

# Study Reveals Previously Unknown Mechanism Behind Acupuncture's Ability to Reduce Pain

Analysis by [Dr. Joseph Mercola](#)

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## STORY AT-A-GLANCE

- › Research suggests acupuncture can be an effective treatment for pain. Clear and robust effects have been found in the treatment of back pain, neck pain, shoulder pain, osteoarthritis and headaches
- › When properly administered to elicit de qi, acupuncture results in the release of nitric oxide (NO) at the acupuncture site, which in turn encourages the release of natural analgesics in your body
- › Previous research shows acupuncture deactivates certain parts of your brain, thereby altering your experience of pain

***Editor's Note: This article is a reprint. It was originally published August 3, 2017.***

When it comes to treating ailments such as chronic pain, I definitely prefer nontoxic options to drugs and surgery. Americans use 80% of all the opioids sold worldwide<sup>1</sup> — a testament to the pervasiveness of pain in this country — and with drug overdoses now being the ninth leading cause of death in the U.S., we clearly need safer alternatives.

Acupuncture is one such alternative. Research shows it can be an effective option for a number of health problems, but pain in particular. Contrary to allopathic, symptom-based medicine, acupuncture aims to eliminate the root cause of your problem, which is said to originate in a dysfunction in your body's energetic meridian system.

## **Basic Principles of Acupuncture**

Traditional Chinese medicine (TCM) views the body as a cohesive system where everything within it is interconnected. In other words, it recognizes that each part of your body has the ability to affect all other parts.

There are 14 major energy channels called meridians that flow through your body. An energy called qi (or chi) circulates along the meridians to all parts of your body, including the internal organs and every cell. This qi is the vital force that literally keeps us alive. Vibrant health is a result of balanced, unimpeded flow of energy through your body.

According to TCM, illness and pain are the byproducts of energy blockages somewhere along one or more meridians. Each acupuncture point along the meridian acts like a pass-through or gate. Energy can get "bottlenecked" in these points, slowing down the flow, sometimes to the point of standstill. This is the precursor to pain and illness.

By inserting a thin needle into the congested or "clogged" area, it opens the gate and allows the energy to flow again. With qi flowing smoothly, your body can re-regulate the flow of energy, repair itself and maintain its own optimal level of health. Herbs and other therapies such as guacha, cupping and moxibustion – the burning of herbs on or over the skin – can be used to support the healing.

## **Acupuncture May Offer Drug-Free Pain Relief**

In a 2012 analysis<sup>2,3</sup> of 29 published studies involving more than 17,900 participants, researchers concluded that acupuncture has a definite effect in reducing chronic pain – more so than standard pain treatment. Real acupuncture also produced slightly better results than using sham needles, which suggests the benefits of needling are due to more than the placebo effect.

By going the extra mile and retrieving the raw data on self-reported pain, and standardizing the various study participants' responses, they were also able to more

accurately assess and compare them as a whole. Overall, the team discovered a "clear and robust" effect of acupuncture in the treatment of back pain, neck pain, shoulder pain, osteoarthritis and headaches.

On a scale of zero to 100, participants who started out with a pain rating of 60 experienced an average 30-point drop (a 50% reduction) in response to the real acupuncture treatments (using needles); a 25-point drop when receiving sham acupuncture; and a mere 17-point drop when receiving "standard pain care" that did not include acupuncture. According to the lead author:<sup>4</sup>

*"The effects of acupuncture are statistically significant and different from those of sham or placebo treatments ... So we conclude that the effects aren't due merely to the placebo effect."*

## **Acupuncture Cuts Pain by Boosting Nitric Oxide**

While there's been a great deal of controversy as to whether or not acupuncture works "for real," and if so, how, research presents an answer to this question. The study<sup>5,6,7,8,9</sup> in question was conducted by researchers at LA BioMed. The research laboratory has developed a noninvasive device capable of sampling biomolecules over specific skin regions.

Using this device, they were able to determine that when acupuncture is properly administered, nitric oxide (NO) is released at the "acupoints" – the acupuncture sites into which the needles are inserted. NO is a soluble gas that is continually produced from the amino acid L-arginine inside your cells. This gas plays an important role in supporting normal endothelial function and protecting your cells' powerhouses, the mitochondria. It's also a potent vasodilator.

