Management of acute headache

Author: A Gilbert, Paediatric Oncologist; N Sudarsan, Paediatrician; A Green, Paediatric trainee; M Lazner CED consultant; C Chadwick, specialist Pharmacist; T Aderotimi, K Iliadis, L Vitta Paediatric Radiologists
Approved by: UHSussex MGC April 2022
Publication date: September 2022. Version 3
Review date: September 2024

Skip to 'red flags'
Skip to management flow chart
Skip to how to request and arrange paediatric imaging
Skip to management of idiopathic intracranial hypertension
Skip to notes on investigations
Skip to diagnosis and management of primary headaches
Skip to Follow-up

Background

- Headaches are a common symptom in childhood. Prevelance increases with age and is unusual in very young children.
- **Most common aetiologies are primary headache (migraine and tension type) and sinusitis related headache**
- In **6-15% a serious neurologic condition is diagnosed**
  - ! 10 children are diagnosed with a brain tumour each week in the UK
- Headaches categorisation:

Primary

- **Tension-type headache**
- **Migraine**
- Cluster Headache (rare)

Secondary (to underlying aetiology)

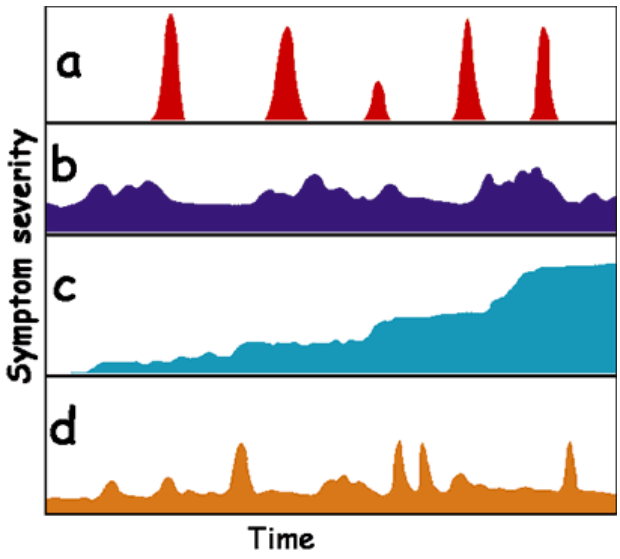
- **Intracranial**
  - **Infection** - meningitis, encephalitis, cerebral abscess
  - **Hydrocephalus**
  - **Tumours** - primary or metastases
  - **Haemorrhoage** - AV malformation, subarachnoid haemorrhage, subdural haematoma
  - **Post-traumatic** - cerebral contusions, subdural
  - **Idiopathic Intracranial Hypertension**
- **Extracranial**
  - **Infection** - influenza, URTI, sinusitis, conjunctivitis, otitis, dental infection
- **Medication overuse headache**
- **Acute and severe systemic hypertension**
- **Other -** caffeine toxicity or withdrawal, medication side-effect, carbon monoxide, hypoglycaemia, sickle cell disease, temporomandibular dysfunction, vasospasm, attributed to refractive error

Assessment

History – Ask explicitly about parental concerns and take them seriously

- **Headache** – location, severity, character, onset, duration, timing, waking from sleep, frequency, history of recurrence (see image below), exacerbating and relieving factors, response to treatment, relationship to menstruation, time off school.
- **Accompanying symptoms:**
  - Fever and / or intercurrent illness
  - Unexplained vomiting (especially on waking)
  - Changes in behaviour, changes in school performance, lethargy
  - Changes in balance, gait, increased clumsiness, loss of skills
  - Change in motor skills – ask about handwriting, computer games, gait, coordination, swallowing difficulties, abnormal head position
  - Nausea, photophobia, aura-like symptoms
  - Visual problems- blurred vision, diplopia, squinting
  - Seizures, Diabetes insipidus
  - Growth and development abnormalities, including pubertal status
- **PMH** - malignancy, infection, trauma
- **Personal or family history** - of brain tumour, leukaemia, sarcoma, early onset breast or bowel cancer, neurofibromatosis types 1&2, Tuberous Sclerosis, Li Fraumeni Syndrome, colorectal polyposis, Gorlins Syndrome, other familial genetic syndromes
- **Family history** - migraine, malignancy
- **Social** - HEADSSS screening tool in older children
- **Lifestyle factors** - sleep, exercise, diet, screen time, caffeine, stress.

