Approach to A Patient With Headache

Objectives:

1. Common types of headache “Migraine, Tension headache, Cluster headache”.

2. How to approach a patient with headache.
3. Red Flags and indications for further investigations like CT brain, MRI.

4. Brief comment on Migraine, Tension Headache, Cluster headache, benign.

5. intracranial tension, temporal arteritis, space-occupying headaches.
6. What is the role of primary health care physician in management “Drug treatment and Prophylaxis” like propranolol, topiramate, amitriptyline, ...
7. What investigations could be requested if needed.

8. When to refer to specialist.

PRIMARY	SECONDARY
D o not have red flag signs and symptoms are at low risk of serious headache.	Caused by infection or vascular disease.
Most common types: Tension-type 40%, Migraine 10% and Cluster 1%.	Check Dangerous headache section.

Table 1. International Classification of Headache Disorders, 2nd ed. (ICHD-2)

Primary headaches

Migraine

Tension-type

Cluster

Other (e.g., cold stimulus headache)

Secondary headaches

Headache attributed to any of the following: head or neck trauma, cranial or cervical vascular disorder, nonvascular intracranial disorder, substance use or withdrawal, infection, disturbance of homeostasis, psychiatric disorder

Headache or facial pain attributed to disorder of the cranium, neck, eyes, ears, nose, sinuses, teeth, mouth, or other facial or cranial structures

Adapted with permission from the American Academy of Neurology: Lipton RB, Bigal ME, Steiner TJ, et al. Classification of primary headaches. Neurology. *2004;63(3):428. Table 1. First level of The International Classification of Headache Disorders, 2nd edition. http://www.neurology.org/content/63/3/427.abstract.*

Table 6. Criteria for Low-Risk Headaches

Age younger than 30 years

Features typical of primary headaches (Tables 1 through 5)

History of similar headache

No abnormal neurologic findings

No concerning change in usual headache pattern

No high-risk comorbid conditions (e.g., human immunodeficiency virus infection)

No new, concerning historical or physical examination findings (Table 7)

Information from reference 6.

1. Acute Headaches “Primary”:

Tension-type

The most common form of headache, and affects more than 40%.

F > M

- Bilateral.
- Mild to Moderate pressure.
- W/O associated Sx.
  Normal Neurological PEx.
- Require no additional laboratory testing or neuroimaging.

Table 2. ICHD-2 Diagnostic Criteria for Episodic Tension-Type Headache

Infrequent

At least 10 episodes occurring fewer than one day per month on average (fewer than 12 days per year) and fulfilling the following criteria:

- Headache lasts 30 minutes to seven days
- Headache has at least two of the following features: bilateral location, pressing or tightening (nonpulsating) quality, mild or moderate intensity, not aggravated by routine physical activity such as walking or climbing stairs
- Both of the following: no nausea or vomiting (anorexia may occur), either photophobia or phonophobia

Headache is not attributed to another disorder

Frequent

At least 10 episodes occurring on more than one but fewer than 15 days per month for at least three months and fulfilling all of the criteria for infrequent episodic tension-type headache

ICHD-2 = International Classification of Headache Disorders, 2nd ed.

Adapted with permission from the American Academy of Neurology: Lipton RB, Bigal ME, Steiner TJ, et al. Classification of primary headaches. Neurology. 2004;63(3):431. Table 4. ICHD-2 criteria for episodic tension-type headache (TTH). http://www.neurology.org/content/63/3/427.abstract.

Treatment:

Recommendations include lifestyle, acute and prophylactic drug therapy, and management of tension-type headache during pregnancy. **Table-3**

Table 3. Medications for tension-type headache

MEDICATION	DOSE
Acute	
Ibuprofen	400 mg
ASA	1000 mg
Naproxen sodium	500-550 mg
Acetaminophen	1000 mg
Prophylactic	
First line	Special for anxiety or stress patients
• amitriptyline	10-100 mg/d
• nortriptyline	10-100 mg/d
Second line	
• mirtazapine	30 mg/d
• venlafaxine	150 mg/d

ASA—acetylsalicylic acid.
Adapted from Toward Optimized Practice.[10]

1st line

Migraine
Key words to distinguish from Tension-type: **Nausea, photophobia (sensitivity to light), and phonophobia (sensitivity to sound).**
Physical activity often exacerbates migraine headache. Combined findings can be summarized by the **POUND** mnemonic: Pulsatile, duration of 4 to 72hr, Unilateral, nausea or vomiting, disabling intensity. **Must meet 4 of the criteria to diagnose Migraine.**
Aura may be present in some cases of migraine. Aura consists of visual, sensory, or speech symptoms that appear gradually**, last no longer than 60 minutes**, and are completely reversible.

-ve aura: LOC, loss of sensation, loss of vision...
+ve aura: tingling, numbness, flashlights…

Table 4. ICHD-2 Diagnostic Criteria for Migraine Without Aura

At least five episodes fulfilling the following criteria:

- Headache episodes lasting four to 72 hours (untreated or unsuccessfully treated)
- Headache has at least two of the following characteristics: unilateral location, pulsating quality, moderate or severe pain intensity, aggravated by (or causes avoidance of) routine physical activity such as walking or climbing stairs
- During the headache, the patient experiences at least one of the following: nausea or vomiting; and photophobia and phonophobia

Headache is not attributed to another disorder

ICHD-2 = International Classification of Headache Disorders, 2nd ed.

