

Migraines

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A migraine headache is typically a pulsating or throbbing pain that ranges from moderate to severe. It can affect one or both sides of the head. It is worsened by physical activity, light, sounds, or odors and is accompanied by nausea, vomiting, and sensitivity to sounds, light, and/or odors.

- Migraines may be triggered by lack of sleep, changes in the weather, hunger, excessive stimulation of the senses, stress, or other factors.
- They can be made worse by physical activity, light, sounds, or odors.
- Doctors base the diagnosis on typical symptoms.
- There is no cure for migraines, but drugs are used to stop the migraine as it is starting, to relieve pain, and to reduce the number and severity of migraines attacks.

(See also [Overview of Headache](#).)

Although migraines can start at any age, they usually begin during puberty or young adulthood. In most people, migraines recur periodically (fewer than 15 days a month). After age 50, headaches usually become significantly less severe or resolve entirely. Migraines are 3 times more common among women. In the United States, about 18% of women and 6% of men have a migraine at some time each year.

Migraines may become chronic. That is, they occur 15 or more days a month. Chronic migraines often develop in people who overuse drugs to treat migraines.

Migraines tend to run in families. More than half the people who have migraines have close relatives who also have them.

Causes

Migraines occur in people whose nervous system is more sensitive than that of other people. In these people, nerve cells in the brain are easily stimulated, producing electrical activity. As electrical activity spreads over the brain, various functions, such as vision, sensation, balance, muscle coordination, and speech, are temporarily disturbed. These disturbances cause the symptoms that occur before the headache (called the aura). The headache occurs when the 5th cranial (trigeminal) nerve is stimulated. This nerve sends impulses (including pain impulses) from the eyes, scalp, forehead, upper eyelids, mouth, and jaw to the brain. When stimulated, the nerve may release substances that cause painful inflammation in the blood vessels of the brain (cerebral blood vessels) and the layers of tissues that cover the brain (meninges). The inflammation accounts for the throbbing headache, nausea, vomiting, and sensitivity to light and sound. Estrogen, the main female hormone, appears to trigger migraines, possibly explaining why migraines are more common among women. Migraines can probably be triggered when estrogen levels increase or fluctuate. During puberty (when estrogen levels increase), migraines become much more common among girls than among boys. Some women have migraines just before, during, or just after menstrual periods. Migraines often occur less often and become less severe in the last trimester of pregnancy when estrogen levels are relatively stable, and they worsen after childbirth when estrogen levels decrease rapidly. As menopause approaches (when estrogen levels are fluctuating), migraines become particularly difficult to control.

Oral contraceptives (which contain estrogen) and estrogen therapy may make migraines worse and may increase the risk of stroke in women who have migraines with an aura.

Other triggers include the following:

- Lack of sleep, including insomnia
- Changes in the weather, particularly barometric pressure

- Red wine
- Certain foods
- Hunger (as when meals are skipped)
- Excessive stimulation of the senses (for example, by flashing lights or strong odors)
- Stress

Various foods have been associated with migraines, but whether they trigger migraines is unclear. These foods include

- Foods that contain tyramine, such as aged cheeses, soy products, fava beans, hard sausages, smoked or dried fish, and some nuts
- Foods that contain nitrates, such as hot dogs and lunch meats
- Foods that contain MSG (monosodium glutamate), a flavor enhancer found in fast foods, broths, seasonings, and spices
- Caffeine (including that in chocolate)

Which foods trigger migraines varies from person to person.

Head injuries, neck pain, or a problem with the joint of the jaw (temporomandibular joint disorder) sometimes triggers or worsens migraines.

Familial hemiplegic migraine, a rare subtype of migraine, is associated with genetic defects on chromosome 1, 2, or 19. The role of genes in the more common forms of migraine is under study.

Symptoms

In a migraine, pulsating or throbbing pain is usually felt on one side of the head, but it may occur on both sides. The pain may be moderate but is often severe and incapacitating. Physical activity, bright light, loud noises, and certain odors may make the headache worse. This increased sensitivity makes many people retreat to a dark, quiet room, lie down, and sleep if possible. Typically, migraines subside during sleep.

The headache is frequently accompanied by nausea, sometimes with vomiting and sensitivity to light, sounds, and/or odors.

Severe attacks can be incapacitating, disrupting daily routines and work.

Attacks vary greatly in frequency and severity. Many people have several types of headache, including mild attacks without nausea or sensitivity to light. These attacks may resemble a [tension-type headache](#) but are a mild form of migraine.

A **prodrome** often occurs before a migraine. The prodrome is sensations that warn people that an attack is about to begin. These sensations may include mood changes, loss of appetite, and nausea.

