

## Is there scientific proof for Acupuncture?

Many sceptics maintain that acupuncture is merely a placebo and has no scientific foundation.

## Acupuncture – the scientific proof

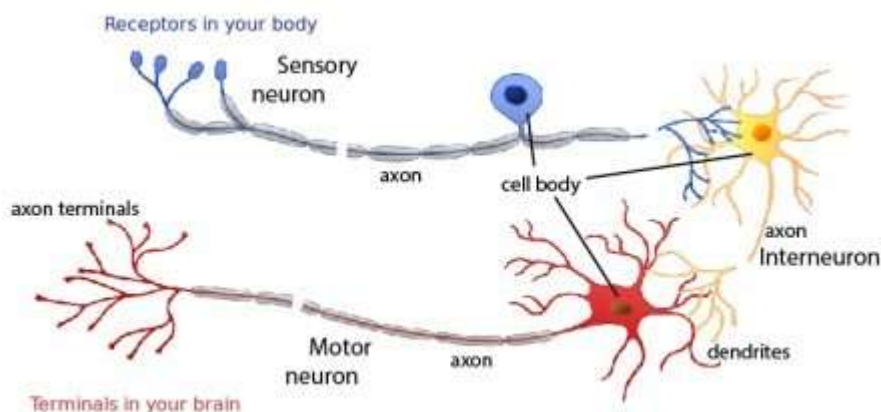
By Michael Ryan

Contrary to the beliefs held by sceptics, there is currently a huge amount of scientific evidence supporting not only the efficacy of acupuncture as a treatment for a host of ailments, but also the mechanisms of this ancient therapy in the body.

### So how does acupuncture work?

When an acupuncture needle is inserted into a point the needle stimulates sensory nerves. We know this because the acupuncture effect goes away if we block those nerves. If we cut the effect of the motor nerves the therapy still works.

- Sensory (Afferent) nerves carry a stimulus message to the brain.
- Motor nerves carry a movement message from the brain.



Researchers have mapped the pathways of the nervous system that acupuncture works on including different levels of the brain, spinal cord and nerves including reflexes which travel from the legs to the organs.

According to Doctor John Longhurst who conducted a large number of studies – over 40 in total – showing that electro- and manual acupuncture applied at specific acupuncture points lowers short-term elevations (by about 50%) and long-term elevations in blood pressure through stimulation of sensory nerve fibres underlying the acupuncture points. Unlike pain, which is subjective, this is a measurable outcome.

Research indicates that Acupuncture channel pathways mirror nervous system pathways. A systematic review of functional MRI scans show changes to the brain in real-time during acupuncture treatment. **Acupuncture consistently activates areas of the brain which stimulate the parasympathetic nervous system and reduce the effects of sympathetic nervous system i.e. the fight or flight/stress response.** Acupuncture stimulates peripheral nerves triggering a cascade that causes changes in the brain and internal organs.

## BIOMOLECULAR CHANGES CAUSED BY ACUPUNCTURE:

### ENDORPHINS

- Endogenous morphine (natural morphine produced by the body)
- Acupuncture stimulates the release of painkilling neuropeptides
- Naloxone prevents the effect of morphine; it also blocks the effect of acupuncture indicating a link between acupuncture and morphine.
- High CCK-8 is a non-responder to acupuncture. It blocks both morphine and acupuncture indicating a further link.

Needle therapy has also been shown to help increase sensitivity to morphine resulting in the potential to reduce the amount of opioid medication required to treat pain.

### ATP & ADENOSINE

- ATP (adenosine tri-phosphate) is energy produced by cells in the body
- When ATP is released from cells it degrades to Adenosine which is a neurotransmitter -a signalling molecule and pain reliever

A study carried out by Goldman in 2010 used field mice and genetically modified mice to test the effects of acupuncture. The genetically modified mice were bred without adenosine receptors; therefore, the study compared mice with adenosine receptors and mice without adenosine receptors. The result found that Acupuncture was only effective in mice with adenosine Receptors indicating acupuncture was not just a placebo.

Taking the principles of this study further in 2012 Takahiro Takano carried out a similar study on humans and found the following:

The interstitial adenosine concentration increased significantly during acupuncture and remained elevated for 30 minutes after the acupuncture. Acupuncture mediated adenosine release was not observed if acupuncture was not delivered in the Zusanli (ST-36) point or if the acupuncture needle was inserted, but not rotated.

Adenosine levels increase in areas of inflammation and hypoxia, where it protects tissues by restoring the oxygen supply: demand ratio, as well as affecting preconditioning, exerting anti-inflammatory effects, and stimulating angiogenesis (formation of new blood vessels).

Adenosine favours the resolution of pathologies such as epilepsy, pain, ischemia, inflammation, and cancer, in which it behaves like a guardian angel against cellular damage.

New adenosynergic drugs for pain, inflammatory diseases and cancer are already in clinical development.

## **FASCIA AND EXTRACELLULAR MATRIX**

When an acupuncture needle is inserted and stimulated it stretches fascial fibroblasts and they granulate causing a cascading effect. Fibroblasts are cells that maintain the structural integrity of the connective tissue and play a crucial role in wound healing. They are the most common connective tissue cells in animals.

