PRIMARY CARE

MED437

Approach to a patient with Headache

Objectives :

1. Describe common types of primary headache ‘migraine, Tension headache, Cluster headache,” and secondary headache.
2. Design an appropriate diagnostic approach to a patient with headache.
3. Identify the red Flags of headache (e.g., intracranial hypertension, temporal arteritis, space-occupying headaches) and indications for further investigations, like CT brain, and MRI
4. Discuss the family physician's role in managing headache “acute, chronic, and Prophylaxis, .
5. Discuss the criteria of referral.

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Important *Notes* *Extra* *Golden*

Editing file link

Background

Headache:

- Pain localized to any part of the head, behind the eyes or ears, or in the upper neck.
- Among the most common medical complaints.
- One of the most common neurological problems presented to GPs and neurologists.
- Almost half (50%) of the adult population have had a headache at least once within the last year.

Guideline for primary care management of headache in adults. Canadian Family

- Headache on 15 or more days every month affects 1.7–4% of the world's adult population .. chronic headache: >15 day/month
- The estimated lifetime prevalence of headache is 66%: headache.

➢ 46% to 78% for tension-type headache.
➢ 14% to 16% for migraine.
➢ 0.1% to 0.3% for cluster headache.

- Most common primary headache disorders are tension-type headache, migraine and cluster.
- Patients with increasingly frequent headaches can develop disabling symptoms.
- Biochemical, metabolic, and other changes induced by frequent headaches and/or medication are thought to cause central sensitization and neuronal dysfunction that results in inappropriate response to innocuous stimuli, lowered thresholds to trigger pain response, exaggerated response to stimuli, and persistence of pain after removal of inciting factors. That what happens in chronic headaches and that is why we give patients with primary headaches a prophylactic medication to reduce the probability to reach this stage.
- Each year, 3% to 4% of patients with episodic migraine or tension-type headaches (TTH) escalate to chronic forms.
- An estimated 2% to 4% of U.S. adults have chronic headaches, and more than 30% of these report daily symptoms.

- Once central sensitization occurs, headaches are difficult to treat and cause substantial morbidity.
- The mean annual cost of chronic migraine (including lost productivity and medical care) is more than three times the cost of episodic migraine (approximately $8,250 vs. $2,650).
- The International Headache Society classification and diagnostic criteria can help physicians differentiate primary headaches (e.g., tension, migraine, cluster) from secondary headaches (e.g., those caused by infection or vascular disease).
- A thorough history and physical examination, and an understanding of the typical features of primary headaches, can reduce the need for neuroimaging, lumbar puncture, or other studies.
- Red flag signs and symptoms include focal neurologic signs, papilledema, neck stiffness, an immunocompromised state, sudden onset of the worst headache in the patient's life, personality changes, headache after trauma, and headache that is worse with exercise.

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

Primary headaches

Migraine

Tension-type

Cluster

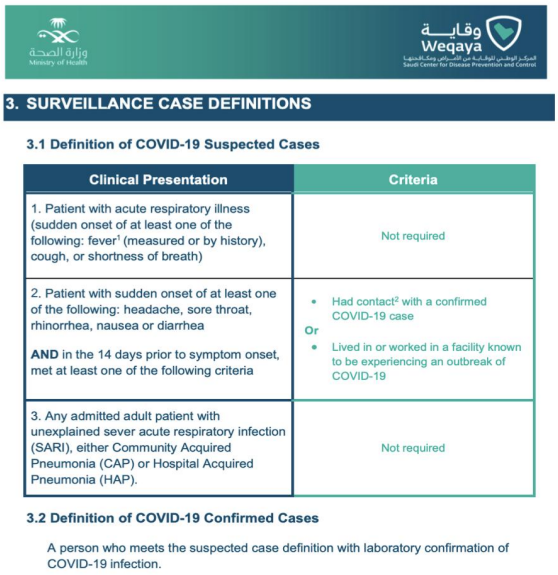
Other (e.g., cold stimulus headache)

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.*



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3. SURVEILLANCE CASE DEFINITIONS

3.1 Definition of COVID-19 Suspected Cases

Clinical Presentation	Criteria
1. Patient with acute respiratory illness (sudden onset of at least one of the following: fever[1] (measured or by history), cough, or shortness of breath)	Not required
2. Patient with sudden onset of at least one of the following: headache, sore throat, rhinorrhea, nausea or diarrhea **AND** in the 14 days prior to symptom onset, met at least one of the following criteria	• Had contact[2] with a confirmed COVID-19 case Or • Lived in or worked in a facility known to be experiencing an outbreak of COVID-19
3. Any admitted adult patient with unexplained sever acute respiratory infection (SARI), either Community Acquired Pneumonia (CAP) or Hospital Acquired Pneumonia (HAP).	Not required

3.2 Definition of COVID-19 Confirmed Cases

A person who meets the suspected case definition with laboratory confirmation of COVID-19 infection.

Covid-19 is the most common cause of headache nowadays

Misconceptions

- Acute or chronic sinusitis appears to be an uncommon cause of recurrent headaches, and many patients presenting with sinus headache turn out to have migraine.
- Patients frequently attribute headaches to eye strain. Headaches are only rarely due to refractive error alone.
- Hypertension can cause headaches: This is true in the case of hypertensive emergencies, it is probably not true for typical migraine or tension headaches.

Case scenario 1

- A 37-year-old woman presents with a 12-year history of episodic headaches. She experiences these 4 times a week, typically beginning at the end of a working day. The pain is generalised and described as similar to wearing a tight band around her head. The headaches are bothersome, but not disabling, and she denies any nausea or vomiting. She is slightly sensitive to noise but has no photophobia. Pain during her attacks typically responds to ibuprofen. Examination reveals tenderness of her scalp and both trapezius muscles.
- A 56-year-old man presents with a 25-year history of constant headache. The onset was insidious and he is certain that the only time he is headache-free is when he sleeps. He states the headache is generalised and his neck and shoulders are always 'tight'. He denies any associated autonomic symptoms including eye tearing, nasal congestion, light and sound sensitivity, nausea, or vomiting.

