

Information for Patients

Acute Therapy: Why Not Over-the-Counter or Other Nonspecific Options? Luzma Cardona MD

Key points:

1. Over-the-counter (OTC) medications are appropriate choices to treat headaches if they work well and are not overused.
2. Prescription medicines developed for migraine are a better choice when over-the-counter medicines fail to relieve headache or OTC use is more than 2 days a week.
3. Read labels and be familiar with active ingredients.
4. Be careful with medicines that contain more than one ingredient.

Most people with headache use over-the-counter (OTC) medicines at one point or another. This is because they are easy to obtain and their cost is low compared to prescription medicine. In fact, by the time the average patient reaches a headache specialist, they have tried on average more than two OTC treatments. OTCs are sometimes called "non-specific" medicines because they work for many different types of pain, not just migraine or other types of headache. Research shows that on average headache sufferers received 4.5 medicines over more than 10 years before receiving a medicine developed specifically for migraine from a health care provider. Table 1 lists some of the most commonly used OTC medications for headache and their active ingredients.

Table 1 Some nonprescription medicines commonly used to treat headache

Brand name	Ingredients (per tablet or capsule)
Aleve	Naproxen sodium 220mg
Advil	Ibuprofen 200mg
Bayer	Enteric coated Aspirin 325mg
Anacin	Aspirin 400mg, Caffeine 32 mg
Excedrin migraine	Aspirin 250mg, Acetaminophen 250mg, caffeine 65mg*
Excedrin tension headache	Acetaminophen 500mg, caffeine 65mg*
Tylenol regular strength	Acetaminophen 325mg
Motrin IB	Ibuprofen 200mg
Sudafed/Excedrin sinus	Pseudoephedrine or Phenylephrine

* Atypical 8 ounce serving of brewed coffee contains at least 100mg of caffeine

Prescription medicines for headache fall into four main categories: 1) nonsteroidal anti-inflammatory drugs like aspirin, usually called "NSAIDs"; 2) morphine-like narcotic drugs, usually called "opioids"; 3) butalbital and isometheptene mucate containing compounds and 4) triptan or ergotamine medications. Triptans and ergotamine-type medicines are particularly effective for migraine or cluster headache. Butalbital and isometheptene mucate products are still more commonly written than most headache specialists prefer. They have little to no proven evidence of benefit for migraine or headache in general. The other two categories of drugs, NSAIDs and opioids, are general pain relievers used for many different kinds of pain. Some NSAIDs are sold over-the-counter, but more are available, and in higher doses, as prescription drugs.

Concerns with OTC and Prescription Non-specific Agents

The combination of aspirin, acetaminophen and caffeine (commonly sold under the brand name of Excedrin) is a particularly popular medicine, especially among migraine patients. Interestingly, the products sold as Excedrin Migraine, Excedrin Menstrual and Excedrin Tension Headache contain identical active ingredients even though advertised for different conditions!

People with headaches frequently use OTC medicines containing decongestants, which are often sold to treat colds or sinus. Heavy advertising encourages the belief that "sinus headache" is a common problem. Thus headache sufferers may believe that their headaches result from sinus problems. This is especially likely if their headache symptoms include forehead pain or facial pressure over the area of the sinuses. Research shows, though, that about 90% of these people have migraine, not sinus problems. Patients do not realize that the decongestants in these "sinus" medicines cause blood vessels to shrink. This action can to some extent help migraine pain.

When OTC agents work reliably and are not overused, they can be the only treatment some people with headache require. In some cases, though, OTC medicines may actually make headaches worse or lead to other problems. Most OTC medicines are suspected of causing Medication Overuse Headache (MOH) if taken more than 2 days a week. Caffeine-containing medicines appear especially likely to cause MOH. The box describes common characteristics of MOH.

What is Medication Overuse Headache (MOH)?

- Sometimes called "rebound" headache
- Too frequent use of pain medicines for any reason can lead to rebound headache.
- Most likely to occur in people who are already prone to headache
- The location and type of pain may vary and do not help much in diagnosing the cause
- Headaches due to medication overuse begin or worsen along with steady or increased use of the overused drug
- Medication overuse headache improves when you stop the overused medicine(s)

Over-the-counter and prescription medications that contain more than one ingredient are a special worry. Table 2 summarizes several concerns. People often use more than one OTC or prescription with similar ingredients. For example, some medicines for "sinus" headache contain acetaminophen. People may use this "sinus" drug along with other medicines advertised for pain, which also contain acetaminophen. This can occur with other ingredients as well. A prolonged headache for which someone takes repeated doses of medicine is a particular worrisome situation, since it could lead to an unintended overdose. This is an especially serious problem with acetaminophen. In fact, liver damage from acetaminophen overdose is the leading reason for liver transplants in the United States.

Table 2 Comparison of OTC & prescription non-specific to more specific migraine drugs

Characteristic	Nonspecific Prescription	OTC & Migraine-Specific (Prescription US, Behind the Counter in some Countries)
Price	Inexpensive	Expensive
Drowsiness	May cause drowsiness	Typically do not cause drowsiness
Risk for damage to bowels or kidneys	Moderate to High when overused	Low
Types	Combination OTCs	Triptans

	Combination prescription drugs Narcotics/Opioids Butalbital compounds Isometheptene mucate	Dihydroergotamine Ergotamine-type medications
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Table 3 summarizes additional things to consider when deciding if over-the-counter medicines or non-specific prescription drugs are a good choice for treating your headaches. As a general rule, it is time to visit your doctor or other medical care provider to discuss more specific options when OTC medicines are not reliably effective. Indications of ineffectiveness include partial instead of complete pain relief, multiple side effects, requiring medicine more than two days a week or the need to take many doses before achieving headache relief.

Table 3 Are over-the-counter medicines okay to use for my headache?

	Probably okay to use*	May not be okay
Pain relief	Good: pain is alleviated or greatly improved	Minimal: mild or partial relief of pain
Consistency/reliability	Good: works all the time	Variable: sometimes does not work , can't predict effect
Side effects	Few or none	Multiple or long-lasting
Frequency of use	Never more than two days a week	More than two days a week on average
Duration of use	Never more than listed on the label	Sometimes more frequent than listed on the label
Your general health	No major health problems or daily medications	Health problems such as ulcers, kidney or liver troubles; taking lots of medications for other conditions

* It is always a good idea to check with your health care provider about any medicines you are taking, even OTCs. You may have other conditions that affect whether these medicines are right for you.

Customizing Your Treatment

The types and doses of medications that are included in some combination drugs do not always make sense. For example, there is no particularly good reason to mix aspirin and acetaminophen to treat a single headache, since they work against pain in a similar way. Experts have long suspected that this mixture is particularly dangerous to the kidneys. Yet Excedrin contains both of these drugs plus caffeine. Acetaminophen, which is common to many OTCs and prescription drugs is contained in the most common opioid prescribed, known as Vicodin™ (hydrocodone). A recent review of a long term study, known as the frequent headache study, reported on medicine use. For past use, chronic daily headache was associated with OTC/caffeine combination products and narcotics/opioids and less with aspirin or ibuprofen. Lastly, the dose of certain medicines, such as caffeine, in some combination products may not always be ideal to treat headache. Prescription butalbital combination analgesics (BCA) are an example.

If a combination of medicines is truly desirable, you get more flexibility by buying the ingredients separately. Then you can combine the single-ingredient medicines in just the right way for a particular headache. For example, you might decide to use caffeine and aspirin to treat a headache. Your choices include using a fixed combination product such as Excedrin, Anacin, or Fiorinal – but they may contain additional ingredients that you do not need, or doses that are not right for you. On the other hand, with just a bit of effort you can customize your treatment, perhaps using a caffeine tablet and aspirin. Excedrin provides a reasonable amount of caffeine but the dose of aspirin or acetaminophen it contains is probably less than desirable for a difficult-to-treat migraine. In addition, you get exposure to a drug you didn't need to use with the combination associated with unnecessary risks. As another example, Anacin contains aspirin and caffeine, but the dose of the latter is lower than generally recommended for headaches. Fiorinal requires a prescription. It is one of several barbiturate combination analgesics (BCA). It contains a drug you might not need - butalbital - which can lead to drug dependence and addictive behavior especially with regular use. You will need two tablets to achieve the correct dose of caffeine, but the dose of aspirin will be lower than ideal despite the fact that you may be drowsy from the BCA. A published guideline states BCAs should be avoided as there is no reason to choose such a combination product when a simpler and often less expensive analgesic is available. The alternatives may be safer by reducing potential for addiction, additive side effects or toxicities and with less risk to produce more frequent headaches.

Recent research suggest that only 5 days of butalbital combination analgesic use per month in women risks creating chronic daily headache. Instead for these reasons, you may do better in treating your headaches by buying separate medicines and combining them in a way that is right for you. Caffeine supplements typically contain 200mg of caffeine per tablet. Many patients use 100mg (½ tablet) or take caffeine in the form of a 6-8 ounce cup of coffee. They may combine this with aspirin in a dose suggested by their health care provider. If you choose this option, be careful not to overuse either drug. In general, this means limiting the use of any medicine to a maximum of 2 days per week on average or 9 days per month at a recommended dose. More than this frequency of use suggests you need to strongly consider one or more form of prevention to get the job done right.

Getting the Job Done Right

Know the job is done right when using acute therapy by following suggestions of Migraine-ACT or Migraine-Assessing Current Therapy. This valid tool asks whether pain is gone with normal daily activity present within 2 hours. Also, are you comfortable with the treatment and can you go on with your day normally? Finally does it work consistently with one time treatment and done, not treat and retreatment needed. Consider these "the get the job done right" standard.

Conclusion

Whether you use over-the-counter or prescription drugs to treat your headaches, a good rule of thumb is to use the least amount of medicine needed to get the job done right. For most people, use of an adequate dose of a reliable medicine early in a headache minimizes the amount and type of medication needed. Headache treatment is generally more effective when it is taken before pain reaches a moderate or severe level. It is also important to know what is in your medications, in particular whether the same drug is in more than one of your medicines. Be careful with combination drugs. If you intend to use combinations, discuss with your doctor or health care provider whether your own combination treatment is right for you.

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Education Center

Biofeedback and Relaxation Training for Headaches

By Gay Lipchik, PhD

Biofeedback, progressive muscle relaxation and abdominal breathing are just several of the behavioral medicine techniques proven to reduce headaches and improve quality of functioning. When employed regularly and combined with preventative medication and optimized acute therapy, quality of life is significantly better than with medication alone.

Headache sufferers are justifiably offended when a doctor or a friend dismisses their pain with an offhand remark such as, "You're just under too much stress. Try to relax."