By relaxing and dilating your blood vessels, NO improves blood flow and lowers blood pressure. NO also encourages release of natural analgesics (pain relieving chemicals) in your body. Together, this helps explain why and how acupuncture works to reduce pain.

A number of acupuncture studies have produced negative results. The reason for this may have to do with the way the acupuncture is done. In order for NO release to occur, "de qi" had to be elicited. De qi feels a bit like an electric shock. Westerners are not accustomed to this sensation, which is why many Western acupuncturists won't do it.

De qi is elicited by twisting the inserted needle. In this study, they twisted the needle for two minutes or until de qi was elicited. They then manipulated the needles for two minutes every five minutes, for a total of 20 minutes each treatment. Heat can also amplify the effectiveness of the treatment and, here, the application of heat also increased NO release at the acupoints.

## **Acupuncture Reduces Osteoarthritis Pain**

A number of studies support the use of acupuncture for pain. A large, landmark study<sup>10,11</sup> published in 2004, which assessed whether acupuncture might work for osteoarthritis pain, produced remarkably positive results.

A total of 570 patients diagnosed with osteoarthritis of the knee were enrolled for this 26-week-long trial – the longest and largest randomized, controlled phase III clinical trial of acupuncture ever conducted. None of the participants had tried acupuncture before, and none had had knee surgery in the previous six months. Nor had they used steroid injections.

The participants were randomly assigned to receive one of three treatments: acupuncture, sham acupuncture or self-help strategies recommended by the Arthritis Foundation, which served as a control group).

Significant differences in response was seen by weeks 8 and 14, and at the end of the trial, the group receiving real acupuncture had a 40% decrease in pain and a nearly 40% improvement in function compared to baseline assessments – a 33% difference in improvement over the sham group.

According to the late Dr. Stephen E. Straus, who served as the first director of the National Center for Complementary and Alternative Medicine (NCCAM), which is a part

of the National Institutes of Health:<sup>12</sup>

*"For the first time, a clinical trial with sufficient rigor, size and duration has shown that acupuncture reduces the pain and functional impairment of osteoarthritis of the knee. These results also indicate that acupuncture can serve as an effective addition to a standard regimen of care and improve quality of life for knee osteoarthritis sufferers.*

*NCCAM has been building a portfolio of basic and clinical research that is now revealing the power and promise of applying stringent research methods to ancient practices like acupuncture."*

## **Other Evidence Showing What Acupuncture 'Does'**

Boosting NO release isn't the only mechanism by which acupuncture reduces pain. Previous research suggests acupuncture stimulates your central nervous system to release natural chemicals that alter bodily systems, pain and other biological processes. In 2003, the World Health Organization (WHO) conducted an extensive review and analysis of clinical trials involving acupuncture.<sup>13</sup> According to this report,<sup>14</sup> acupuncture:

- Stimulates the conduction of electromagnetic signals, which may release immune system cells or painkilling chemicals
- Activates your body's natural opioid system, which may help reduce pain or induce sleep
- Stimulates your hypothalamus and pituitary gland, which modulate numerous body systems
- Alters secretion of neurotransmitters and neurohormones, which may positively influence brain chemistry

According to the WHO's analysis, "Some of these studies have provided incontrovertible scientific evidence that acupuncture is more successful than placebo treatments in

certain conditions." The report again confirmed its benefits for pain, saying:

*"The proportion of chronic pain relieved by acupuncture is generally in the range 55–85 percent, which compares favorably with that of potent drugs (morphine helps in 70 percent of cases) and far outweighs the placebo effect (30–35 percent)."*

## **Acupuncture Reduces Pain by Shutting Down Certain Brain Regions**

In the BBC documentary, "The Science of Acupuncture," which originally aired in 2015, a team of researchers conducted an experiment that had never been done before. Using high-tech MRI imaging, they visually demonstrated that acupuncture has a very real effect on the brain.

Acupuncture, it turns out, does something completely unexpected – it deactivates certain parts of the brain, particularly in the limbic system, decreasing neuronal activity, opposed to having an activating impact.