Diagnosis is tension type headache

Medications for tension-type headache	
Medication	**Dose**
Acute	
Ibuprofen Acetaminophen.	400 mg 1000 mg
Prophylactic	
First line amitriptyline antidepressant	10-100 mg/d
Second line mirtazapine venlafaxine	 30 mg/d 150 mg/d

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

The difference in the number of episodes

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.

Case scenario 2

- Ahmed is a 14-year-old boy. He attends your clinic accompanied by his mother. He presents with a two months history of headaches that he describes as “pulsating” and that make his head “very sore”. He says that in the past two months, he has had 6 of these headaches. He also says that light hurts his eyes when he has the headaches. He does not feel nauseous or vomit during the headaches. Mother tells you that when Ahmed has the headaches he is unable to go to school and that the headaches last from 2 to 4 hours. She gives Ahmed paracetamol and if that doesn’t work she also gives him ibuprofen. This combination of medication helps.
- You diagnose migraine without aura. How would you manage this?

➢ Reassure them that a serious underlying cause is unlikely

➢ Tell them that migraines are a well-recognised problem although what causes them is not known for certain

➢ Explain the risk of medication overuse headache

For acute management of migraine

- Taking into account the person's preference, comorbidities and risk of adverse events: Offer therapy:
- **First line**: Simple analgesics (Ibuprofen 400 mg, acetaminophen 1000 mg)
- **Second line**: Triptans

- Mild to moderate attacks — not associated with vomiting - simple analgesics (NSAIDs, acetaminophen) or combination analgesics
- Moderate to severe attacks — not associated with vomiting -oral
- migraine-specific agents are first-line, including oral triptans and the combination of sumatriptan-naproxen.
- When complicated by vomiting , **non oral** migraine-specific medications including subcutaneous sumatriptan OR nasal sumatriptan, non oral antiemetic agents

Managing patients with migraine

- Pay attention to lifestyle and specific migraine triggers.
- Lifestyle factors to avoid include (irregular or skipped meals, a stressful lifestyle, lack of exercise and obesity, Common triggers for headaches include menses, stress, exertion, sleep disturbance, odors, caffeine withdrawal, and dietary items such as cheese, wine, chocolate, monosodium glutamate (MSG), and hot dogs.
- Use acute pharmacologic therapy for individual attacks.
- Use prophylactic pharmacologic therapy, when indicated.
- Evaluate and treat coexistent medical and

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.

Acute Migraine Medication

First line	Ibuprofen 400 mg acetaminophen 1000 mg
Second line	• Triptans: oral sumatriptan 100 mg • Subcutaneous sumatriptan 6 mg if the patient is vomiting early in the attack. • Nasal spray: 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

Prophylactic Medications

Prophylactic Medications	Starting dose	Titration,* daily Dose increase	Target dose or therapeutic range
First line propranolol	20 mg twice daily	40 mg/wk	40-120 mg twice daily
metoprolol	50 mg twice daily	50 mg/wk	50-100 mg twice daily
amitriptyline	10 mg at bedtime	10 mg/wk	10-100 mg at bedtime
Second line Topiramate	25 mg/d	25 mg/wk	50 mg twice daily
candesartan	8 mg/d	8 mg/wk	Few side effects; limited experience in prophylaxis
gabapentin	300mg/d	300 mg every 3-7 d	Few drug interactions

Dosing Recommendations for First- and Second-Line Medications for Episodic Migraine Prevention

Drug	Starting dose	Daily dosage	Adverse effects	Contraindications	Cost per month for minimum daily dosage*
Beta blockers					
Atenolol	50 mg	100 mg daily	Bradycardia, depression, fatigue, hypotension, impotence, lethargy	Asthma, bradycardia, COPD	$10
Metoprolol	50 mg two times daily	37.5 to 200 mg daily	Bradycardia, depression, fatigue, hypotension, impotence, lethargy	Asthma, bradycardia, COPD	$20
Nadolol (Corgard)	40 to 80 mg	20 to 160 mg daily	Bradycardia, depression, fatigue, hypotension, impotence, lethargy	Asthma, bradycardia, COPD	$40 ($140)
Propranolol	40 mg divided two to three times daily	120 to 240 mg two to three times daily	Bradycardia, depression, fatigue, hypotension, impotence, lethargy	Asthma, bradycardia, COPD	$50
Timolol	20 to 30 mg	20 to 30 mg daily or 10 to 15 mg two times daily	Bradycardia, depression, fatigue, hypotension, impotence, lethargy	Asthma, bradycardia, COPD	$50
Anticonvulsants					
Divalproex (Depakote)	250 mg	250 to 500 mg twice daily	Alopecia, asthenia, dizziness, hepatic failure, nausea (common), pancreatitis, somnolence, thrombocytopenia, tremors, weight gain	Liver disease, pregnancy	$15 ($200)
Divalproex ER (Depakote ER)	500 mg	500 to 1,000 mg once daily			$50 ($200)
Topiramate (Topamax)	15 to 25 mg	25 to 200 mg once daily	Paresthesia (common), decreased appetite, difficulty with memory and concentration, fatigue, kidney stones, language problems, metabolic acidosis, nausea	Pregnancy	$15 ($180)
Antidepressants					
Amitriptyline	10 mg	25 to 150 mg once daily	Blurry vision, constipation, decreased seizure threshold, dry mouth, orthostatic hypotension, QT prolongation, sedation, tachycardia, urinary retention	Do not use within 14 days of MAOI, avoid in acute myocardial infarction, seizure disorder	$10
Venlafaxine	37.5 mg	150 mg once daily	Dry mouth, hypertension, insomnia, mydriasis, nausea, nervousness, seizures	Do not use within 14 days of MAOI	$30

COPD = chronic obstructive pulmonary disease; ER = extended release; MAOI = monoamine oxidase inhibitor.

*—Estimated retail price of one month's treatment based on information obtained at https://www.goodrx.com (accessed September 25, 2018).

Information from references 8 and 10; drug information from Prescription Drug Cards. Doses provided are for doses studied.