Headache patterns:



a acute recurrent (migraine)

b chronic non-progressive (tension, anxiety, depression, somatisation)

c **chronic progressive** (tumour, benign cranial hypertension, brain abscess, hydrocephalus)

d acute on chronic non-progressive tension headache with co-existent migraine

Examination – plot weight, height, blood pressure, head circumference in < 2yrs

- Full neurological examination including cerebellar function, gait walking, running, rising from floor, balance, fine motor, gross motor. Kernig and Brudzinski signs.
- Visual exam with fundoscopy, pupils, fields, movements, acuity - in CED or urgent ophthalmology referral. See 'SEH referral guide' on Microguide
- Pubertal status

"Red flags" to evaluate the cases which require urgent investigations:

Headache Characteristics:	Examination Findings:
Persistent headache **waking the child or on waking** **Sudden onset** and severe/thunderclap headache **Persistent / recurrent nausea or vomiting**, particularly early morning **Impaired level of consciousness,** confusion, disorientation, pervasive lethargy **Worse if recumbent, bending down, coughing or straining** **Progressive chronic course** Consistent **location** of recurrent headaches, especially **occipital** headache A **change** in the headache characteristics if known to normally have tension headaches/migraines **AssociatedSeizures** Worsening headache with **fever**	**Abnormal neurology:** Focal motor signs, abnormal gait abnormallity, coordination, swallowing difficulties, bell's palsy greater than 4 weeks, regression in motor skills **Visual symtpoms / signs:** papillodema, optic atrophy, retinal haemorrhages, nystagmus, reduced visual acuity not attribuatble to refractive error, fields reduction, proptosis, new onset paralytic (non-concomitant) squint **Hypertension** **Increasing head circumference** crossing 2 centiles (under 2 year old) **Nuchal rigidity** **Abnormal head position** eg head tilt, wry neck **Delayed or arrested puberty or growth**: 1^{ry} or 2^{ry} amenorrhoea, galactorrhoea, polyuria/polydipsia, short stature **Skin lesions that suggest neurocutaneous syndrome**

Patient History and Family History:

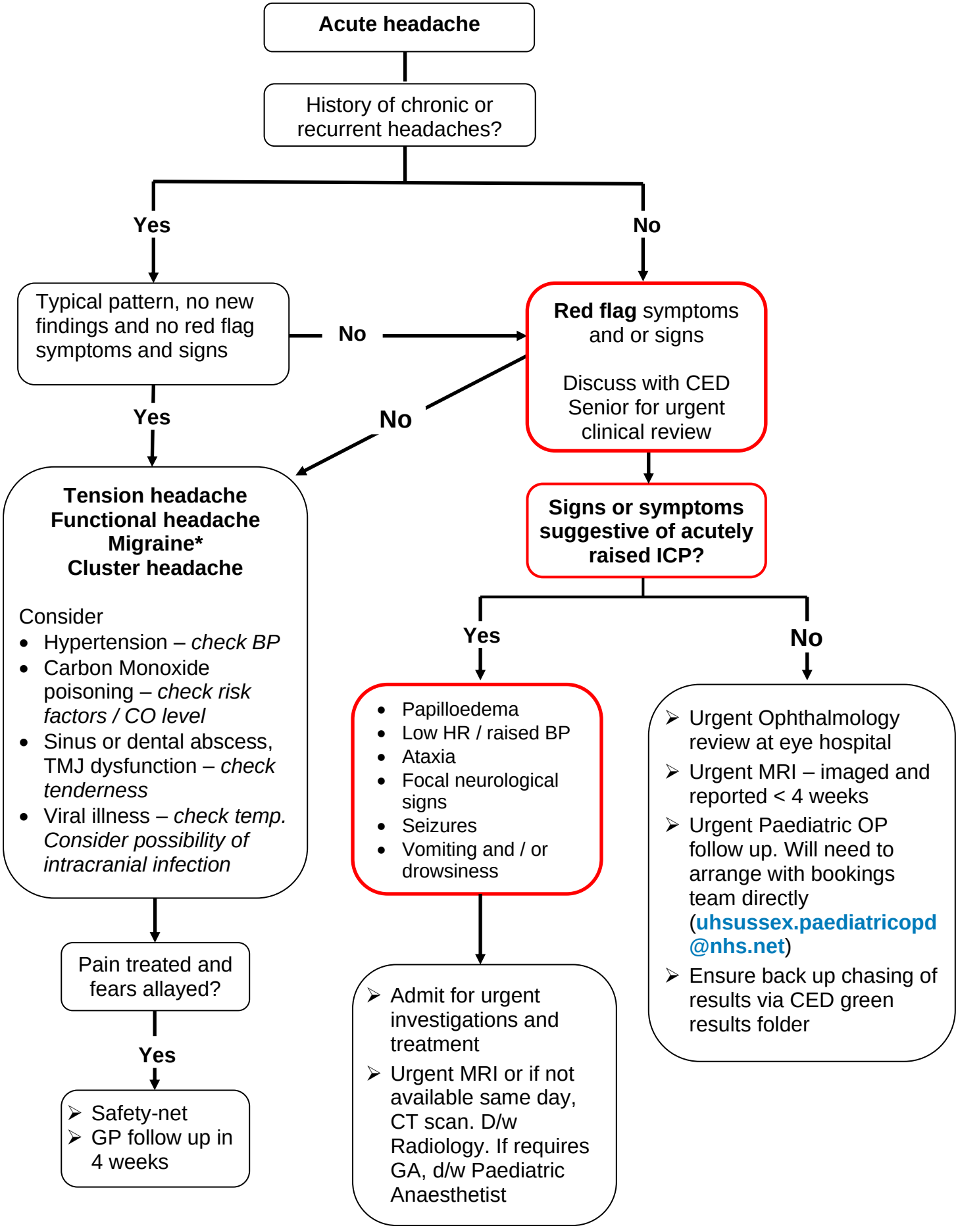
Age < 4 years. Parents may report excessive crying, high pitched cry, irritability, holding head

