Headache in Children

Supervised by **Dr. Amir Naghshzan (AmirNaghshzan@gmail.com)**

1. Definition

Headache is one of the most common neurologic complaints in children. Most headaches are primary (migraine or tension-type), but identifying secondary headaches requiring urgent evaluation is the priority.

2. Clinical Presentation

Important History

Ask about

Ask about	Why it matters
Age at onset	Very young children are more likely to have secondary causes
Acute vs chronic	Guides differential diagnosis
First or recurrent headache	First severe headache needs careful evaluation
Location	Frontal, unilateral, occipital
Character	Throbbing, pressure, stabbing
Duration	Minutes, hours, days
Severity	Functional impairment
Frequency	Episodic vs chronic
Morning headache	Raised ICP
Awakens from sleep	Red flag
Vomiting	Migraine or raised ICP
Fever	Infection
Neck stiffness	Meningitis
Visual symptoms	Migraine aura, papilledema
Weakness or seizures	Intracranial pathology
Recent head trauma	Intracranial hemorrhage
Medication use	Medication-overuse headache
Family history	Migraine

Physical Examination

Always examine:

General & Vital Signs

- Vital signs
- Blood pressure
- Growth parameters
- Mental status

Neurologic & Physical

- Complete neurologic examination
- Cranial nerves
- Motor and sensory examination
- Gait
- Fundoscopy (papilledema)
- Neck stiffness
- Skin (rash, neurocutaneous lesions)
- Sinus tenderness
- Teeth/TMJ
- Vision

3. Diagnostic Approach

Step 1: Is it Primary or Secondary?

Suggestive of Primary Headache

- Recurrent similar episodes
- Normal neurological examination
- Positive family history
- Headache-free intervals
- Normal growth
- Typical migraine features

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Treat as primary headache.

Look for Red Flags — Remember SNOOP4

Red flag	Possible cause
S — Systemic symptoms (fever, weight loss)	Infection, malignancy
N — Neurologic deficit	Stroke, tumor
O — Sudden onset ("thunderclap")	Hemorrhage
O — Occipital headache	Structural lesion (especially in young children)
P — Positional headache	CSF pressure disorder
P — Papilledema	Raised ICP
P — Progressive worsening	Tumor, hydrocephalus
P — Precipitated by coughing/Valsalva	Posterior fossa lesion

Any red flag → urgent evaluation.

Step 2: Pattern Recognition

Pattern	Likely diagnosis
Recurrent throbbing + nausea	Migraine
Bilateral pressure	Tension headache
Fever + neck stiffness	Meningitis
Morning headache + vomiting	Raised ICP
Sudden worst headache	Hemorrhage
Daily headache after analgesics	Medication-overuse
Facial pain + nasal symptoms	Sinusitis
Vision problems	Refractive error, glaucoma

4. Differential Diagnosis

Primary

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

Secondary

Infectious

- Meningitis
- Encephalitis
- Brain abscess
- Sinusitis

Neurologic

- Brain tumor
- Hydrocephalus
- Intracranial hemorrhage
- Idiopathic intracranial hypertension

Systemic

- Hypertension
- Dehydration
- Anemia
- Hypoglycemia
- Carbon monoxide poisoning

Eye disorders

- Refractive error
- Acute glaucoma

Medication related

- Medication-overuse headache
- Drug adverse effects

5. Investigations

No investigations are needed if: Typical migraine, Normal examination, No red flags

Laboratory Tests (when indicated)

Test	Indication
CBC	Infection, anemia
ESR/CRP	Inflammatory disease
Electrolytes	Dehydration
Glucose	Hypoglycemia
Blood culture	Suspected meningitis

Neuroimaging

MRI preferred for

- Chronic headache
- Neurological deficits
- Suspected tumor
- Posterior fossa lesion