Prophylactic Medications

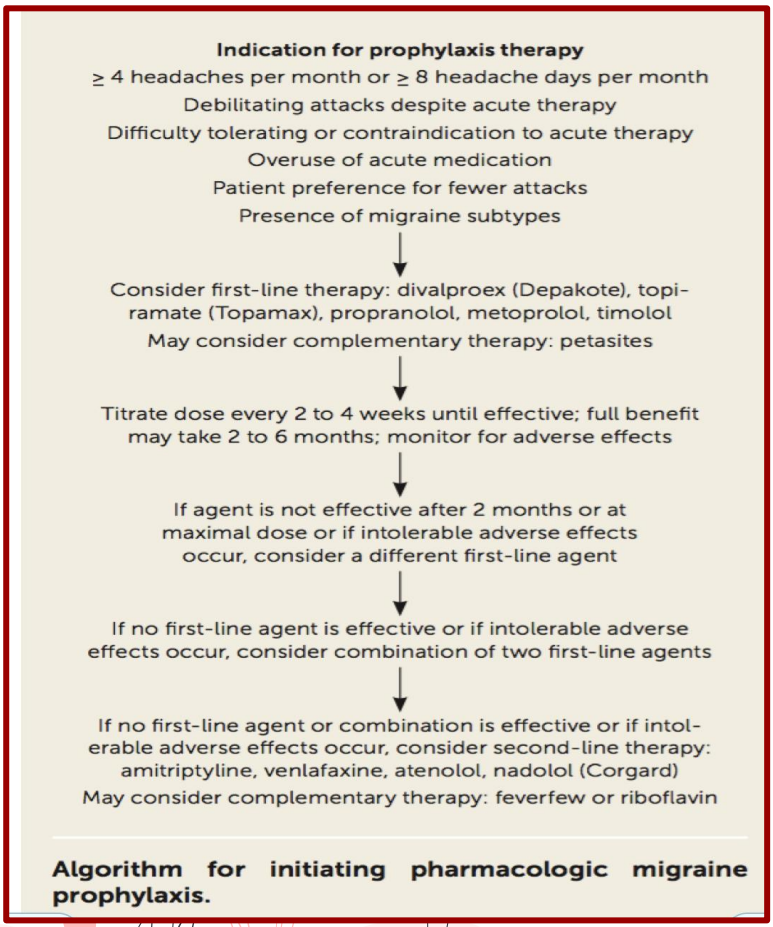
- Educate patients on the need to take the medication daily and according to the prescribed frequency and dosage .
- Ensure that patients have realistic expectations, Explain that…

➢ 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 weeks 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.
- 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
- 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



Algorithm for initiating pharmacologic migraine prophylaxis.

Case scenario 3

- Aliya is a 28-year-old woman who was diagnosed with migraine with aura 6 months ago. She has, on average, 1 migraine attack per week, for which she takes an NSAID and an anti-emetic.
- Because Aliya has migraine about 4 times per month, she is unlikely to develop medication overuse headache. You are therefore happy with her current treatment plan. However, during an attack, she is unable to work or continue her normal daily activities. She also worries a lot about when the next attack is going to happen and their frequency causes her to take a lot of time off work.

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.

What is aura? Reversible non motor weakness, less than 60 minutes followed by headache.

- You want to confirm that she is not a taking combined hormonal contraceptive for contraception purposes. Why?
- The World Health Organization, 2009 (medical eligibility criteria) recommends that the oral contraceptive pill should not be used in women with migraine with aura at any age.
- There is an increased risk of ischaemic stroke in people with migraine with aura. This risk is increased in women using combined hormonal contraception.

She wants to become pregnant in the future, but still needs migraine prophylaxis, what should you do?

- Migraine without aura often improves during pregnancy. However, migraine with aura is more likely to continue throughout pregnancy.
- Seek specialist advice if prophylactic treatment for migraine is
- Offer pregnant women paracetamol for the acute treatment of needed during pregnancy. migraine.

You suggest propranolol for migraine prophylaxis.

- **How would you assess the effectiveness of the propranolol?** Headache diary
- **When would you review the need to continue this prophylaxis?**

➢ It might take 4-8 weeks for substantial benefit to occur.

➢ If the prophylactic drug provides substantial benefit in the first 2 months of therapy, this benefit might increase further over several additional months of therapy

➢ 6-12 months after the start of prophylactic treatment.

Headache Diary

- A headache diary can help document date, duration, symptoms, treatment, and outcome of each headache episode, in addition to suspected triggers or other patient observations.
- A diary may identify an overlooked cause of secondary headaches or a recurrent trigger for migraine episodes.

- Migraine was the correct diagnosis in 82% of patients previously diagnosed with non migraine headaches and in 88% of patients diagnosed with sinus headaches.
- Patients often describe more than one type of headache. More than 80% of those with confirmed migraine also have TTH, and patients with any primary headache may develop superimposed secondary headaches.

في بعض الحالات صعب التشخيص يكون من أول زيارة فيستخدم المريض هذا الجدول عشان يدون كل صداع يجي بالتفصيل

Headache Diary

Date/time headache started	How long did the pain last?	Where did you feel the pain?	Headache severity 0=none 1=mild 2=moderate 3=severe	What did you do to relieve the pain?	How long did it take?	Day of menstrual cycle (if appropriate)	Stress level	Weather change? Yes/No	Possible trigger (Foods, etc.)
									