Therefore, it can be said that:

***Acupuncture stimulates the body to release its own natural pain killers. It also stimulates the release of molecules associated with tissue healing and disease resolution.***

Even though Acupuncture has its beginnings in a time before Western Medicine was researching and objectively looking at the scientific theory underpinning the practice, there is empiric proof that the therapy is effective. Moreover, it is a way to re-engage the body in its own healing process, rather than just treating the symptoms of disease. This becomes clearer, the more we learn to understand the science on which needle therapy rests.

There is more to the ancient science of Acupuncture than meets the eye.

### **What is evidence based medicine?**

The application of the best available (i.e., most reliable) evidence gained from the scientific method to guide clinical decision-making. The most rigorous evidence comes from meta-analysis of multiple double-blinded, placebo-controlled clinical trials.

### **What is the Evidence for Acupuncture?**

As of June 2017 there have been over 8000 trials for acupuncture – more than both physiotherapy and chiropractic combined. In fact, the growth in Acupuncture research is double that for the rest of bio-medicine. Research in acupuncture is not only increasing in quantity but also in terms of the quality of medical journals in which it appears.

McDonald and Janz (both Australian practitioners) have published a comparative literature review of all systematic reviews of every condition for which there is acupuncture research and found the following:

- **Strong evidence of acupuncture effectiveness for 8 separate conditions**
- **Moderate evidence of effectiveness for 38 separate conditions**
- **Weak positive evidence for 71 conditions**
- **Little or no evidence for 5 conditions**

A previous report indicated there was strong evidence for only 3 conditions indicating that the strength of the evidence continues to increase over time due to both the quality and quantity of research/trials conducted.

The Strong evidence for acupuncture effectiveness included the following

- **Migraine prevention**
- **Headache**
- **Low back pain**
- **Knee/osteo arthritis**
- **Allergic rhinitis**
- **Chemotherapy induced nausea and vomiting**
- **Post operative nausea and vomiting**
- **Post operative pain**

It is no longer possible to say that the effectiveness of acupuncture is attributed to the placebo effect or that it is useful only for musculoskeletal pain.

An ongoing search by the European journal of integrative medicine, had found over 870 recommendations [for acupuncture by November 2015] for over 100 conditions from multiple international groups and over 30 countries. As of June 2017 that number is now over 1000

“In an analysis of patient-level data from 29 high quality Randomized Controlled Trials, 17 were found statistically to have significant differences between both acupuncture versus sham and acupuncture versus no acupuncture control for all pain types studied” (Vickers et al 2012).

They found the effects are persistent for over 12 months in treating pain:

- 30% of patients had a reduction with no acupuncture
- 5% of patients had a reduction with sham acupuncture
- 50% of patients had a reduction with acupuncture

In the USA a 2 year retroactive study of 89000 patients conducted by American Speciality Health Incorporated indicated that 93% of respondents said that acupuncture was effective in treating

their primary condition indicating that real world data was more positive towards acupuncture than the trial data. Furthermore in a Network Meta analysis, comparing different treatments for sciatica, acupuncture comes in second behind biological agents and ahead of other treatments including manipulation, surgery, intra operative interventions and non opioids/opioids.

### **Safety of alternatives to acupuncture for pain:**

#### **Opioids**

Opioids for low back pain (Shaheed 2016):

“Irrespective of study design, the predominant causes for drop-out were adverse events or lack of efficacy, with half of trials having 50% of participants drop out owing to these 2 reasons.”

For people with chronic low back pain who tolerate the medicine, opioid analgesics provide modest short-term pain relief but the effect is not likely to be clinically important within guideline recommended doses. According to the CDC: “From 1999 to 2015, more than 183,000 people have died in the U.S. from overdoses related to prescription opioids.” More than the number who died from taking heroin and cocaine combined in the same period. The annual death rate from opioids in the US is greater than that from motor vehicle accidents

#### **NSAIDs:**

“The adverse cardiovascular profile of NSAIDs includes risk of atherothrombotic events like myocardial infarction (MI) and stroke, which can be fatal. The increased cardiovascular risk has been observed both in people with a prior high risk of cardiovascular disease and in previously healthy individuals and this risk appears to be dose dependent”

Apart from rofecoxib, diclofenac is the agent most associated with an increased risk of cardiovascular events: a 40%–60% higher relative risk of serious cardiovascular events, compared to non-use of NSAIDs, has been reported.” Reddy et al, 2013

According to a report in the British medical journal into the risk of acute myocardial infarction with NSAIDs in real world use based on a cohort of 446763 individuals including 61460 with acute myocardial infarction was acquired found that taking any dose of NSAIDs for one week, one month, or more than a month was associated with an increased risk of myocardial infarction.

It was found that all NSAIDs were associated with an increased risk of acute myocardial infarction. The risk was greatest during the first month and with higher doses. Onset risk occurred in the first week

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5423546/>

#### **First line treatment for migraines**

- **Topiramate – anti-convulsant**
- **Propranolol – beta-blocker**
- **Amitriptyline – tricyclic antidepressant**

Indicating that migraine treatment with these medications is off label meaning there may be no specific clinical evidence for the efficacy in treating migraines.

*“A large body of research indicates that acupuncture is more effective than usual care for many conditions. It also significantly outperforms sham acupuncture demonstrating specific effects” (Truss, 2017).*