 3 hours
Associated symptoms	Nausea, vomiting, photophobia*, phonophobia*; may have aura (usually visual, but can involve other senses or cause speech or motor deficits)	None	Ipsilateral lacrimation and redness of the eye; stuffy nose; rhinorrhea; pallor; sweating; Horner syndrome; focal neurologic symptoms rare; sensitivity to alcohol

* May be inferred from the behavior of young children.

Graphic 70794 Version 2.0

Diagnostic criteria for migraine

Migraine without aura
A. At least five attacks fulfilling criteria B through D
B. Headache attacks lasting 4 to 72 hours (untreated or unsuccessfully treated)
C. Headache has at least two of the following characteristics:
Unilateral location
Pulsating quality
Moderate or severe pain intensity
Aggravation by or causing avoidance of routine physical activity (eg, walking or climbing stairs)
D. During headache at least one of the following:
Nausea, vomiting, or both
Photophobia and phonophobia
E. Not better accounted for by another ICHD-3 diagnosis
Migraine with aura
A. At least two attacks fulfilling criterion B and C
B. One or more of the following fully reversible aura symptoms:
Visual
Sensory
Speech and/or language
Motor
Brainstem
Retinal
C. At least two of the following four characteristics:
At least one aura symptom spreads gradually over ≥5 minutes, and/or two or more symptoms occur in succession
Each individual aura symptom lasts 5 to 60 minutes
At least one aura symptom is unilateral
The aura is accompanied, or followed within 60 minutes, by headache
D. Not better accounted for by another ICHD-3 diagnosis, and transient ischemic attack has been excluded
Migraine with typical aura
A. At least two attacks fulfilling criteria B through D
B. Aura consisting of visual, sensory and/or speech/language symptoms, each fully reversible, but no motor, brainstem or retinal symptoms
C. At least two of the following four characteristics:
At least one aura symptom spreads gradually over ≥5 minutes, and/or two or more symptoms occur in succession
Each individual aura symptom lasts 5 to 60 minutes
At least one aura symptom is unilateral
The aura is accompanied, or followed within 60 minutes, by headache
D. Not better accounted for by another ICHD-3 diagnosis, and transient ischemic attack has been excluded
Features of migraine in children
Attacks may last 2 to 72 hours
Headache is more often bilateral than in adults; an adult pattern of unilateral pain usually emerges in late adolescence or early adulthood
Occipital headache is rare and raises diagnostic caution for structural lesions
Photophobia and phonophobia may be inferred by behavior in young children

ICHD-3: International Classification of Headache Disorders, 3rd edition.

Adapted from: Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition (beta version). Cephalalgia 2013; 33:629.

Graphic 50876 Version 6.0

Tension-type headache diagnostic criteria

A. At least 10 episodes fulfilling criteria B through E. The number of days per month with such headache determines the subtype:
<1 day a month: infrequent episodic TTH
1 to 14 days a month: frequent episodic TTH
≥15 days a month: chronic TTH
B. Headache lasting from 30 minutes to 7 days for episodic TTH; headache lasts hours or may be continuous for chronic TTH
C. At least two of the following pain characteristics:
Pressing/tightening (nonpulsating) quality
Mild or moderate intensity (may inhibit but does not prohibit activities)
Bilateral location
No aggravation by walking stairs or similar routine physical activity
D. Both of the following:
No nausea or vomiting (anorexia may occur)
Photophobia and phonophobia are absent, or one but not the other may be present
E. Not attributed to another disorder

TTH: tension-type headache.

Reproduced with permission from: Headache classification subcommittee of the International Headache Society. The International Classification of Headache Disorders: 2nd edition. Cephalalgia 2004; 24(Suppl 1):9.