									
									
									
									
									
									

International Classification of Headache Disorders, 3rd Edition

Classification	Determinants
Migraine without aura	A. At least five attacks fulfilling criteria B, C, and D B. Attack lasting 4 to 72 hours (untreated or unsuccessfully treated) C. Having at least two of these characteristics: aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs), moderate or severe pain intensity, pulsating quality, unilateral location D. Having at least one of these conditions during the headache: nausea and/or vomiting, phonophobia or photophobia
Migraine with aura	A. At least two attacks fulfilling criteria B and C B. Having one or more of these fully reversible aura symptoms: brainstem, motor, retinal, sensory, speech and/or language, visual C. Having at least two of these characteristics: at least one aura symptom spreads gradually over at least 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
Episodic migraine*	Characterized by those with migraine who have zero to 14 headache days per month[4]
Chronic migraine	A. Headaches at least 15 days per month for more than 3 months and fulfilling criteria B and C B. Occurring in patients with at least five attacks fulfilling criteria in the Migraine with Aura or Migraine without Aura sections C. For at least 8 days per month for more than 3 months, fulfills any of the following: 1. Criteria C and D for Migraine without Aura section 2. Criteria B and C for Migraine with Aura section 3. Believed by the patient to be migraine at onset and relieved by triptan or ergot derivative
Medication-overuse headache	A. Headache occurring on at least 15 days per month in a patient with a pre-existing headache disorder B. Regular overuse for more than three months of one or more drugs that can be taken for acute and/or symptomatic treatment of headache†

*—Episodic migraine is not recognized in the *International Classification of Headache Disorders*, 3rd ed., but its definition in the literature is recognized as zero to 14 headache days per month.
†—Regular intake of ergotamine, triptan, or opioid medications for a total of at least 10 days per month or nonopioid medications (e.g., acetaminophen, nonsteroidal anti-inflammatory drugs) for at least 15 days per month.

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Case scenario 4

Abdullah is a 31-year-old man. He has a history of severe headaches, which are the worst pain he has ever felt. When he gets these headaches, he has pain on 1 side of his head, around his eye and along the side of his face. He also experiences watery eye and nasal congestion, on the same side as the headache. He experienced the headache for the first time 2 weeks ago. The CT scan done was normal and you have been asked to evaluate him. He tells you that, since his first severe headache 2 weeks ago, he has experienced 6 more headaches. He says that on average his severe headaches last from 30 to 90 minutes.

Diagnosis is cluster headache.

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.

What advice and support can you offer about his diagnosis?

- Management primarily pharmacologic

Offer O2 100% (most effective treatment in acute case) or a subcutaneous or nasal triptan for the acute treatment.

- What prophylaxis for cluster headache could you offer him?
- Prophylactic medication: consider offering him verapamil.
- Seek specialist advice before starting verapamil.
- Early specialist referral recommended

What medications would you not offer for the acute management of his cluster headache attacks?

You would not offer paracetamol, NSAIDS, oral triptans,
ergots or opioids as there is no evidence to suggest that they would have any clinical benefit in the treatment of cluster headache.

General practice points for managing primary headache in adults

- Rule out secondary headache.
- Imaging is not recommended for the routine assessment of patients with headache with normal neurologic examination findings, and no red flags.
- History and physical examination findings are usually sufficient to make a diagnosis
- Migraine should be considered in patients with recurrent moderate or severe headaches and normal neurologic examination findings
- Consider a diagnosis of migraine in patients with a previous diagnosis of recurring “sinus” headache.
- Medication overuse is considered when patients with migraine or tension-type headache use **combination analgesics, Opioids, or triptans on ≥10 d/mo** or **Acetaminophen or NSAIDs on ≥15 d/mo** .
- Comprehensive migraine therapy includes management of lifestyle factors and triggers, acute and prophylactic medications, and migraine self-management strategies
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- The strongest predictive factors for headache progression are frequent headache episodes at baseline and **medication overuse.**
- Definitions of chronic migraine and TTH specify that symptoms be present on at **least 15 days per month,** but central sensitization may occur at lower frequencies. Migraine may have a threshold for central sensitization of four episodes per month.
- Symptoms predictive of migraine escalation are pulsating quality, severe pain, photophobia, phonophobia, and attacks lasting longer than 72 hours.
- Long attack duration and nausea are predictive of development of chronic TTH.
- The highest medication-associated risk is with opioids, followed by triptans, ergotamines, and nonopioid analgesics.
- Several psychiatric conditions (e.g., major depressive disorder, bipolar disorder, anxiety) are associated with headache frequency and disability. It is unclear if these are risk factors or comorbidities, or if they share etiologies with chronic headaches.
- Stressful life events are associated with increasing headache frequency, especially in middle age.

TABLE 1

Risk Factors for Escalation of Episodic Migraine to Chronic Migraine

Risk factor	Odds ratio (95% CI)	Comments
Headache days per month*		—
0 to 4	1.00 (referent)	
5 to 9	7.6 (2.2 to 26.1); $P = .001$	
10 to 15	25.4 (7.6 to 84.5); $P = .001$	
Medication overuse*†		—
Opioids	4.4 (0.3 to 59.7)	
Triptans	3.7 (0.8 to 16.4)	
Ergotamines	2.9 (0.4 to 23.0)	
Analgesics	2.7 (0.6 to 11.7)	
Obesity (BMI > 30 kg per m²)	5.53 (1.4 to 21.8)	May explain other associations (e.g., sleep disorders)
Diabetes mellitus	3.34 (0.96 to 12.3); $P = .059$	Not significant after adjusting for BMI and baseline headache frequency
Arthritis	3.29 (1.03 to 10.5); $P < .05$	Not significant after adjusting for BMI and baseline headache frequency
Head or neck injury	Males: 3.3 (1.0 to 19.8) Females: 2.4 (1.0 to 10.8)	No relationship with severity or time since injury

BMI = body mass index.

*—Highly significant in multivariate analysis adjusting for other variables.
†—Use of any headache medication on 10 or more days per month.

Information from references 2, 7, 8, and 11.

