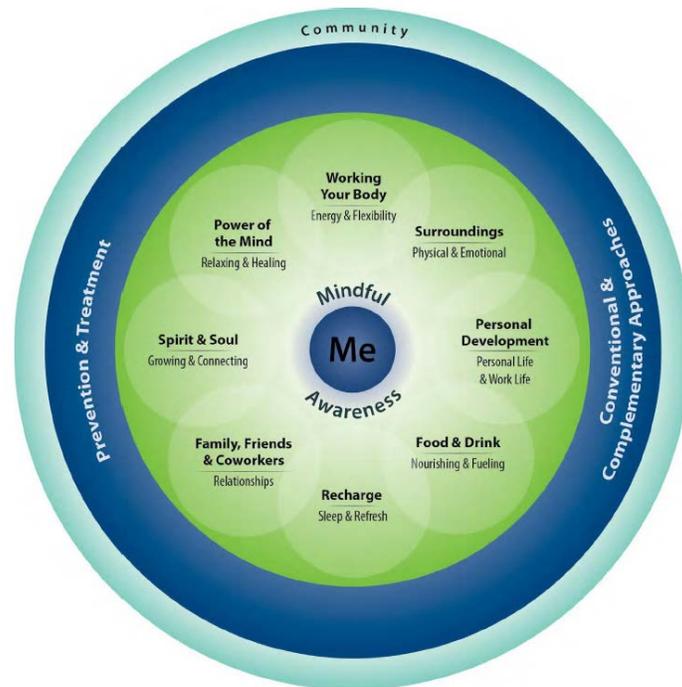


WHOLE HEALTH: CHANGE THE CONVERSATION

Advancing Skills in the Delivery of
Personalized, Proactive, Patient-Driven Care

Headache Clinical Tool



This document has been written for clinicians. The content was developed by the Integrative Medicine Program, Department of Family Medicine, University of Wisconsin-Madison School of Medicine and Public Health in cooperation with Pacific Institute for Research and Evaluation, under contract to the Office of Patient Centered Care and Cultural Transformation, Veterans Health Administration.

Information is organized according to the diagram above, the *Components of Proactive Health and Well-Being*. While conventional treatments may be covered to some degree, the focus is on other areas of Whole Health that are less likely to be covered elsewhere and may be less familiar to most readers. There is no intention to dismiss what conventional care has to offer. Rather, you are encouraged to learn more about other approaches and how they may be used to complement conventional care. The ultimate decision to use a given approach should be based on many factors, including patient preferences, clinician comfort level, efficacy data, safety, and accessibility. No one approach is right for everyone; personalizing care is of fundamental importance.

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This clinical tool highlights key guidelines for managing headaches using a Whole Health approach. For additional details, see the [Headache](#) educational overview.

How Common Are Headaches?

Ninety percent of headaches are migraines (with or without aura), tension headaches, or a mixture of the two.¹ Sixteen percent of women and 6% of men suffer from migraine.¹ The highest incidence of migraine occurs between the ages of 20 and 35 and is often associated with family history. Migraine headaches cost employers \$7.9 billion annually with an additional \$5.4 billion lost as a result of decreased productivity, and migraine medical care costs are estimated at \$1 billion per year.² Tension-type headache is the most common type of primary headache, and the disability attributed to it is larger worldwide than disability due to migraine.³ The lifetime prevalence of tension-type headache varies between 30% and 78%.³ Forty percent of Veterans report chronic headaches.⁴ Ten percent have a diagnosis of migraine, 12% have a diagnosis of tension-type headache, and 6% report both.⁴

Definitions

Migraine is defined as a disorder of recurrent headaches manifesting in attacks lasting 4 to 72 hours. Typical characteristics of the headache are that they⁵

- Are unilateral in location,
- Have a pulsating quality,
- Are moderate to severe in intensity,
- Are aggravated by routine physical activity, and
- Can be associated with nausea and/or intolerance to light or sound.

Tension headache is defined as a disorder of recurrent episodes of pain that is typically³

- Bilateral,
- Pressing or tightening in quality,
- Mild to moderate in intensity, and
- Does not worsen with physical activity.

There is no nausea with tension headaches, but light or sound intolerance (photophobia and phonophobia) may occur.