Their experiment also clearly showed that superficial sham needling does not have this effect. Your limbic system is associated with the experience of pain, adding further evidence that something unique happens during acupuncture. It quite literally alters your experience of pain by shutting down these deeper brain regions.

## **Other Nondrug Solutions for Pain Relief**

There are many other ways to address pain beside acupuncture. Below is a long list of suggestions. Clearly, there are times when pain is so severe that a narcotic pain reliever may be warranted. But even in those instances, the options that follow may allow you to at least reduce the amount you take, or the frequency at which you need to take it.

If you need an acute pain reliever, you can consider an over-the-counter (OTC) option. Research<sup>15</sup> shows prescription-strength naproxen (Naprosyn, sold OTC in lower dosages

as Aleve) provides the same pain relief as more dangerous narcotic painkillers.

However, while naproxen may be a better alternative to narcotic painkillers, it still comes with a very long list of potential side effects,<sup>16</sup> and the risks increase with frequency of use, which is why I discourage anyone from taking them, especially long term. It would be far better to try some of the nontoxic options below.

**Eliminate or radically reduce most grains and sugars from your diet** — Avoiding grains and sugars will lower your insulin and leptin levels and decrease insulin and leptin resistance, which is one of the most important reasons why inflammatory prostaglandins are produced. That is why stopping sugar and sweets is so important to controlling your pain and other types of chronic illnesses.

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**Take a high-quality, animal-based omega-3 fat** — Omega-3 fats are precursors to mediators of inflammation called prostaglandins. (In fact, that is how anti-inflammatory painkillers work, by manipulating prostaglandins.)

Good sources include wild-caught Alaskan salmon, sardines and anchovies, which are all high in healthy omega-3s while being low in contaminants such as mercury. As for supplements, my favorite is krill oil, as it has a number of benefits superior to fish oil.

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**Optimize your sun exposure and production of vitamin D** — Optimize your vitamin D by getting regular, appropriate sun exposure, which will work through a variety of different mechanisms to reduce your pain. Sun exposure also has anti-inflammatory and pain relieving effects that are unrelated to vitamin D production, and these benefits cannot be obtained from a vitamin D supplement.

Red, near-, mid- and far-infrared light therapy (photobiology) and/or infrared saunas may also be quite helpful as it promotes and speeds tissue healing, even deep inside the body.

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**Medical cannabis** — Medical marijuana has a long history as a natural analgesic and is now legal in some form in 43 states; seven states are still holding out with

approving CBD only. You can learn the laws in your state on [covercannabis.com](https://covercannabis.com).<sup>17</sup>

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**Kratom** – Kratom (*Mitragyna speciosa*) is another plant remedy that has become a popular opioid substitute.<sup>18</sup> In August 2016, the U.S. Drug Enforcement Administration issued a notice saying it was planning to ban kratom, listing it as a Schedule 1 controlled substance. However, following massive outrage from kratom users who say opioids are their only alternative, the agency reversed its decision.<sup>19</sup>

There's very little research showing how to use kratom safely and effectively, and it may have a very different effect from one person to the next. In 2023 Congress began introducing bills to address this issue and to regulate its use more closely.<sup>20</sup>

Kratom is likely safer than an opioid for someone in serious and chronic pain. However, it's important to recognize that it is a psychoactive substance and should not be used carelessly.

Also, while it may be useful for weaning people off opioids, kratom is in itself addictive. So, while it appears to be a far safer alternative to opioids, it's still a powerful and potentially addictive substance. So please, do your own research before trying it.

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**Emotional Freedom Techniques (EFT)** – **EFT** is a drug-free approach for pain management of all kinds. EFT borrows from the principles of acupuncture in that it helps you balance out your subtle energy system.

It helps resolve underlying, often subconscious, and negative emotions that may be exacerbating your physical pain. By stimulating (tapping) well-established acupuncture points with your fingertips, you rebalance your energy system, which tends to dissipate pain.

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**Meditation and mindfulness training** – Among volunteers who had never meditated before, those who attended four 20-minute classes to learn a meditation technique called focused attention (a form of mindfulness meditation) experienced significant



pain relief – a 40% reduction in pain intensity and a 57% reduction in pain unpleasantness.<sup>21</sup>

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**K-Laser, class 4 laser therapy** – If you suffer pain from an injury, arthritis or other inflammation-based pain, I'd strongly encourage you to try K-Laser therapy. It can be an excellent choice for many painful conditions, including acute injuries. By addressing the underlying cause of the pain, you will no longer need to rely on painkillers.

