

# HEADACHE (MIGRAINE)

## **Why Does it Hurt?**

What hurts when you have a headache? The bones of the skull and tissues of the brain itself never hurt, because they lack pain-sensitive nerve fibers. Several areas of the head can hurt, including a network of nerves which extends over the scalp and certain nerves in the face, mouth, and throat. Also sensitive to pain, because they contain delicate nerve fibers, are the muscles of the head and blood vessels found along the surface and at the base of the brain.

The ends of these pain-sensitive nerves, called nociceptors, can be stimulated by stress, muscular tension, dilated blood vessels, and other triggers of headache. Once stimulated, a nociceptor sends a message up the length of the nerve fiber to the nerve cells in the brain, signaling that a part of the body hurts. The message is determined by the location of the nociceptor. A person who suddenly realizes "My toe hurts," is responding to nociceptors in the foot that have been stimulated by the stubbing of a toe.

A number of chemicals help transmit pain-related information to the brain. Some of these chemicals are natural painkilling proteins called endorphins, Greek for "the morphine within." One theory suggests that people who suffer from severe headache and other types of chronic pain have lower levels of endorphins than people who are generally pain free.

## **When Should You See a Physician?**

Not all headaches require medical attention. Some result from missed meals or occasional muscle tension and are easily remedied. But some types of headache are signals of more serious disorders, and call for prompt medical care. These include:

- ❑ Sudden, severe headache
- ❑ Sudden, severe headache associated with a stiff neck
- ❑ Headache associated with fever
- ❑ Headache associated with convulsions
- ❑ Headache accompanied by confusion or loss of consciousness

- ❑ Headache following a blow on the head
- ❑ Headache associated with pain in the eye or ear
- ❑ Persistent headache in a person who was previously headache free
- ❑ Recurring headache in children
- ❑ Headache which interferes with normal life

A headache sufferer usually seeks help from a family practitioner. If the problem is not relieved by standard treatments, the patient may then be referred to a specialist - perhaps an internist or neurologist. Additional referrals may be made to psychologists.

### **What Tests Are Used to Diagnose Headache?**

Diagnosing a headache is like playing twenty questions. Experts agree that a detailed question-and-answer session with a patient can often produce enough information for a diagnosis. Many types of headaches have clear-cut symptoms which fall into an easily recognizable pattern.

Patients may be asked:

- ❑ How often do you have headaches?
- ❑ Where is the pain?
- ❑ How long do the headaches last?
- ❑ When did you first develop headaches?
- ❑ The patient's sleep habits and family and work situations may also be probed.

Most physicians will also obtain a full medical history from the patient, inquiring about past head trauma or surgery, eye strain, sinus problems, dental problems, difficulties with opening and closing of the jaw, and the use of medications. This may be enough to suggest strongly that the patient has migraine or cluster headaches. A complete and careful physical and neurological examination will exclude many possibilities and the suspicion of aneurysm, meningitis, or certain brain tumors. A blood test may be ordered to screen for thyroid disease, anemia, or infections which might cause a headache.

A test called an electroencephalogram (EEG) may be given to measure brain activity. EEG's can indicate a malfunction in the brain, but they cannot usually pinpoint a problem that might be causing a headache. A physician may suggest that a patient with unusual headaches undergo a computed tomographic (CT) scan and/or a magnetic resonance imaging (MRI) scan. The scans enable the physician to distinguish, for example, between a bleeding blood vessel in the brain and a brain tumor, and are important diagnostic tools in cases of headache associated with brain lesions or other serious disease. CT scans produce X-ray images of the brain that show structures or variations in the density of different types of tissue. MRI scans use magnetic fields and radio waves to produce an image that provides information about the structure and biochemistry of the brain.

If an aneurysm (an abnormal ballooning of a blood vessel) is suspected, a physician may order a CT scan to examine for blood and then an angiogram. In this test, a special fluid which can be seen on an X-ray is injected into the patient and carried in the bloodstream to the brain to reveal any abnormalities in the blood vessels there.

A physician analyzes the results of all these diagnostic tests along with a patient's medical history and examination in order to arrive at a diagnosis.