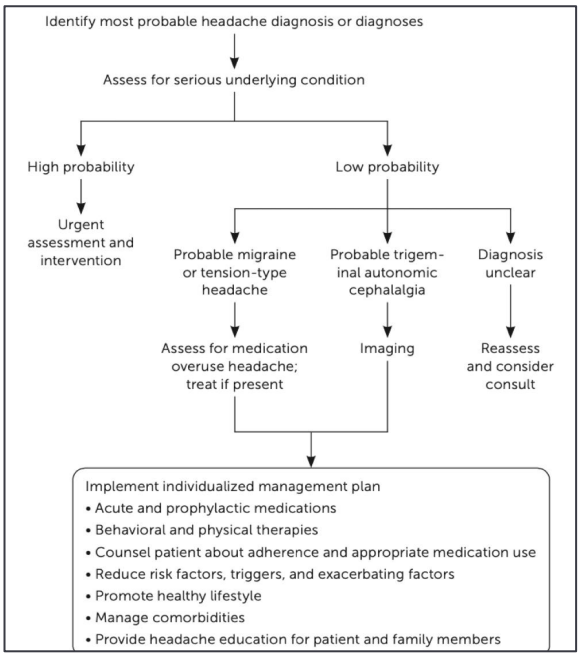


TABLE 4

SNNOOP10 Mnemonic for Red Flag Symptoms in Patients with Headache

Sign or symptom	Potential cause of headache
Systemic symptoms (e.g., fever, rash, myalgia, weight loss)	Intracranial infection or nonvascular condition; carcinoid tumor, pheochromocytoma
Neoplasm diagnosis (current or history)	Brain neoplasm or metastasis
Neurologic deficit or dysfunction (e.g., focal deficits, seizure, cognitive or consciousness changes)	Intracranial disorder
Onset sudden or abrupt*	Subarachnoid hemorrhage, cranial or cervical vascular lesion
Older age (> 50 years)	Giant cell arteritis, cervical or intracranial lesions
Painful eye plus autonomic features	Posterior fossa; pituitary, cavernous sinus, or ophthalmic condition; Tolosa-Hunt syndrome
Painkiller overuse or new medication	Medication overuse headache, medication adverse effect or incompatibility
Papilledema	Intracranial condition, intracranial hypertension
Pathology of immune system	HIV or opportunistic infection
Pattern: new headache or change in pattern of established headache	Intracranial condition
Position exacerbates or relieves pain	Intracranial hypotension or hypertension
Posttraumatic onset (acute or chronic)	Subdural hematoma, vascular condition
Precipitated by sneezing, coughing, or exercise	Posterior fossa or Arnold-Chiari malformation
Pregnancy or puerperium	Cranial or cervical vascular condition, hypertension/preeclampsia, cerebral sinus thrombosis, epidural-related headache
Progressive and atypical presentation	Nonvascular intracranial condition

*—Recurrent "thunderclap" headaches suggest reversible cerebral vasoconstriction syndrome.

Adapted with permission from Do TP, Remmers A, Schytz HW, et al. Red and orange flags for secondary headaches in clinical practice: SNNOOP10 list. Neurology. *2019;92(3):136.*

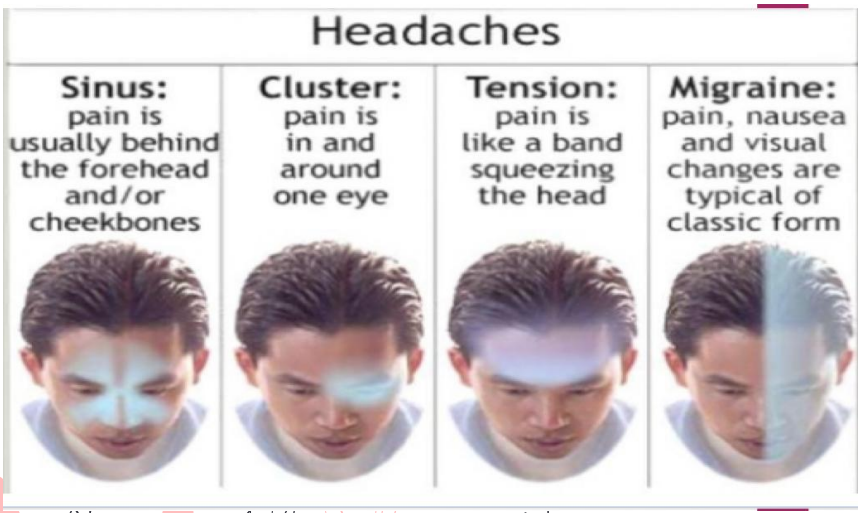
Papilledema	Intracranial condition, intracranial hypertension
Pathology of immune system	HIV or opportunistic infection
Pattern: new headache or change in pattern of established headache	Intracranial condition
Position exacerbates or relieves pain	Intracranial hypotension or hypertension
Posttraumatic onset (acute or chronic)	Subdural hematoma, vascular condition
Precipitated by sneezing, coughing, or exercise	Posterior fossa or Arnold-Chiari malformation
Pregnancy or puerperium	Cranial or cervical vascular condition, hypertension/preeclampsia, cerebral sinus thrombosis, epidural-related headache
Progressive and atypical presentation	Nonvascular intracranial condition

*—Recurrent "thunderclap" headaches suggest reversible cerebral vasoconstriction syndrome.

Adapted with permission from Do TP, Remmers A, Schytz HW, et al. Red and orange flags for secondary headaches in clinical practice: SNNOOP10 list. Neurology. *2019;92(3):136.*

Characteristics of migraine, tension-type, and cluster headache syndromes

Symptom	Migraine	Tension-type	Cluster
Location	Adults: Unilateral in 60 to 70 percent, Children and adolescents: Bilateral in majority	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 which 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	4 to 72 hours	30 minutes to 7 days	15 minutes to 3 hours
Associated symptoms	Nausea, vomiting, photophobia, phonophobia; may have aura	None	Ipsilateral lacrimation, redness of the eye; stuffy nose; rhinorrhea; pallor; sweating; Horner syndrome;



Important elements in history : headache for the first time or those with a change in headache pattern

Explore the following important elements :

- Headache onset (thunderclap (emergency, subarachnoid hemorrhage), head or neck trauma)
- previous attacks (progression of symptoms)
- duration of attacks (4 hours, continuous)
- days per month with headache
- Pain location
- Headache-associated symptoms
- Relationship to precipitating factors (stress, posture etc)
- Effect on work and family activities
- Response to acute and preventive medications
- Presence of coexisting conditions (depression, asthma, etc)

Approach to the physical examination

- Screening neurologic examination
- Neck examination
- Blood pressure measurement
- If indicated, a focused neurologic examination
- If indicated by associated jaw complaints, an examination for temporo-mandibular disorders

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.