K-Laser is a class 4 infrared laser therapy treatment that helps reduce pain, reduce inflammation and enhance tissue healing – both in hard and soft tissues, including muscles, ligaments or even bones. The infrared wavelengths used in the K-Laser allow for targeting specific areas of your body and can penetrate deeply into the body to reach areas such as your spine and hip.

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**Chiropractic** – Many studies have confirmed that chiropractic management is much safer and less expensive than allopathic medical treatments, especially when used for pain such as low back pain.

Qualified chiropractic, osteopathic and naturopathic physicians are reliable, as they have received extensive training in the management of musculoskeletal disorders during their course of graduate health care training, which lasts between four to six years. These health experts have comprehensive training in musculoskeletal management.

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**Physical therapy** – Physical therapy has been shown to be as good as surgery for painful conditions such as torn cartilage and arthritis.

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**Foundation training** – Foundation training is an innovative method developed by Dr. Eric Goodman to treat his own chronic low back pain. It's an excellent alternative to painkillers and surgery, as it actually addresses the cause of the problem.

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**Massage** – A systematic review and meta-analysis published in the journal Pain Medicine included 60 high-quality and seven low-quality studies that looked into the

use of massage for various types of pain, including muscle and bone pain, headaches, deep internal pain, fibromyalgia pain and spinal cord pain.<sup>22</sup>

The review revealed massage therapy relieves pain better than getting no treatment at all. When compared to other pain treatments like acupuncture and physical therapy, massage therapy still proved beneficial and had few side effects. In addition to relieving pain, massage therapy also improved anxiety and health-related quality of life.

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**Astaxanthin** – Astaxanthin is one of the most effective fat-soluble antioxidants known. It has very potent anti-inflammatory properties and in many cases works far more effectively than anti-inflammatory drugs. Higher doses are typically required and you may need 8 milligrams (mg) or more per day to achieve this benefit.

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**Ginger** – This herb has potent anti-inflammatory activity and offers pain relief and stomach-settling properties. Fresh ginger works well steeped in boiling water as a tea or grated into vegetable juice.

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**Curcumin** – In a study of osteoarthritis patients, those who added 200 mg of curcumin a day to their treatment plan had reduced pain and increased mobility. A past study also found that a turmeric extract composed of curcuminoids blocked inflammatory pathways, effectively preventing the overproduction of a protein that triggers swelling and pain.<sup>23</sup>

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**Boswellia** – Also known as boswellin or "Indian frankincense," this herb contains specific active anti-inflammatory ingredients.

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**Bromelain** – This enzyme, found in pineapples, is a natural anti-inflammatory. It can be taken in supplement form but eating fresh pineapple, including some of the bromelain-rich stem, may also be helpful.

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**Cetyl myristoleate (CMO)** – This oil, found in fish and dairy butter, acts as a joint lubricant and anti-inflammatory. I have used this for myself to relieve ganglion cysts and carpal tunnel syndrome. I used a topical preparation for this.

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**Evening primrose, black currant and borage oils** – These contain the essential fatty acid gamma-linolenic acid (GLA), which is particularly useful for treating arthritic pain.

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**Cayenne cream** – Also called capsaicin cream, this spice comes from dried hot peppers. It alleviates pain by depleting the body's supply of substance P, a chemical component of nerve cells that transmits pain signals to your brain.

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**Mind-body therapies** – Methods such as hot and cold packs, aquatic therapy, yoga, various mind-body techniques and cognitive behavioral therapy<sup>24</sup> can also result in astonishing pain relief without drugs.

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**Grounding** – Walking barefoot on the earth may also provide a certain measure of pain relief by combating inflammation.

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**Low-Dose Naltrexone (LDN)** – Naltrexone is an opiate antagonist, originally developed in the early 1960s for the treatment of opioid addiction. When taken at very low doses (LDN, available only by prescription), it triggers endorphin production, which can boost your immune function and ease pain.

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