Change in behaviour, personality, educational performance, lethargy, mood disturbance, withdrawal, disinhibition

Family or Personal History: of brain tumour, neurofibromatosis, tuberous sclerosis, colorectal polyposis, leukaemia, sarcoma, early onset breast or bowel cancer, genetic predisposing syndromes

Preexisting hydrocephalus or VP shunt

Management flow-chart



Notes on investigations and management of secondary headaches:

An isolated headache with no other symptoms lasting more than 4 weeks is unlikely to be a brain tumour

Consider urgent imaging if:

- Any **red flag signs** present (especially abnormal neuro exam) and / or
- there is a suspicious element in the history.

Remember normal neuro exam does not exclude intracranial pathology!
Discuss with senior doctor if in doubt.

MRI is not available out of hours at the Alex or PRH and for young children requires sedation or a general anaesthetic, so may not be appropriate if urgent imaging is required.

CT scan is available 24 hours a day for urgent imaging. Its best use is for hydrocephalus or intracranial haemorrhage, but may identify SOL or their effects.

Always discuss the appropriate imaging with the on-call Paediatric Radiology Consultant.

See next page for "how to guide" for arranging imaging.

If there is concern of raised intracranial pressure with imaging suggestive of a brain tumour → urgent referral to Kings College hospital neurosurgery – do not refer patients with brain tumours to Southampton or St Georges.

Migraine can mimic a more serious condition as it can be accompanied by a variety of focal neurological symptoms.

Meningitis / encephalitis may or may not be associated with signs of raised intracranial pressure. **LP** is required. Defer until after imaging / clinical improvement if there are focal neurological signs, markedly reduced GCS, cardiovascular compromise or coagulopathy.

Idiopathic Intracranial Hypertension see flow chart on next page

How to request a CED / in-patient Paediatric US / CT / MRI

In Hours (9am - 5pm Mon - Fri)
Non-GA study

- Complete request form - paper symphony request from CED and SSU, or electronic request form on PANDA for all other areas.
- Discuss with Paediatric Radiology Consultant in person or on extension 63152 / 62585

MRI / CT
GA Studies (In hours)

- Done on CEPOD list:
  - Complete request form - paper symphony request from CED and SSU, or electronic request form on PANDA for all other areas
  - Discuss with Paediatric Radiology Consultant
  - If approved, discuss with duty paediatric anaesthetic Consultant or 3rd on call anaesthetist Registrar on bleep 8224
  - Liaise with Level 4 MRI (ext 63505) / CT (ext 67521) and anaesthetic team re: scan time
  - Complete paper checklist form if GA MRI request (available in Level 4 MRI)