Red flags and other potential indicators of secondary headache

Red flags Emergent (address immediately)

- Thunderclap onset
- Fever and meningismus
- Papilledema with focal signs or reduced LOC
- Acute glaucoma

Urgent (address within hours to days)

- Temporal arteritis
- Papilledema (WITHOUT focal signs or reduced LOC)
- Relevant systemic illness
- Elderly patient: new headache with cognitive change

Yes → **Refer and investigate**

Possible indicators of secondary headache

- Unexplained focal signs
- Atypical headaches
- Unusual aura symptoms
- Onset after age 50 y

Aggravation by neck movement

- Abnormal neck examination findings (cervicogenic headache)
- Jaw symptoms (consider temporomandibular joint disorder)

Headache with ≥2 of

- Nausea
- Light sensitivity
- Interference with activities

→ **migraine**

No

Headache with no nausea but ≥2 of

- Bilateral headache
- Non pulsating pain
- Mild to moderate pain
- Not worsened by activity

→ **Tension type headache**

Medication overuse Assess

• Ergots, triptans, combination analgesics, or codeine ≥10 d/mo **OR** • Acetaminophen or NSAIDs ≥15 d/mo **Manage**

• Educate patient

• Consider prophylactic medication

• Provide an effective acute medication for severe attacks

• Gradual withdrawal of opioids if used

• Abrupt (or gradual) withdrawal of acetaminophen, NSAIDs, or triptans

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.

Read, it is enough to know that we need neuroimage

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.

Diagnosis: Giant cell arteritis
Treatment: high dose of steroid.

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.

Medication overuse headache (MOH)

- Also called analgesic rebound headache
- Consider a diagnosis in patients with headache on ≥15 d/mo
- 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
- MOH appears to be highest with opioids containing combination analgesics, and aspirin/acetaminophen/caffeine combinations.
- The risk with triptans is considered intermediate
- The risk is lowest with NSAIDs

Diagnosis of medication-overuse headache

- When medication-overuse headache is suspected, the patient should also be evaluated for the presence of the following:

➢ Psychiatric comorbidities
➢ Psychological and physical drug dependence
➢ Use of inappropriate coping strategies.

Coping strategies for headache

- 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.

Management of MOH- Patient education.

- 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

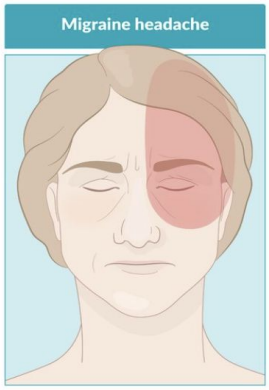
Strategy for cessation of medication overuse

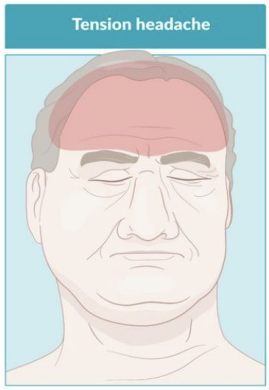
- Abrupt withdrawal should be advised for patients with suspected medication overuse headache (MOH) caused by simple analgesics (acetaminophen, NSAIDs) or triptans.
- Gradual withdrawal should be advised for patients with suspected medication-overuse headache caused by opioids and opioid- containing analgesics.
- Patient follow-up and support

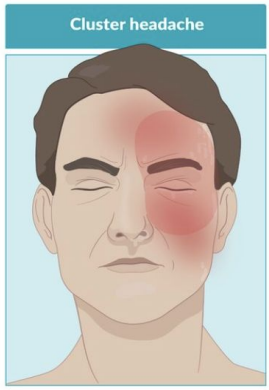
Tips to Remember

- A thorough history is the most important way to differentiate among the different causes of headache, which are many.
- A useful mnemonic for the symptoms of migraine headache is POUND. P indicates a pulsatile quality of headache. O indicates 1-day duration (<4 hours suggests TTH). U indicates unilateral location. N indicates the presence of nausea or vomiting. D indicates a disabling intensity.
- Medication-overuse headache should be strongly considered in patients who may be overusing narcotic or barbiturate-containing analgesics, which results in a refractory daily or near-daily headache.
- The overuse of triptan drugs (more than 3 days a week, for 2 or more weeks) is now becoming a common cause of medication-overuse headache.
- It is important to assess for alarm features that suggest headache due to a secondary, non benign cause.
- There are serious causes of headache that exist and for which neuroimaging may be normal.
- For migraine treatment, codeine, and other narcotics, has high potential for “rebound” headaches and opiate dependence and should generally be avoided.
- It is important to note that triptans do not have a class effect; therefore, lack of efficacy or intolerance of side effects to 1 triptan does not predict a patient's response to other triptans.
- Triptans are contraindicated in patients with CAD or uncontrolled hypertension.
- Preventive migraine treatment should be considered in patients with frequent disabling migraine headaches (>2 per month), and may reduce frequency by one third to one half.