Headaches are diagnosed as

- Vascular
- Muscle contraction (tension)
- Traction
- Inflammatory

Vascular headaches - a group that includes the well-known migraine - are so named because they are thought to involve abnormal function of the brain's blood vessels or vascular system. Muscle contraction headaches appear to involve the tightening or tensing of facial and neck muscles. Traction and inflammatory headaches are symptoms of other disorders, ranging from stroke to sinus infection. Some people have more than one type of headache.

## **What Are Migraine Headaches?**

The most common type of vascular headache is migraine. Migraine headaches are usually characterized by severe pain on one or both sides of the head, an upset stomach, and at times disturbed vision.

Former basketball star Kareem Abdul-Jabbar remembers experiencing his first migraine at age 14. The pain was unlike the discomfort of his previous mild headaches.

"When I got this one I thought, 'This is a headache'," he says. "The pain was intense and I felt nausea and a great sensitivity to light. All I could think about was when it would stop. I sat in a dark room for an hour and it passed."

*Symptoms of migraine.* Abdul-Jabbar's sensitivity to light is a standard symptom of the two most prevalent types of migraine-caused headache: classic and common.

The major difference between the two types is the appearance of neurological symptoms 10 to 30 minutes before a classic migraine attack. These symptoms are called an aura. The person may see flashing lights or zigzag lines, or may temporarily lose vision. Other classic symptoms include speech difficulty, weakness of an arm or leg, tingling of the face or hands, and confusion.

The pain of a classic migraine headache may be described as intense, throbbing, or pounding and is felt in the forehead, temple, ear, jaw, or around the eye. Classic migraine starts on one side of the head but may eventually spread to the other side. An attack lasts 1 to 2 pain-wracked days.

*Common migraine* - a term that reflects the disorder's greater occurrence in the general population - is not preceded by an aura. But some people experience a variety of vague symptoms beforehand, including mental fuzziness, mood changes, fatigue, and unusual retention of fluids. During the headache phase of a common migraine, a person may have

diarrhea and increased urination, as well as nausea and vomiting. Common migraine pain can last 3 or 4 days.

Both classic and common migraine can strike as often as several times a week, or as rarely as once every few years. Both types can occur at any time. Some people, however, experience migraines at predictable times - for example, near the days of menstruation or every Saturday morning after a stressful week of work.

*The migraine process.* Research scientists are unclear about the precise cause of migraine headaches. There seems to be general agreement, however, that a key element is blood flow changes in the brain. People who get migraine headaches appear to have blood vessels that overreact to various triggers.

Scientists have devised one theory of migraine which explains these blood flow changes and also certain biochemical changes that may be involved in the headache process. According to this theory, the nervous system responds to a trigger such as stress by causing a spasm of the nerve-rich arteries at the base of the brain. The spasm closes down or constricts several arteries supplying blood to the brain, including the scalp artery and the carotid or neck arteries.

As these arteries constrict, the flow of blood to the brain is reduced. At the same time, blood-clotting particles called platelets clump together—a process which is believed to release a chemical called serotonin. Serotonin acts as a powerful constrictor of arteries, further reducing the blood supply to the brain.

Reduced blood flow decreases the brain's supply of oxygen. Symptoms signaling a headache, such as distorted vision or speech, may then result, similar to symptoms of stroke.

Reacting to the reduced oxygen supply, certain arteries within the brain open wider to meet the brain's energy needs. This widening or dilation spreads, finally affecting the neck and scalp arteries. The dilation of these arteries triggers the release of pain-producing substances called prostaglandins from various tissues and blood cells. Chemicals which cause

inflammation and swelling, and substances which increase sensitivity to pain, are also released. The circulation of these chemicals and the dilation of the scalp arteries stimulate the pain-sensitive nociceptors. The result, according to this theory: a throbbing pain in the head.

*Women and migraine.* Although both males and females seem to be equally affected by migraine, the condition is more common in adult women. Both sexes may develop migraine in infancy, but most often the disorder begins between the ages of 5 and 35.

The relationship between female hormones and migraine is still unclear. Women may have "menstrual migraine" - headaches around the time of their menstrual period - which may disappear during pregnancy. Other women develop migraine for the first time when they are pregnant. Some are first affected after menopause.