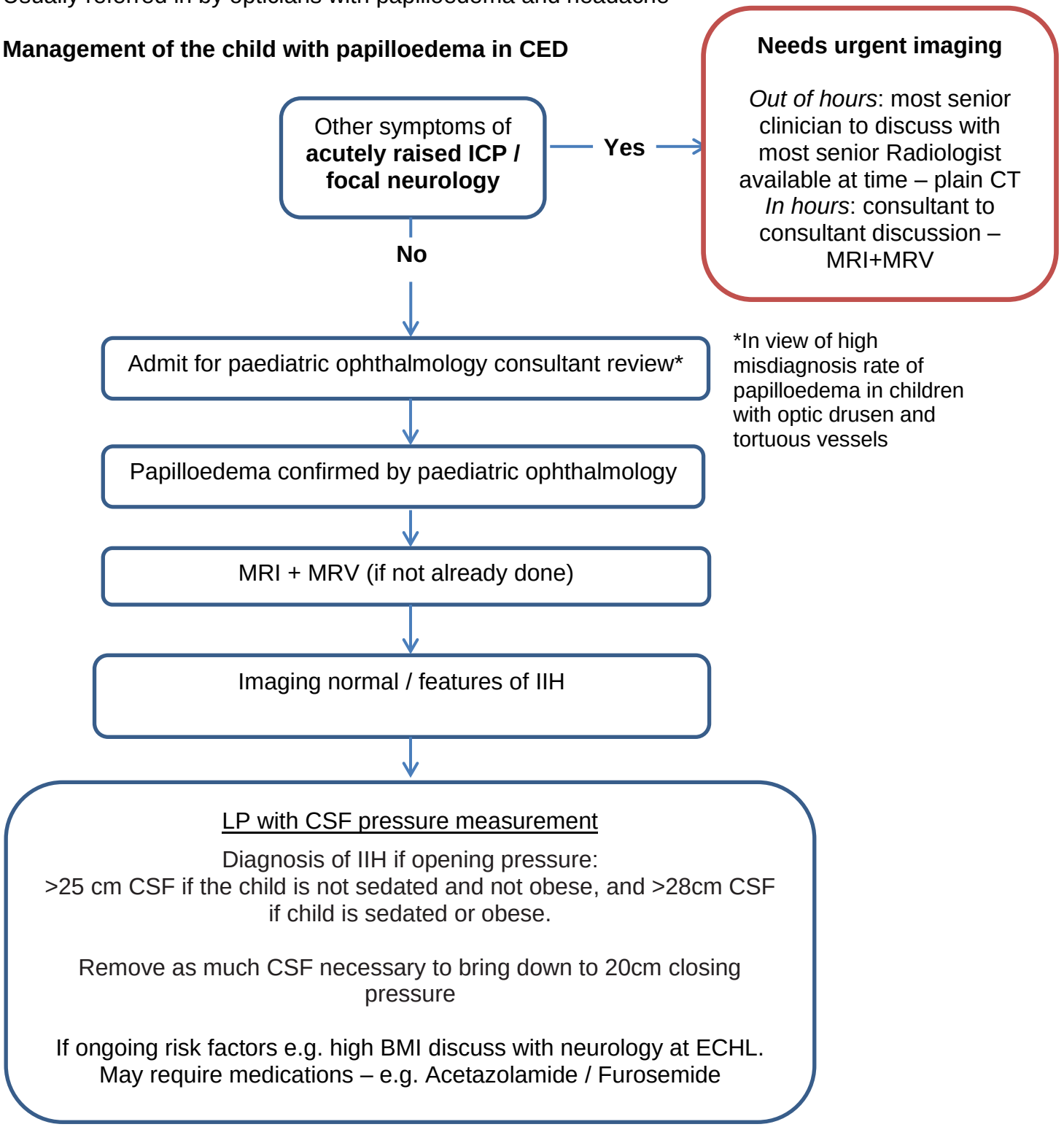
Out of Hours
(After 5pm Mon - Fri; All day weekends / bank holidays)

- US / CT: Complete request form - paper symphony request from CED and SSU, or electronic request form on PANDA for all other areas
  - Discuss with on call radiology registrar (ext: 64239)
  - For USS - radiology registrar will arrange a time
  - For CT - Bleep CT radiographer on 8800 to arrange
- MRI: Senior discussion with on call paediatric radiology consultant.
- GA CT / MRI out of hours requests need consultant to consultant discussion.