An **aura** precedes migraines in about 25% of people. The aura involves temporary, reversible disturbances in vision, sensation, balance, muscle coordination, or speech. People may see jagged, shimmering, or flashing lights or develop a blind spot with flickering edges. Less commonly, people experience tingling sensations, loss of balance, weakness in an arm or a leg, or difficulty talking. The aura lasts minutes to an hour before and may continue after the headache begins. Some people experience an aura but have only a mild or no headache. These mild headaches may be similar to tension-type headaches.

Migraine attacks may last for hours to a few days (typically 4 hours to several days). Severe attacks can be incapacitating and disrupt family and work life.

Migraines usually become less severe as people age.

Did You Know...

Sometimes migraines cause symptoms such as disturbances in vision or balance without causing a headache.

Taking pain relievers too often can make migraines worse.

Diagnosis

- A doctor's evaluation
- Sometimes computed tomography or magnetic resonance imaging

Doctors diagnose migraines when symptoms are typical and results of a physical examination (which includes a [neurologic examination](#)) are normal.

No procedure can confirm the diagnosis. If headaches have developed recently or if certain [warning signs](#) are present, computed tomography (CT) or magnetic resonance imaging (MRI) of the head is often done, and a spinal tap (lumbar puncture) is sometimes done to exclude other disorders.

If people who are known to have migraines develop a headache that is similar to their previous migraines, doctors rarely do tests. However, if the headache is different, particularly if warning signs are present, a doctor's examination and often tests are needed.

Prevention

When treatment does not prevent people from having frequent or incapacitating migraines, taking drugs every day to prevent migraine attacks can help (see Table: [Drugs Used to Treat Migraines](#)). Taking preventive drugs may help people who are taking pain relievers or other migraine drugs too often take these drugs less often.

The choice of a preventive drug is based on the side effects of the drug and on other disorders present, as in the following examples:

- [Beta-blockers](#), such as [propranolol](#), are often used, particularly in people with anxiety or coronary artery disease.
- The anticonvulsant [topiramate](#) may be given to people who are overweight because it can promote weight loss.
- The anticonvulsant divalproex can help stabilize mood and may be useful if migraines make functioning difficult.
- [Amitriptyline](#) may be given to people with depression or insomnia.

Treatment

- Elimination of triggers
- Behavioral interventions
- Yoga
- Drugs to stop a migraine from progressing
- Drugs to control pain
- Drugs to prevent migraines

Migraines cannot be cured, but they can be controlled.

Doctors encourage people to keep a headache diary. In it, people write down the number and timing of attacks, possible triggers, and their response to treatment. With this information, triggers may be identified and eliminated when possible. Then, people can participate in their treatment by avoiding triggers, and doctors can better plan and adjust treatment. Doctors also recommend using behavioral interventions (such as relaxation, biofeedback, and stress management) to control migraine attacks, especially when stress is a trigger or when people are taking too many drugs to control the migraines.

Yoga can reduce the intensity and frequency of migraines. Yoga combines physical poses that strengthen and stretch muscles with deep breathing, meditation, and relaxation.

Drugs

Some drugs stop (abort) a migraine as it is starting or keep it from progressing. Some are taken to control the pain. Others are taken to prevent migraines.

When migraines are or become severe drugs that can abort the migraine are used. They are taken as soon as people sense a migraine is starting. They include the following:

- **Triptans** (5-hydroxytryptamine [5-HT], or serotonin, agonists) are usually used. Triptans prevent nerves from releasing substances that can trigger migraines. Triptans are most effective when taken as soon as the migraine begins. They may be taken by mouth or by nasal spray or be injected under the skin (subcutaneously).
- **Dihydroergotamine** is given intravenously, subcutaneously, and by nasal spray to stop severe, persistent migraines. It is usually given with a drug used to relieve nausea (antiemetic drug), such as [prochlorperazine](#), given intravenously.
- **Certain antiemetic drugs** (such as [prochlorperazine](#)) may be used to relieve mild to moderate migraines. [Prochlorperazine](#), taken by mouth or given as a suppository, is also used to stop migraines when people cannot tolerate triptans or [dihydroergotamine](#).

Because triptans and [dihydroergotamine](#) may cause blood vessels to narrow (constrict), they are not recommended for people who have angina, coronary artery disease, or uncontrolled high blood pressure. If older people or people with risk factors for coronary artery disease need to take these drugs, they must be monitored closely.

If migraines are usually accompanied by nausea, taking an antiemetic with a triptan when symptoms begin is effective. Antiemetics (such as [prochlorperazine](#) or [metoclopramide](#)), taken alone, may stop mild or moderate migraines from progressing.