CT preferred for

- Head trauma
- Acute hemorrhage
- Emergency setting

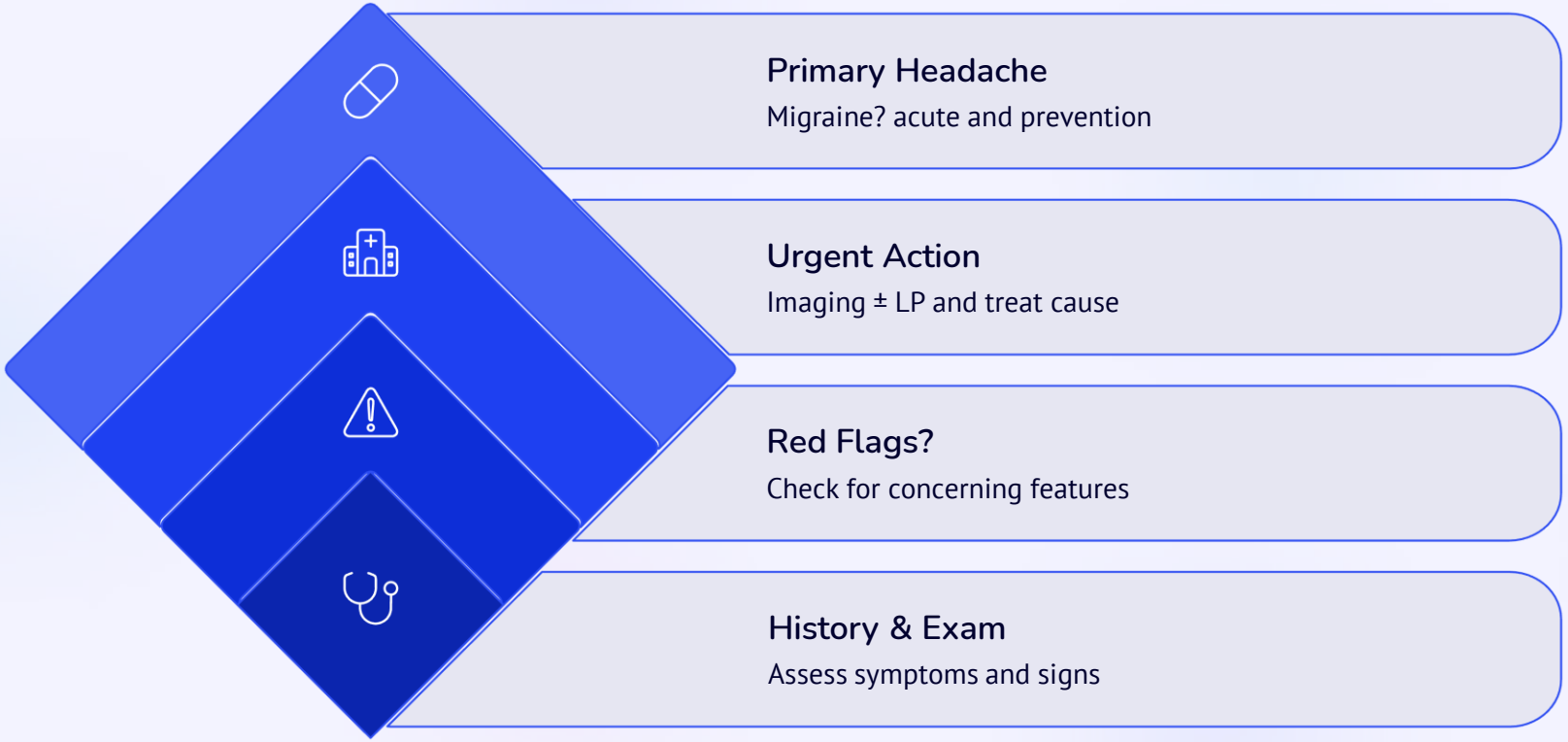
Lumbar Puncture

Only after excluding raised ICP when indicated.

Indications

- Suspected meningitis
- Encephalitis
- Idiopathic intracranial hypertension

6. Management Algorithm



Child with headache → History + Examination → Red flags? → Yes: Urgent imaging ± LP → Treat cause | No: Primary headache likely → Migraine? → Acute therapy → Lifestyle advice → Frequent attacks? → Preventive therapy

7. Drug Summary Table

Acute Migraine Treatment

Drug	Pediatric dose	Maximum
Acetaminophen	15 mg/kg	1 g
Ibuprofen	10 mg/kg	600 mg
Naproxen	5–7 mg/kg	500 mg
Ondansetron	0.15 mg/kg	8 mg

Triptans (Older Children/Adolescents)

Drug	Comments
Sumatriptan nasal	Effective for adolescents
Rizatriptan	Approved in older children in many regions

⚠ Avoid using triptans in suspected stroke or hemiplegic migraine.