The effect of oral contraceptives on headaches is perplexing. Scientists report that some women with migraine who take birth control pills experience more frequent and severe attacks. However, a small percentage of women have fewer and less severe migraine headaches when they take birth control pills. And normal women who do not suffer from headaches may develop migraines as a side effect when they use oral contraceptives. Investigators around the world are studying hormonal changes in women with migraine in the hope of identifying the specific ways these naturally occurring chemicals cause headaches.

*Triggers of headache.* Although many sufferers have a family history of migraine, the exact hereditary nature of this condition is still unknown. People who get migraines are thought to have an inherited abnormality in the regulation of blood vessels.

"It's like a cocked gun with a hair trigger," explains one specialist. "A person is born with a potential for migraine and the headache is triggered by things that are really not so terrible."

These triggers include stress and other normal emotions, as well as biological and environmental conditions. Fatigue, glaring or flickering lights, changes in the weather, and certain foods can set off migraine. It may

seem hard to believe that eating such seemingly harmless foods as yogurt, nuts, and lima beans can result in a painful migraine headache. However, some scientists believe that these foods and several others contain chemical substances, such as tyramine, which constrict arteries - the first step of the migraine process. Other scientists believe that foods cause headaches by setting off an allergic reaction in susceptible people.

While a food-triggered migraine usually occurs soon after eating, other triggers may not cause immediate pain. Scientists report that people can develop migraine not only during a period of stress but also afterwards when their vascular systems are still reacting. For example, migraines that wake people up in the middle of the night are believed to result from a delayed reaction to stress.

*Other forms of migraine.* In addition to classic and common, migraine headache can take several other forms:

Patients with hemiplegic migraine have temporary paralysis on one side of the body, a condition known as hemiplegia. Some people may experience vision problems and vertigo - a feeling that the world is spinning. These symptoms begin 10 to 90 minutes before the onset of headache pain.

In ophthalmoplegic migraine, the pain is around the eye and is associated with a droopy eyelid, double vision, and other problems with vision.

Basilar artery migraine involves a disturbance of a major brain artery at the base of the brain. Preheadache symptoms include vertigo, double vision, and poor muscular coordination. This type of migraine occurs primarily in adolescent and young adult women and is often associated with the menstrual cycle.

Benign exertional headache is brought on by running, lifting, coughing, sneezing, or bending. The headache begins at the onset of activity, and pain rarely lasts more than several minutes.

Status migrainosus is a rare and severe type of migraine that can last 72 hours or longer. The pain and nausea are so intense that people who have

this type of headache must be hospitalized. The use of certain drugs can trigger status migrainosus. Neurologists report that many of their status migrainosus patients were depressed and anxious before they experienced headache attacks.

Headache-free migraine is characterized by such migraine symptoms as visual problems, nausea, vomiting, constipation, or diarrhea. Patients, however, do not experience head pain. Headache specialists have suggested that unexplained pain in a particular part of the body, fever, and dizziness could also be possible types of headache-free migraine.

### **How is Migraine Headache Treated?**

During the Stone Age, pieces of a headache sufferer's skull were cut away with flint instruments to relieve pain. Another unpleasant remedy used in the British Isles around the ninth Century involved drinking "the juice of elderseed, cow's brain, and goat's dung dissolved in vinegar." Fortunately, today's headache patients are spared such drastic measures.

Drug therapy, biofeedback training, stress reduction, and elimination of certain foods from the diet are the most common methods of preventing and controlling migraine and other vascular headaches. Joan, the migraine sufferer, was helped by treatment with a combination of an antimigraine drug and diet control.

Regular exercise, such as swimming or vigorous walking, can also reduce the frequency and severity of migraine headaches. Joan found that whirlpool and yoga baths helped her relax.

During a migraine headache, temporary relief can sometimes be obtained by applying cold packs to the head or by pressing on the bulging artery found in front of the ear on the painful side of the head.

*Drug therapy.* There are two ways to approach the treatment of migraine headache with drugs: prevent the attacks, or relieve symptoms after the headache occurs.

For infrequent migraine, drugs can be taken at the first sign of a headache in order to stop it or to at least ease the pain. People who get occasional mild migraine may benefit by taking aspirin or acetaminophen at the start of an attack. Aspirin raises a person's tolerance to pain and also discourages clumping of blood platelets. Small amounts of caffeine may be useful if taken in the early stages of migraine. But for most migraine sufferers who get moderate to severe headaches, and for all cluster headache patients (see section "Besides Migraine, What Are Other Types of Vascular Headaches?"), stronger drugs may be necessary to control the pain.