When migraines are severe, fluids given intravenously can help relieve headache and make people feel better, especially if people are dehydrated from vomiting.

For mild to moderately severe migraines, pain relievers ([analgesics](#)) can help control the pain. Often, nonsteroidal anti-inflammatory drugs (NSAIDs) or [acetaminophen](#) is used. They can be taken as needed during a migraine, with or instead of a triptan. For occasional mild migraines, analgesics that contain caffeine, an opioid, or butalbital (a barbiturate) may help. However, overuse of analgesics, caffeine (in analgesic preparations or in caffeinated beverages), or triptans can lead to daily, more severe migraines. Such headaches, called medication overuse headaches, occur when these drugs are taken more than 2 to 3 days each week.

Missing or reducing a dose of a drug used to treat migraines or taking it late may trigger or worsen a migraine.

When other treatments are ineffective in people with severe migraines, [opioid analgesics](#) may be used as a last resort.

Drugs Used to Treat Migraines

Type	Examples	Some Side Effects
Prevention		
Anticonvulsants	Divalproex Valproate	Hair loss, stomach upset, liver dysfunction, a tendency to bleed, tremors, and weight gain Not used in pregnant women with migraines
	Topiramate	Weight loss, confusion, and depression
	Atenolol Metoprolol	Spasm of the airways (bronchospasm), an abnormally slow heart rate (bradycardia), fatigue, insomnia, worsening of heart failure, and sexual dysfunction
Beta-blockers	Nadolol Propranolol Timolol	Changes in blood sugar levels (possibly making it difficult for doctors to know when blood sugar levels become too low in people with diabetes) With some beta-blockers, unfavorable effects on lipid (fat) levels
Calcium channel blockers	Verapamil	Dizziness, low blood pressure, and weakness Constipation
A botulinum toxin (used to block nerve activity)	OnabotulinumtoxinA	Neck pain and stiffness Weakness of muscles in the face and sometimes the neck
Tricyclic antidepressants	Amitriptyline	Drowsiness, weight gain, increased heart rate, dry mouth, confusion, and constipation
Treatment of severe migraines		
Antiemetic drugs (used to relieve nausea)	Metoclopramide Prochlorperazine	Low blood pressure, drowsiness, involuntary movements, and muscle spasms Nausea, vomiting, and minor muscle cramping
Ergot derivatives	Dihydroergotamine	Rarely, chest pain due to an inadequate blood supply to the heart muscle (angina)
	Almotriptan Eletriptan Frovatriptan Naratriptan Rizatriptan Sumatriptan Zolmitriptan	
Triptans (5-hydroxytryptamine [5-HT], or serotonin, agonists)	Codeine Meperidine Oxycodone	Flushing, tingling, dizziness, drowsiness, nausea, and a sense of pressure or pain in the throat or chest Slowing of breathing, constipation, retention of urine, drowsiness, and nausea
Opioids*		
Treatment of mild to moderate migraines		
Analgesics	Acetaminophen	Medication overuse headache (rebound headache) if the drug is taken too frequently Occasionally rash
	Aspirin Indomethacin Naproxen	Medication overuse headache if the drug is taken too frequently Gastritis (inflammation of the stomach) and peptic ulcers With indomethacin , worsening of depression, seizures, and tremors with decreased mobility and muscle stiffness and, in older people, dizziness and confusion
Nonsteroidal anti-inflammatory drugs (NSAIDs)		

*Opioids should be used as a last resort when migraines are severe and other measures are ineffective.

Drugs Mentioned In This Article

Generic Name

Select Brand Names

Generic Name	Select Brand Names
OnabotulinumtoxinA	BOTOX
Dihydroergotamine	D.H.E. 45, MIGRANAL
prochlorperazine	COMPRO
metoclopramide	REGLAN
acetaminophen	TYLENOL
Amitriptyline	No US brand name
Frovatriptan	FROVA
Indomethacin	INDOCIN
Zolmitriptan	ZOMIG
Sumatriptan	IMITREX
Almotriptan	AXERT
Naratriptan	AMERGE
propranolol	INDERAL
Rizatriptan	MAXALT
Eletriptan	RELPAX
Metoprolol	LOPRESSOR, TOPROL-XL
Meperidine	DEMEROL
topiramate	TOPAMAX
Oxycodone	OXYCONTIN
Verapamil	CALAN
Atenolol	TENORMIN
Naproxen	ALEVE, NAPROSYN
Nadolol	CORGARD

Generic Name	Select Brand Names
Timolol	TIMOPTIC

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