Physical and mental tension can certainly make headaches worse. But simply telling someone to relax doesn't help deal with deadlines, demanding bosses, crying babies, honking horns, unpaid bills, and missed sleep, to name just a few of life's daily hassles. Relaxation is a skill. Like other skills, it can be mastered with time, practice and a good instructor. There are a variety of mind-body approaches to easing tension and improving pain tolerance. Some have proven track records in preventing headaches or reducing their severity.

Biofeedback and progressive muscles relaxation are the most widely accepted non-drug techniques for headache control and prevention. Their effectiveness has been demonstrated during 25 years of research with well over 100 investigations.

Biofeedback and relaxation training typically yield a 45% to 60% reduction in headache frequency and severity. This is equivalent to the reduction in headache achieved by many headache medications, such as propranolol (Inderal®) and amitriptyline (Elavil®), but without any of the negative side effects. The most common limitation of biofeedback and relaxation training is that it requires time commitment and implementation effort on behalf of the patient. Biofeedback sessions may take one hour and training sessions may include several weekly visits over the course of several months.

For many headache sufferers, the combination of drug and non-drug treatments yields the most significant improvement in headache activity. For example, the average improvement with either biofeedback alone or propranolol alone is a 55% reduction in migraine. However, when biofeedback is combined with propranolol, the average improvement is a 70% reduction in migraine.

Bringing the Body into Awareness using Biofeedback

Biofeedback (or biological feedback) uses an instrument that monitors a bodily response, such as muscle tension or skin temperature, as the person tries to modify that response. For example, the monitor might give feedback with a tone that goes higher if the muscles in the forehead tighten and lower if the muscles relax. Another type of monitor uses a visual display such as a light that changes color as you increase or decrease temperature in your hands (or feet).

Increased muscle tension and changed body temperature are two of the body's responses to stress and strain. By providing you with instant and continuous information on these involuntary and unconscious processes in the body, you can observe and modify your body's reaction to stress. After you have used biofeedback to develop your ability to recognize and reduce tension in your body, you will be able to do so anywhere and any time without the help of the equipment. These skills aid in preventing, reducing, or stopping a headache. Biofeedback, like progressive muscle relaxation, works best when you learn the skills from a qualified professional, typically a psychologist or psychiatrist who is trained in this procedure.

Typically, electromyogram (EMG) biofeedback is used as a prevention approach for tension-type headaches. With EMG biofeedback, an EMG machine monitors skeletal muscle tension. Just about any muscle can be monitored, but three muscles most commonly used are:

1. *Frontalis*: the muscle in your forehead that is involved with frowning and tightens up when you are worried or under pressure.
2. *Masseter*: this muscle tightens your jaw and often stays clenched when you are tense, frustrated, or angry.
3. *Trapezius*: this muscle hunches your shoulders and tightens when you are alarmed or anxious or in response to environmental stressors, such as sitting too long at a computer.

These muscles are used in EMG biofeedback because they typically respond to stress and can be easily measured. EMG training is done by placing two sensors (electrodes) at a specified distance from each other on the skin over the identified muscle. A third sensor is placed on a neutral spot to serve as an electrical reference point. These sensors do not cause any discomfort whatsoever; they simply record your body's responses.

Thermal or hand-warming biofeedback was first used at the famous Menninger Clinic in Kansas. Researchers there discovered that headache patients who learned to raise the temperature of their hands using biofeedback had fewer and less severe headaches when they practiced this skill regularly.

Hand-warming works in the following way. When a person is anxious or under stress, the blood vessels in the fingers narrow and the hands become cooler. That's why we tend to get "cold and clammy hands" when we're frightened or nervous. On the other hand, when you are relaxed, the blood vessels in your hands expand and your hands get warmer. You can get an idea of how stressed you are by taking your hand or finger temperature with a thermometer or biofeedback instrument. You can learn to reduce your level of arousal through the process of temperature biofeedback training. Then, whenever your hands are cool or you are experiencing stress, you use your hand-warming skills to produce a more relaxed state.

Although it's often assumed that "tension-type" headache responds better to techniques to control muscle tension, it has been found that migraine patients improve as much with EMG biofeedback as they do with thermal biofeedback. Thus, the mechanism of action for biofeedback and relaxation training may be more complex than meets the eye. We know that headache sufferers who regularly practice these techniques report a decreased sense of helplessness and an increased sense of self-control. These changes in mental outlook and behavior may increase your ability to prevent headaches as well as your ability to reduce pain, especially if used as soon as you notice a headache coming on.

Relaxation Training

Relaxation training involves learning how to achieve a physical and mental state of calm and relaxation within a few minutes. It is a systematic set of procedures, rather than simply trying to relax on your own with activities like gardening, reading, or watching TV. Relaxation training is recommended for headache management because headaches are often related to the body's reaction to everyday stresses like deadlines, demanding bosses, crying babies, honking horns, unpaid bills, and missed sleep, to name a few of life's daily hassles. For headache-prone people, stress does not need to be excessive. Unpredictability or change in life is all that is needed. Even normal everyday levels of stress can trigger a headache.

Relaxation training slows down the sympathetic nervous system, which is responsible for the stress response. The sympathetic nervous system is involved in regulating heart rate, blood vessel expansion and contraction, blood pressure, sweat production, sleep, and alertness. During stress, heart rate and blood pressure increase, sweat production increases, breathing becomes shallow, and adrenaline and other hormones are released, causing blood vessels to constrict and muscles to contract. You may have noticed that your shoulders are hunched up and your jaws are clenched during stress. You can see then how slowing the stress response might be beneficial.

Deep relaxation reverses many of the physical responses that can trigger headaches. Additionally, during deep relaxation, the relaxed person takes fewer breaths per minute, yet breathes more deeply, "bathing" the blood cells in oxygen, which means more oxygen gets to the muscles and to the brain. Increasing oxygen supply to the brain seems to help prevent headaches. With practice, deep relaxation changes your body's response to adrenaline and other stress hormones so that it takes a greater disruption from life stresses (and the stress response) to trigger a headache. Becoming deeply relaxed not only helps reduce headache frequency, but it can give a greater sense of self-control as well as decrease irritability, anxiety, depression, insomnia, and blood pressure.

Learning to Relax

Relaxation training is typically provided "live" in a clinic office by an experience therapist (usually a psychologist). Learning to become deeply relaxed may take several sessions, so you may be scheduled for 4 to 10 visits. Visits may be scheduled a couple of weeks apart or once weekly. During your clinic visits, you will be given instructions and in-office practice sessions for a variety of relaxation techniques. Most likely you will be provided audiotapes and written materials to help you practice at home between your office visits. Then you will learn how to use these skills in your daily life. Relaxation training typically begins with two primary techniques: abdominal or deep breathing and progressive muscle relaxation.

Deep Breathing: To teach you deep breathing, your therapist will ask you to place one hand on your chest and one hand on your abdomen, just under your ribs, so that you are more aware of your breathing. Next, you will be asked to breathe in slowly through your nose, pulling your breath down towards your stomach, pushing your abdomen outwards, allowing yourself to fill your lungs completely. Your hand on your abdomen should rise slightly more than your hand on your chest when you are breathing deeply. Breathe out slowly, pulling your stomach in towards your spine, and think the word "relax." With each slow, deep breath you likely will feel yourself becoming more relaxed. After you have learned to breathe deeply, you will be asked to focus on slowing your breathing. For the first 1 to 2 weeks, you will probably be asked to practice this breathing exercise for 5 to 10 minutes, 2 to 3 times daily as well as during progressive muscle relaxation (PMR) training. After you have mastered the technique, you should check in with yourself throughout the day to remember to breathe deeply.

Progressive Muscle Relaxation: Next you will be instructed in PMR, the most commonly used muscle relaxation technique for the management of headaches. With PMR, you physically tense and then relax your muscles. It might sound like a contradiction, but for a muscle to become relaxed it is helpful for it to be tightened first. Tightening muscles also makes you more aware of what tense muscles feel like. This will help you to identify tension in those muscles early on, so you can apply relaxation skills to prevent the muscle from becoming tenser and to reserve the stress response. Your therapist will demonstrate how to gently tense and relax each muscle. You will learn to tense and then relax muscles in your hands, forearms, upper arms, feet, calves, thighs, stomach, chest, shoulders, neck, face, and head. Next, your therapist will take you through an in-office practice of slowly tensing and relaxing these muscles, while asking you to focus on each muscle, comparing sensations of relaxation with sensations of tension. Between muscle groups, you will be asked to focus also on your breathing. After tensing and relaxing all of the muscle groups, your therapist may ask you to focus on a relaxing scene that you have discussed before beginning the PMR practice. For example, many patients describe a beach scene, waterfalls, or walking through the woods. For many patients this helps to further deepen their relaxation, and the imagery can be used alone as a quick relaxation skill. The entire practice session takes about 25 to 30 minutes.

During your in-office practice of PMR, the room may be dimly lit and you may be offered the comfort of a recliner. You also will be asked to remove your eyeglasses, and you might be asked to remove your shoes, loosen your tie, belt, or any other restrictive clothing (suit jacket, for example) in order to be as comfortable as possible. Your therapist will probably ask you to rate your tension levels before and after your in-office practice. And you will probably be asked to keep track of your practice in relaxation logs so that you can discuss with your therapist any problems you might have with practicing the techniques.

The Relaxation Routine

Some people become very relaxed after their first practice session, but the vast majority of people do not notice substantial reductions in muscle tension, stress levels, or headache activity until they have practiced for some time. So, do not become discouraged if you do not get immediate results. Also, not everyone can imagine the pleasant relaxing scene as vividly as they'd like. This will likely come with practice, although some people find it difficult to learn this skill. If it doesn't get easier with practice, don't use it as a relaxation strategy. It is important that you use what works best for you rather than to get discouraged. You don't have to master all of the techniques your therapist teaches you to improve.

For relaxation training to be effective at reducing your headaches, initially you need to practice daily for about 25 minutes at a time. Ideally, you will practice twice daily. You need to practice enough that deep relaxation becomes a habit, so that when you say "relax" to yourself, your body knows how to respond. The amount of time it takes to get deeply relaxed gets shorter with practice and as you learn briefer methods of relaxation in your follow-up office visits.

The goal is for relaxation training to be a portable skill that you can use anytime, any place, at any moment's notice. Initially, however, you might want to consider that your body is in training. You have to train your body to know what it is to be completely relaxed.

Summary

Deep relaxation is a skill that teaches you how to recognize signs of stress in your body and how to reduce them before they reach the level of painful muscles and headache. These techniques work best to prevent headaches. However, they can be helpful if you use them as soon as you notice a headache starting, rather than during a full-blown attack.

Biofeedback and relaxation techniques are most effective in preventing headaches, rather than treating a headache in progress. Nonetheless, many headache sufferers do report that these techniques often lessen the severity and duration of headache if used during a headache attack. Many patients find these techniques to be effective alternatives to medication, while research also shows that typically headaches are best controlled over time by combining these techniques with some use of preventive and acute medication.

