

Headache

Definition / Supporting Information

Headaches are classified as primary or secondary. The goals of clinical assessment are to differentiate between primary and secondary headache and to identify and treat the underlying cause of secondary headaches

Primary headaches are idiopathic, not caused by another known condition, and probably represent an interplay of genetic, developmental and environmental factors. They include:

- Migraine
- Tension-type headaches (TTHs)
- Cluster headaches
- Other primary neuralgias

Secondary headaches are attributed to a specific underlying cause, for example:

- Infection
- Vascular disorder / disease
- Trauma (see Head Injuries)
- Toxin (including medications and overuse of medications) (see Drug Overdose / Poisoning)
- Mass lesion

Keywords / also known as: anxiety, brain tumour, depression, head pain, migraine

Essential History

The first step in evaluating a child with headache is to rule out secondary causes.

Ask about:

- Length of time the child has had headaches
- Pattern of headaches over time
 - Episodic or chronic
 - Stable or progressive
- Severity
- Quality
- Location, including if the headache radiates to other areas
- Duration
- Frequency (including time of day they occur)

- The effect on the child's quality of life
- Factors that trigger, exacerbate and relieve the headache attacks
- Associated features (eg, photophobia, nausea, ptosis)
- Past medical history including head and neck trauma (see Head Injuries)
- Family history
- Drug history (prescribed, over-the-counter, street drugs)
- 'Stressors' that may be contributing to headache
 - Obtain a psychosocial, educational and family history to identify these stressors
- Consider possible danger to child / need for safeguarding measures

'Red Flag' Symptoms and Signs

Ask about:

- Acute headache with fever
 - Consider acute infective causes such as meningitis / meningoencephalitis (see Meningitis (bacterial) and meningococcal septicaemia in under 16s [[NICE clinical guideline CG102](#)])
- Headache that:
 - Is worse overnight or on waking
 - Wakes the child from sleep
 - Has sudden onset and reaches maximum intensity within 5 minutes
 - Is worse on coughing or straining
 - Changes with posture
 - Is associated with confusion or disorientation
 - Lasts more than 4 weeks
- New visual disturbance, squint or abnormal eye movements
- New neurological deficit or symptoms such as loss of balance / co-ordination problems / head tilt or gait abnormalities
- Vomiting, especially if early morning or persistent (occurring on most days for 2 or more weeks)
- Impaired level of consciousness
- Change in personality / behaviour
- Cognitive decline
- Compromised immunity, caused, for example, by the human immunodeficiency virus (HIV) or immunosuppressive drugs
 - Consider intracranial abscess
- A history of malignancy known to metastasise to the brain

- Age < 4 years
 - Headache in this age group is very unusual and may indicate serious underlying pathology

Look for:

- Abnormal growth parameters
- Signs of early or delayed puberty
- High blood pressure
- Cervical spine abnormalities
- Scoliosis
- Abnormalities on ear, nose and throat (ENT) examination
- Focal neurological deficits
- Papilloedema
- Ataxia
- Cushing's triad (note that this is a late sign of raised intracranial pressure, ICP, indicating imminent brainstem herniation – over reliance on the presence of Cushing's triad may lead to a delay in the diagnosis of raised ICP):
 - Hypertension
 - Bradycardia
 - Irregular respirations

Differential Diagnosis / Conditions

See Diagnosis of headaches [[NICE Headaches pathway](#)]

See NICE-accredited guidance [[The brain pathways guideline: A guideline to assist healthcare professionals in the assessment of children who may have a brain tumour](#)]

Disorders in childhood / adolescence that can cause headache as a secondary sign / symptom:

- Tumour
- Head or neck trauma (see Head Injuries)
- Vascular – arteriovenous malformation (AVM), venous sinus thrombosis
- Epilepsy (most commonly as a post ictal headache (eg, idiopathic occipital lobe epilepsy of childhood))
- Non-vascular intracranial disorder
 - High-pressure headache – idiopathic intracranial hypertension
 - Low-pressure headache – eg, following lumbar puncture or spontaneous cerebrospinal fluid (CSF) leaks
 - Congenital malformations eg, Chiari -1 malformation
- Substance use / abuse or withdrawal (including medication overuse eg, paracetamol) (see Drug Overdose and Poisoning)