Graphic 79672 Version 4.0

Diagnostic criteria for cluster headache

Cluster headache: Diagnostic criteria for cluster headache require the following:
A. At least five attacks fulfilling criteria B through D
B. Severe or very severe unilateral orbital, supraorbital and/or temporal pain lasting 15 to 180 minutes when untreated; during part (but less than half) of the time-course of cluster headache, attacks may be less severe and/or of shorter or longer duration
C. Either or both of the following:
1. At least one of the following symptoms or signs ipsilateral to the headache:
a) Conjunctival injection or lacrimation
b) Nasal congestion and/or rhinorrhea
c) Eyelid edema
d) Forehead and facial sweating
e) Forehead and facial flushing
f) Sensation of fullness in the ear
g) Miosis and/or ptosis
2. A sense of restlessness or agitation
D. Attacks have a frequency between one every other day and eight per day for more than half of the time when the disorder is active
E. Not better accounted for by another ICHD-3 diagnosis
Episodic cluster headache: Diagnostic criteria for episodic cluster headache require the following:
A. Attacks fulfilling criteria for cluster headache and occurring in bouts (cluster periods)
B. At least two cluster periods lasting from seven days to one year (when untreated) and separated by pain-free remission periods of one month or more
Chronic cluster headache: Diagnostic criteria for chronic cluster headache require the following:
A. Attacks fulfilling criteria for cluster headache
B. Attacks occurring without a remission period, or with remissions lasting less than one month, for at least one year

ICHD-3: International Classification of Headache Disorders 3rd edition.

Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition (beta version). Cephalalgia 2013; 33:629.

Graphic 80843 Version 5.0

Clinical features that may indicate intracranial pathology in children with headache

Headache characteristics
Headache awakens the child or occurs upon waking
Sudden severe headache ("thunderclap" headache, "worst headache of my life")
Associated neurologic signs and symptoms (eg, persistent nausea/vomiting, altered mental status, ataxia, etc)
Headache worsened in recumbent position or by cough, micturition, or defecation
Absence of aura
Chronic progressive headache pattern
Change in quality, severity, frequency, or pattern of headache
Occipital headache
Recurrent localized headache
Lack of response to medical therapy
Headache duration of less than six months
Examination findings
Abnormal neurologic examination (eg, ataxia, weakness, diplopia, abnormal eye movements)
Papilledema or retinal hemorrhages
Growth abnormalities (increased head circumference, short stature or deceleration of linear growth, abnormal pubertal progression, obesity)
Nuchal rigidity
Signs of trauma
Cranial bruits
Skin lesions that suggest a neurocutaneous syndrome (neurofibromatosis, tuberous sclerosis complex)
Patient history
Risk factor for intracranial pathology (eg, sickle cell disease, immune deficiency, malignancy or history of malignancy, coagulopathy, cardiac disease with right-to-left intracardiac shunt, head trauma, neurofibromatosis type 1, tuberous sclerosis complex)
Age <3 years
Family history
Absence of family history of migraine

Data from:

1. *Lewis DW, Ashwal S, Dahl G, et al. 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. Neurology 2002; 59:490.*
2. *Newton RW. Childhood headache. Arch Dis Child Educ Pract Ed 2008; 93:105.*
3. *Prince JS, Gunderman R, Coley BD, et al. Expert Panel on Pediatric Imaging. ACR Appropriateness Criteria. Headache - child. American College of Radiology, Reston, VA, 2008. http://www.acr.org/SecondaryMainMenuCategories/quality_safety/app_criteria/pdf/ExpertPanelonPediatricImaging/HeadacheChildDoc3.aspx (Accessed on March 17, 2011).*
4. *Strasburger VC, Brown RT, Braverman PK, et al. Headache. In: Adolescent Medicine A Handbook for Primary Care, Lippincott Williams & Wilkins, Philadelphia 2006. p.25.*
5. *Wilne S, Koller K, Collier J, et al. The diagnosis of brain tumours in children: a guideline to assist healthcare professionals in the assessment of children who may have a brain tumour. Arch Dis Child 2010; 95:534.*