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Information for Patients

Caffeine and Migraine

Robert E. Shapiro, MD., Ph.D. and Robert Cowan, MD

Key Points

1. Caffeine affects pain.
2. Acute treatment of headaches with caffeine is sometimes effective, but should be limited to not more than two days per week.
3. For people who experience migraine, caffeine taken 3 or more days per week, for whatever reason, may lead to dependency and increased migraine frequency.
4. For those who have frequent headaches, avoidance of all caffeine is ideal, and at least until improvement in headache frequency is seen.

Migraine patients often report that a strong cup of coffee can stop some attacks. This is not surprising to hear. Caffeine is a key active ingredient in many headache medications including Excedrin™, Anacin™, MdoI™, Darvon Compound™, Fioricet™, and Migranal™. Caffeine may aid in the body's absorption of these medicines, but can caffeine itself relieve headaches? Few research studies have examined this question, but the answer appears to be yes. Caffeine can provide some headache relief. For example, one small controlled study found that caffeine was better than placebo, and as good as acetaminophen, in relieving tension-type headaches.

So why not just treat your headaches with coffee? Unfortunately, caffeine's effects on the brain can vary tremendously depending upon how often you use it. With occasional use, it may provide modest acute headache relief as well as its characteristic satisfying sense of alertness and well-being. However, with daily or near daily caffeine exposure, the brain may develop a tolerance for the drug. This means, a given dose becomes less effective with repeated use. Dependency develops when the brain expects that an additional dose of caffeine will be coming soon. If that caffeine expectation is unmet, a withdrawal syndrome results which includes headache itself as a prominent symptom, along with fatigue, trouble concentrating, nausea, and other symptoms suggestive of migraine. An example of this withdrawal syndrome may be the "weekend migraine", where attacks tend to occur on Saturdays or Sundays associated with "sleeping in" and delaying the morning cup of coffee.

We don't fully understand the mechanisms underlying the different effects of caffeine on the brain. However, the specific targets of action of caffeine in the brain and nerves outside the brain are known. Caffeine affects the activity of a naturally occurring and necessary brain substance called adenosine. Adenosine levels in the blood go up during migraine attacks. Furthermore, adenosine when injected into a vein can trigger migraine attacks. Adenosine is widely available in the brain and can produce many effects including less brain electrical activity, temporary widening of blood vessels, and control of some aspects of sleep and movement. Adenosine acts by sticking to specific receptor molecules on the surfaces of some brain cells. Caffeine can block the action of these receptors and thereby stop the effects of adenosine. We do not know how these effects of caffeine result in acute anti-migraine and pain control actions.

In daily caffeine users, caffeine has less of an effect on brain action and blood vessel size. Caffeine withdrawal may lead to a significant increase in blood flow in the brain. This is due to an increase in blood vessel size as a result of stretching or dilation. These chronic effects of caffeine are likely a result of changes in the numbers, types and change in function of adenosine receptors active on brain cells. These changes may contribute to caffeine tolerance and dependency.

Caffeine is the world's most popular drug and coffee possibly second most valuable product after oil. Up to 90% of Americans of all ages consume some caffeine daily with more than 50% consuming coffee daily. More than 50% average 300mg per day with an average daily dosage for all consumers of about 200mg. One report estimates nearly 95% of Brazil's population consumes caffeine daily, whereas only about 63% of Canadian adults do so. The average dietary caffeine consumption in some Scandinavian countries is more than 400 mg per person per day. It is not hard to reach 200-300mg of caffeine daily since a standard 8-ounce cup of coffee made by the American drip method contains between 125 and 250mg of caffeine. A 12-ounce can of Coca Cola contains 34mg. Also, the usual 'cup' of coffee for many individuals is often actually 12 or even 16 ounces and sometimes more.

Do not underestimate the power or potency of caffeine. Caffeine dependency can occur after as little as 7 days of exposure. 100mg per day can sustain dependency. In fact, many individuals can avoid caffeine withdrawal symptoms by as little as 25mg - the equivalent of about 2 tablespoons of most "gourmet" coffees. Carefully controlled studies show that caffeine doses as low as about 10mg can be reliably noticed by particularly sensitive people. These studies also show that more than 30 percent of people can feel the effects of 18mg or less.

Is "decaf" coffee OK? According to a US Department of Agriculture rule, 97.5 % of caffeine must be removed from coffee in order for it to be called decaffeinated. Therefore, the starting potency of coffee is very relevant to the final potency of decaf. University of Florida researchers have measured up to 6.9 mg caffeine per 8 oz of Starbucks brewed decaffeinated coffee and up to 15.8 mg caffeine per 1 oz shot of Starbucks decaffeinated espresso. So only a couple of cups of decaf a day might still have a considerable effect on some people.

Studies of caffeine dependency and tolerance show that daily caffeine users are actually more motivated to consume it to avoid withdrawal symptoms, than to experience the lift that its stimulant properties may provide. Caffeine's combination of a punishing syndrome of withdrawal, along with a rewarding sense of wakefulness, has made coffee, tea, and chocolate, some of humanity's best-loved foods. One might say that caffeine-producing plants have succeeded in motivating humans to cultivate them widely and with very great care.

Not everyone consuming daily caffeine is equally likely to develop dependency and withdrawal syndrome. Studies indicate that genetics make some people more likely than others. Scientists do not know whether the inherited tendency to experience caffeine withdrawal syndrome relates to the genetic factors that cause migraine. However, chronic daily headache (CDH) patients are much more likely to use daily dietary caffeine and/or prefer caffeine-containing headache medications. Moreover, people who occasionally experience migraine attacks are at a higher risk of developing CDH when they also consume caffeine daily too. In one study, consumers of 100mg caffeine daily had nearly 3 times higher likelihood of developing CDH than those drinking less. This association is particularly notable for young women - a group already at greater risk for migraine and the march or progression to daily headache.

In summary, caffeine may lead to the development of medication-overuse headache (so-called "rebound" headache). As such, patients should limit caffeine use as recommended for other acute medications for migraine. This use should not exceed two days per week. The unwelcome news is that patients with a history of severe or chronic migraine should consider eliminating caffeine entirely, at least for several months. This typically needs to be done with removal of other overused painkillers and the addition of further preventive management of headache. Removing caffeine alone is rarely enough to solve the problem. For patients with high daily caffeine intake, this reduction in use should be achieved over a gradual taper of days or even weeks to limit the impact of withdrawal syndrome. If you elect removal in a "cold turkey" manner, you may suffer severe migraine attacks which are more difficult to bring under control. Once migraine attacks are no longer frequent, caffeine might be reintroduced, but limited to no more than two days per week, if at all. For some people, it seems that any amount of caffeine can trigger or worsen migraine. A headache log or diary helps to determine if resuming caffeine leads to more headaches.

It is important to emphasize that caffeine consumption is rarely the sole 'cause' of frequent headaches including migraine. However, it is a modifiable risk factor, unlike many other unavoidable migraine triggers. Caffeine is often a significant and overlooked contributor to the problem of frequent and chronic daily headache. Migraine sufferers should use caffeine less frequently or remove it entirely as one component of a program of therapies for success - and it requires no prescription.

Information for Patients

Chronic Daily Headache: An Overview

By Jeanetta Rains, PhD and Frederick R. Taylor, MD, FAHS

Key risks for progression of headaches to chronic daily headache include:

1. **Acute medication use month after month at greater than 2 days per week**
2. **Stress and life events, particularly with unrecognized/untreated anxiety and/or depression**
3. **Poor Sleep, often influenced by all the other risk factors**
4. **Obesity**
5. **Caffeine, in smaller amounts than you may think!**

Chronic daily headache refers to headaches of almost any type that occur very frequently, generally at least 15 days per month for a period of six months or more. Chronic migraine is diagnosed when headache occurs greater than 15 days per month and migraine or pain killer use occurs at least 8 of those days. Patients with tension-type headaches and no migraine occurring 15 or more days per month are diagnosed with chronic tension-type headache.

The Importance of Achieving a Specific and Accurate Headache Diagnosis

Getting a specific headache diagnosis that is accurate is very important because it will have a major influence on matching your treatment plan to the type of headache and severity of illness. Diagnosis influences the treatment plan by directing the type of medical tests that are run, type of medications recommended and long-term management goals you and your practitioner select. More importantly, matching your beliefs about your headache type(s) to an accurate diagnosis is crucial, as otherwise test recommendations, medications and long-term behavioral management adherence is likely to decrease or not be started at all. For example, the plan of care will be very different for headaches diagnosed as sinusitis than for headaches diagnosed as migraine. But if you believe your headaches are due to sinus headache, while your practitioner believes you have migraine, try to resolve the differences so you can comfortably put recommendations into action. For those with "chronic" migraine a very different treatment regimen is likely to be offered than for those with less frequent "episodic" migraine. Incorrect diagnosis leads to an inappropriate treatment plan and lack of relief for the patient. With chronic migraine, wrong treatment may even lead to a worsening of the headache condition. An accurate diagnosis yields the best chance for appropriate treatment to relieve symptoms. A diagnosis you believe to be incorrect causes you to likely distrust the treatment, so communication of your opinion about your headache beliefs is critical to resolve differences.

Headache diagnoses and treatment plans are made on the basis of:

- Accurate total of any days with headache in an average month and accurate duration of headache with or without treatment. This identifies the likely headache syndrome.
- Pain characteristics such as location, severity, pain quality, and response to routine physical activity.
- Associated symptoms like sensitivity to noise (phonophobia), visual changes, and light sensitivity (photophobia).
- History of the illness (that is, when it started, how it has changed, and how long it takes to reach peak or worst pain/disability).
- Physical (especially exam of your head and neck muscles) and neurological exams especially your eyes.

Because symptom patterns tend to change over time—especially in the case of chronic headaches—the history is particularly important. Along with a physical examination, the history helps determine the need for specialized tests—either to rule out progressive or life-threatening problems or to confirm the diagnosis. An accurate diagnosis then guides physicians to a specific treatment approach, one that is most often based on scientific research.

Research shows that at least one-third to one-half of patients seen in specialty headache clinics began with occasional migraine attacks that gradually progress or transform into chronic migraine. Sometimes the migraine symptoms themselves will also transform over time. For example, the migraine symptoms might have initially involved severe throbbing pain on one side of the head accompanied by nausea and vomiting. After progression of the condition, headaches might occur on both sides of the head (bilateral) as a constant dull pain with or without nausea.

To assess if headaches are progressing, an accurate and detailed description of the headache characteristics, duration, and frequency are all very important. This history will help ensure an accurate diagnosis. An understanding of the specific causes or contributing factors that lead to progression, and then reversing them, is key to successful treatment.