Several drugs for the prevention of migraine have been developed in recent years, including serotonin agonists which mimic the action of this key brain chemical. One of the most commonly used drugs for the relief of classic and common migraine symptoms is sumatriptan, which binds to serotonin receptors. For optimal benefit, the drug is taken during the early stages of an attack. If a migraine has been in progress for about an hour after the drug is taken, a repeat dose can be given.

Physicians caution that sumatriptan should not be taken by people who have angina pectoris, basilar migraine, severe hypertension, or vascular, or liver disease.

Another migraine drug is ergotamine tartrate, a vasoconstrictor which helps counteract the painful dilation stage of the headache. Other drugs that constrict dilated blood vessels or help reduce blood vessel inflammation also are available.

For headaches that occur three or more times a month, preventive treatment is usually recommended. Drugs used to prevent classic and common migraine include methysergide maleate, which counteracts blood vessel constriction; propranolol hydrochloride, which stops blood vessel dilation; amitriptyline, an antidepressant; valproic acid, an anticonvulsant; and verapamil, a calcium channel blocker.

Antidepressants called MAO inhibitors also prevent migraine. These drugs block an enzyme called monoamine oxidase which normally helps nerve cells absorb the artery-constricting brain chemical, serotonin. MAO inhibitors can have potentially serious side effects - particularly if taken

while ingesting foods or beverages that contain tyramine, a substance that constricts arteries.

Many antimigraine drugs can have adverse side effects. But like most medicines they are relatively safe when used carefully and under a physician's supervision. To avoid long-term side effects of preventive medications, headache specialists advise patients to reduce the dosage of these drugs and then stop taking them as soon as possible.

Biofeedback and relaxation training. Drug therapy for migraine is often combined with biofeedback and relaxation training. Biofeedback refers to a technique that can give people better control over such body function indicators as blood pressure, heart rate, temperature, muscle tension, and brain waves. Thermal biofeedback allows a patient to consciously raise hand temperature. Some patients who are able to increase hand temperature can reduce the number and intensity of migraines. The mechanisms underlying these self-regulation treatments are being studied by research scientists.

"To succeed in biofeedback," says a headache specialist, "you must be able to concentrate and you must be motivated to get well."

A patient learning thermal biofeedback wears a device which transmits the temperature of an index finger or hand to a monitor. While the patient tries to warm his hands, the monitor provides feedback either on a gauge that shows the temperature reading or by emitting a sound or beep that increases in intensity as the temperature increases. The patient is not told how to raise hand temperature, but is given suggestions such as "Imagine your hands feel very warm and heavy."

"I have a good imagination," says one headache sufferer who traded in her medication for thermal biofeedback. The technique decreased the number and severity of headaches she experienced.

In another type of biofeedback called electromyographic or EMG training, the patient learns to control muscle tension in the face, neck, and shoulders.

Either kind of biofeedback may be combined with relaxation training, during which patients learn to relax the mind and body.

Biofeedback can be practiced at home with a portable monitor. But the ultimate goal of treatment is to wean the patient from the machine. The patient can then use biofeedback anywhere at the first sign of a headache.

*The antimigraine diet.* Scientists estimate that a small percentage of migraine sufferers will benefit from a treatment program focused solely on eliminating headache-provoking foods and beverages.

Other migraine patients may be helped by a diet to prevent low blood sugar. Low blood sugar, or hypoglycemia, can cause headache. This condition can occur after a period without food: overnight, for example, or when a meal is skipped. People who wake up in the morning with a headache may be reacting to the low blood sugar caused by the lack of food overnight.

Treatment for headaches caused by low blood sugar consists of scheduling smaller, more frequent meals for the patient. A special diet designed to stabilize the body's sugar-regulating system is sometimes recommended.

For the same reason, many specialists also recommend that migraine patients avoid oversleeping on weekends. Sleeping late can change the body's normal blood sugar level and lead to a headache.

### **Besides Migraine, What Are Other Types of Vascular Headaches?**

After migraine, the most common type of vascular headache is the toxic headache produced by fever. Pneumonia, measles, mumps, and tonsillitis are among the diseases that can cause severe toxic vascular headaches. Toxic headaches can also result from the presence of foreign chemicals in the body. Other kinds of vascular headaches include "clusters," which cause repeated episodes of intense pain, and headaches resulting from a rise in blood pressure.