Preventive Therapy (Specialist or Experienced Physician)

Consider if:

- ≥4 disabling headaches/month
- Significant school absence
- Poor response to acute therapy

Options include:

- Topiramate
- Propranolol
- Amitriptyline (with behavioral therapy)
- Lifestyle modification

8. Admission Criteria

Admit if:

- Suspected meningitis
- Encephalitis
- Raised intracranial pressure
- Altered consciousness
- Persistent vomiting with dehydration
- Status migrainosus
- Uncontrolled pain
- Need for urgent imaging
- New focal neurological deficits

Refer to Pediatric Neurology if:

- Diagnostic uncertainty
- Abnormal neurological examination
- Recurrent disabling migraine
- Failure of first-line therapy
- Chronic daily headache
- Seizures
- Papilledema
- Suspected intracranial lesion

Urgent referral:

- Thunderclap headache
- Progressive neurologic deficit
- Suspected brain tumor
- Raised ICP

10. Follow-up

At each visit assess:

Headache Profile

- Frequency
- Severity
- Headache diary
- Trigger identification

Functional Impact

- School attendance
- Medication use

Lifestyle Factors

- Sleep
- Hydration
- Meals
- Caffeine
- Screen time
- Exercise

11. Clinical Pearls

✓ Most pediatric headaches are primary, especially migraine and tension-type headache.

✓ A normal neurological examination greatly lowers the likelihood of serious intracranial disease.

✓ MRI is preferred over CT for evaluating chronic or non-emergent headaches because it provides better visualization of posterior fossa lesions and avoids ionizing radiation.

✓ Neuroimaging is not routinely indicated for recurrent headaches with a normal examination and no

✓ Avoid frequent use of analgesics (>2–3 days/week), as this may lead to medication-overuse headache.

12. Common Mistakes in Exams and Practice

- ❌ Ordering CT or MRI for every child with headache.
- ❌ Missing papilledema by not performing fundoscopy.
- ❌ Failing to measure blood pressure.
- ❌ Overlooking medication-overuse headache.
- ❌ Diagnosing sinusitis without supportive nasal symptoms.
- ❌ Missing meningitis because fever is absent early.
- ❌ Ignoring progressively worsening headaches.
- ❌ Not providing education on lifestyle modifications and headache triggers.

✓ Lifestyle measures—adequate sleep, hydration, regular meals, physical activity, stress management, and limiting excessive caffeine and screen time—are essential in headache management.

13. Key Take-Home Messages

01

Most childhood headaches are migraine or tension-type.

02

The primary goal is to identify secondary causes requiring urgent intervention.

03

Always screen for red flags (SNOOP4).

04

Perform a complete neurologic examination, including fundoscopy and blood pressure measu

05

Typical recurrent migraine with a normal examination generally does not require neuroimaging.

06

MRI is preferred when imaging is indicated; CT is reserved for emergencies such as trauma or suspected hemorrhage.

07

Acetaminophen (15 mg/kg) and ibuprofen (10 mg/kg) are effective first-line treatments for acute migraine.

08

Prevent medication-overuse headache by limiting analgesic use to ⩽2–3 days per week.

09

Promote healthy lifestyle habits as part of every treatment plan.

10

Urgent referral is required for neurologic deficits, papilledema, thunderclap headache, signs of raised intracranial pressure, or suspected CNS infection.

High-Yield Examination Checklist

✓ Ask	✓ Examine	✓ Think	✓ Do
Onset	Blood pressure	Migraine	Treat pain early
Duration	Fundoscopy	Meningitis	Hydration
Pattern	Neurologic exam	Brain tumor	Lifestyle advice
Vomiting	Neck stiffness	Raised ICP	Headache diary
Visual symptoms	Vision	Sinusitis	MRI only if indicated
Trauma	Mental status	Medication-overuse	Refer when red flags are present