What are common risk factors for progression from an episodic headache to a chronic headache condition?

There are several risk factors that put the headache patient at risk for exacerbation of their condition. Several of these are "modifiable" or conditions that the patient with their physician can work with to help prevent headaches from progressing. Modifiable risk factors are (1) medication overuse, (2) stress, (3) sleep disturbance, (4) obesity, and (5) caffeine. Some factors are not modifiable, such as a genetic predisposition. Therefore, it is important that patients work closely with their physician to help establish boundaries for those conditions that they have control over. Some modifiable risk factors are reviewed in detail below.

1. Medication overuse

An important and common cause of headache progression is overuse of certain headache medications. When taken often, the very medications used to treat tension-type and migraine headache attacks can cause episodic headache to progress into a chronic headache condition. The medications known to play a role in this process include:

- Analgesics combined with caffeine
- Caffeine
- Ergotamine
- Opiates
- Prescribed analgesics
- Over-the-counter analgesics
- Triptans

All these medications can be effective in treating episodic headache when used on an occasional basis. However, when used more than two days a week, they may transform and aggravate headache. The result is called medication overuse headache previously known as rebound or analgesic overuse headache.

For medication overuse headache, the pain usually improves when the acute medication is tapered and then discontinued. Within two months (and frequently sooner), the chronic headache pattern will revert back to the earlier episodic headache pattern or will remit. However, discontinuation of medications that are being overused should only be done under close supervision of your practitioner because serious side effects may occur. Some of these side effects may include temporary worsening of headache, seizures, agitation, sweating, among others. That said, typically to get the process initiated, reduction of 1 tablet per week of any over the counter medication overused is safe without risk, except for pain worsening, while waiting for advice. Changes in prescription medications should probably be directed by your provider.

Following discontinuation of medications that are being overused should improve the headache status over time. This improvement confirms that the medication was indeed part of the problem. Even when episodic headache remains, it is often much more responsive to conventional treatment after the medication overuse has

been eliminated. It is important to recognize that a history of medication overuse will put the patient at risk of future overuse. Therefore, many of these patients may benefit from a daily preventive therapy in order to reduce frequent use of acute medications.

2. Stress

Stress is the most commonly identified trigger for a headache in the average headache sufferer. Therefore, it is not surprising that frequent life changes and chronic daily stressors or "hassles" are also implicated in the development of chronic headaches. These stressors may result in anxiety or depression or occur more likely due to either condition. Recognition of these relationships can be key to developing an adequate treatment plan.

3. Sleep disturbance

Headache may be aggravated by frequent sleep disturbance. The most common sleep problem for headache sufferers is insomnia, including difficulty falling asleep, difficulty staying asleep, or poor quality "non-restful" sleep. Snoring is a specific risk factor for chronic headache in some patients. Though the cause is not known, snoring could disturb sleep quality or compromise breathing.

4. Obesity

Obesity is associated with increasing headache frequency. Although the mechanisms for this are not well understood, several factors likely play a role. Diet and exercise are an important part of maintaining healthy headache hygiene. Discuss exercise and weight loss plans with your practitioner if you feel that this is something that you may be able to address in trying to control your headaches or keep your headaches from progressing.

5. Caffeine

Caffeine is added to certain pain medications because it can be beneficial for migraine when used occasionally and in moderation, defined ideally as 2 days per week or less. Frequent use of caffeine can also be a risk factor for headache progression. Caffeine is the most widely-used mood-altering substance in America. It is present in many beverages, dietary supplements, and in some foods, such as chocolate. Many Americans consume caffeine daily with very little awareness that they are ingesting a drug with potent effects. For some headache sufferers, caffeine aggravates headache in much the same way that medication overuse can. If eliminating caffeine, decide whether to cold turkey or taper it. The former may be associated with severe temporary exacerbation of headaches. A taper can be associated with failure to stop the caffeine and milder temporary mood variability.

Steps that can help reduce the risk of headache progression

1. Avoid using over-the-counter and acute prescription headache medications more than two days a week, with rare exceptions. If this is difficult, a daily medication to prevent migraine attacks may be useful.
2. Minimize, better yet, eliminate use of caffeine.
3. Make lifestyle changes that help to manage stress including
 - o routine exercise
 - o reduce stress
 - o eat healthily or lose weight, if needed
 - o try relaxation therapy, cognitive therapy or other nonpharmacological approaches
4. Get sufficient sleep (a regular pattern of seven to eight hours of sleep per night).
 - o speak with your provider about persistently disturbed sleep- especially if you snore
5. Carefully follow your provider's recommendations for any treatment plan
6. Follow-up with your practitioner and keep a routine headache diary so you have an accurate account of your headache frequency, medication taken and response to treatment

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Information for Patients

Headaches in Children

Did you know?

- Headaches can be a common problem in children
- Somewhere between 4% and 10% of children have migraine headaches.
- Many adults with headaches started having their headaches as children, with 20% reporting the onset before age 10.
- Most headaches in children are benign - meaning they are not symptoms of some serious disorder or disease.
- Migraine headaches often run in families, so information on other family member's headaches are important.
- Headache may interfere with participation in activities and school and can be a significant health problem.

[What is a primary headache?](#)

[When to call the doctor about your child's headaches?](#)

[Why do you need to know what kind of headache your child is having?](#)

[What is a migraine headache \(episodic\)?](#)

[What can we do to prevent my child's headaches?](#)

[What should I do if my child gets a headache?](#)

[How do you know your child "really" does have a headache?](#)

What is a primary headache?

Headaches can be divided into two categories, primary or secondary.

- Primary refers to headaches that occur on their own and not as the result of some other health problem. Primary headaches include migraine, migraine with aura, tension-type headache, and cluster headache.
- Secondary refers to headaches that result from some cause or condition, such as a head injury or concussion, blood vessel problems, medication side effects, infections in the head or elsewhere in the body, sinus disease, or tumors. There are many different causes for secondary headaches, ranging from rare, serious diseases to easily treated conditions.

When to call the doctor about your child's headache?

You should consult your family doctor if headaches are frequent or severe or include unusual symptoms. Your physician may ask you to describe features of your headache (for example, the location of the pain, pain severity, and any other symptoms associated with the headache attack). To rule out possibility of secondary headache, the physician may decide to order special tests, including a CT scan or an MRI. Worrisome symptoms that should be brought to your doctor's attention include:

- Headaches that wake a child from sleep.
- Early morning vomiting without nausea (upset stomach).
- Worsening or more frequent headaches.
- Personality changes.
- Complaints that "this is the worst headache I've ever had!"
- The headache is different than previous headaches.
- Headaches with fever or a stiff neck.
- Headaches that follow an injury.

Why do you need to know what kind of headache your child is having?

As you may be aware, children suffer from a number of different types of headaches. It is important to rule out any dangerous cause for their headache that may classify it as a "secondary headache." It also is important to understand what type of headache your child has because it will impact treatment, level of disability, and lifestyle factors that will impact how to take care of a child with headaches. For example, a child with migraine may have a common factor that precedes their attack, such as fasting or low blood sugar. Therefore, it is important to know how to avoid conditions that may increase the risk of an attack and have medications that are specific for the headache being treated.

- **What is a tension-type headache (episodic)?**
This type of headache has also been called a tension headache, muscle contraction headache, stress-related headache, and "ordinary headache." These headaches can be either episodic or chronic and may include tightness in the muscles of the head or neck.
- A tension-type headache can last from 30 minutes to several days. Chronic tension headaches may persist for many months. The pain usually occurs on both sides of the head, is steady and nonthrobbing. Some people say "it feels like a band tightening around my head." The pain is usually mild to moderate in severity. Most of the time the headache does not affect the person's activity level.
- Tension-type headaches are usually not associated with other symptoms, such as nausea or vomiting. Some people may experience sensitivity to light or sound with the headache, but not both. Muscle tightness may be noticed by some patients but doesn't always have to occur.

What is a migraine headache (episodic)?

Migraine headaches are recurrent headaches that occur at intervals of days, weeks or months. There may or may not be a pattern to the attacks—for example, teenage girls may tend to have attacks associated with their menstrual cycle. Migraines generally have some of the following symptoms and characteristics:

- Untreated, they can last from 1 to 72 hours in children. Sleep or medical treatment can reduce this time period.
- Headache starts on one side of the head. This may vary from headache to headache and in children, they may start in the front or in both temples.
- Throbbing or pounding pain during the headache.
- Pain is rated as moderate to severe.

- Pain gets worse with exertion. The pain may be so severe that it is difficult or almost impossible to continue with normal daily activities.
- Nausea, vomiting, and/or stomach pain commonly occur with the attacks.
- Light and/or sound sensitivity is also common.
- Pain may be relieved with rest or sleep.
- Other members of the family have had migraines or "sick headaches."
- Auras, or a visual disturbance, may occur in some children between 5-60 minutes prior to the headache. These auras are recognized as blurry vision, flashing lights, colored spots, or even dizziness.

What can we do to prevent my child's headaches?

Taking good care of your child can decrease their frequency and severity of his/her headaches:

1. Drink plenty of fluid (4-8 glasses per day)
 - Caffeine should be avoided
 - Sports drinks may help during a headache as well as during exercise by keeping sugar and sodium levels normal
2. Regular and sufficient sleep
 - Fatigue and over exertion can trigger headaches
 - Most children and adolescents need to sleep 8 to 10 hours each night and keep a regular sleep schedule to help prevent headaches
3. Eat balanced meals at regular times
 - Skipping meals can cause low blood sugar, hypoglycemia, which can trigger a headache
 - Avoid foods that trigger headaches in your child
4. Minimize stress and overcommitments
 - Avoid overcrowded schedules or stressful and potentially upsetting situations
5. Follow prescribed treatment plan
 - Also, if your child's doctor prescribed daily medication to reduce headache frequency (call preventive or prophylactic medication), remember to have him/her take it every day, whether he/she is having headaches or not

What should I do if my child gets a headache?

1. Have your child take pain medication for his/her headache as soon as they feel pain. He/she may be taking over-the-counter medication or prescription medication when they get a headache. Follow the doctor's instructions in using the medication and treatment plan.
2. Keep a record of your child's headaches. Write down everything that might relate to your child's headache (foods, odors, situations), how long it lasted, and how much pain the headache caused.
 - a. Learn the signs and symptoms that might be associated with a headache so you can recognize an oncoming episode.
3. Help teach your child on what to do when a headache starts. Your child needs to be able to treat his/her headaches at school and at home.
 - a. Your child should not be afraid to tell you about their headache.
 - b. Your child will need to know what to do at school, so you may need to work with the nurse to establish the treatment plan that the physician has established for your child. This may require that both you and the physician get involved in working with the school to implement a successful treatment plan.

How do you know your child "really" does have a headache?