- Infection
 - Bacterial meningitis
 - Lyme disease
 - Abscess
- Systemic disease
 - Coeliac disease
 - Hypothyroidism
- ENT conditions
 - Sinusitis
 - Tonsillitis
- Teeth / jaw conditions
 - Dental caries
 - Temporomandibular joint disorder
 - Teeth grinding (Bruxism)
- Obesity
 - Obstructive sleep apnoea
- Disorders which contribute to psychological distress accompanying headache
- Neglect, abuse at home or at school

Common primary headache disorders in childhood / adolescence

See Headaches in over 12s: diagnosis and management [[NICE clinical guideline CG150](#)] and [The International Classification of Headache Disorders, 3rd edition \(beta version\)](#)

- Migraine without aura - recurrent headache attacks with the following features:
 - Constant or throbbing pain
 - Unifrontal or bifrontal location of pain
 - Lasts 1–72 hours (may be shorter in children than in adults)
 - Moderate or severe intensity
 - Aggravated by routine physical activity
 - Association with:
 - Nausea / vomiting
 - Pallor
 - Photophobia, and / or phonophobia
- Migraine with typical aura (less common in children and adolescents than migraine without aura)
 - Attacks consist of migraine headache as above with aura as defined below:
 - Visual (eg, flashing lights, loss of vision)
 - Sensory (eg, numbness or tingling)
 - Functional (eg, dizziness, weakness, speech impairment)
 - Gradual development over at least 5 minutes

- Duration of less than 1 hour
 - Related in time to migraine headache
 - Fully reversible
- Chronic migraine
 - Frequent headaches (headaches on 15 or more days per month for more than 3 months)
 - Presence of migraine features on at least 8 days per month
 - Cannot be attributed to a secondary cause
- Tension type headache (TTH)
 - Generally considered to be mild, recurrent headaches
 - Mild and moderate in severity
 - Diffuse in location
 - Having a pressing quality
 - Generally can be differentiated from migraine by:
 - Reduced severity
 - Not worse with movement
 - Not throbbing
 - No associated nausea / vomiting
 - No visual disturbances or increased light / noise sensitivity
 - No aura / warning sign
 - Subdivided on the basis of frequency
 - Infrequent, episodic
 - Frequent, episodic
 - Chronic
 - No secondary causes are identified
- Cluster headache
 - Attacks of severe, unilateral pain in orbital / supraorbital or temporal regions, lasting 15–180 minutes and occurring from once every other day to eight times per day
 - Part of the trigeminal autonomic cephalalgias
- Childhood periodic syndromes

Investigations

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Neurology Team(s)):

- Imaging
 - If abnormalities on the neurological examination are identified, neuroimaging may be required to identify a medically or surgically treatable cause of the headaches

Treatment Approach

See Management of headaches [NICE Headaches pathway] and Headaches in over 12s: diagnosis and management (2012) [NICE clinical guideline CG150]

See Management of migraine (with or without aura) [NICE Headaches pathway]

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team), or specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Neurology Team(s)):

- Secondary headaches
 - Treatment is aimed at correcting the underlying cause
 - Headaches should resolve once the underlying cause is corrected
- The treatment of primary headache disorders in children is threefold:
 - Acute therapy
 - Biobehavioural therapy (see below)
 - Preventive and prophylactic therapy
- Clear goals of treatment must be discussed with the patient and parents

Acute therapy

- The first component of effective headache treatment
- Acute therapy is designed to:
 - Ameliorate the episodic headache
 - Enable a quick return to normal activity without relapse
- General analgesics, such as paracetamol
- Non-steroidal anti-inflammatory drugs (NSAIDs) eg, ibuprofen, naproxen sodium
 - Good tolerability and effective in clinical trials
 - Ibuprofen is the mainstay of treatment for the acute treatment of childhood headaches and migraines. Proper use of ibuprofen requires:
 - Identification by the child of onset of the headache
 - Rapid initiation of treatment
 - Proper dosing based on weight
 - Avoidance of overuse; limited to 3 times per week
- Many prescribed medications contain sedatives or opiates:
 - May relieve pain
 - May delay / prevent return to normal functioning
 - Codeine containing medications should not be used / prescribed for:
 - Children under 12 years
 - Any child younger than 18 years after tonsillectomy or adenoidectomy
- When NSAIDs are ineffective or not completely effective in the treatment of migraine, migraine-specific therapy is often required