Adapted with permission from the American Academy of Neurology: Lipton RB, Bigal ME, Steiner TJ, et al. Classification of primary headaches. Neurology. *2004;63(3):428. Table 2. ICHD-2 diagnostic criteria for 1.1 Migraine without aura. http://www.neurology.org/content/63/3/427.abstract.*

Table 3. ICHD-2 Diagnostic Criteria for Migraine with Typical Aura

At least two episodes fulfilling the following criteria:

- Aura consisting of at least one of the following, but no motor weakness: fully reversible visual symptoms including positive features (e.g., flickering lights, spots or lines) and/or negative features (i.e., loss of vision); fully reversible sensory symptoms including positive features (i.e., pins and needles) and/or negative features (i.e., numbness); fully reversible dysphasic speech disturbance
- At least two of the following: homonymous visual symptoms and/or unilateral symptoms; at least one aura symptom develops gradually over five or more minutes and/or different aura symptoms occur in succession over five or more minutes; each symptom lasts at least five minutes, but no longer than 60 minutes
- A headache that fulfills the criteria for migraine without aura (Table 4), and begins during the aura or follows the aura within 60 minutes

Headache not attributed to another disorder

ICHD-2 = International Classification of Headache Disorders, 2nd ed.

Adapted with permission from the American Academy of Neurology: Lipton RB, Bigal ME, Steiner TJ, et al. Classification of primary headaches. Neurology. *2004;63(3):429. Table 3. ICHD-2 criteria for 1.2.1 Typical aura with migraine headache. http://www.neurology.org/content/63/3/427.abstract.*

Treatment:

- Recommendations include lifestyle management, acute treatment, prophylaxis, menstrual migraine, and migraine treatment during pregnancy.

1\ Acute

Table 2. Migraine medications: *A) Acute migraine medications. B) Prophylactic migraine medications.*

A)

TYPE	ACUTE MEDICATIONS
First line	Ibuprofen 400 mg, ASA 1000 mg, naproxen sodium 500-550 mg, acetaminophen 1000 mg
Second line	Triptans: oral sumatriptan 100 mg, rizatriptan 10 mg, almotriptan 12.5 mg, zolmitriptan 2.5 mg, eletriptan 40 mg, frovatriptan 2.5 mg, naratriptan 2.5 mg • Subcutaneous sumatriptan 6 mg if the patient is vomiting early in the attack. Consider for attacks resistant to oral triptans • Oral wafer: rizatriptan 10 mg or zolmitriptan 2.5 mg if fluid ingestion worsens nausea • Nasal spray: zolmitriptan 5 mg or sumatriptan 20 mg if patient is nauseated Antiemetics: domperidone 10 mg or metoclopramide 10 mg for nausea
Third line	Naproxen sodium 500-550 mg in combination with a triptan
Fourth line	Fixed-dose combination analgesics (with codeine if necessary; not recommended for routine use)

1st line: Analgesics
2nd line: Triptans for moderate-severe headaches
3rd line: Injections for SEVERE headache + Triptans as Anti-emetics

2\ Prophylaxis

B)

PROPHYLACTIC MEDICATIONS	STARTING DOSE	TITRATION,* DAILY DOSE INCREASE	TARGET DOSE OR THERAPEUTIC RANGE†	NOTES
First line				
• propranolol	20 mg twice daily	40 mg/wk	40-120 mg twice daily	Avoid in asthma
• metoprolol	50 mg twice daily	50 mg/wk	50-100 mg twice daily	Avoid in asthma
• nadolol	40 mg/d	20 mg/wk	80-160 mg/d	Avoid in asthma
• amitriptyline	10 mg at bedtime	10 mg/wk	10-100 mg at bedtime	Consider if patient has depression, anxiety, insomnia, or tension-type headache
• nortriptyline	10 mg at bedtime	10 mg/wk	10-100 mg at bedtime	Consider if patient has depression, anxiety, insomnia, or tension-type headache
Second line				
• topiramate	25 mg/d	25 mg/wk	50 mg twice daily	Consider as a first-line option if the patient is overweight
• candesartan	8 mg/d	8 mg/wk	16 mg/d	Few side effects; limited experience in prophylaxis
• gabapentin	300 mg/d	300 mg every 3-7 d	1200-1800 mg/d divided into 3 doses	Few drug interactions
Other				
• divalproex	250 mg/d	250 mg/wk	750-1500 mg/d divided into 2 doses	Avoid in pregnancy or when pregnancy is possible
• pizotifen	0.5 mg/d	0.5 mg/wk	1-2 mg twice daily	Monitor for somnolence and weight gain
• onabotulinumtoxinA	155-195 units	No titration needed	155-195 units every 3 mo	For chronic migraine only (headache on ≥15 d/mo)
• flunarizine	5-10 mg at bedtime	No titration needed	10 mg at bedtime	Avoid in patients with depression
• venlafaxine	37.5 mg/d	37.5 mg/wk	150 mg/d	Consider for migraine in patients with depression
Over the counter				
• magnesium citrate	300 mg twice daily	No titration needed	300 mg twice daily	Effectiveness might be limited; few side effects
• riboflavin	400 mg/d	No titration needed	400 mg/d	Effectiveness might be limited; few side effects
• butterbur	75 mg twice daily	No titration needed	75 mg twice daily	Effectiveness might be limited; few side effects
• coenzyme Q10	100 mg 3 times daily	No titration needed	100 mg 3 times daily	Effectiveness might be limited; few side effects

ASA—acetylsalicylic acid.
*Dosage can be increased every 2 wk to avoid side effects. For most drugs, slowly increase to the target dose; a therapeutic trial requires several months. The expected outcome is reduction not elimination of attacks.
†If the target dose is not tolerated, try a lower dose. If the medication is effective and tolerated, continue it for at least 6 mo. If several preventive drugs fail, consider a specialist referral.
Adapted from Toward Optimized Practice.[10]

Considerations regarding Migraine Management & Prophylaxis:

Box 5. Comprehensive migraine management

Consider the following when managing patients with migraine:

- Pay attention to lifestyle and specific migraine triggers in order to reduce the frequency of attacks. Lifestyle factors to avoid include the following:
  - -irregular or skipped meals
  - -irregular or too little sleep
  - -a stressful lifestyle
  - -excessive caffeine consumption
  - -lack of exercise
  - -obesity
- Use acute pharmacologic therapy for individual attacks
- Use prophylactic pharmacologic therapy, when indicated, to reduce attack frequency
- Use nonpharmacologic therapies
- Evaluate and treat coexistent medical and psychiatric disorders
- Encourage patients to participate actively in their treatment and to employ self-management principles:
  - -self-monitoring to identify factors influencing migraine
  - -managing migraine triggers effectively
  - -pacing activity to avoid triggering or exacerbating migraine
  - -maintaining a lifestyle that does not worsen migraine
  - -practising relaxation techniques
  - -maintaining good sleep hygiene
  - -developing stress management skills
  - -using cognitive restructuring to avoid catastrophic or negative thinking
  - -improving communication skills to talk effectively about pain with family and others
  - -using acute and prophylactic medication appropriately

Box 6. Pharmacologic prophylaxis for migraine

Prophylactic medication is indicated in the following circumstances:

- Recurrent migraine attacks are causing considerable disability despite optimal acute drug therapy
- Frequency of acute medication use is approaching levels that place the patient at risk of medication-overuse headache
  - -acute medications are used on ≥ 10 d/mo for triptans, ergots, opioids, and combination analgesics
  - -acute medications are used on ≥ 15 d/mo for acetaminophen and NSAIDs
- Recurrent attacks with prolonged aura are occurring (hemiplegic migraine, basilar-type migraine, etc)
- Contraindications to acute migraine medications are making symptomatic treatment of migraine attacks difficult

Box 7. Pharmacologic prophylaxis for migraine

Consider the following when prescribing prophylactic medication:

- Educate patients on the need to take the medication daily and according to the prescribed frequency and dosage
- Ensure that patients have realistic expectations as to what the likely benefits of pharmacologic prophylaxis will be:
  - -Headache attacks will likely not be abolished completely
  - -A reduction in headache frequency of 50% is usually considered worthwhile and successful
  - -It might take 4-8 wk for substantial benefit to occur
  - -If the prophylactic drug provides substantial benefit in the first 2 mo of therapy, this benefit might increase further over several additional months of therapy
- Evaluate the effectiveness of therapy using patient diaries that record headache frequency, drug use, and disability levels
- For most prophylactic drugs, initiate therapy with a low dose and increase the dosage gradually to minimize side effects
- Increase the dose until the drug proves effective, until dose-limiting side effects occur, or until a target dose is reached
- Provide an adequate drug trial. Unless side effects mandate discontinuation, continue the prophylactic drug for at least 6-8 wk after dose titration is completed
- Because migraine attack tendency fluctuates over time, consider gradual discontinuation of the drug for many patients after 6 to 12 mo of successful prophylactic therapy, but preventive medications can be continued for much longer in patients who have experienced substantial migraine-related disability

Based on Géraud et al[28] and the Scottish Intercollegiate Guidelines Network guidelines.[29]

- COCP are C.I with migraine because it increase the risk of ischemic stroke.

Cluster
They are relatively rare. The age of onset of cluster headaches varies, with 70% of patients reporting onset before 30 years of age.
Characterized by **brief** (15 to 180 minutes) episodes of **severe** head pain most commonly describes as **sharp**, but it can also be pulsating and pressure-like. Can occur on both sides of the head, most patients report **unilateral** pain. Occurs in the **retro-orbital area**, followed by the **temporal** region, **upper teeth**, **jaw**, **cheek**, **lower teeth**, and **neck**. Associated autonomic symptoms: **eyelid edema, nasal congestion, lacrimation, or forehead sweating.**
There tend to be **several** (up to eight) episodes in the same day, with each episode **lasting between 15 and 180 minutes**. Episodes occur daily for a number of weeks followed by a period of remission. On average, **a period of cluster headaches lasts six to 12 weeks**, with **remission lasting up to 12 months**.

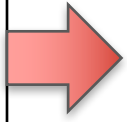


Table 5. ICHD-2 Diagnostic Criteria for Cluster Headache

At least five episodes fulfilling the following criteria:

- Severe or very severe unilateral orbital, supraorbital, or temporal pain lasting 15 to 180 minutes if untreated
- Headache is accompanied by at least one of the following ipsilateral autonomic symptoms: conjunctival injection or lacrimation, nasal congestion or rhinorrhea, eyelid edema, forehead and facial sweating, miosis or ptosis, restlessness or agitation
- Headache episodes occur from one every other day to eight per day

Not attributable to another disorder

Episodic cluster headache

Fulfills all of the above criteria

At least two cluster periods lasting seven to 365 days and separated by pain-free remissions of more than one month

Chronic cluster headache

Fulfills all of the above criteria

Episodes recur for more than one year without remission periods or with remission periods lasting less than one month

ICHD-2 = International Classification of Headache Disorders, 2nd ed.

Information from reference 4.

Treatment:

- Recommendations include lifestyle management, acute treatment, prophylaxis, menstrual migraine, and migraine treatment during pregnancy. **Table 4**

1st line: 100% Oxygen

Table 4. Medications for cluster headache: *Consider early specialist referral.*

MEDICATION	DOSE
Acute	
Subcutaneous sumatriptan	6 mg
Intranasal zolmitriptan	5 mg
100% oxygen	12 L/min for 15 min through non-rebreathing mask
Prophylactic*	
First line	
• verapamil	240-480 mg/d (higher doses might be required)
Second line	
• lithium	900-1200 mg/d
Other	
• topiramate	100-200 mg/d
• melatonin	Up to 10 mg/d

*If the patient has more than 2 attacks daily, consider transitional therapy while verapamil is built up (eg, 60 mg of prednisone for 5 d, then reduced by 10 mg every 2 d until discontinued).
Adapted from Toward Optimized Practice.[10]

Dangerous Headaches “secondary”:

Patients with characteristics of secondary headache should be evaluated to determine whether the headache is dangerous. **CT scan** of the head is the most widely used imaging study for acute head trauma because of its availability, speed, and accuracy. However, **MRI** of the brain is **more sensitive** for detecting subdural hematoma, and is therefore particularly important in identifying smaller lesions. **(Table 7)**