Idiopathic Intracranial Hypertension (IIH)

Usually seen in female patients with high BMI
Usually referred in by opticians with papilloedema and headache

Management of the child with papilloedema in CED



Diagnosis of Primary Headaches:

Headache Feature	Migraine with or without aura	Tension-type Headache
Pain location	Unilateral or bilateral, frontotemporal	Bilateral
Pain quality	Throbbing or banging Pulsating	Pressing / tightening
Pain intensity	Moderate or severe	Mild or moderate
Effect on activities	Aggravated by, or causes avoidance of routine ADL	Not aggravated by routine ADL
Other symptoms	Photophobia/ phonophobia Nausea and / or vomiting **Aura*** symptoms can occur with or without headache – are fully reversible – develop over at least 5 minutes – last 5 – 60 minutes Visual symptoms: flickering lights, spots or lines and / or partial loss of vision; Sensory symptoms: numbness and / or pins and needles; and / or speech disturbance.	None
Duration of headache	2 – 72 hours	30 mins – continuous
Frequency of headache	< 15 days / month (episodic) ≥ 15 days / month for > 3 months (chronic)	< 15 days / month (episodic) ≥ 15 days / month for > 3 months (chronic)

***** *NB motor symptoms, double vision, ataxia or decreased LOC are NOT typical for migraine aura*

Medication overuse headache- Consider in children whose headache developed or worsened while they were taking the following drugs for ≥ 3 months:
- triptans, opoioids, ergots or combination analgesic meds on ≥ 10 days / month or;
- paracetamol or an NSAID, either alone or in combination, on ≥ 15 days / month

Cluster Headaches are rare Unilateral pain around the eye or side of face, associated with same sided opthalmic symptoms (red watering eyes, swollen eyelid, constricting pupil or drooping eyelid) and/or nasal congestion or running and facial sweating.

Management of Primary Headaches:

Consider admitting any child with one or more red flag signs or those whose diagnosis requires hospitalisation

See next page for specific conditions

Management of migraines

Acute treatment options for children include:

- Early use of paracetamol or ibuprofen (10 mg/kg) in young children.
- Oral or nasal sumatriptan and a NSAID or paracetamol for older children.
- Consider an anti-emetic in addition to other treatments even if no nausea and vomiting (ondansetron).

- If oral / nasal drugs are ineffective or not tolerated
  - Offer a non-oral dose of prochlorperazine or metoclopramide (if using I.V co-administrate with fluids as can cause hypotension). Be aware that prochlorperazine can cause an acute oculogyric crisis in children – use with caution.
  - Consider adding a non-oral NSAID or triptan if these have not been tried.

Do not use opioids in the acute treatment of migraine.

NB triptans and prochlorperazine are not licensed in children for migraine. This is a common issue in Paediatric prescribing. The prescriber must use the children's BNF for guidance and take full responsibility for the decision. The patient (or parent / carer) should provide informed consent, which should be documented.

Prophylaxis of migraines

Consider medication prophylaxis when appropriate and choose based on comorbidities or individual characteristics. Medication options available include:

- Pizotifen / Propranolol / Topiramate

See the Children's BNF for doses and regime.

Lifestyle measures - good sleep hygiene, regular exercise, routine meals, adequate fluid intake, management of migraine triggers

Review the need for continuing prophylaxis 6 months after the start of treatment.

Management of tension-type headaches:

- Consider paracetamol and / or ibuprofen as required. **Do not give opioids**
- Provide reassurance and "lifestyle advice": regular sleep, hydration, regular sports, avoid caffeine / alcohol, screen time
- Headache diary can help document frequency and treatment success
- Consider a course of up to 10 sessions of acupuncture over 5 – 8 weeks for prophylactic treatment of chronic tension-type headache or other biobehavioural techniques (psychotherapy, relaxtaion therapy)
- Warn patient about the risk of medication overuse headache.

Management of medication overuse headache

- Withdraw all overused medication.
- Stop abruptly for at least 1 month; do not withdraw gradually.
- Advice regarding likelihood that headaches will get worse before they get better.
- Review 4 – 8 weeks after withdrawal of medication

Follow-up of children with headaches:

Children discharged with out-patient imaging need follow up in an acute Paediatric clinic AFTER their imaging has been done.

If the frequency exceeds 2 per week and/or normal daytime activities including school attendance are heavily affected, consider a Paediatric out-patient appointment.

Most primary headaches can be referred back to the GP.

- Keeping a headache diary may help to identify and avoid possible trigger factors.
  - Frequency, duration and severity
  - Associated symptoms
  - All medication taken to relieve headache
  - Possible triggers (including menstruation)

- Alternative treatment methods include acupuncture, physiotherapy, yoga, Jacobson's progressive muscle relaxation technique, biofeedback etc. may be helpful

- If there is a functional element to headaches, consider concurrent referral to CAMHS for pain coping management