

Spectrum of a Migraine

By: [Harvey Blumenthal, MD](#)

[Introduction](#)

[Migraine With and Without Aura](#)

[Differential Diagnosis and Investigation](#)

[Distinguishing Migraine Without Aura From Tension-Type Headache](#)

[Transformed Migraine and Chronic Tension-Type Headache](#)

[Migraine Triggers](#)

[Atypical Migraine](#)

[Summary](#)

Introduction

Recent astonishing basic science discoveries are altering our concepts of migraine at a breathtaking pace. Migraine is now considered a genetic disorder influenced by other internal and external factors. The neurologic disorder we call migraine results from altered neurochemical, electrical, and vascular changes in the nervous system. While headache is the most common and usually the most dramatic manifestation, remember, there is more to migraine than headache. Occasionally, the visual symptoms, nausea, vomiting, or frightening focal neurological symptoms, such as blurred vision and weakness, are more distressing to the patient than the headache itself. Little wonder that the clinical manifestations of migraine can be so variable across a broad spectrum of symptom presentations.

At one end of this spectrum is the most common clinical syndrome called migraine without aura, and at the other end are rare and complex disorders like familial hemiplegic migraine and basilar migraine, which are discussed later in the article. Even migraine without aura presents with a range of variable symptoms, frequency, and duration of attacks—not only between patients but between different attacks in the same patient—a spectrum within the larger spectrum.

Migraine With and Without Aura

The two most common patterns of migraine are migraine with **aura**, formerly called classic migraine, and migraine without aura, or common migraine. Approximately 18 percent of women and six percent of men in the USA are plagued by migraine, and 15 to 30 percent will experience an aura, described below, with some of their migraine attacks.

Five phases of migraine

There are five phases of migraine that are not universally present, and may variably occur during different attacks in the same individual, underscoring the concept of a clinical spectrum of migraine. The **first phase**, or **prodrome**, occurs in 40 to 60 percent of migraineurs. This consists of altered mood, irritability, depression or euphoria, fatigue, yawning, excessive sleepiness, craving for certain food like chocolate, all of which suggest origin of these symptoms in the hypothalamus of the brain. These symptoms usually precede the headache phase of the migraine attack by several hours or even days, and experience teaches the patient or observant family that the migraine attack has begun.

The **second phase** of migraine is called the aura. The two most common aura symptoms are visual or sensory phenomena. Less common symptoms are weakness, lack of coordination, or speech problems such as word finding difficulty. The aura symptoms usually

precede the headache phase of the migraine attack, but occasionally will occur simultaneously. Sometimes, two aura symptoms will occur in the attack, usually visual and sensory symptoms. These may occur simultaneously but more likely consecutively.

The aura symptoms appear gradually over five to 20 minutes and usually subside just before the headache begins. When confronted by a patient who has recently experienced only one or two such attacks for the first time, the doctor must differentiate whether these focal neurological symptoms represent migrainous aura or manifestations of impending stroke (TIA) or even a focal sensory seizure. Passage of time with repeated identical self-limited attacks and diagnostic testing may be required to be sure, but there are certain features more typical of migraine aura. First, visual and sensory TIA symptoms and seizures usually develop more rapidly than the gradual progression of an aura over five to 20 minutes. Second, migraine aura is often characterized by a combination of **negative** and **positive symptoms**—the migraineur may experience a hole in the vision (negative symptoms) and dazzling, glimmering, scintillating lights (positive phenomena). TIA usually presents as a black or blank negative visual loss only. Sometimes, especially in the elderly, the visual aura occurs repeatedly without any headache. These are called late life migraine accompaniments. Sometimes these patients experienced more typical migraine in youth, the migraine subsiding for many years, only to recur as migraine aura without headache in later life. In this setting, the doctor may be more secure in the diagnosis. However, late life migraine accompaniments often develop with no previous history of migraine. These patients with new late life migraine symptoms must be carefully evaluated to rule out cerebrovascular disease, tumor, or even retinal detachments.