Below from 432 teamwork

Table 3. Secondary Causes of Headache

Type	*Examples*
Infectious	Meningitis, sinusitis
Intracranial pressure disorders	Increased intracranial pressure from mass, decreased intracranial pressure from post–lumbar puncture headache
Medication related	Medication overuse headache, medication-induced adverse effects, intracranial hemorrhage secondary to anticoagulation
Metabolic	Hypoxia, obstructive sleep apnea
Neuralgias	Occipital or trigeminal neuralgia
Posttraumatic	Traumatic brain injury
Structural	Arnold-Chiari malformation; cervical spine, myofascial pain, or temporomandibular joint disorders
Vascular	Arterial aneurysm, cerebrovascular accident, giant cell arteritis, hypertensive urgency

Adapted with permission from the American Academy of Neurology: Halker RB, Hastriter EV, Dodick DW. Chronic daily headache: an evidence-based and systematic approach to a challenging problem. Neurology. *2011;76(7 suppl 2):S38. Table 1 Causes of primary and secondary chronic daily headache on page S38. http://www.neurology.org/content/76/7_Supplement_2/S37.extract.*

1. Idiopathic intracranial hypertension:

Increased intracranial pressure in the absence of a tumor or other diseases.
Most cases occur in young women who are obese. Patients with higher BMIs and recent weight gain are at increased risk.

Symptoms:

i. Diffuse headache, worse in the morning.
ii. Aggravating by coughing and sneezing.
iii. Horizontal diplopia
iv. Pulsatile tinnitus

Management

1. Lumbarpuncture
2. Patients without visualloss: carbonic anhydrase inhibitor(eg,acetazolamide).
3. Patients with severe symptoms, early visual field loss high-dose Corticosteroids.
4. Diuretics
5. If the medication is not useful refer to neurosurgeon.

2. Temporal arteritis (Giant cell arteritis):

It's a form of vasculitis that affects medium and large arteries especially external carotid artery and its branches.

Risk Factors:

1. Age: >50
2. Sex: Women
3. Polymyalgia rheumatic

Symptoms

1. Sudden onset headache, localized to the temporal region.
2. Tenderness and sensitivity on the scalp.
3. Jaw claudication
4. Unilateral visual loss or occasionally diplopia.
5. Constitutional symptom.

Investigations: arterial biopsy and **ESR.**

Management:

high dose corticosteroids as soon as possible to prevent blindness. Refer to ophthalmologist and rheumatologist.

3. Space occupying lesions:

Usually due to malignancy but it can be caused by other pathology such as an abscess, cysts and hematoma.

Headache tends to be quite a late feature, and it is usually very severe, waking patients from sleep.

Presentation:

1. Papilledema.
2. Vomiting.
3. Focal neurological symptoms, or non-focal neurological symptoms.

Investigations: CRP, ESR and brain CT or MRI.

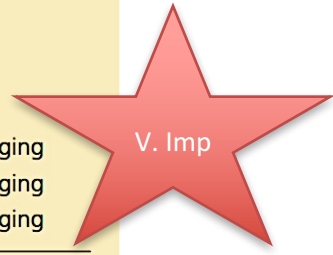
Management: (refer to specialist)

- Lumbar puncture is contraindicated with space occupying lesions.

Table 7. Red Flag Signs and Symptoms in the Evaluation of Acute Headache

Danger sign or symptom	*Possible diagnoses*	*Tests*
First or worst headache of the patient's life	Central nervous system infection, intracranial hemorrhage	Neuroimaging
Focal neurologic signs (not typical aura)	Arteriovenous malformation, collagen vascular disease, intracranial mass lesion	Blood tests, neuroimaging
Headache triggered by cough or exertion, or while engaged in sexual intercourse	Mass lesion, subarachnoid hemorrhage	Lumbar puncture, neuroimaging
Headache with change in personality, mental status, level of consciousness	Central nervous system infection, intracerebral bleed, mass lesion	Blood tests, lumbar puncture, neuroimaging
Neck stiffness or meningismus	Meningitis	Lumbar puncture
New onset of severe headache in pregnancy or postpartum	Cortical vein/cranial sinus thrombosis, carotid artery dissection, pituitary apoplexy	Neuroimaging
Older than 50 years	Mass lesion, temporal arteritis	Erythrocyte sedimentation rate, neuroimaging
Papilledema	Encephalitis, mass lesion, meningitis, pseudotumor	Lumbar puncture, neuroimaging
Rapid onset with strenuous exercise	Carotid artery dissection, intracranial bleed	Neuroimaging
Sudden onset (maximal intensity occurs within seconds to minutes, thunderclap headache)	Bleeding into a mass or arteriovenous malformation, mass lesion (especially posterior fossa), subarachnoid hemorrhage	Lumbar puncture, neuroimaging
Systemic illness with headache (fever, rash)	Arteritis, collagen vascular disease, encephalitis, meningitis	Blood tests, lumbar puncture, neuroimaging, skin biopsy
Tenderness over temporal artery	Polymyalgia rheumatica, temporal arteritis	Erythrocyte sedimentation rate, temporal artery biopsy
Worsening pattern	History of medication overuse, mass lesion, subdural hematoma	Neuroimaging
New headache type in a patient with:		
Cancer	Metastasis	Lumbar puncture, neuroimaging
Human immunodeficiency virus infection	Opportunistic infection, tumor	Lumbar puncture, neuroimaging
Lyme disease	Meningoencephalitis	Lumbar puncture, neuroimaging

Information from references 5, and 20 through 24.



2. Chronic Headaches:

Chronic daily headache is defined as the presence of a headache on **15 days or more per month** for at least three month. It is further divided into headaches of **short** or **long** duration. (Check table in last page).

Headaches of short duration are defined as lasting **less than 4hr**, whereas **headaches of long duration** are defined as lasting **more than 4hr**.