Graphic 79664 Version 4.0

Important components of the headache history for children and adolescents

Historical feature	Possible significance
Headache history	
Age at onset	▪ Migraine headaches frequently begin in the first decade of life. ▪ Chronic nonprogressive headaches begin in adolescence.
Mode of onset	Abrupt onset of severe headache ("thunderclap headache" or "worst headache of my life") may indicate intracranial hemorrhage.
What is the headache pattern: acute, acute recurrent, chronic progressive, nonprogressive daily, or mixed?	Helps to determine the cause (see table "Etiology of headache").
How often does the headache occur?	▪ Migraines typically occur 2 to 4 times per month; almost never daily. ▪ Chronic nonprogressive headaches may occur 5 to 7 days per week. ▪ Cluster headaches typically occur 2 to 3 times per day for several months.
How long does the headache last?	▪ Migraines typically last 1 to 3 hours in young children and may last longer (48 to 72 hours) in adolescents. ▪ The duration of tension headaches is variable; they may last all day. ▪ Cluster headaches usually last 5 to 15 minutes but may last for 60 minutes.
Is there an aura or prodrome?	Aura or prodrome is suggestive of migraine headaches; if the warning symptoms are focal and repeatedly located to the same side of the body, a seizure or vascular or structural cause should be suspected.
When do the headaches occur?	▪ Headaches that wake the child from sleep or occur on waking may indicate increased intracranial pressure/space-occupying lesion. ▪ Tension-type headaches typically occur late in the day.
What is the headache quality (throbbing/pulsating, dull aching, squeezing, etc)?	▪ Migraine headaches have a throbbing/pulsating quality. ▪ Chronic nonprogressive headaches have a squeezing pressure or tightness that waxes and wanes. ▪ Cluster headaches have a deep continuous pain.
Where is the pain?	▪ Occipital location may indicate posterior fossa neoplasms but also may occur in basilar migraine. ▪ Cluster headaches are usually temporal or retro-orbital. ▪ Localized pain may suggest a specific secondary etiology (eg, sinusitis, otitis, dental abscess).
What brings the headache on or makes it worse?	▪ Headache in the recumbent position or with straining/valsalva may indicate an intracranial process. ▪ Migraines may be triggered by certain foods, odors, bright lights, noise, lack of sleep, menses (in girls), and strenuous activity. ▪ Tension-type headaches may worsen with stress, bright lights, noise, strenuous activity. ▪ Cluster headaches may be worsen with lying down or resting.
What makes the headache go away?	▪ Migraines typically respond to analgesic medications, dark, quiet room, cool compress, or sleep. ▪ Chronic tension-type headaches may respond to sleep (but not to analgesic medications).
Are there associated symptoms?	▪ Neurologic deficits (eg, ataxia, altered mental status, binocular horizontal diplopia) may indicate increased intracranial pressure and/or a space-occupying lesion. ▪ Fever may indicate infection, or rarely intracranial hemorrhage. ▪ Stiff neck may indicate meningitis, complicated pharyngitis, or intracranial hemorrhage. ▪ Localized pain may indicate localized infection (eg, otitis media, pharyngitis, sinusitis, dental abscess). ▪ Autonomic symptoms (eg, nausea, vomiting, pallor, chills, flushing, fever, dizziness, syncope, etc) may indicate migraine or cluster headache. ▪ Dizziness, numbness, and/or weakness may occur with idiopathic intracranial hypertension.
Do symptoms continue between headaches?	▪ Persistence of symptoms (neurologic symptoms or nausea/vomiting) between headache episodes is suggestive of increased intracranial pressure and/or mass lesions. ▪ Resolution of symptoms between episodes is characteristic of migraine headaches.
Headache burden	
Do the headaches impair normal functioning (eg, school attendance, activity) and quality of life?	Children with chronic nonprogressive headaches have frequent school absences; impaired function may warrant referral.
Additional information	
Past medical history	Certain underlying conditions increase the likelihood of intracranial pathology (eg, sickle cell disease, immune deficiency, malignancy or history of malignancy, coagulopathy, cardiac disease with right-to-left intracardiac shunt, head trauma, neurofibromatosis type 1, tuberous sclerosis complex).
Medications and vitamins	Medications that may cause headache include oral contraceptives, glucocorticoids, selective serotonin reuptake inhibitors, and serotonin-norepinephrine reuptake inhibitors, among others. Medications associated with idiopathic intracranial hypertension include growth hormone, tetracyclines, vitamin A (in excessive doses), and withdrawal of glucocorticoids.
Recent change in weight or vision	May be associated with intracranial process (eg, pituitary tumor, craniopharyngioma, idiopathic intracranial hypertension).
Recent changes in sleep, exercise, or diet	May precipitate headaches; may be associated with mood disorder.
Change in school or home environment	May be a source of psychosocial stress.
Family history of headache or neurologic disorder	Migraine headaches and some tumors and vascular malformations are heritable.
What do child and parents think is causing the pain?	Indicates their levels of anxiety about the headache.