The sensory auras of migraine usually consist of numbness (negative sensory symptoms) **and** positive symptoms of tingling. Numbness would be considered a negative sensory symptom because it is the absence of feeling. Tingling is a positive sensory symptom because a new sensation presents itself. Again, these sensory symptoms usually progress over five to 20 minutes and are followed by the headache phase, which is the **third phase** of the migraine attack, and usually the most dramatic. It is the headache phase of migraine for which most patients consult doctors.

The **fourth phase** of migraine is the **headache termination**. Sleep, even a brief nap of one or two hours, is the most common natural method of headache resolution, but biofeedback and relaxation exercises may also be helpful. Biofeedback is a behavioral approach to reducing and managing pain. Patients are taught to control certain functions such as muscle contraction and release and corrected breathing to enhance blood flow to peripheral blood vessels. Today, pharmacologic treatment is the most common medical intervention to terminate an acute migraine attack.

The **fifth phase** of migraine, the postdrome, is reported by 94 percent of patients, but these symptoms have not been widely studied. The postdrome symptoms may last about 24 hours and range from feeling drained or washed-out to an unusual sense of elation or euphoria. Some patients experience either a low-grade, background headache for 24 to 48 hours or a recurrent migraine attack, and they may still be sensitive to light, sound, and movement.

In 1988, the International Headache Society (IHS) published an extensive classification and diagnostic criteria for headache disorders; although widely acclaimed and almost universally accepted by headache specialists, the IHS classification may be too complex and unwieldy and various simplified modifications of the IHS criteria have been suggested. The experienced doctor uses the IHS criteria as a guide, but must not be rigidly hide-bound by them. Furthermore, both migraine and tension-type headache are very common and when patients report symptoms of both, there may be overlapping features which make it difficult to tell where one ends and the other begins. In fact, the IHS system of classification is being revised and should be more accurate and complete when available by 2002. There is no diagnostic test for migraine and the diagnosis is made on the basis of the history and a normal examination. Therefore, the more thorough the history, the more certain the

diagnosis.

Diagnosing Migraine

Often, the patient does not initially describe the headache characteristics well, and the skillful doctor must take the time to extract important subtle historical points. For example, some patients spontaneously report only pressure-type pain in the back of the head, but by digging a little deeper, the examiner will help the patient recall that the worst headaches, occurring infrequently, build up with an intense throbbing quality and radiate to one eye or temple. Often these patients report that being unsure at the outset if this headache will build to severe intensity, they fail to take acute care medication early enough and obtain less effective relief than if they had treated the migraine earlier in the attack.

The headache of migraine is one-sided in 60 percent of cases and usually alternates sides from one attack to the next. Often, the patient will insist the headache is always on one side, but when pressed will recall that rarely, perhaps 10 percent of the time, the headache will occur on the opposite side. This **alternating hemicrania**, however infrequent, makes the doctor more secure in the diagnosis of migraine. Some migraineurs at first insist the headache is on both sides, but, if asked, will admit it is worse on one side. The headache usually builds up over a period of 30 minutes to several hours, but may occur with more rapid intensity. Although the pain of migraine is usually moderate to severe, many patients will report milder headaches, which they refer to as "sinus headaches," or "regular headaches," which in reality are milder migraine attacks. Benign headaches that recur episodically are much more likely to be migraine or tension-type headache than sinusitis. Sometimes radiography is needed to settle the issue, and CT of the sinuses is superior to sinus x-rays in diagnosing acute sinusitis. Many patients are very test-oriented and, already knowing full well of the radiologist's normal report, anxiously ask, "what did the x-ray show?" and fail to appreciate the knowledgeable opinion of an experienced doctor in making a diagnosis based on a thorough history and examination.

