

Migraine Relief

Generally speaking, migraine is thought to be a disorder of your central nervous system, most likely originating in your brain stem.⁷ While most brain regions do not register or transmit pain signals, the trigeminal nerve network does.

Pain is relayed through the trigeminal network to an area in your brain stem called the trigeminal nucleus. From there, it is conveyed to the sensory cortex in your brain that is involved in awareness of pain and other senses. However, what initially activates your trigeminal nerve to set off your migraine is still under debate. In some cases, eye tracking can contribute, other times a vestibular imbalance from the inner ear may be the culprit.

One hypothesis is that a wave of neurotransmitters racing across your cortex can directly stimulate your trigeminal nerve, setting off a chain reaction that ends in the transmitting of pain signals.

In all likelihood, there are several mechanisms at play. We know, for example, that migraine is more common in women than men, and this has been linked to hormonal influences.

Nutritional deficiencies can contribute to or cause a number of different health problems, including migraines. In the video above, "America's pharmacist" Suzy Cohen discusses drug-free solutions for migraine and headache relief, including nutritional supplements. Nutrients of particular importance here are [vitamin D](#), magnesium, [Coenzyme Q10 \(CoQ10\)](#) and riboflavin (vitamin B2), and deficiencies in one or more of these is quite common.

In a migraine study involving more than 7,400 children, teens and young adults, 16 to 51 percent of participants had below average levels of vitamins depending on the vitamin tested. Those suffering from chronic migraines were overall more likely to have CoQ10 and riboflavin deficiency compared to those with episodic migraines.

Unfortunately, many of the patients in this study were prescribed preventive therapy and too few were given supplements alone for the researchers to determine if supplementation was enough to actually prevent migraines. However, other research suggests they can.

For example, research using vitamin D supplementation demonstrated a reduction in C-reactive protein (CRP) and a statistically significant reduction in headache frequency. Another more recent study by Finnish researchers found that men with the lowest vitamin D levels were twice more likely to suffer frequent headaches than those with the highest levels.

Overall, the lower the men's blood level of vitamin D, the more frequent their headaches. Those with a vitamin D blood level of 15.3 nanograms per milliliter (ng/mL) or lower typically had one or more headaches per week, while those with a level of 11.6 ng/mL or lower reported up to seven headaches per week. Ideally, your vitamin D level should be in the 40 to 60 ng/mL range, so both of these groups were severely deficient. As reported by Deming Headlight:

"The researchers theorized that vitamin D has anti-inflammatory properties that prevent swelling in the sensory neurons and the microglial cells in the brain and is essential for proper brain function. In the study information, they also note that previous studies show vitamin D prevents musculoskeletal pain, a major cause of tension headaches."

According to research presented at the 50th Annual Meeting of the American Headache Society in 2010, nearly 42 percent of patients with chronic migraine were deficient in vitamin

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D. The study also showed that the longer you suffered from chronic migraines, the more likely you are to be vitamin D deficient.

Magnesium Is Empirically Recommended for All Migraine Sufferers

Magnesium — which can affect both serotonin receptor function and the production and use of neurotransmitters — has also been shown to play an important role in the prevention and treatment of migraines, and migraine sufferers are more likely to suffer from magnesium deficiency than non-migraineurs. Barring that option, magnesium threonate may be your best option for an oral supplement. It has superior absorbability compared to other forms of magnesium, and since its ability to cross the blood-brain barrier makes it more likely to have a beneficial effect on your brain.

B Vitamins Are Also Important

Besides CoQ10, magnesium and vitamin D, other vitamin deficiencies linked to migraines include [riboflavin](#) (B2), B6, B12 and folic acid. One 2009 study evaluated the effect of 2 mg of folic acid, 25 mg vitamin B6 and 400 micrograms (mcg) of [vitamin B12](#) in 52 patients diagnosed with migraine with aura.

Are Migraines a Mitochondrial Problem?

The fact that nutritional deficiencies worsen migraine and supplementation can ease it lends support to the theory that migraines are a mitochondrial disorder. Ubiquinol — the reduced form of CoQ10 — plays a vital role in ATP production, which is the basic fuel for your mitochondria.

That said, while ubiquinol may be beneficial, for long-term migraine relief you really need to address your diet in a more comprehensive manner. One of the most effective strategies to optimize your mitochondrial function is nutritional ketosis and, indeed, a [ketogenic diet](#) may be quite beneficial if you struggle with migraines. As explained by the Migraine Relief Center:

"The links between diet and migraine are well established. Most migraineurs recognize certain foods that either trigger an attack or make an episode worse ... The ketogenic diet, while not new, has been found to have a beneficial effect for some migraine patients, and research into how this diet works provides interesting links to migraine causes that may encourage sufferers to experiment ...

Ketones are produced when the body burns fat for energy instead of carbohydrates (glucose). A ketogenic diet is very low in carbohydrates ... Anti-seizure medications originally intended for those with epilepsy are often prescribed to migraine sufferers.

These medications typically block glutamate (a neurotransmitter), high concentrations of which are often found in both migraine and epilepsy patients. As ketones block high concentrations of glutamate, a ketogenic diet can have a beneficial effect for migraine sufferers."

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Functional Neurology May Be Helpful Adjuncts to Migraine Treatment

While I believe cleaning up your diet (avoiding food triggers and allergic ingredients, and going ketogenic) and avoiding other triggers (changes in sleep cycles, dehydration, elevated stress) functional neurology may be a helpful adjunct therapy. Research has found addressing eye tracking function, and other brain based mechanisms has helped reduce the frequency and severity of migraine attacks in those suffering from migraine with and without aura.