Recognizing the signs and symptoms of a headache will help you and your child take control of them. For example, we can see a child may be getting a headache or has a headache because:

- They sit quietly in a chair, bed or sofa and do not watch TV
- They do not want to exert themselves
- They may fall asleep at an unusual time
- They may have nausea, vomiting, or other stomach-related symptoms
- Light and noise may bother them
- They may seem lethargic or fatigued

Looking for signs of headache will help you and your child realize that the disability associated with headache is real and should not be dismissed.

Information for Patients

Headaches in Kids: What Parents Can Do to Help

By Paul Winner, DO, FAAN

Be Prepared for these Four Simple but Critical Steps:

- Step 1: Describe in detail what your child experiences, how often and for how long.
- Step 2: Ask for a specific diagnosis, such as migraine, not just headache.
- Step 3: Get in writing a treatment plan you agree with, understand and can follow.
- Step 4: Request a follow-up visit and answer to what to do if the treatment is not working.

Headaches occur at any age, from two to three years of age and older. The number of new severe headaches peak during adolescence. Headache symptoms in youngsters do not exactly mirror those in adults. As a result youngsters often remain without a correct headache diagnosis for many years until the episodes take on an older age pattern. Severe adult headache with disability that lasts for up to a day, often with nausea, vomiting, and sensitivity to light and sound is migraine.

Since children and adolescents can experience severe headaches and not be able to describe what they are feeling, it's important for parents to provide information. With a little background, careful observation, and creative questioning, you can get an idea about your child's headaches and seek the right diagnosis.

How headache differs in young people

Many children get headaches and many actually have migraine with or without aura. There are some noticeable differences in migraine when comparing clinical symptoms between children and adults. Specifically, in children:

- The headaches may be shorter, lasting only an hour or two. Frequently, they're over in less than twelve hours.
- The episodes don't occur as often. For example, they may happen only once a month, or every few months in the youngest.
- The headaches may go away after a period of a few months to years.
- The pain tends to be more bi-frontal (across the forehead) than unilateral (on one side of the head). As children get older, the pain tends to be more unilateral.
- When they're fairly young (2-8 years of age) and before they complain of headache, children may get other childhood migraine syndromes. The two most common are abdominal migraine and cyclic vomiting syndrome.
 - Abdominal migraine seems like migraine except instead of headache, children complain of stomach aches. The pain is vague or cramping around the belly button or all over the stomach.
 - Cyclic vomiting syndrome consists of episodes of vomiting with predictable repeat weeks later. These can be very dramatic and can lead to dehydration.
 - Since episodic abdominal pain or vomiting may be due to a gastroenterological problem, it's a good idea to have a gastroenterologist assess your child before initiating migraine therapies.
- Children may not report nonpain symptoms normally associated with a migraine episode, such as sensitivity to light or sound. (These symptoms may be inferred from their behavior.)

Piecing the puzzle together

Might your child have migraine headaches? One challenge parents and doctors face is figuring out what the children experience when they have an episode. If you ask them direct questions, such as, "Are you sensitive to light or sound?" they may not understand your question. Sometimes rephrasing the question or watching their behavior may help get a better understanding of potential headache symptoms. For example, a child with light sensitivity may not want to play outside or watch TV because "the light is so bright".

Nausea is another symptom that's difficult for a younger person to identify or explain. Ask your child, "Are you nauseated?" and there's a good chance they won't understand your question. Even if you say, "Are you sick to your stomach?" they might not know what you mean. You may notice, however, that they simply do not want to eat or they may say that their stomach feels bad.

By watching your child's behavior, you also can help identify what your child may be experiencing when they have a migraine attack. For instance:

- Watch to see if they go into a quiet place to rest or even nap.
- Notice if they talk to you less than usual or have a mood swing.
- Watch for a change in their daily routine. They may not engage in their usual reading or television activities because their eyes hurt or focusing is more challenging.
- Be aware of when they resume their normal activities.
- Look for signs of nausea or stomach upset. To find out if they're nauseated, ask if they would like something to eat – especially their favorite food. If they refuse, they probably are experiencing nausea and having a migraine episode.

What to expect when you visit your medical provider

When a young person is diagnosed with migraine, it's important to understand that you are dealing with a benign (not dangerous) disorder. Migraine certainly is a serious problem, but there is usually nothing to fear. In nearly all instances, it is an episodic disorder that can be treated. When you visit your medical provider try to remember the following:

- Step 1: Be prepared to describe in detail what your child experiences, how often these episodes occur, and how long they last.
- Step 2: Ask for a specific diagnosis, such as migraine, cyclic vomiting syndrome, or tension-type headache, etc. You can then start working with the school nurse, teachers, coaches and other family members who spend time with your child.
- Step 3: Ask for a clear treatment plan with which you agree and obtain it in writing because you and the school will need to understand it completely so it is followed.
- Step 4: Ask, even insist on a follow-up visit and what to do if treatment is not working.

In general, your youngster won't have to go through much testing to get the diagnosis of migraine. However, on a case-by-case basis, the practitioner may do further evaluation. For example, if you have an unusual history and/or the medical provider finds something when doing a physical examination on your child, the provider may want to obtain additional tests to rule out other possible causes of headache. These may include simple blood tests or Neuroimaging studies.

Treatment for young people

The approach to treatment depends on the level of disability a child or adolescent experiences. If the person experiences mild disability – they miss just an hour of class, don't have severe pain, or have only minimal associated symptoms – then the treatment can be as simple as reassuring them and making sure they get some rest. You can use mild analgesics, such as acetaminophen.

However, if the episodes cause moderate to severe disability, such as duration of pain for four or six hours, and prevent the child from staying in school or participating in his or her usual activities, your provider should recommend other medications or treatments. An over-the-counter, non-steroidal option, such as ibuprofen, may suffice at this point.

If your child's headaches are not relieved within one or two hours by analgesics or combination analgesics, then you may need to consider migraine-specific medications, such as triptans or dihydroergotamine. These medicines are designed to relieve a headache within two to four hours, preferably as little as one to two hours. The triptan group includes tablets, nasal sprays, and an injectable form. Dihydroergotamine is available in nasal spray or injectable formats and when necessary compounding pharmacies can make other formulations. There are clinical studies on the use of triptans and dihydroergotamine in children and adolescents, but they currently are not approved by the Food and Drug Administration (FDA) for use in younger than 18 years olds and therefore their use is "off-label."

Opiates or narcotics in children are not usually recommended because they cause sedation and may cause dependence if used too often.

A child or teen who is getting a headache one or two times a week should use preventive therapy – medication taken daily to prevent the onset of a migraine or non-drug behavioral approaches or better yet both. It is best for parent and child or teen to review the subject with their practitioner who will be familiar with the medications available and assess which one might prove optimal.

It's important to remember that children and adolescents should limit acute pain treatment to two days a week. If your child feels a need for frequent dosing with headache medications, it could be a hint that something else might be wrong. Just as adults can begin to have chronic daily headache, young people can also. This is why it is important for all headache sufferers to monitor the frequency of headaches, the medications taken and the response to treatment.

Non-pharmacologic approaches

Non-pharmacologic approaches can be used in all young patients and can be quite beneficial. The following regular lifestyle routines or habits may prove very helpful in your child:

- Make sure they sleep at the same hours nightly, if possible.
- Make sure that they exercise regularly as this reduces stress, anxiety, mood swings and helps them keep their weight under control (all risks for increasing headaches).
- See to it that they eat on a regular schedule and don't skip meals. Low blood sugar may cause headache. Encourage fresh and unprocessed foods whenever possible.
- Commonly used supplements (magnesium, riboflavin, coenzyme Q10) and the herb butterbur (Pedadalex®) may be helpful in migraine prevention.
- Decrease caffeine intake from soft drinks and iced tea to one dose a day or less.
- Check to be sure that they drink plenty of water, particularly during the summer.
- Consider more formalized therapy, including biofeedback and stress management techniques, if these simple lifestyle changes don't produce positive results.

As a parent, one of the best solutions you can try is education – for yourself and your child. It's important for young people to know that they may have a significant problem, but that they are normal. Almost one out of five women and one out of 20 men suffer from migraine. Doctors understand some of the science behind it and have excellent treatments available today. In addition, there is great hope because extensive research is taking place in this age group.

Finding the right medical provider

If your child fails to control their headaches despite these steps, reassess each step and meet with your provider. Consider a second opinion to learn about possible alternative management. Often going to see a Pediatric Neurologist or Headache Specialist comfortable in caring for children with headaches leads to effective treatment. Preventive treatment reduces frequency and acute therapy stops a headache or at least blunts the pain within an hour or two. For the most part, children and adolescents respond well to the right therapy and need not suffer excessively.

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Information for Patients

Headache Hygiene - What is it?

Headache hygiene is the practice of taking care of yourself in a way that will reduce the likelihood, frequency, intensity, and severity of headaches. One surely wonders if this is possible? Indeed it is! Many lifestyle factors influence migraine and other headache conditions. Therefore, taking care of these lifestyle factors may help reduce the risk of severe attacks. These include two simple steps:

1. Lifestyle changes
2. Trigger avoidance

1. Lifestyle Changes

Migraine is not a predictable disorder for all people. Simple things like changes to a normal routine can lead to a severely disabling migraine attack. Understanding how lifestyle affects the severity and frequency of attacks can be a large part of successful migraine prevention.

It is unrealistic to expect anyone to completely change a certain life style. However, certain things are relatively easy to do. For example:

1. Maintain regular sleep patterns. Go to sleep and wake up at the same time each day.
2. Exercise regularly. For example, aerobic exercise for at least 30 minutes three times a week will help reduce frequency or severity of migraine.
3. Eat regular meals, do not skip meals, and eat a good, healthy breakfast.
4. Reduce stress. Limit stress by avoiding conflicts and resolving disputes calmly. Some people find it helpful to take a daily "stress break."
5. Avoiding known triggers (see table on Common Triggers)

Establishing daily routines that help reduce migraine attacks is important for long-term migraine prevention. For example:

1. Schedule a relaxation period that includes relaxation strategies such as:
 - o Take slow, deep breaths
 - o Focus the mind on a relaxing image or scene
 - o Try soft relaxing lighting and sounds
2. Exercise on a regular basis, even if your daily routine changes (such as when traveling, when you have house guests, or when your workload increases).
3. Maintain the medication treatment plan designed by you and your physician. Early intervention may help prevent the migraine from progressing into a severe, disabling attack.

2. Trigger avoidance

Triggers are specific factors that may increase your risk of having a migraine attack. The migraine sufferer has inherited a sensitive nervous system that under certain circumstances, can lead to migraine. Triggers do not "cause" migraine. Instead, they are thought to activate processes that cause migraine in people who are prone to the condition. A certain trigger will not induce a migraine in every person; and, in a single migraine sufferer, a trigger may not cause a migraine every time. By keeping a headache diary, you will be able to identify some triggers for your particular headaches. Once you have identified triggers, it will be easier for you to avoid them and reduce your chances of having a migraine attack.