For patients with migraine, **modifiable risk factors** for progression to chronic migraine include: **obesity**, **medication over use**, **stressful life events**, **snoring**, **caffeine** overuse, and **other causes of chronic pain**. (Important to ask for during Hx) Unless systemic symptoms are present, there is no role for laboratory testing. It is important to evaluate for red flags that may suggest a secondary cause of headache or a headache requiring more immediate evaluation.

Check next Table

Table 1. Types of Chronic Daily Headache

Type	*Features*	*Treatment*
Short duration		
Brief headache syndromes		
Hypnic	Develops during sleep; lack of autonomic symptoms; must have 2 of 3 criteria: (1) occurs more than 15 times per month, (2) lasts more than 15 minutes after awakening, and (3) starts after 50 years of age	Lithium, caffeine
Primary cough	Onset from cough or Valsalva maneuver; generalized pain; lasts from 1 second to 30 minutes; must rule out secondary causes	Indomethacin (Indocin)
Primary exertional	Pulsating pain; lasts 5 minutes to 48 hours; brought on by physical exertion; must rule out secondary causes	Indomethacin
Primary stabbing	Transient and localized stabs of pain; felt over orbit, temple, or parietal area; no accompanying symptoms	Indomethacin
Trigeminal autonomic cephalalgias*		
Chronic cluster headache	Deep stabbing pain behind the eye; abrupt onset; lasts 15 to 180 minutes; accompanied by at least 1 of the following ipsilateral symptoms: (1) conjunctival injection or lacrimation, (2) nasal congestion or rhinorrhea, (3) eyelid edema, (4) forehead or facial sweating, (5) miosis and/or ptosis, or (6) sense of agitation or restlessness; frequency of once every other day to 8 episodes per day; recurs for longer than 1 year without remission of more than 1 month's time	Abortive: 100% oxygen, sumatriptan (Imitrex) Prophylactic: verapamil, lithium
Paroxysmal hemicrania	Severe unilateral orbital, supraorbital, or temporal pain; lasts 2 to 30 minutes; accompanied by 1 of the ipsilateral symptoms consistent with cluster headache; more than 5 attacks per day more than half the time; by definition, headache is prevented by indomethacin (unlike cluster headaches, which are longer and are not prevented by indomethacin)	Indomethacin
SUNA/SUNCT	Unilateral orbital, supraorbital, or temporal stabbing or pulsating pain; lasts 5 to 240 seconds; accompanied by ipsilateral conjunctival injection and lacrimation; 3 to 200 attacks per day	Uncertain
Long duration		
Hemicrania continua	Unilateral, continuous pain of moderate severity; has at least 1 of the following: (1) conjunctival injection and/or lacrimation, (2) nasal congestion and/or rhinorrhea, and (3) ptosis and/or miosis; defined by a complete response to indomethacin	Indomethacin
Migraine	Lasts 4 to 72 hours; usually unilateral; often with nausea/vomiting and photophobia or phonophobia; aggravated by activity	Abortive: analgesics, antiemetics, triptans Prophylactic: amitriptyline, propranolol, topiramate (Topamax), valproate (Depacon)
New daily persistent	Present daily for more than 3 months; unremitting within 3 days of onset; usually bilateral with a pressing/tightening quality; not aggravated by activity; usually not with autonomic symptoms	Migraine prophylactic agents; new daily persistent headaches generally refractory to treatment
Tension type	Gradual increase in frequency from episodic to chronic headache; usually bilateral with a pressing/tightening quality; not aggravated by activity; usually not with autonomic symptoms	Amitriptyline

SUNA = short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms; SUNCT = short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing.

**—Unilateral trigeminal distribution with autonomic features.*

Information from reference 2.

Short duration	Long duration
Trigeminal autonomic cephalalgias: Have unilateral trigeminal distribution with autonomic features, and include chronic cluster headache, paroxysmal hemicrania, and short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms or with conjunctival injection and tearing.	Have migraines or tension- type headaches. Other types of long-duration chronic daily headache include hemicrania continua and new daily persistent headache.
Brief headache syndromes: Include hypnic, primary stabbing, primary cough, and primary exertional headaches.	**Transformed migraine**: Occur in patients with a history of migraines who have a rapid or gradual progression to chronic daily headache and patients commonly have a daily headache with flare-ups similar to their previous migraine.
Overuse of abortive medication: Including acetaminophen, NSAID, triptans, butalbital, caffeine, and narcotics. It is present when patient with migraine or tension-type of headache use combination of analgesics, opioids or triptans **on >10d/mon** OR Acetaminophen or NSAID on **>15d/mon.**	
	Tension-type headaches: are characterized by occipital or bilateral bandlike discomfort that builds slowly and may persist for several days. Unlike migraine, there is usually a lack of associated nausea or photophobia.
	New daily persistent headache: is generally more refractory to treatment than chronic tension-type headache. The headache becomes constant within 72 hours.