- In some cases, regular overuse of acute or symptomatic headache medication may result in medication-overuse headache

Migraine with or without aura

Acute treatment

- Consider combination therapy with an oral triptans eg, sumatriptan and an NSAID, or an oral triptan and paracetamol
 - Triptans are not licensed for use in childhood migraine, however the British National Formulary for Children (BNFc) provides accepted dosing guidelines
 - For young people aged 12–17 years consider a nasal triptan in preference to an oral triptan
 - Where oral preparations or nasal preparations are ineffective or not tolerated:
 - Offer a non-oral preparation (eg, intravenous metoclopramide hydrochloride or buccal prochlorperazine)
- Consider an anti-emetic in addition to other acute treatment for migraine even in the absence of nausea and vomiting
- Do not offer ergots or opioids for the acute treatment of migraine

Biobehavioural therapy

- Second component of effective headache treatment
- Essential for children to maintain a lifetime response to the treatment and management of their headaches
- Biobehavioural therapy can be divided into three components
 - Treatment adherence
 - A clear understanding by the patient and parents about the importance of the treatment is essential
 - Psychological or biobehavioural intervention may identify and overcome barriers to treatment adherence and other aspects of management
 - Lifestyle management
 - In many instances, unhealthy lifestyle habits serve as a trigger for childhood headaches
 - Encourage:
 - Adequate hydration
 - Limited use of caffeine
 - Regular exercise
 - Adequate nutrition through regular meals and a balanced diet
 - Adequate sleep

- The patient and parents must understand that these objectives:
 - Are long-term lifetime goals
 - Can control the effect of migraines and minimise the use of medication
 - Lifestyle changes may improve quality of life and may reverse disease progression
- Biofeedback-assisted relaxation therapy
 - May be a useful addition
 - For children, single-session biofeedback-assisted relaxation therapy has been shown to be learnt quickly and efficiently

Prophylactic treatment

- The third component of effective headache treatment
- Should be instituted when the headache or migraine becomes frequent or disabling; this will depend on the individual patient
- For all prophylactic medications, titrate doses slowly to an effective level
 - Requires understanding by the patient and family that this may be a lengthy process (eg, weeks or months)
- Consider topiramate or propranolol hydrochloride (seek specialist advice).
 - Topiramate is associated with a risk of fetal malformations and can impair the effectiveness of hormonal contraceptives.
 - Topiramate [unlicensed]: initially 0.5 mg/kg/day, increased slowly at 2-week intervals up to 2 mg/kg/day in two divided doses. For children > 16 years: give 25 mg at night, increasing by 25 mg increments each week to 50-100 mg per day in 2 divided doses (maximum 200 mg/day).
 - Propranolol hydrochloride: initially 200–500 micrograms/kg twice daily, usual dose 10–20 mg twice daily (maximum dose 2 mg/kg twice daily). For children > 12 years: give 20–40 mg twice daily, usual dose 40–80 mg twice daily (maximum dose 4 mg/kg daily with single max. dose 120 mg).
- Consider amitriptyline hydrochloride (seek specialist advice).
 - Amitriptyline hydrochloride: initial doses of 200–500 micrograms/kg once daily (max. per dose 10 mg), increasing to 1 mg/kg once a day have been used [unlicensed]. For children > 12 years: give 10 mg once daily, increasing gradually to 75 mg once daily. Titrate slowly to the full dose over 8–10 weeks to minimise side-effects, particularly somnolence
- Do not offer gabapentin for the prophylactic treatment of migraine.
- If both topiramate and propranolol hydrochloride are unsuitable or ineffective, consider a course of up to 10 sessions of acupuncture over 5–8 weeks (children 12 years and over).
- Riboflavin (400 mg/day for children > 12 years) may be effective in reducing migraine frequency and intensity for some people.

- Review the need for continuing migraine prophylaxis 6 months after the start of prophylactic treatment.
- Do not routinely offer combined hormonal contraceptives for contraception to girls who have migraine with aura.