Mental health history/symptoms, psychosocial stressors	Chronic nonprogressive headaches may be associated with depression or anxiety.

Information compiled from:

1. *Lewis DW, Koch T. Headache evaluation in children and adolescents: When to worry? When to scan? Pediatr Ann 2010; 39:399.*
2. *Rothner AD. The evaluation of headaches in children and adolescents. Semin Pediatr Neurol 1995; 2:109.*
3. *Strasburger VC, Brown RT, Braverman PK, et al. Headache. In: Adolescent Medicine A Handbook for Primary Care, Lippincott Williams & Wilkins, Philadelphia 2006. p.25.*

Graphic 71717 Version 6.0

Important aspects of the examination of a child with headache

Examination feature	Possible significance
General appearance	Altered mental status may indicate meningitis, encephalitis, intracranial hemorrhage, elevated intracranial pressure, hypertensive encephalopathy.
Vital signs	• Hypertension may cause headache or be a response to increased intracranial pressure • Fever suggests infection (most commonly upper respiratory infection) but may occur with intracranial hemorrhage or central nervous system malignancy
Head circumference	Macrocephaly may indicate slowly progressive increases in intracranial pressure.
Height and weight trajectories	Abnormal or altered trajectories may indicate intracranial pathology.
Auscultation of the neck, eyes, and head for bruit	Bruit may indicate arteriovenous malformation.
Palpation of the head and neck	• Localized scalp tenderness may occur in migraine and tension-type headaches • Scalp swelling may indicate head trauma • Sinus tenderness may indicate sinusitis • Temporomandibular joint (TMJ) and/or masseter tenderness suggests TMJ dysfunction • Nuchal rigidity may indicate meningitis • Posterior neck pain may indicate an anatomic abnormality (eg, Chiari malformation) • Thyromegaly may indicate thyroid dysfunction
Visual fields	Visual field abnormalities may indicate increased intracranial pressure and/or a space-occupying lesion.
Funduscopy	• Papilledema may indicate increased intracranial pressure • Retinal hemorrhages may indicate increased intracranial pressure or head trauma
Otoscopy	May demonstrate otitis media; hemotympanum may indicate trauma.
Oropharynx	Signs of pharyngitis? Dental decay or abscess?
Neurologic examination (see text for details)	Abnormal neurologic examination (particularly mental status, eye movements, papilledema, asymmetry, coordination disturbance, abnormal deep tendon reflexes) may indicate intracranial pathology but also may occur with migraine headache.
Skin examination	Signs of neurocutaneous disorders (eg, neurofibromatosis, tuberous sclerosis complex, which are associated with intracranial neoplasms) or trauma (bruises, abrasions, etc).
Spine	Signs of occult spinal dysraphism (eg, midline vascular of pigment changes), which may be associated with structural abnormalities (eg, Chiari malformation).

Data from:

1. *Great Ormond Street Hospital for Children Clinical Guideline. Headache. www.gosh.nhs.uk/clinical_information/clinical_guidelines/cmg_guideline_00045. Accessed on March 29, 2011.*
2. *Lewis DW, Koch T. Headache evaluation in children and adolescents: When to worry? When to scan? Pediatr Ann 2010; 39:399.*
3. *Newton RW. Childhood headache. Arch Dis Child Educ Pract Ed 2008; 93:105.*

Graphic 59967 Version 6.0

Pediatric headache diary

Date/ time start/time finish	Location*/quality•	Severity Δ	Symptoms before headache ◇	Trigger(s) §	Associated features ¥	Relieving factors ‡	Full, partial, or no relief?

* Left side, right side, both sides, front, back, behind eye, all around head.
• Throbbing (pulsating), dull, squeezing/tightening, splitting, stabbing, etc.
Δ Rate from 1 to 10, with 10 being the most severe.
◇ Flashing lights, blind spots, blurred vision, nausea, numbness, tingling, etc.
§ Foods, odors, light, heat, exercise, traveling in car, lack of sleep, etc.
¥ Nausea, vomiting, numbness, tingling, weakness, etc.
‡ Medication (including dose), sleep, inactivity, darkness, cold compresses, etc.

Graphic 78869 Version 4.0