Table 5. Diagnosing primary headache syndromes

DESCRIPTION	HEADACHE SYNDROME
Patients with recurrent headache attacks and normal neurologic examination findings (in some patients other clinical symptoms might also need to be considered)*	• Diagnose migraine without aura (migraine with aura if an aura is present) if they have at least 2 of the following: -nausea during the attack -light sensitivity during the attack -some of the attacks interfere with their activities • Diagnose episodic tension-type headache† if headache attacks are not associated with nausea, and have at least 2 of the following: -bilateral headache -nonpulsating pain -mild to moderate intensity -headache is not worsened by activity • Diagnose cluster headache or another trigeminal autonomic cephalalgia if headache attacks meet all the following criteria: -frequent -severe -brief (duration <3 h) -unilateral -ipsilateral conjunctival injection, tearing, or restlessness during the attacks (ipsilateral ptosis or miosis might be present on examination). Neurologist referral recommended
Patients with headache on ≥15 d/mo for >3 mo and with normal neurologic examination findings‡	• Diagnose chronic migraine if headaches meet migraine diagnostic criteria (above) or are quickly aborted by migraine-specific medications (triptans or ergots) on ≥8 d/mo -Chronic migraine with medication overuse if the patient uses ergots, triptans, opioids, or combination analgesics on ≥10 d/mo or uses plain acetaminophen or NSAIDs on ≥15 d/mo -Chronic migraine without medication overuse if patients do not have medication overuse as defined above • Diagnose chronic tension-type headache if headaches meet episodic tension-type headache diagnostic criteria (above), except mild nausea might be present
Patients with continuous daily headache for >3 mo with normal neurologic examination findings§	• Diagnose hemicrania continua‖ (neurologist referral recommended) if the headache -is strictly unilateral -is always on the same side of the head (ptosis or miosis might be present on examination) -responds dramatically to indomethacin • Diagnose new daily persistent headache‖ if the headache is unremitting since its onset. It is important to consider secondary headaches in these patients. Neurologist referral recommended

How to approach a patient with headache.
History Taking:

- **Thunderclap headache**, which is characterized by sudden-onset headache pain, with peak intensity occurring within several minutes, requires prompt evaluation. **DDx**: Subarachnoid hemorrhage, Hypertensive emergencies, Vertebral artery dissections, & Acute angle-closure glaucoma.

- **Use of illicit drugs**, including **cocaine and methamphetamine**, can **increase the risk of intracranial bleeding** or stroke. **Prescription or over-the-counter medications** such as aspirin, other NSAID, anticoagulants, and glucocorticoids increase the risk of intracranial bleeding.

- A history of HIV infection or other immunosuppressive conditions in patients with headache may suggest a **brain abscess**, **meningitis**, or **malignancy** of the CNS. **Coexisting infection** in the lungs, sinuses, or orbital areas may precede and cause a CNS infection.

Table 2. Red Flags Suggestive of a Secondary Cause of Headache

Red flag	*Possible secondary etiologies*
Headaches aggravated or relieved by assuming an upright or supine position	Intracranial hemorrhage
Headaches provoked by Valsalva maneuver	Arnold-Chiari malformation
History of sudden onset of headache	Subarachnoid hemorrhage
Onset of headache after 50 years of age	Brain neoplasm
Papilledema	Disorders with increased intracranial pressure (i.e., intracranial mass or bleed)
Presence of focal or lateralizing neurologic signs	Hemorrhagic stroke
Presence of systemic symptoms (i.e., weight loss, fevers, myalgias)	Giant cell arteritis, meningitis, encephalitis
Recent pregnancy	Postpartum preeclampsia

Information from references 3 and 6.

Physical Examination

- Abnormalities are one of the best predictors of CNS pathology. A **focal neurologic deficit** should not be attributed to migraine headache unless a similar pattern has occurred with a previous migraine. **Abnormal findings on examination** can be pronounced, such as **meningismus** or **unilateral vision loss**, or subtle, such as **extensor plantar response** or **unilateral pronator drift**.

- **Obtundation** or **confusion** suggests a dangerous headache.

- Patients with **headache and fever, papilledema, or severe hypertension** (systolic pressure greater than 180 mm Hg or diastolic pressure greater than 120 mm Hg) require evaluation for CNS infection and ICP.
  Patients also should be evaluated to determine if their BP should be lowered to safer levels to avoid intracranial hemorrhage from malignant hypertension. Contusions and facial or scalp lacerations increase the likelihood of associated intracranial hemorrhage.

Box 2. Important elements of the headache history in patients presenting with headache for the first time or those with a change in headache pattern

Explore the following important elements of the headache history:

- Headache onset (thunderclap, head or neck trauma), previous attacks (progression of symptoms), duration of attacks (<3 hours, >4 hours, continuous), days per month with headache
- Pain location (unilateral, bilateral, associated neck pain, etc)
- Headache-associated symptoms (nausea, vomiting, photophobia, conjunctival injection, rhinorrhea, etc)
- Relationship of headache attacks to precipitating factors (stress, posture, cough, exertion, straining, neck movement, jaw pain, etc)
- Headache severity and effect on work and family activities
- Acute and preventive medications tried, response, and side effects
- Presence of coexistent conditions that might influence treatment choice (insomnia, depression, anxiety, hypertension, asthma, and history of heart disease or stroke)

Based on expert opinion of the Guideline Development Group.

Box 4. Red flags and other potential indicators of secondary headache: *Appropriate referral or investigation should be considered.*

Red flags: emergent (address immediately)

- Thunderclap onset
- Fever and meningismus
- Papilledema with focal signs or reduced level of consciousness
- Acute glaucoma

Red flags: urgent (address within hours to days)

- Temporal arteritis
- Papilledema without focal signs or reduced level of consciousness
- Relevant systemic illness
- Elderly patient: new headache with cognitive change

Other possible indicators of secondary headache (less urgent)

- Unexplained focal signs
- Atypical headaches (not consistent with migraine or tension-type headache)
- Unusual headache precipitants
- Unusual aura symptoms
- Onset after age 50 y
- Aggravation by neck movement; abnormal neck examination findings (consider cervicogenic headache)
- Jaw symptoms; abnormal jaw examination findings (consider temporomandibular joint disorder)

d on the Scottish Intercollegiate Guidelines Network guideline[29] and expert pinion of the Guideline Development Group.

Box 3. Approach to the physical examination of a patient presenting with headache for the first time or with a change in headache pattern

The physical examination should incorporate the following elements:

- Screening neurologic examination
  - -general assessment of mental status
  - -cranial nerve examination
    - —fundoscopy, pupils, eye movements, visual fields, evaluation of facial movements for asymmetry and weakness
  - -assessment for unilateral limb weakness, reflex asymmetry, and coordination in the arms
  - -assessment of gait, including heel-toe walking (tandem gait)
- Neck examination
  - -posture, range of motion, and palpation for muscle tender points
- Blood pressure measurement
- If indicated by other neurologic symptoms or signs on screening examination, a focused neurologic examination (eg, lower cranial nerve examination in a patient with dysarthria, or plantar responses in a patient with reflex asymmetry)
- If indicated by associated jaw complaints, an examination for temporomandibular disorders
  - -assessment of jaw opening
  - -palpation of muscles of mastication for tender points

ed on the Scottish Intercollegiate Guidelines Network guideline[29] and expert opinion of the Guideline Development Group.