*Chemical culprits.* Repeated exposure to nitrite compounds can result in a dull, pounding headache that may be accompanied by a flushed face. Nitrite, which dilates blood vessels, is found in such products as heart medicine and dynamite, but is also used as a chemical to preserve meat. Hot dogs and other processed meats containing sodium nitrite can cause headaches.

Eating foods prepared with monosodium glutamate (MSG) can result in headache. Soy sauce, meat tenderizer, and a variety of packaged foods contain this chemical which is touted as a flavor enhancer.

Headache can also result from exposure to poisons, even common household varieties like insecticides, carbon tetrachloride, and lead. Children who ingest flakes of lead paint may develop headaches. So may anyone who has contact with lead batteries or lead-glazed pottery.

Artists and industrial workers may experience headaches after exposure to materials that contain chemical solvents. These solvents, like benzene, are found in turpentine, spray adhesives, rubber cement, and inks.

Drugs such as amphetamines can cause headaches as a side effect. Another type of drug-related headache occurs during withdrawal from long-term therapy with the antimigraine drug ergotamine tartrate.

Jokes are often made about alcohol hangovers but the headache associated with "the morning after" is no laughing matter. Fortunately, there are several suggested treatments for the pain. The hangover headache may also be reduced by taking honey, which speeds alcohol metabolism, or caffeine, a constrictor of dilated arteries. Caffeine, however, can cause headaches as well as cure them. Heavy coffee drinkers often get headaches when they try to break the caffeine habit.

*Cluster headaches.* Cluster headaches are a rare form of headache notable for their extreme pain and their pattern of occurring in "clusters", usually at the same time(s) of the day for several weeks. A cluster headache usually begins suddenly with excruciating pain on one side of the head, often behind or around one eye. In some individuals, it may be preceded by a migraine-like "aura." The pain usually peaks over the next 5 to 10 minutes,

and then continues at that intensity for up to an hour or two before going away.

People with cluster headaches describe the pain as piercing and unbearable. The nose and the eye on the affected side of the face may also get red, swollen, and runny, and some people will experience nausea, restlessness and agitation, or sensitivities to light, sound, or smell. Most affected individuals have one to three cluster headaches a day and two cluster periods a year, separated by periods of freedom from symptoms.

A small group of people develop a chronic form of the disorder, characterized by bouts of cluster headaches that can go on for years with only brief periods (2 weeks or less) of remission.

Cluster headaches generally begin between the ages of 20 and 50, although the syndrome can also start in childhood or late in life. Males are much more likely than females to develop cluster headaches. Alcohol (especially red wine) provokes attacks in more than half of those with cluster headaches, but has no effect once the cluster period ends. Cluster headaches are also strongly associated with cigarette smoking.

Scientists aren't sure what causes the disorder. The tendency of cluster headaches to occur during the same time(s) from day to day, and more often at night than during the daylight hours, suggests they could be caused by irregularities in the body's circadian rhythms, which are controlled by the brain and a family of hormones that regulate the sleep-wake cycle.

There are medications available to lessen the pain of a cluster headache and suppress future attacks. Oxygen inhalation and triptan drugs (such as those used to treat migraine) administered as a tablet, nasal spray, or injection can provide quick relief from acute cluster headache pain. Lidocaine nasal spray, which numbs the nose and nostrils, may also be effective. Ergotamine and corticosteroids such as prednisone and dexamethasone may be prescribed to break the cluster cycle and then tapered off once headaches end. Verapamil may be used preventively to decrease the frequency and pain level of attacks. Lithium, valproic acid, and topiramate are sometimes also used preventively.

*Painful pressure.* Chronic high blood pressure can cause headache, as can rapid rises in blood pressure like those experienced during anger, vigorous exercise, or sexual excitement.

The severe "orgasmic headache" occurs right before orgasm and is believed to be a vascular headache. Since sudden rupture of a cerebral blood vessel can occur, this type of headache should be evaluated by a doctor.