	Tension headache	Migraine headache	Cluster headache
Sex	F>M	F>M	**M>F**
Duration	-30 minutes to a couple of days	-4–72 hours	-30–180 minutes -Shortest, recurring attacks
Frequency	-Occasionally to daily -Episodic or chronic	-Occasionally to several times a month	-1–3 episodes ever 24 hours -Usually occur in a cyclical pattern (clusters)
Localization	-Holocephalic or bifrontal Can be unilateral	-Mostly unilateral(60%)	-Mostly unilateral -Localized to the **periorbital** and/or temporal region
Character	-**Dull**, nonpulsating, **band-like** or vise-like pain -Constant	-**Pulsating**, boring/hammering pain	-Often burning or piercing pain -Attacks develop within several minutes -Often wakes patients up from sleep
Intensity	-Mild to moderate Mildest	-Moderate to severe In between	-**Severe**, agonizing pain -Because of the severity of pain, some patients report experiencing suicidal thoughts (hence the name “suicidal headache”).
Additional symptoms	**-No autonomic symptoms (vomiting, nausea, phonophobia, or photophobia)** -Tightness in the posterior neck muscles -Pericranial tenderness	**-Nausea, vomiting** **-Hyperacusis** **-Photophobia** **-Phonophobia** **-Preceding aura** **-Prodrome**	**-Ipsilateral autonomic symptoms: conjunctival injection and/or lacrimation, rhinorrhea and nasal congestion** -Partial Horner syndrome: **ptosis and miosis**, but no anhidrosis
Triggers/Exacerbating factors	-Stress -Lack of sleep, fatigue -Routine activities (e.g., climbing stairs) do not exacerbate symptoms. Exercises don’t trigger symptoms	-Stress -Fluctuation in hormone levels: oral contraceptives, menstruation -Certain types of food (e.g., those containing tyramines or nitrates such as processed meat, chocolate, cheese) -Exacerbated by exertion	-Alcohol







Character	Unilateral; throbbing, hammering	Bilateral; dull, "band-like" compression	Unilateral; piercing, stabbing, burning
Course	Slowly progressing headache that may last up to 72 hours	Initially episodic, may progress to chronic form with daily headaches	Clustering of attacks lasting for weeks followed by periods of remission (75% of cases)
Additional symptoms	Often accompanied by nausea/vomiting, phonophobia/photophobia, Aura phenomena may occur	Photophobia/phonophobia may occur, **no** nausea, **no** vomiting	Autonomic symptoms (lacrimation, rhinorrhea, sweating)
Note	♀ > ♂; age of onset: 15–25 years; exercise exacerbates headache	♀ > ♂; age of onset: 30–40 years; exertion **does not** exacerbate the headache!	Attacks often occur at night ♂ > ♀; age of onset: 20–40 years; short duration of attacks(30–40 min)
Remember	High risk of medication-overuse headache!	Autonomic symptoms are absent!	

Cluster headache

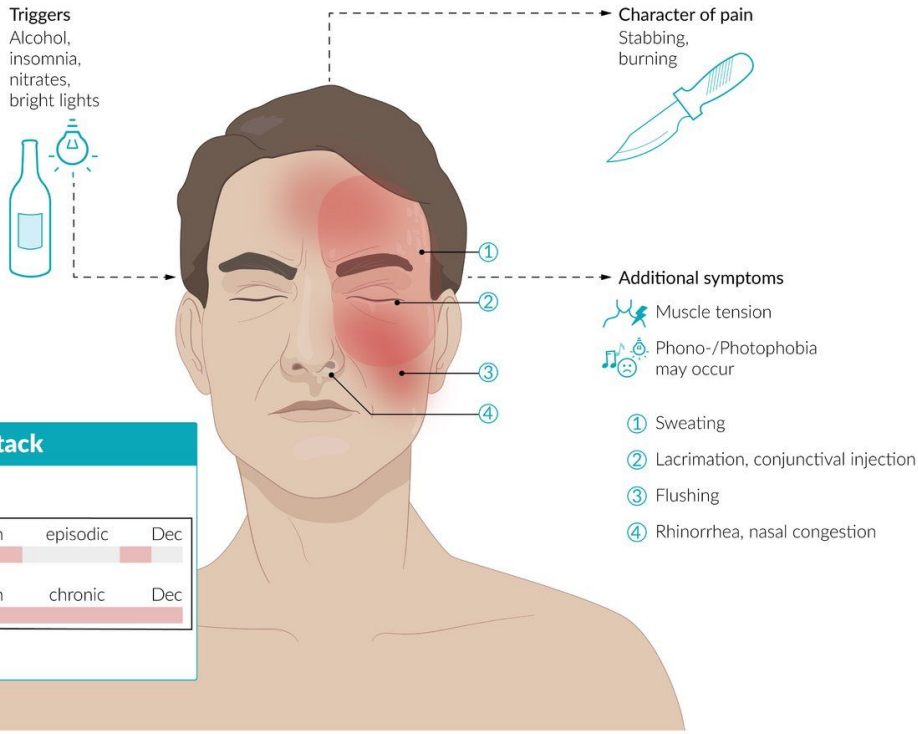
Epidemiology
♂ > ♀ (3:1);
typically 20–40 years of age

Duration
~30–40 min/attack

Frequency
Typically ~1–3 attacks/24 h

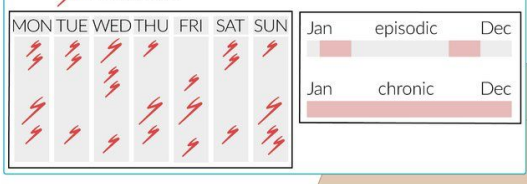
Note
Attacks often occur at night; patient is restless and paces around during an attack

Therapy
Acute: triptans, 100% O_2
Chronic: verapamil (prophylactic)



Course of an attack

Periods of cluster headache
= Acute attack



Migraine

Epidemiology
♀ > ♂ (3:1)

Duration
4–72 hours

Frequency
Up to several times per month

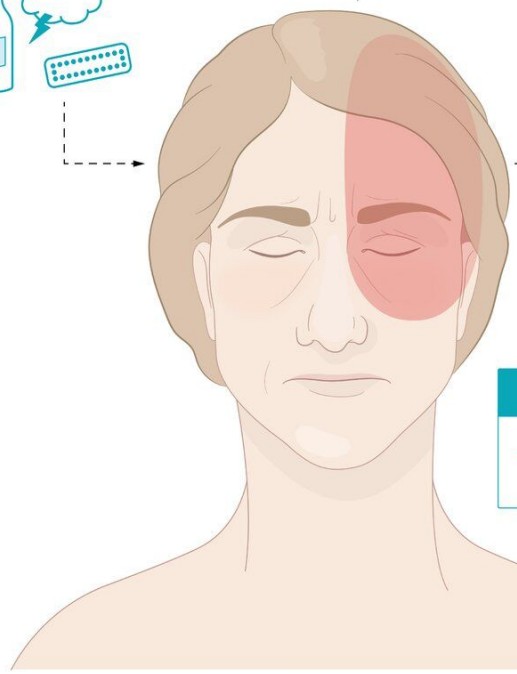
Age of onset
Typically during adolescence and early adulthood (15–25 years of age)