Common Triggers

Categories	Triggers	Examples
Dietary	Skiping meals/fasting Food Items	Aged cheese Alcohol/red wine Chemicals [eg. MSG (monosodium glutamate)] Caffeine withdrawal Processed meats (containing nitrates)
	Medications	Nitroglycerine
Chronobiology	Change in sleep patterns	Napping Oversleeping Too little sleep
Environmental	Weather changes	Extreme heat or cold
	Bright lights Odors/pollution	Sun without eye shades Smog, perfumes, chemicals Flashing lights or screens
Hormonal	Estrogen level changes (rapid fluctuations in estrogen levels)	Menstruation Hormone replacement therapies Birth control pills Menopause
Stress	Work	Unrealistic timeliness
	Home	Financial issues
	Family	Job changes / moving Childbirth / marriage Death/loss
Stress Letdown	Discontinuation of work	Weekends / vacations Ending a project or stressful task (such as a presentation)
Physical	Injuries	Head trauma
	Over-exertion	Exercising when out of shape or in heat

Information for Patients

The Role of Adherence and Triggers in Headache Management

By Dawn Buse, PhD

Key Points:

1. *Best outcomes of care result from sticking to your plan through excellent communication with a provider*
2. *You best select if, when and how to use advice through self-observation, including use of a calendar or diary*
3. *Success is improved by review of triggers and their management*
4. *Top of the list headache triggers include changes in sleep and exercise, lack of stress management and a proper eating plan*

Adherence: What Is It and Why Does It Matter?

"Adherence" and "compliance" are terms that are used to refer to a patient's role in their medical care. "Compliance" refers to the degree to which patients follow medical recommendations of their health care providers (HCP). "Adherence" is a preferable term in headache care because it refers to collaboration between the patient and the HCP. The patient plays a vital role in the success of his or her headache management. While a HCP may provide medical advice and prescriptions, it is the patient who ultimately chooses if, when, and how to implement that advice.

Effective headache treatment can include both pharmacological (medication) and non-pharmacological (behavioral) components. Adherence challenges in pharmacological treatment may include misuse of medication (including unrefilled, overused, underused, incorrectly used, and nonadvised discontinuation of prescribed medications). Some of these behaviors can have severe consequences. For example, overusing medication can lead to "medication overuse headache" or "rebound headache". Combining medications without medical advice can lead to dangerous interactions and side effects. Taking medications too early (before the pain of migraine begins) or too late into an attack can limit their effectiveness.

Following the behavioral components of headache treatment can be even more challenging. This may include keeping appointments, keeping a headache calendar or diary if the HCP prefers, practicing proper sleep hygiene, exercising regularly, practicing stress management and incorporating relaxation techniques into daily life, maintaining a healthy weight or losing weight, reducing or eliminating caffeine and not smoking.

Motivation and Behavior Change

Making behavior changes such as weight loss or smoking cessation can be extremely difficult. The psychologist Albert Bandura developed social learning theory to help explain human behavior and change. The theory states that there are two vital components to successful behavior change: 1. self-efficacy (the confidence in one's ability to perform an action), and 2. outcome efficacy (the belief that a behavior or set of behaviors will have a desirable result). Therefore, in order to accomplish a goal, one must both want to change and have the knowledge and tools necessary to complete the change. Behavioral change and achieving goals can occur in small steps. One theory of behavioral change proposes that behavior change can be broken down into five stages: 1. Precontemplation (the patient is not thinking about changing behavior and does not recognize the need or a problem); 2. Contemplation (the patient recognizes a need or problem and begins to think about changing behavior and may be developing a plan, but has not taken any action); 3. Preparation (the patient has done research, developed a plan and may begin making minor changes or actions); 4. Action (the patient is actively engaged in the behavior change or new actions); and 5. Maintenance (the patient is continuing behaviors necessary to maintain changes). This theory can be applied to many types of behavior change including starting an exercise regimen, quitting smoking, or following a healthy diet. This model helps patients recognize that even what seems like small steps are important in reaching a goal and that a "lapse" or "relapse" is not a failure, but rather a step back from which the patient can recover.

Partnership and Communication with your HCP

Open patient-provider communication is essential for effective headache treatment. You and your HCP must work together as a team to manage your headaches. You should see your doctor for an accurate diagnosis of your headache and to rule out any injury or illness that may be the cause of your headache. Your HCP needs to know about the frequency and severity of your headaches, triggers, and how they affect your life. This may start with keeping a headache calendar and sharing that information with your provider. You should work with this individual to create a headache management plan to ideally include preventing more headache, reducing current frequency of headache and successful relief when treating a headache with pain drugs. This plan may include behavioral techniques that you can learn with a professional or on your own as well as medication. You and your doctor may try many treatment options before you discover what works best for you. This plan should be evaluated regularly and may be updated as needed. See achenet.org under Articles for "How to Talk to Your Practitioner About Your Headaches" for more advice about preparing for your appointment and speaking with your doctor about your headaches.

What Can You Do to Manage Your Headaches?

The most important things that you can do to control your headaches are: 1. communicate openly with your HCP about how headaches affect your life, 2. identify your personal triggers and work with the HCP for ideas to reduce them, 3. Control universal triggers by a. maintaining a healthy lifestyle of regular sleep, exercise and eating plan, b. practice relaxation and stress management techniques, 4. take supplements and medications as prescribed and discuss any questions, concerns, or side effects with your HCP, 5. adhere to the decisions you make, 7. seek professional help if necessary.

What are Headache Triggers?

Headache triggers are factors that may lead to a headache or make it more likely for you to have an attack. They vary for each individual; however, there are some common triggers. The best way to identify these is to keep a "[headache diary](#)" in which you record when you have a headache as well as what you eat, drink, when you sleep, your hormonal cycle (for women), medications taken, factors in the environment, weather, and any other changes. Keeping a headache diary for one to two months helps identify any triggers or patterns to avoid or change to improve your headaches. You can use this information to identify your triggers yourself and also take this diary with you to your next medical appointment.

Some of the most common headache triggers and suggestions for maintaining a healthy lifestyle:

1. **Diet and nutrition:** Eating appropriate portions, healthy eating, and maintaining a healthy weight are all very important habits for people who suffer from headaches. It is very important that you eat a healthy, well balanced diet with meals scheduled on a regular basis throughout the day (including breakfast.) It is important to include healthy choices such as fresh fruits and vegetables, lean meats, poultry and fish, other sources of protein, and whole grains. Whenever possible choose fresh foods to avoid chemicals in overly processed or preserved foods which trigger headache. Skipping a meal or waiting too long to eat or becoming dehydrated can trigger a headache. Caffeine and alcohol overuse or withdrawal can also trigger headaches. In addition, some people think that certain cheeses, chocolate, red wine, tea and coffee and other foods trigger their headaches. You can keep a food diary to determine if specific foods are related to your headaches.
2. **Sleep:** It is important to maintain a healthy and regular sleep cycle. Most people feel that 7-8 hours a night is an appropriate amount of sleep for an adult, but you should pay attention to your own body to learn your own sleep needs. It is important to maintain a regular sleep and wake cycle, both during the week and on the weekends, and avoid getting too little or too much sleep. Be aware that less than 6 hours and more than 9 hours is a proven provoker for next day headache
3. **Environmental factors:** Environmental factors such as bright or flickering lights, strong smells such as perfume, and changes in the weather including a drop in barometric pressure (which often occurs before a storm) may trigger a headache. You may not be able to control all of these factors, but there may be changes that you can make in your home and work environment that may make it less likely to trigger a headache. In addition, you may want to keep an eye mask and ear plugs on hand in case of a headache. Many people find that they can help stop a headache if they are able to lie down in a dark, quiet room and relax or sleep.

4. Psychological and emotional factors: Many people who suffer from headaches report that stress and multiple demands in their life can lead to headaches. While it may not be possible to reduce or eliminate the amount of stress in your life you can learn ways to manage stress, organize your time, learn to say "no" to unrealistic demands, ask for help when necessary, and teach your family and friends about the importance of taking care of yourself. You should try to schedule some time during each day to relax both your body and mind. You may find that it is helpful to schedule exercise, a walk, or a yoga class, or you may be comfortable finding time during the day to do a relaxation exercise such as deep breathing or visual imagery. This is as easy as imagining you are sitting on a beautiful, tropical beach while you are sitting at your desk.

5. Hormonal factors (for women): Many women find that their headaches frequently occur during certain times of their menstrual cycle, often just before or at the beginning of their menstrual flow. You may want to keep a headache diary and note the timing of your headaches. If you find that they are related to your menstrual cycle you should talk to your HCP about treatment options. In addition, you should be aware that maintaining a regular and healthy lifestyle including proper diet, sleep, exercise, stress management, and relaxation will be particularly important for you during this time each month.

6. Pregnancy is a unique time for women with headaches. Many women find that they experience headaches early in the pregnancy but feel much better as the pregnancy progresses. If you are pregnant or considering becoming pregnant it is very important to communicate this to your provider. Many headache medications can harm a developing fetus and your HCP can help provide the best care for you and your baby.

7. Lifestyle: You may find that factors such as intense exercise or long-distance travel, especially across time zones, trigger your headaches. You may also find other factors both at home and in the workplace that triggers your headaches. It may not be possible to eliminate or avoid these triggers; however, you should carefully review your lifestyle determining your stress factors in all areas of your life including occupational or academic, family, social, financial, and personal. When making decisions always try to choose the healthier option, as that will help you avoid headache attacks.

What is relaxation training and stress management?

When you are tense your body turns on the sympathetic nervous system or "flight or fight" response. This state makes you more vulnerable to a headache. The goal of relaxation training is to learn how to activate the "relaxation response". The "relaxation response" is defined as your ability to make your body release chemicals and brain signals that make your muscles and organs slow down and increase blood flow to the brain. Some medications have this effect; however they may also have unwanted side effects. You can train your body and brain to relax just as well without drugs while remaining conscious and aware at the same time. There are several ways to achieve this state including diaphragmatic (deep) breathing, visual imagery, progressive muscle relaxation, and other techniques that you can practice on your own. These techniques will cause the relaxation response in your body which includes slow, deep regular breathing, slow and regular heart rate, increased circulation (which you can feel with warmer hands and feet), lowered metabolic rate and reduced muscle tension.