### **What Are Muscle-Contraction Headaches?**

It's 5:00 p.m. and your boss has just asked you to prepare a 20-page briefing paper. Due date: tomorrow. You're angry and tired and the more you think about the assignment, the tenser you become. Your teeth clench, your brow wrinkles, and soon you have a splitting tension headache.

Tension headache is named not only for the role of stress in triggering the pain, but also for the contraction of neck, face, and scalp muscles brought on by stressful events. Tension headache is a severe but temporary form of muscle-contraction headache. The pain is mild to moderate and feels like pressure is being applied to the head or neck. The headache usually disappears after the period of stress is over. Ninety percent of all headaches are classified as tension/muscle contraction headaches.

By contrast, chronic muscle-contraction headaches can last for weeks, months, and sometimes years. The pain of these headaches is often described as a tight band around the head or a feeling that the head and neck are in a cast. "It feels like somebody is tightening a giant vise around my head," says one patient. The pain is steady, and is usually felt on both sides of the head. Chronic muscle-contraction headaches can cause sore scalps - even combing one's hair can be painful.

In the past, many scientists believed that the primary cause of the pain of muscle-contraction headache was sustained muscle tension. However, a growing number of authorities now believe that a far more complex mechanism is responsible.

Occasionally, muscle-contraction headaches will be accompanied by nausea, vomiting, and blurred vision, but there is no preheadache syndrome

as with migraine. Muscle-contraction headaches have not been linked to hormones or foods, as has migraine, nor is there a strong hereditary connection.

Research has shown that for many people, chronic muscle-contraction headaches are caused by depression and anxiety. These people tend to get their headaches in the early morning or evening when conflicts in the office or home are anticipated.

Emotional factors are not the only triggers of muscle-contraction headaches. Certain physical postures that tense head and neck muscles - such as holding one's chin down while reading - can lead to head and neck pain. So can prolonged writing under poor light, or holding a phone between the shoulder and ear, or even gum-chewing.

More serious problems that can cause muscle-contraction headaches include degenerative arthritis of the neck and temporomandibular joint dysfunction, or TMD. TMD is a disorder of the joint between the temporal bone (above the ear) and the mandible or lower jaw bone. The disorder results from poor bite and jaw clenching.

Treatment for muscle-contraction headache varies. The first consideration is to treat any specific disorder or disease that may be causing the headache. For example, arthritis of the neck is treated with anti-inflammatory medication and TMD may be helped by corrective devices for the mouth and jaw.

Acute tension headaches not associated with a disease are treated with analgesics like aspirin and acetaminophen. Stronger analgesics, such as propoxyphene and codeine, are sometimes prescribed. As prolonged use of these drugs can lead to dependence, patients taking them should have periodic medical checkups and follow their physicians' instructions carefully.

Nondrug therapy for chronic muscle-contraction headaches includes biofeedback, relaxation training, and counseling. A technique called cognitive restructuring teaches people to change their attitudes and responses to stress. Patients might be encouraged, for example, to imagine that they are

coping successfully with a stressful situation. In progressive relaxation therapy, patients are taught to first tense and then relax individual muscle groups. Finally, the patient tries to relax his or her whole body. Many people imagine a peaceful scene - such as lying on the beach or by a beautiful lake. Passive relaxation does not involve tensing of muscles. Instead, patients are encouraged to focus on different muscles, suggesting that they relax. Some people might think to themselves, Relax or My muscles feel warm.

People with chronic muscle-contraction headaches may also be helped by taking antidepressants or MAO inhibitors. Mixed muscle-contraction and migraine headaches are sometimes treated with barbiturate compounds, which slow down nerve function in the brain and spinal cord.

People who suffer infrequent muscle-contraction headaches may benefit from a hot shower or moist heat applied to the back of the neck. Cervical collars are sometimes recommended as an aid to good posture. Physical therapy, massage, and gentle exercise of the neck may also be helpful.

### **When is Headache a Warning of a More Serious Condition?**

Like other types of pain, headaches can serve as warning signals of more serious disorders. This is particularly true for headaches caused by traction or inflammation.

Traction headaches can occur if the pain-sensitive parts of the head are pulled, stretched, or displaced, as, for example, when eye muscles are tensed to compensate for eyestrain. Headaches caused by inflammation include those related to meningitis as well as those resulting from diseases of the sinuses, spine, neck, ears, and teeth. Ear and tooth infections and glaucoma can cause headaches. In oral and dental disorders, headache is experienced as pain in the entire head, including the face. These headaches are treated by curing the underlying problem. This may involve surgery, antibiotics, or other drugs.