✓ **The indications for referral** to a neurologist or headache specialist may include **diagnostic uncertainty**, **unsuccessful outpatient therapy**, or **the desire to administer more specialized treatment**, such as onabotulinumtoxinA. **Patients with severe psychiatric illness** should be evaluated by a psychiatrist. It may be necessary to hospitalize some patients (e.g., those with intractable migraine, those who are opioid dependent) to **discontinue abortive medications in a monitored setting**, to **treat the headache with intravenous medications**, such as dihydroergotamine, and **Pregnant female wants headache prophylaxis**.

Diagnostic Neuroimaging:

Indicated for **all patients who present with signs or symptoms of dangerous headache**, because they are at increased risk of intracranial pathology. **American College of Radiology** has made a few specific recommendations (Table 8).

Lumbar Puncture LP is useful for identifying infection, the presence of RBCs (which suggests bleeding), and abnormal cells associated with some CNS malignancies. In adults with suspected subarachnoid hemorrhage, it is important to perform LP to check for blood or xanthochromia.

CT scan of the head should be performed before LP, **even if the results of neurologic examination are normal**, because there is **a risk of central herniation** of the brain even in the absence of physical examination findings of subarachnoid hemorrhage.

Table 8. American College of Radiology Recommendations for Neuroimaging in Patients with Headache

Clinical features	*Recommended imaging modality*
Headache in immunocompromised patients	MRI of the head with and without contrast media
Headache in patients older than 60 years with suspected temporal arteritis	MRI of the head with and without contrast media
Headache with suspected meningitis	CT or MRI of the head without contrast media
Severe headache in pregnancy	CT or MRI of the head without contrast media
Severe unilateral headache caused by possible dissection of the carotid or arterial arteries	MRI of the head with and without contrast media, MRA of the head and neck, or CTA of the head and neck
Sudden onset or severe headache; worst headache of the patient's life	CT of the head without contrast media; CTA of the head with contrast media, MRA of the head with or without contrast media, or MRI of the head without contrast media

CT = computed tomography; CTA = computed tomographic angiography; MRA = magnetic resonance angiography; MRI = magnetic resonance imaging.

Information from reference 28.

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	*Evidence rating*	*References*
A diagnosis of migraine is highly likely with presence of headache with nausea, or if the patient reports experiencing two of three features from either of these symptom triads: nausea, photophobia, or pulsating pain; or nausea, photophobia, or a headache that worsens with exertion.	C	15
Head computed tomography should be performed before lumbar puncture in all patients with suspected subarachnoid hemorrhage, regardless of findings on neurologic examination.	C	23
A patient with sudden onset of severe headache (e.g., patient reporting the worst headache of his or her life, or maximal from initiation, or thunderclap headache) should be evaluated with computed tomography of the head without contrast media.	C	28
Immunocompromised patients with severe headache should be evaluated with magnetic resonance imaging of the head with and without contrast media.	C	28

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to http://www.aafp.org/afpsort.xml.

Role of Primary Health Care Physician:

1. To arrange specific consultations for headache.
2. To institute a system of detailed history taking, patient education at the outset of the consultation.
3. To institute a process of management that is individualized for each patient, using a new algorithm. Assessing the impact on the patient's daily life is a key aspect of diagnosis and management.
4. To prescribe only treatments that have objective evidence of favorable efficacy and tolerability.
5. To utilize prospective follow-up procedures to monitor the success of treatment.
6. To organize a team approach to headache management in primary care.

3. Management \ Treatment:

Non-pharmacological:

- Several behavioral modifications are recommended for patients with chronic daily headache. These include cessation of caffeine and tobacco use, improved sleep hygiene, diet changes, and regular mealtimes.
- Acupunture also has proven effective for reducing the frequency of headaches in persons with both migraine and tension-type headache.
- Internet-based biofeedback and relaxation techniques that have been shown to decrease headache frequency and severity, and medication use.
- Cognitive behavior therapy for chronic daily headache, both in group and individualized settings to reduce headache frequency and severity.

Pharmacological:

- Abortive drug therapies for acute headaches include acetaminophen, NSAID, tramadol (Ultram), and triptans.
- Chronic daily headache, concerns about headache from medication overuse should prompt the phy- sician to consider headache prophylaxis to lessen the need for abortive therapy.
- **1st line for chronic headache:** Propranolol, a beta blocker, also reduces the frequency of headache for persons with migraine.
- **2nd line:** A tricyclic antidepressant, reduces headache duration and severity for chronic tension- type headache.
- **3rd line:** Valproate (Depacon) and topiramate (Topamax) are anticonvulsants that can reduce the frequency of chronic migraine by 50%.

Medication over use:

- Migraine sufferers are particularly prone to developing medication-overuse headache. Recommendations for diagnosis and management of medication-overuse headache are shown in Boxes 8 and 9 .