Pathophysiology

Migraine headaches are thought to be related to vasodilators such as substance P and calcitonin gene-related peptide, which are released by peripheral nerve endings from cranial nerve V on blood vessels in the scalp and meninges.¹ Glutamate, nitric oxide, and vanilloid receptors are also theorized to play a role in migraines. The release of serotonin by platelets seems to increase pain and prolong headaches. Genetic, environmental, and hormonal factors also play a role.¹

A Whole Health Approach to Headaches

Food and Drink

Dietary triggers are found in 20% of patients with migraine.⁶ Multiple studies have shown that people with aura symptoms are more likely to report foods as headache triggers.⁷⁻⁹ Common food triggers include the following:¹

- Red wine
- Dark beers
- Aged cheeses
- Nuts
- Onions
- Chocolate
- Aspartame (NutraSweet)
- Processed meats containing nitrates
- Caffeine excess (more than 5 cups daily)
- Caffeine withdrawal

Fasting, alcohol, chocolate, and cheese are the precipitating factors most frequently reported.¹⁰

Allergies to foods such as wheat or dairy can cause headaches. Studies have shown success with the elimination of foods based on positive IgE and IgG antibodies to specific foods.¹¹⁻¹⁴ One small study of 54 patients found that reducing fat intake from 65.9 to 27.8 grams daily was associated with decreases in headache frequency, intensity, duration, and medication intake.¹⁵ In addition, some migraine sufferers have reactive hypoglycemia due to diet-induced hyperinsulinemia.¹⁰ A review of 45 studies found that the most frequently cited and most significant precipitating factor for migraine headache was skipping meals. This effect was more pronounced in women.¹⁶ A food diary is recommended for identifying headache food triggers. It is important to recognize that food can trigger headaches up to 24 hours after consumption.¹⁷ While additional research data specific to headaches and elimination diets is needed, an elimination diet may be a helpful component of a Personal Health Plan (PHP) for someone with headaches. See the **Elimination Diets** clinical tool for more information.

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Excessive caffeine intake has also been linked to headaches. One case series found that adolescents and children ingesting over 1,400 milligrams weekly of caffeine from cola drinks experienced resolution of headaches with gradual reduction in cola intake.¹⁸ Energy drinks, which are increasingly popular with younger people, including Veterans, contain significant amounts of caffeine and other stimulants and should be used with caution. Obesity, elevated fasting blood sugar, total cholesterol, LDL cholesterol, and truncal obesity increase the risk of migraine.¹⁹

Working Your Body

Physical activity has been found to have benefit for people suffering from headache, and many reasons have been postulated for this.²⁰ Exercise seems primarily to decrease headache intensity, as opposed to frequency or duration, according to some studies.

- **Physical therapy (PT)**

Physical therapy has not been shown to be effective when used alone but can be useful as an adjunct to biofeedback and relaxation in patients with limitation of head and neck range of motion.²¹

- **Tai chi**

One small clinical trial found that a 15-week program of tai chi was effective in reducing the impact of tension-type headache when compared to a wait-list control.²²

Of course, as a part of active self-care, physical activity has innumerable benefits for many health conditions. See the **Working Your Body** module for more details. Any recommendations that focus patients on taking ownership of their own health are likely to have added benefit.

Power of Mind/Mind-Body

The U.S. Headache Consortium evidence-based guidelines of 2000 note that:²³

1. Relaxation training, electromyographic biofeedback, and cognitive behavioral therapy may be considered as treatment options for the prevention of migraines.
2. Behavioral therapy (biofeedback, relaxation) may be combined with preventive drug therapy to achieve additional clinical improvement for migraine relief.
3. Patients for whom behavioral treatments of migraine may be most suitable include those with the following characteristics:
 - Preference for a nondrug approach
 - Intolerance or contraindication to drug treatment
 - Absent or minimal response to drug treatment
 - Pregnancy
 - History of long-term or excessive use of analgesic medications that aggravate headache symptoms
 - Presence of significant life stress and lack of coping skills

Dietary Supplements

Note: Please see the module on [Dietary Supplements](#) for more information about how to determine whether or not a specific supplement is appropriate for a given individual. Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

The following supplements are listed based on the order that they could be introduced to headache patients, noting that the approach should be tailored according to what else a person is taking, and recognizing that sometimes taking more than one supplement at a time can have additional benefits. Patients tend to tolerate these supplements quite well. If possible, try each one for a few weeks before making changes, and only change one supplement at a time so it is easier to tell which supplements are having which effects. Costs of each supplement range from \$5 to \$20 a month. Some of these (namely, the vitamins and minerals) are on the VA formulary.