Behavioral headache management is most successful when you identify triggers and start a plan to avoid or reduce them, practice regular lifestyle habits, practice relaxation and stress management and adhere to the plan you have created with or without your HCP. You will find that some triggers are impossible or difficult to eliminate or avoid; however, you may be able to make some changes in your lifestyle which may help your headaches including eating nutritious meals on a regular schedule, getting regular exercise, maintaining a regular sleep pattern and using techniques to manage stress. You can also use relaxation techniques to help avoid headaches or reduce the pain and duration of a headache once it has started. Most importantly adhere to what you start, to give your plan sufficient time to become a habit. You may also benefit from guidance and assistance from a professional in making healthy lifestyle changes, managing stress, and incorporating relaxation techniques into your life.

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Information for Patients

Secondary Headaches

A headache is secondary when it is caused by some other condition. The term is used to distinguish this type of headache from the primary headache disorders like migraine, tension-type headache or cluster headache. Many medical conditions can cause headache but there are usually clues in the medical history or examination to suggest secondary headache.

Headache can be caused by general medical conditions such as severe hypertension, or by conditions that affect the brain and its coverings. Infections of the head and neck, including pharyngitis, sinusitis and meningitis have headache as a symptom. Head trauma, even if it is mild, can often lead to headache. Anything that takes up space inside the head can cause headache, including tumor, subdural hematoma and hydrocephalus. Other blood vessel problems, like subarachnoid hemorrhage which can result from rupture of an aneurysm can lead to severe headache.

The key to distinguishing secondary headaches from primary headache lies in the features of the headache, other symptoms occurring at the same time, and the physical examination. Your doctor often looks for warning signs that would point to a secondary headache over a primary headache. These include:

- First or worst headache of your life
- Abrupt onset of headache without any warning or build-up
- Fundamental change in the pattern of recurrent headaches
- Headache beginning at unusual ages
 - ≤5 years old
 - ≥50 years old
- The presence of cancer, HIV, pregnancy
- Abnormal physical exam
- Headache onset:
 - with seizure or syncope
 - with exertion, sex or Valsalva (squeezing)

There are also features that your doctor will look for that will be reassuring that a primary headache disorder exists:

- Stable pattern of headache over many months or years
- Long-standing history
- Family history of similar headaches
- Normal physical exam
- Headaches consistently triggered by:
 - Hormonal cycle
 - Specific foods
 - Specific sensory input
 - Light
 - Odors
 - Weather changes

Talk to your doctor if you have concerns that your headache may be due to some other medical condition. Being confident that there is no secondary cause for headache is an important first step to developing an effective treatment plan for headache.

Information for Patients

Sleep, Insomnia and Migraine

Rashmi Halker, MD; Bert Vargas, MD; David Dodick, MD

Key Points:

1. *Schedule consistent bedtime that allows 8 hours time in bed.*
2. *No TV, reading, music in bed.*
3. *Use visualization techniques to shorten time to sleep onset.*
4. *Move your last food to at least 4 hours before bedtime; limit fluids within 2 hours of bedtime.*
5. *Stop naps.*

Overview

Medical providers have known for over a century that there is an association between poor sleep and the frequency and intensity of migraine and other pain syndromes. Insomnia, also referred to as psychophysiological insomnia by many, is one type of poor sleep. The longer word suggests interplay between mind and body factors in insomnia. Other common types of sleep difficulties include sleep apnea, frequent snoring, and excessive daytime sleepiness. Researchers define insomnia as difficulty falling asleep (initiation or onset of sleep) or staying asleep, early morning waking, or waking up feeling unrefreshed. These latter types are sleep maintaining problems. Insomnia, of one or both types, is a common finding amongst individuals with chronic migraine. In many cases, insomnia may stem from other medical problems which cause chronic pain (making it difficult to sleep comfortably) or which disrupts normal sleeping patterns. Until recently this relationship between insomnia and migraine was not well studied.

Information from Research and a Simple Treatment Plan

At the University of North Carolina (UNC), Chapel Hill, researchers studied this association by interviewing 147 adults with transformed migraine (TM). None of the patients reported feeling "refreshed" upon awakening and four out of five regularly felt "tired" upon waking. This compares to responses of individuals with infrequent migraines – approximately one in four felt "refreshed" upon waking and only about one in three awakened feeling "tired."

TM has frequently been used for those with migraine who at some earlier time had lower number of headaches including migraines and have "transformed" to higher frequency over 15 days per month. Officially a International Classification system defines chronic migraine as individuals with fifteen or more days of headache for greater than 3 months and 8 or more days of either migraine drug use for headache or migraine descriptive pain symptoms. In this UNC survey insomnia was a complaint of the majority of those who had more than 15 days of headache with migraine with two-thirds having difficulty falling asleep. When asked about their sleep habits, almost 80% watch TV or read in bed, 70% get up in the middle of the night to use the bathroom, approximately 60% regularly nap during the day, and a little over 50% regularly use sleeping pills. Interestingly, less than one in ten used caffeine within 8 hours of bedtime. This poor quality of sleep and the suboptimal sleep habits reported by these researchers represent typical sleep issues for those with frequent, severe migraine needing specialty headache care. Can addressing insomnia positively affect sleep and migraine?

These UNC researchers attempted to see if making changes in sleep patterns could have an effect on migraine frequency and intensity. Forty-three women with chronic migraine were randomly placed into one of two groups. The first group received formal instructions on how to improve their sleep habits. The other received placebo instructions. They were asked to keep a diary of their headaches. Six weeks later at follow-up women who changed their sleep behavior saw a significant improvement in headache frequency and intensity. Dramatic improvement was seen in one of three, to the extent that they no longer met criteria for chronic migraine. None of the placebo group had such a dramatic change. However, this placebo group was then given the formal teaching that the other group received and followed for another six weeks. At the final visit, six weeks later, almost 50% of all subjects who followed the sleep suggestion experienced headache improvement so that they no longer met criteria for chronic migraine. The sleep plans given to the patients to improve their sleep quality were listed in recommendations 1-5 in italics at the top of this article. Since they are so important read them again here:

1. *Schedule consistent bedtime that allows 8 hours time in bed.*
2. *No TV, reading, music in bed.*
3. *Use visualization techniques to shorten time to sleep onset.*
4. *Move your last food to at least 4 hours before bedtime; limit fluids within 2 hours of bedtime.*
5. *Stop naps.*

Risk Factors for a Sleep Disorder

Since poor sleep can be associated with more frequent and severe migraine, it is only natural to ask what factors place people at risk for developing a sleep disorder. Changing behaviors as suggested in the sleep plan address factors that can disturb natural sleep. Other potential risk factors for insomnia include:

- Stressful life events, such as death of a loved one, divorce, or the loss of a job.
- Day-to-day life stresses such as concerns about school, work, family, and finances may lead to disruptive sleep.
- Depression, anxiety and other mental health disorders can lead to fragmented sleep patterns, and these individuals can have trouble sleeping or may even sleep too much.
- Medications including prescription drugs and medications available over-the-counter. Many prescription drugs, including antidepressants, corticosteroids, allergy medications, pain medications, and blood pressure medications can interfere with sleep patterns. Other over-the-counter medications, including those for allergies, cough and cold, pain, and weight loss can also disrupt sleep. Many can leave you feeling groggy, others contain caffeine and other stimulants that prevent you from getting a good night's sleep.
- Using caffeine, nicotine, alcohol – especially before bed. Caffeine and nicotine contain stimulants that can keep you up at night. Alcohol can initially lead to sedation, but it prevents you from reaching deeper stages of sleep, can lead to waking in the middle of the night, and a feeling of not being refreshed in the morning.
- Medical conditions associated with chronic pain, breathing difficulties, or frequent urination can lead to sleeping difficulties. Medical conditions that have been linked with insomnia include arthritis, gastro-esophageal reflux disease (GERD), cancer, lung diseases, congestive heart failure, overactive thyroid, obstructive sleep apnea, and Parkinson's disease. Treating these conditions can lead to better sleep.
- Change in environment or work schedule, such as jet lag from changing time zones, working nights, or shift work, can lead to insomnia.
- Eating too much or too late in the evening can lead to trouble sleeping due to heartburn. Many people experience heartburn after meals, and this can be worsened by lying flat.
- Poor sleep habits, including irregular sleep times, stimulating activities before bed, and reading, watching TV, or studying/working in bed can all contribute to insomnia.
- Female gender – women can experience hormonal shifts during their menstrual cycle and during menopause that can lead to trouble sleeping. Lack of estrogen is thought to play a role.
- Age over 60 – As sleeping patterns change with age, insomnia often becomes more common. It is estimated that nearly half of elderly individuals suffer from sleep problems.

More on Sleep Plans

Several lifestyle modifications, particularly changes to your daytime and bedtime routine, can help with insomnia. Try to include the following in your sleep plan:

- Stick to a regular sleep schedule. Keeping your sleep times consistent, even on weekends, can help maintain your body's natural sleep rhythm.
- Get out of bed when you're not sleeping. In the mornings, allow yourself to sleep as much as you need to feel rested, and then get out of bed. At night, if you are unable to fall asleep after 15 minutes, get out of bed and try to do something relaxing, such as reading. Try to wait until you become drowsy before getting back in bed and attempting to sleep.
- Use your bed and bedroom only for sleeping and intimate relations. Don't eat, read, work, or watch TV in bed.
- Find ways to relax before bed. Creating a relaxing bedtime ritual, such as a warm bath, reading, soft music, yoga, or prayer can all be helpful techniques.
- Avoid napping, as taking naps can make it more difficult to sleep at night. If you cannot avoid a nap, limit it to no more than 30 minutes, and don't nap after 3 PM.
- Make your bedroom conducive to sleep. Close the door or run a fan to create a soft background noise to shut out other noise, adjust the temperature so that it's comfortable, and keep the bedroom dark. Don't keep a TV or computer in the bedroom.
- Exercise and stay active. At least 30 minutes of vigorous exercise daily, 5-6 hours before bedtime, can be helpful.
- Avoid or limit caffeine, nicotine, and alcohol.
- Avoid large meals or beverages before bed.
- Check your medications to see if they have possible side effects which may be contributing to sleep problems.
- Adequately treat your pain so that it's not keeping you up at night.
- Set your alarm so that you know when it's time to get up in the morning, but otherwise hide the clocks from view. The less often you know what time it is at night, the better you'll likely sleep.

You might consider crossing out or putting an X before those activities you have mastered or accomplished, circling or placing an O before those you consider an Opportunity or not accomplished and then star or * in front of a priority that you believe you can accomplish. When you succeed with that goal star another opportunity and so on and so on until all are marked with a finished X. When you achieve this you will be sleeping more soundly. If not, you are in need of the 33 Sleep Secrets you can locate under the Search option on www.mercola.com or advice at www.sleepfoundation.org. Otherwise, consider a very well trained sleep center/specialist assessment.