Box 8. Diagnosis of medication-overuse headache

Consider the following in the diagnosis of medication-overuse headache:

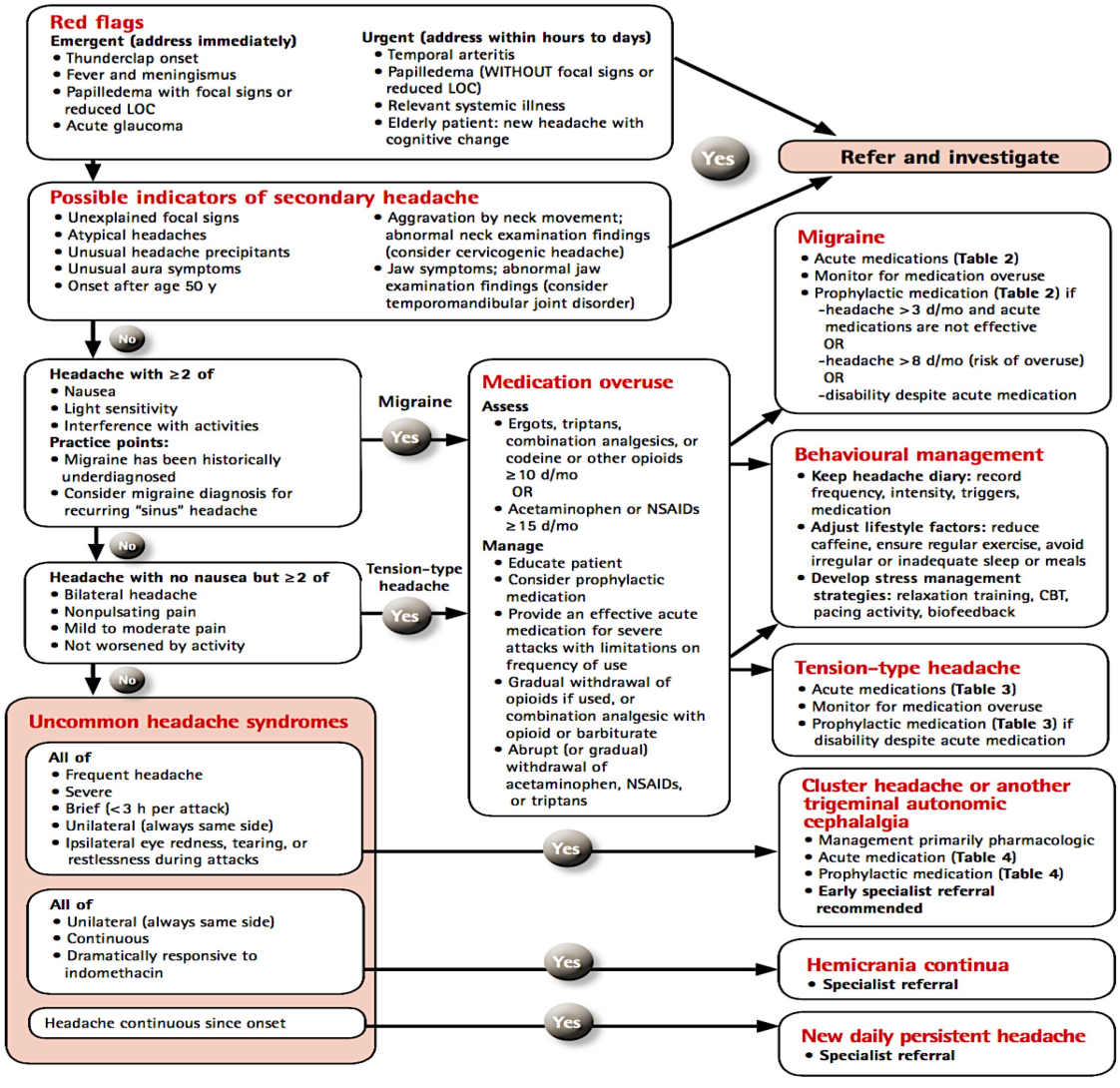
- Consider a diagnosis of medication overuse headache in patients with headache on ≥15 d/mo and assess patients for possible medication overuse (use of triptans, ergots, combination analgesics, or opioid-containing medications on ≥10 d/mo, or use of acetaminophen or NSAIDs on ≥15 d/mo)
- When medication-overuse headache is suspected, the patient should also be evaluated for the presence of the following:
  -psychiatric comorbidities (depression and anxiety); these might need to be considered in planning an overall treatment strategy
  -psychological and physical drug dependence
  -use of inappropriate coping strategies. Rather than relying on medication as a main coping strategy, patients with suspected medication overuse might benefit from training in and development of more adaptive self-management strategies (eg, identification and management of controllable headache triggers, relaxation exercises, effective stress management skills, and activity pacing)
- Headache diaries that record acute medication intake are important in the prevention and treatment of medication-overuse headache

Box 9. Management of medication-overuse headache

Treatment plans for patients with medication-overuse headache should include the following:

- Patient education. Patients need to understand that
  - -acute medication overuse can increase headache frequency
  - -when medication overuse is stopped, headache might worsen temporarily and other withdrawal symptoms might occur
  - -many patients will experience a long-term reduction in headache frequency after medication overuse is stopped
  - -prophylactic medications might become more effective
- A strategy for cessation of medication overuse
  - -abrupt withdrawal should be advised for patients with suspected medication-overuse headache caused by simple analgesics (acetaminophen, NSAIDs) or triptans; however, gradual withdrawal is also an option
  - -gradual withdrawal should be advised for patients with suspected medication-overuse headache caused by opioids and opioid-containing analgesics
- Provision of a prophylactic medication while medication overuse is stopped. While many prophylactic agents are used (tricyclics, β-blockers, etc), drugs with the best evidence for efficacy in chronic migraine with medication overuse are
  - -onabotulinumtoxinA, 155 units to 195 units injected at intervals of 3 mo by clinicians experienced in its use for headache
  - -topiramate with slow titration to a target dose of 100 mg/d
- A strategy for the treatment of remaining severe headache attacks with limitations on frequency of use (eg, a triptan for patients with analgesic overuse, dihydroergotamine for patients with triptan overuse, etc)
- Patient follow-up and support

Figure 1. Quick reference algorithm from the *Guideline for Primary Care Management of Headache in Adults*



CBT—cognitive behavioural therapy, LOC—level of consciousness, NSAID—nonsteroidal anti-inflammatory drug.
Adapted from Toward Optimized Practice.[10]

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