Characteristics of the various types of more serious traction and inflammatory headaches vary by disorder:

*Brain tumor.* As they grow, brain tumors sometimes cause headache by pushing on the outer layer of nerve tissue that covers the brain or by pressing against pain-sensitive blood vessel walls. Headache resulting from a brain tumor may be periodic or continuous. Typically, it feels like a strong pressure is being applied to the head. The pain is relieved when the tumor is treated by surgery, radiation, or chemotherapy.

*Stroke.* Headache may accompany several conditions that can lead to stroke, including hypertension or high blood pressure, arteriosclerosis, and heart disease. Headaches are also associated with completed stroke, when brain cells die from lack of sufficient oxygen.

Many stroke-related headaches can be prevented by careful management of the patient's condition through diet, exercise, and medication.

Mild to moderate headaches are associated with transient ischemic attacks (TIA's), sometimes called "mini-strokes," which result from a temporary lack of blood supply to the brain. The head pain occurs near the clot or lesion that blocks blood flow. The similarity between migraine and symptoms of TIA can cause problems in diagnosis. The rare person under age 40 who suffers a TIA may be misdiagnosed as having migraine; similarly, TIA-prone older patients who suffer migraine may be misdiagnosed as having stroke-related headaches.

*Spinal tap.* About one-fourth of the people who undergo a lumbar puncture or spinal tap develop a headache. Many scientists believe these headaches result from leakage of the cerebrospinal fluid that flows through pain-sensitive membranes around the brain and down to the spinal cord. The fluid, they suggest, drains through the tiny hole created by the spinal tap needle, causing the membranes to rub painfully against the bony skull. Since headache pain occurs only when the patient stands up, the "cure" is to remain lying down until the headache runs its course - anywhere from a few hours to several days.

*Head trauma.* Headaches may develop after a blow to the head, either immediately or months later. There is little relationship between the severity of the trauma and the intensity of headache pain. In most cases, the cause of

the headache is not known. Occasionally the cause is ruptured blood vessels which result in an accumulation of blood called a hematoma. This mass of blood can displace brain tissue and cause headaches as well as weakness, confusion, memory loss, and seizures. Hematomas can be drained to produce rapid relief of symptoms.

*Temporal arteritis.* Arteritis, an inflammation of certain arteries in the head, primarily affects people over age 50. Symptoms include throbbing headache, fever, and loss of appetite. Some patients experience blurring or loss of vision. Prompt treatment with corticosteroid drugs helps to relieve symptoms.

Meningitis and encephalitis headaches are caused by infections of meninges-the brain's outer covering-and in encephalitis, inflammation of the brain itself.

*Trigeminal neuralgia.* Trigeminal neuralgia, or tic douloureux, results from a disorder of the trigeminal nerve. This nerve supplies the face, teeth, mouth, and nasal cavity with feeling and also enables the mouth muscles to chew. Symptoms are headache and intense facial pain that comes in short, excruciating jabs set off by the slightest touch to or movement of trigger points in the face or mouth. People with trigeminal neuralgia often fear brushing their teeth or chewing on the side of the mouth that is affected. Many trigeminal neuralgia patients are controlled with drugs, including carbamazepine. Patients who do not respond to drugs may be helped by surgery on the trigeminal nerve.

*Sinus infection.* In a condition called acute sinusitis, a viral or bacterial infection of the upper respiratory tract spreads to the membrane which lines the sinus cavities. When one or more of these cavities are filled with fluid from the inflammation, they become painful. Treatment of acute sinusitis includes antibiotics, analgesics, and decongestants. Chronic sinusitis may be caused by an allergy to such irritants as dust, ragweed, animal hair, and smoke. Research scientists disagree about whether chronic sinusitis triggers headache.

## **Conclusion**

If you suffer from headaches and none of the standard treatments help, do not despair. Some people find that their headaches disappear once they deal with a troubled marriage, pass their certifying board exams, or resolve some other stressful problem. Others find that if they control their psychological reaction to stress, the headaches disappear.

*Source: NINDS (NIH)  
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