Magnesium

Magnesium may prevent migraines from occurring by counteracting vasospasm, inhibiting platelet aggregation, and stabilizing cell membranes.^{24,25} It also influences serotonin receptors, nitric oxide synthesis and release, and inflammatory mediators.²³ Levels of ionized tissue magnesium are often low in patients with migraines, especially in those with menstrual migraine.²⁶⁻²⁸ The American Academy of Neurology and American Headache Society state in their 2012 guidelines that magnesium 600 milligrams is probably effective (evidence category B) for migraine prevention and should be considered for prophylaxis.²⁹

Magnesium oxide is the most widely available form, and it is the cheapest option. However, it is poorly absorbed, especially when taken with calcium, zinc, or iron. Magnesium may cause diarrhea, particularly in patients with irritable bowel syndrome. Magnesium gluconate is less likely to cause diarrhea, as is magnesium aspartate.¹ Magnesium supplementation should be continued for three months to determine benefit, especially in menstrual migraines. Magnesium can be used safely for the prevention and treatment of migraine in pregnancy.¹

Riboflavin (B2)

Riboflavin is hypothesized to improve mitochondrial energy reserves. Patients with migraine are thought to have reduced phosphorylation potential in brain and muscle, suggesting a mitochondrial defect in electron transport.¹ The American Academy of Neurology and American Headache Society state in their 2012 guidelines that riboflavin 400 milligrams daily is probably effective (evidence category B) for preventing migraines and should be considered for prophylaxis.²⁹ It is safe in pregnancy, and it may cause yellow discoloration of the urine.¹

Butterbur (*Petasites hybridus* root)

Butterbur has been used for fever, muscle spasm, and wound healing for centuries.³⁰ It is thought to act through calcium channel regulation and inhibition of peptide leukotriene

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biosynthesis.³¹ The American Academy of Neurology and American Headache Society state in their 2012 guidelines that butterbur 50-75 milligrams twice daily is established as effective (evidence category A) and should be offered to patients for migraine prophylaxis.²⁹ Side effects include excessive belching. Effects in pregnancy are unknown.¹ Pyrrolizidine alkaloids (PAs) found in butterbur can be carcinogenic, hepatotoxic, and cause bleeding problems, so it is important to use preparations where these compounds have been removed.³⁰ Look for supplements labeled or certified as PA-free and for supplements labeled USP (U.S. Pharmacopeial Convention) to ensure that the product has what the label states.

Coenzyme Q10 (Co-Q10)

Co-Q10 is an endogenous cofactor functioning to promote mitochondrial proton-electron translocation.³¹ The American Academy of Neurology and American Headache Society state in their 2012 guidelines that Co-Q10 100 milligrams three times daily is possibly effective (evidence category C) for migraine prevention and may be considered for prophylaxis.²⁹ The recommended dosage is 150-300 milligrams daily for a minimum of three months.¹ It is also safe in pregnancy.¹

Fish oil

Fish oil is theorized to decrease inflammation, relax vasculature, and inhibit serotonin release from platelets. One study compared olive oil to omega-3 supplementation for two months in 27 adolescents and found that both groups had a reduction in headache frequency.³² A larger study with 97 adults using omega-3 supplementation found no effects.³³ The recommended dose varies from 2 to 6 grams daily. See the **Food and Drink** educational overview for more information on omega-3s and essential fatty acids in general.

Melatonin

Melatonin is used for improved sleep in the setting of chronic headaches. Beneficial effects have been found for migraine and other headaches.³⁴⁻³⁶ However, a double-blind, placebo-controlled study comparing extended release melatonin 2 milligrams at bedtime to placebo did not find benefit.³⁷ The recommended dose varies greatly. Some people do well on just 0.3 milligrams, but for most people, starting at 2 milligrams at bedtime and titrating up every four days from the lowest dose is reasonable.