Differential Diagnosis and Investigation

To be sure, we must always be aware of **migraine mimics**, episodic headaches caused by congenital vascular malformations, repeated exposure to carbon monoxide, transient increased spinal fluid pressure resulting from a cyst in the brain, or other structural brain disease. In the elderly, **temporal arteritis**, an inflammation of the cranial blood vessels, must always be considered. Other brain inflammations may present with frequent headaches before other symptoms as mental changes, seizures or strokes result from the blood vessel inflammation. Even headache resulting from brain tumor may mimic migraine or tension-type headache.

Certain danger signals usually warn the doctor this headache may be more serious than migraine. The young healthy patient with a textbook history for migraine and a normal examination seldom requires diagnostic investigation. If, however, the patient fails to respond as expected to treatment efforts, diagnostic testing may be wise.

Unsuspected inflammations, malignancy, or infections such as Lyme disease sometimes can be diagnosed only by spinal fluid (CSF) examination.

For structural brain lesions, MRI (short for magnetic resonance imaging, which uses magnetic fields to image soft tissues such as muscle, brain, and nerves) is usually more sensitive than CT scanning, but CT is more sensitive for demonstrating intracranial bleeding from a ruptured aneurysm in the first 24 hours while MRI becomes more sensitive after 48 hours.

Recently we have learned there is a high familial incidence of aneurysms; unsuspected asymptomatic intracranial aneurysms were found in nine percent of 396 persons having a first degree relative with an aneurysm. A careful family history is therefore important if a warning leak is suspected.

Diagnostic techniques for determining migraine

CT of the sinuses is more sensitive than sinus x-rays or MRI. We must never forget dental disease or jaw dysfunction as a cause of head or facial pain, or localized eye disease such as glaucoma, which can cause one-sided orbital pain. Cervical spine disease or lesions at the base of the skull may cause pain at the back of the head and plain x-rays or imaging should be considered.

Certain prescription medications such as nonsteroidal anti-inflammatory drugs (NSAIDs), estrogen, other hormones, or certain calcium-channel blockers may cause or worsen headache. Since these drugs are often used to treat headaches, sorting out the diagnosis may be difficult. Overuse of OTC and prescription analgesics, ergots, and caffeine can cause rebound headaches.

Distinguishing Migraine Without Aura From Tension-Type Headache

Tension-type headache (TTH) is the most common kind of headache, experienced by almost everyone some time in their lifetime. Most people take an aspirin or acetaminophen and never even think about consulting a doctor for these occasional mild headaches. TTHs are less intense than migraine and rarely disabling; these are nonthrobbing, pressure or tight band-like global headaches that seldom have associated symptoms like nausea or light sensitivity. When TTH occurs for more than 15 days per month for over six months it is termed **chronic tension-type headache** (CTTH), distinguishing it from **episodic tension-type headache** (ETTH,) which occurs fewer than 15 days per month.

Before publication of the IHS system of headache classification in 1988, TTH was called tension headache or muscle contraction headache. We commonly see patients who begin with tightness in the back of the head or upper neck pressure and these mild headaches can often be relieved with simple analgesics, physical therapy, and/or biofeedback. If not treated early, however, this TTH may progress and assume characteristics of migraine with a severe throbbing quality and radiate to become localized over one orbital region, accompanied by nausea or light sensitivity. Modern headache investigators increasingly speculate that migraine and TTH may have a common origin resulting from "neurogenic inflammation," altered pain regulating chemical transmitters in the brain stem, and changes in cranial blood vessels. In support of this view are recent reports about episodic TTH responding to sumatriptan in patients who also have migraine. In any case, patients with TTH seldom consult doctors, and when they do, treatment is usually easy with reassurance, simple analgesics, biofeedback, medicine to combat anxiety, or certain antidepressants. Most patients respond to over-the-counter preparations but some will require prescription medication. Occasional use of simple or combination pain medicines, butalbital combinations or opioids, which are common ingredients in powerful pain medications, may afford good rapid relief; these can be used safely up to two times a week, but the patient must be cautioned against dose escalation and increased frequency of use, which can lead to analgesic rebound headache.