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Information for Patients

Temporomandibular Disorders and Headache

Steven Graff-Radford, DDS

Key Points:

1. A temporomandibular disorder involves the chewing muscles, temporomandibular joint and connected structures.
2. The signs and symptoms of TMD are often transient and self-limiting. Simple and reversible treatments have to be preferred over irreversible procedures.
3. The goals of treatment for TMD are to decrease pain and to restore normal function.
4. Five basic treatment tools include a) patient education and self care, b) cognitive and behavioral intervention, c) pharmacologic management, d) physical medicine techniques, e) surgery.

Overview

Temporomandibular disorders (TMD) are a collective term embracing a number of clinical problems that involve the chewing muscles, the temporomandibular joint (TMJ) and associated structures, or both. This is also called Temporomandibular Pain Disorder Syndrome by at least some. The syndrome is described by pain and tenderness of the chewing muscles, joint sounds with jaw opening and limited jaw movement. Pain in the TMJ may occur in 1 in 10 of the population and TMD has been reported in nearly one-half of the US population. Work in this field has not specifically sorted headache from facial pain. In non-patient population studies, 3 out of 4 have at least one joint dysfunction sign (clicking, limited range of motion) and about 1 in 3 have at least one symptom (pain, pain on palpation). Out of those with a sign or symptom, fewer than 1 in 20 require treatment and even fewer have headache as the primary pain. Because both headache and TMD are so common they may be one and the same or separate entities. The TMJ and associated face and mouth structures should be considered as triggering or persisting factors for migraine. Scientific study has described the pathways and mechanisms for pain referral from the head to the temporomandibular joint and visa versa. Headache may result from temporomandibular structures or pain may be referred to the temporomandibular joint, secondary to a primary headache diagnosis. It is essential not to confuse the issue and suggest a cause and effect relationship because both are present or based on treatment responses. Longitudinal studies suggest that TMD is a disorder usually effecting females between 15 and 30. It is suggested the disorder is self limiting and takes about 7-10 years to resolve and rarely are TMD's a problem later in life. This is possibly due to the nature of the lining of the TMJ with its ability to remodel.

Classification Criteria by the International Classification of Headache Disorders²

Criteria exist for use by headache specialists to diagnose TMD created by the classification committee of the International Headache Society. TMD are listed as: Headache or facial pain attributed to temporomandibular joint (TMJ) disorder criteria:

- A. Recurrent pain in one or more regions of the head and/or face
- B. X-ray, MRI and/or bone scintigraphy demonstrate TMJ disorder
- C. Evidence that pain can be attributed to the TMD, based on at least one of:
 1. pain is precipitated by jaw movements and/or chewing of hard or tough food
 2. reduced range of or irregular jaw opening
 3. noise from one or both TMJs during jaw movements
 4. tenderness of the joint capsule(s) of one or both TMJs
- D. Headache resolves within 3 months, and does not recur, after successful treatment

Comment: Pain from the temporomandibular joint or related tissues is common. It is due to the so-called temporomandibular joint disorders (e.g., disk displacements, osteoarthritis, and joint hypermobility) or rheumatoid arthritis, and may be associated with myofascial pain and headache.

Etiology

It is not clear what triggers a TMD. Perhaps it is arthritis, or perhaps associated with trauma to the joint. This does not need to be a major trauma, as in a direct assault on the joint, but possible due to smaller traumas such as perpetual grinding or clenching of the teeth.

The TMJ is made up of two bones, the temporal bone and condyle, which are separated by a fibrous disk, and surrounded by a capsule. The TMJ is lined by fibrocartilage, which is cartilage largely composed of fibers like those in ordinary connective tissue. This gives the joint the tendency to remodel. Inflammation within the joint accounts for TMD pain and the dysfunction (abnormal movement) is due to a disk, condyle incoordination. When the disk, which separates the two bones making up the TMJ, slips forward a noise or clicking can be heard, as the condyle rides over the disk. This may progress to locking, where the mouth does not open more than 25 mm (normal 45mm). This is due to anterior movement of the disk where the condyle can't ride over the forward located disk. Imaging the TMJ with MRI can help identify the disk position; tomographic imaging is also very helpful in identifying degenerative changes and condyle movement. Muscle pain disorders may include spasm, myositis, muscle splinting and myofascial pain. The most frequent muscle disorder included in TMD classification is myofascial pain. Myofascial pain is described as dull and/or aching pain associated with the presence of trigger points (tender areas) in muscles, tendons or fascia. A trigger point is identified as a localized spot of tenderness in a palpable taut band of muscle, tendon or ligament, which when pushed replicates the pain sensation. These trigger points may be the hallmark of tension-type headache.

Treating headache by targeting TMD's

The goals of treatment for TMD are to decrease pain, and to restore normal function. Because the signs and symptoms of TMD can be transient and self-limiting, simple and reversible treatments have to be preferred over complicated and irreversible procedures. These goals may be achieved through a structured, time limited program, which addresses the physical disorder and the perpetuating factors. The five basic areas that should be considered are summarized below and include a) patient education and self care, b) cognitive and behavioral intervention, c) pharmacologic management, d) physical medicine techniques, and e) surgery.

Patient education and self care

Satisfactory management requires an explanation and reassurance. Persistent jaw joint noise may be interpreted as a sign of disease. Understanding that joint noise may occur in otherwise healthy joints may be difficult to accept. Likewise complaints of limited mouth opening and other signs of joint dysfunction must be interpreted and assessed in the context of age, gender and general health. You deserve realistic expectations regarding treatment outcome and must have reasonable goals. Simple modification of lifestyle and oral habits may be sufficient to alter symptom intensity.

Cognitive and behavioral intervention

Behavior modification programs are often accompanied by relaxation training, hypnosis or biofeedback. Muscle relaxation training techniques are varied, and the choice of technique will depend on the skill of the therapist and suitability of the patient. This approach has been shown to be generally effective in reducing or controlling muscle pain.

Pharmacologic management

Drugs are used in the management of TMD to control symptoms. These include anti-inflammatories (both steroidal and non steroidal), muscle relaxants and antidepressants and antiepileptic agents. The antidepressants and antiepileptic agents are used to help the body block pain signals.

Physical therapy

Physical therapy modalities provide a popular and safe approach to the management of TMD's. Treatment goals are generally based on physical rehabilitation of the

joint by reducing joint inflammation, restoring joint mobility and elimination of muscle pain through heat and stretching. Occlusal appliances have been the mainstay of dental therapies for TMD since Costen first published his report on jaw joint pain in 1934. Typically, occlusal appliances are made from rigid heat cured acrylic which covers the occlusal surfaces of either the upper or lower dentition. The potential benefits of occlusal appliance use have been attributed to removing strain from the joint surface, relaxation of masticatory muscles, and reduction or elimination of teeth clenching and grinding. However, these accepted mechanisms of action are largely unproven by research. A second appliance design called a repositioning device or splint is less commonly used. Its function is to reposition the mandible in a forward or protruded direction, theoretically to aid recovery of the inflamed discs tissues. These devices have significant risk of altering the bite, and therefore are discouraged in most situations. Currently the NTI (Nociceptive Trigeminal Inhibition Tension Suppression System (NTI-tss) is popular and, although these can be effective, negative or adverse events may outweigh their benefit including cases of aspiration into the lungs. Splint therapy is usually necessary and safe only during the day.

Occlusal therapy

The association between occlusion and TMD is one of the most controversial topics in dentistry. Malocclusion or misalignment of the teeth is often suggested to be a cause of headache in susceptible individuals. However, 'occlusal theories' are weakly supported by research. The malocclusions which are seen in adults are probably of little consequence, as skeletal adaptation has already occurred. However certain dental abnormalities such as missing posterior cross bite in the occlusion, excessive vertical or horizontal discrepancy between the upper and lower anterior teeth may contribute in a small way to the development of TMD.

Surgery

Given the self limiting nature of most TMD surgical intervention is rarely warranted. Joint injection with corticosteroid is frequently part of treatment programs but lacks literature support for its value. Authors have expressed concern regarding the potential for condylar damage due to repeated injection of corticosteroid. As a result, clinicians are urged to limit use of this modality for individual patients. Improvement of jaw mobility and reduced joint pain with irrigation (arthrocentesis) of the joint with lactated Ringer's solution or normal saline may occur. Arthroscopy is a more invasive approach than arthrocentesis but allows for direct viewing of the joint surfaces. Data exists for the usefulness in the restoration of mouth opening for both procedures. The use of open joint surgery is relatively rare but may be justified in cases where circumstances are extreme, and disability associated with joint disease impacts greatly on quality of life.

Conclusion

TMD are a collection of clinical entities that are often very painful and disabling. Yet, they are self limiting and usually respond to conservative therapy. Basic principals of management to reduce pain and restore range of motion will reduce disability and often contribute to reducing primary headache if it co exists.

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Tools for Healthcare Professionals & Their Patients

Trigger Avoidance Information

Headache Hygiene Tips

Headache may be triggered or worsen with certain types of foods, activities, medications, or stress. Below is a list of possible ways to make a few modifications to your lifestyle that may significantly impact the frequency of headaches

Get Regular Sleep	<ul style="list-style-type: none"> Go to bed and wake up at regular times each day Do not sleep excessively on the weekends and too little on the weekdays Most adults need approximately 6-8 hours of sleep per night
Eat Regular Meals	<ul style="list-style-type: none"> Low blood sugar can trigger a headache Eat regular meals three times each day including protein, fruits, vegetables and carbohydrates Too much sugar may lead to a rapid increase in blood sugar followed by a rapid decline in blood sugar, which can trigger a headache
Get Moderate Amounts of Routine Exercise	<ul style="list-style-type: none"> Moderate exercise three to five times each week will help reduce stress and keep you physically fit Too much exercise or inconsistent patterns of exercise may trigger headache
Drink Plenty of Water	<ul style="list-style-type: none"> Anormal adult should drink plenty of water throughout the day Dehydration may cause headaches
Limit Caffeine, Alcohol and other Drugs	<ul style="list-style-type: none"> Caffeine is a stimulant and caffeine withdrawal may cause headaches when blood levels of caffeine taper Alcohol may be a trigger for headaches and alcohol in moderation may reduce the number of headaches
Reduce Stress	<ul style="list-style-type: none"> Stress may lead to an increase in headache Relaxation and stress management may help reduce headaches

Identifying Headache Triggers Worksheet

[Click here for a downloadable version of the worksheet](#)

	Date of trigger- Exposure	Headache Description- Describe course of headache
Aged cheese		
Alcohol		
Chocolate		
Citrus fruits		
Cured meats		
Dehydration		
Excess caffeine		
Excessive exercise		
Eyestrain or other visual triggers		
Fatigue		
Menstruation		
Medication use/missed		
MSG		
NutraSweet®		
Nuts		
Onions		
Salty foods		
Sleep deprivation		
Skipped meals		
Stress		
Others (list below)		