Therapy
NSAIDs or triptans;
antiemetics for nausea

Remember
Overuse of triptans can cause medication-overuse headaches

Triggers
E.g., weather changes, alcohol, stress, physical activity
♀: menstruation, oral contraceptive pills

Character of pain
Pounding, throbbing



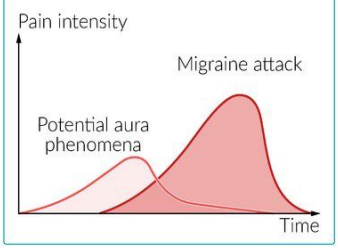
Additional symptoms


Nausea, vomiting, anorexia or excessive hunger


Phonophobia/photophobia


25% with aura phenomena

Course of an attack



Prophylaxis

Lifestyle changes
E.g., endurance sports and stress reduction

Tension headache

Epidemiology
Most common type of headache,
♀ > ♂, 30–40 years of age

Duration
30 min.–7 days (persistent)

Frequency
Rarely to daily

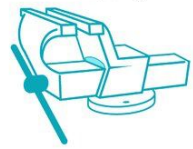
Note
Exertion does not exacerbate the pain!
No nausea or vomiting!

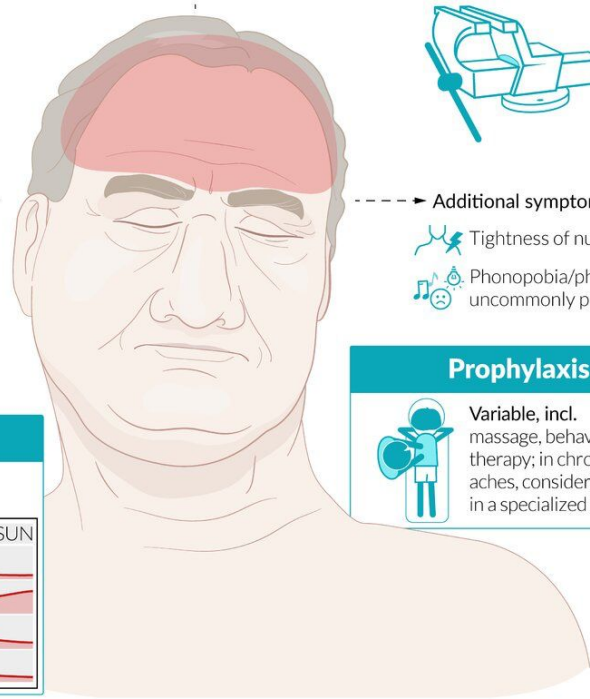
Therapy
Acute: NSAIDs
Chronic: amitriptyline (prophylactic)

Remember
Risk of medication-overuse headache

Triggers
Variable, incl. depression, anxiety disorders, stress

Character of pain
Bilateral, dull, nonpulsatile, compressing band-like or vice-like quality





Additional symptoms

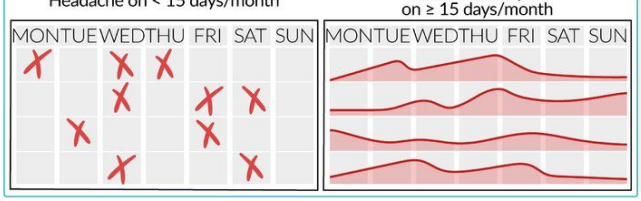
Tightness of nuchal muscles

Phonopobia/photophobia uncommonly present

Prophylaxis

Variable, incl.
massage, behavioral therapy; in chronic headaches, consider treatment in a specialized clinic

Course of an attack



Summary of the management

	Tension	Migraine	Cluster
Acute Management			
First line	- Ibuprofen - Acetaminophen	**<u>No vomiting:</u>** - **Mild:** "ibuprofen/ Acetaminophen" - **Severe:** "oral triptans / Sumatriptan-naproxen" **<u>vomiting:</u>** - **Non oral:** SC/ nasal Sumatriptan, non oral antiemetic agent	- O2 100% "most effective" - subcutaneous /nasal triptan "Do not offer paracetamol, NSAIDs, or oral triptans"
Prophylaxis			
First line	- Antidepressant "amitriptyline"	- propranolol "CI in asthma and COPD" - Metoprolol - amitriptyline "Avoid in MAOIi, MI, Seizure"	- Verapamil
Second line	- Mirtazapine - Venlafaxine	- topiramate "CI in pregnant 🤰" - candesartan - gabapentin	

Questions

1. What is the strongest predictive factor for headache progression to chronic headache?
A. Medication overuse
B. Arthritis
C. DM
D. Head trauma

2. Which symptoms of the following is NOT considered predictive of migraine escalation ?
A. Pulsating quality
B. Photophobia
C. Phonophobia
D. Attacks lasting less than 72 hours

3. Which type of headache is probably secondary to a significant lesion?
A. Cluster type headache
B. Tension type headache
C. Headache with normal neurologic examination
D. Headache without aura

4. What is the definition of medication overuse headache (MOH)?
A. 15 or more days per month for NSAIDS
B. 15 or more days per month for opioid
C. 20 or more days per month for ergotamines
D. 10 or more days per month for acetaminophen

5. A 30 year old man, known hypertension is evaluated in the office for an 8 months history of intensely painful headaches, which occur up to 10 times per day and last approximately 5 to 10 minutes each. The pain is most severe around the left eye, and he has no pain between attacks. Each attack is associated with rhinorrhea, lacrimation, and conjunctival injection. The patient has a 12 pack year smoking history. Results of a physical and neurological examination are normal. Which of the following is the first line acute treatment for this patient?
A. Topiramate
B. Hyperventilation
C. 100% oxygen inhalation
D. Verapamil

1. A
2. D
3. A
4. A
5. C