Cluster headache

Acute treatment

- Consider oxygen at a flow rate of at least 12 L/minute with a non-rebreathing mask and a reservoir bag and / or a subcutaneous or nasal triptan for the acute treatment of cluster headache
- Do not offer paracetamol, NSAIDS, opioids, ergots or oral triptans for the acute treatment of cluster headache

Prophylactic treatment

- Consider verapamil hydrochloride (seek specialist advice).

Tension-type headache (TTH)

Acute treatment

- Consider paracetamol or an NSAID for the acute treatment of TTH

Complications of treatment

- Medication overuse
 - Can cause medication overuse headache
 - Triptans, opioids, ergots or combination analgesic medications on 10 days per month or more (for over 3 months) or
 - Paracetamol, aspirin (for children > 16 years) or an NSAID, either alone or in any combination, on 15 days per month or more (for over 3 months)
 - Characterised by inadequate response to treatment
 - Avoiding overuse is critical in acute therapy
- Low-dose or delayed treatment
 - Increase in analgesic use over time, with decreased effectiveness
- When rebound headaches are identified, a recovery period free of analgesic use is required. Follow NICE guidance

When to Refer

Refer urgently to specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Neurology Team(s)) if:

- Headaches with any 'red flag' symptoms or signs
- Headaches that do not respond routinely to acute treatment

- Headaches that are increasing in frequency, severity, or duration
- Headaches in which the features acutely change

Refer to specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Neurology Team(s)) if:

- Side-effects of medications limit increasing the medication to an effective dose
- Psychological factors that interfere with management
- Disability that impairs functioning

‘Safety Netting’ Advice

- Advise parents / carers to seek urgent medical advice if any ‘red flag’ signs or symptoms develop

Follow-up:

- Assess regularly:
 - Morbidity of headaches
 - Effectiveness of treatment
 - Disability
 - Quality of life

Patient / Carer Information

****Please note: whilst these resources have been developed to a high standard they may not be specific to children.***

- [Headaches](#) (Web page), the NHS website
- [Headaches in over 12s: Diagnosis and management](#) (patient information) (Web page), NICE clinical guideline 150, National Institute for Health and Care Excellence.
- [Migraine](#) (Web page), the NHS website
- [Headaches](#) (Web page), MindEd. (Module on the common causes of headache, their [presentation](#) and the treatment options. Also helps in better understanding of the impact of headache on child’s social and family life)
- [Tension Type Headaches](#) (Web page), the NHS website
- [HeadSmart: Be Brain Tumour Aware](#) (Website).
- [Migraine Action](#) (Website).

Resources

National Clinical Guidance

[Headaches in over 12s: Diagnosis and management](#) (patient information) (Web page), NICE clinical guideline 150, National Institute for Health and Care Excellence.

[Meningitis \(bacterial\) and meningococcal septicaemia in under 16s](#) (Web page), NICE clinical guideline 102, National Institute for Health and Care Excellence.

[The brain pathways guideline: A guideline to assist healthcare professionals in the assessment of children who may have a brain tumour](#) (Web page), RCPCH endorsed guidance, Royal College of Paediatrics and Child Health.

Medical Decision Support

[Neglect](#) (Web page), RCPCH Child Protection Companion

[Headaches overview](#) (Web page), NICE headache pathway, National Institute for Health and Care Excellence.

[Head injury](#) (Web page), NICE headache pathway, National Institute for Health and Care Excellence.

[Brain cancers](#) (Web page), NICE headache pathway, National Institute for Health and Care Excellence.

[Social and emotional wellbeing for children and young people overview](#) (Web page), NICE headache pathway, National Institute for Health and Care Excellence.

[Lifestyle advice on diet and physical activity for families and children](#) (Web page), NICE headache pathway, National Institute for Health and Care Excellence.

Suggested Resources

****Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.***

[Head Injury](#) (Web page – requires log-in), Spotting the Sick Child

[Sumatriptan for migraine headaches](#) (Web page), Medicines for Children

Acknowledgments

Content Editor: Dr Will Christian

Clinical Expert Reviewers: Dr Rachel Howells and Dr Helen Cross

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AAP Reviewer: Deepak Kamat, MD, PhD, FAAP

Paediatric Trainee Reviewer: Dr Dionysios Grigoratos

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Update information

Created: 2015

Date last updated: -

Next review due: 2018