Feverfew (*Tanacetum parthenium* leaf)

Feverfew is a member of the daisy family and has been used for centuries for pain, fever, and headache.³⁰ It inhibits platelet aggregation and inflammatory mediators such as serotonin and prostaglandins. One study found a 70% reduction in frequency and severity in 270 patients with migraine.³⁸ No head-to-head trials with other migraine treatments have been conducted, and no long-term studies have documented safety.¹ The dose is 125 milligrams daily of the dried leaf standardized to a minimum of 0.2% parthenolide.¹ *Feverfew is not safe in pregnancy because it can cause uterine contractions.*³⁰ Drugs that interact with feverfew include anticoagulants and some hepatically metabolized medications.³⁰

Valerian (*Valeriana officinalis* root)

Valerian is used for improved sleep and anxiety in general, and for people with chronic headaches. In migraine patients with anxiety, valerian may be preferable to benzodiazepines because it is not associated with morning grogginess or dependency.³¹ It works by stimulation of GABA receptors and inhibition of reuptake of GABA. The dosage is 100-300 milligrams of extract at bedtime, or 250 milligrams every six hours for anxiety.¹ It should not be used during pregnancy.¹

Manipulative Therapies

Chiropractic

Headache is the third most common reason to seek chiropractic care.³⁹ A National Center for Complementary Alternative Medicine–funded research study of 80 patients found that compared with massage, spinal manipulative therapy (SMT) led to greater improvements in pain and disability, which lasted through follow-up at 24 weeks.⁴⁰ Guidelines developed after a systematic review of 21 trials published through 2009 concluded the following:³⁹

- For migraine, spinal manipulation and massage are recommended for management of patients with episodic or chronic migraines.
- For tension-type headaches, spinal manipulation cannot be recommended for the management of episodic headaches.
- A recommendation cannot be made for or against the use of spinal manipulation for patients with chronic tension-type headaches.

Side effects from chiropractic are uncommon, and overall risk is low. A 2009 systematic review of chiropractic safety, while noting more research was needed, found that serious adverse event reports had an incidence of 1.46 for every 10 million manipulations.⁴¹ One study found that 4.3% of subjects experienced neck stiffness after initial spinal manipulation, and it disappeared for all cases after two weeks.⁴² Spinal manipulation was noted to have a risk of stroke of 5 per 100,000 manipulations.⁴¹

Massage

A randomized controlled trial of 47 participants found that a massage group receiving six 45-minute massages exhibited greater improvements in migraine frequency and sleep quality than control subjects during the interventions and at a three-week follow-up.⁴³ At this point, research regarding massage and headaches is limited; findings to date are only somewhat promising.

For more information specific to osteopathic medicine, another form of manipulative therapy, see the **Osteopathic Medicine** clinical tool.

Other Healing Systems

Acupuncture

A U.S. survey revealed that 9.9% of those using acupuncture did so for migraine or other headaches.⁵ Clinical Practice Guidelines published in 1998 by the National Institutes of Health stated that acupuncture could be a useful adjunctive treatment or an acceptable

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alternative treatment to several disturbances, including headaches.⁴⁴ A systematic review that pooled data from 31 randomized controlled trials involving a total of 3,916 patients found that acupuncture was superior to sham acupuncture and medication therapy in improving chronic headache (migraine and tension headache) intensity, frequency, and response rate.⁴⁵ Another systematic review of 11 trials with 2,317 participants found acupuncture to be better than control (no treatment, drugs, relaxation, or physical therapy) and sham acupuncture for the treatment of tension headaches, in terms of the number of headache days and pain intensity. Long-term effects beyond three months were not evaluated.³ Risk of adverse events for acupuncture was noted to be 0.05 per 10,000 treatments and 0.55 per 10,000 patients.^{46,47}

Homeopathy

A systematic review done in 1999 concluded that available trial data did not indicate that homeopathy is an effective prophylactic treatment of migraine beyond a placebo effect.⁴⁸

Whole Health: Change the Conversation Website

Interested in learning more about Whole Health?
Browse our website for information on personal and professional care.

<http://projects.hsl.wisc.edu/SERVICE/index.php>

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