Transformed Migraine and Chronic Tension-Type Headache

Dr. Ninan Mathew coined the term "transformed migraine," describing the phenomenon of patients with infrequent or episodic migraine in their teens who develop frequent milder headaches in their 30s and 40s. They often take increasing doses of medications, both

prescription and OTC preparations, which usually contain caffeine, barbiturates, aspirin or acetaminophen. People with a predisposition to headaches will often develop a pharmacologic tolerance to these drugs, and as the medicine is metabolized, a rebound headache occurs, usually in the early morning, several hours after the last dose. The patient then takes more of the offending medicine resulting in a vicious cycle in which the drug is perpetuating and worsening the headache condition and the episodic migraine is "transformed" into a chronic daily headache. Over 90 percent of patients with transformed migraine have a history of migraine without aura and 80 percent take excessive amounts of medication. Other factors promoting transformation include trauma or meningitis, but in many cases a precipitating factor cannot be identified.

These patients are very difficult to treat, and hospitalization is often necessary for detoxification and treatment with intravenous dihydroergotamine to interrupt the pain cycle, followed by the institution of a more rational and effective comprehensive outpatient treatment program. In reviewing the history, patients with analgesic rebound headaches will usually report taking Tylenol with Codeine, Fiorinal and other prescription drugs, but will neglect telling the doctor about the 12 to 16 Excedrin, Anacin, Pain-Aid, NSAIDs, aspirin, or acetaminophen they take every day, so the doctor must remember to specifically ask about nonprescription medications. The recent FDA approval of over-the-counter combination products for mild migraine may confuse patients and increase the prevalence of rebound headaches.

Chronic TTH must be separated from other chronic headache conditions with different natural histories and perhaps different underlying mechanisms; these include transformed migraine (episodic migraine transformed into near-daily headache, usually resulting from excessive medication), hemicrania continua (a continuous unrelenting one-sided headache), and new daily persistent headaches. In a recent field trial, several investigators were unable to satisfactorily classify 35 to 40 percent of their chronic headache patients according to existing IHS diagnostic criteria.

Migraine Triggers

There is also a spectrum of variable migraine triggers reported by patients. These include altered sleep patterns, sleep deprivation, or sleeping longer than usual. Some migraineurs can predict their attacks with barometric pressure changes that precede weather fronts. Migraine can develop in response to motion sickness, especially in childhood.

- **Menstruation** is a very common trigger, and some women may suffer attacks of **pure menstrual migraine** only when they have their periods. More often, women recognize that their migraine attacks are more predictable and more severe around menstruation, underscoring the influence of hormonal changes on migraine. It is not surprising that birth control pills or other hormonal manipulation may increase the frequency and severity of migraine attacks. Falling levels of estrogen seem to trigger headache by affecting pain receptors and blood vessels in the brain.
- **Certain forms of alcohol** such as beer, red wine or champagne commonly trigger migraine. Other substances like caffeine, cured meats, MSG, Nutrasweet, strong cheeses, yogurt, pickled foods and others are common precipitants. Often, these triggers may not be recognized until the patient keeps a headache diary and records what foods and beverages were taken in the 24 hours before the migraine attack.
- **External sensory stimuli** are among the most common migraine triggers. Certain smell stimuli such as cigar smoke, particular bath oils, perfumes, or other stimuli,

such as scents wafting in a candle shop, may precipitate migraine. The most intensively and scientifically studied migraine trigger is the spectrum of **visual sensory stimuli**, ranging from bright light to specific striped and other geometric patterns.

Atypical Migraine

The IHS classification includes **migrainous headache disorder**. This diagnosis designates patients whose headache characteristics are typical of migraine, but at least one criterion is lacking. While these patients would be excluded from entry into a migraine drug study protocol, almost all clinicians would make a provisional diagnosis of migraine and treat these patients for migraine accordingly.

Summary

We have reviewed the variable clinical features of migraine and some relationships of migraine with other headache disorders. While we contend these views are generally shared by most headache specialists, we must also acknowledge that some very respected headache