



EVIDENCE BASED

ACUPUNCTURE

EVIDENCE SUMMARY - OSTEOARTHRITIS



ACUPUNCTURE FOR OSTEOARTHRITIS

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Osteoarthritis is a chronic disease characterised by the deterioration of cartilage in joints that results in bones rubbing together, creating stiffness, pain, and impaired movement. Although osteoarthritis may affect any joint, the knee, hip, and hand are most commonly affected.¹ Knee osteoarthritis accounts for more than 80% of the disease's total burden and affects at least 19% of American adults aged 45 years and older.²

Osteoarthritis (OA) is a major contributor to functional and social impairment, physical disability and poorer quality of life in older adults and increases the risk of further health issues.

While OA is related to ageing, it is also associated with a variety of risk factors, including obesity, lack of exercise, genetic predisposition, poor bone density, occupational injury, trauma, and gender, with a predominance in females compared to males. The prevalence of OA is increasing due to a rise in contributing factors such as obesity and an ageing population.¹

CLINICAL EVIDENCE FOR PAIN RELIEF & IMPROVED JOINT FUNCTION

In the last decade, high quality evidence from a number of systematic reviews and meta-analyses have found acupuncture to be effective for OA, superior to both sham acupuncture needling and usual care, including pain medication.³⁻⁸

A network meta-analysis comparing 22 physical interventions in 152 studies, found acupuncture to be as effective as balneotherapy and more effective than sham acupuncture, muscle-strengthening exercise, Tai Chi, weight loss, standard care and aerobic exercise (in that order).³

In a sub-analysis that looked only at moderate to high quality studies, acupuncture was superior to standard care and muscle-strengthening exercises.³

Another systematic review of 12 randomised controlled trials found acupuncture was effective for reducing pain intensity, as well as improving functional mobility and quality of life. This study found that the effect of reducing pain intensity was greater when treatment lasted for more than four weeks compared to shorter treatment durations.⁴

Two more recent reviews have assessed the long-term effect of acupuncture for osteoarthritis. Lin et al.⁵ found that acupuncture improved both short and long-term physical function at six months, but pain relief was not maintained long term.

An even larger meta-analysis published in 2018, which included 39 RCTs and 20,827 patients who suffered from four chronic pain conditions (musculoskeletal pain, OA, chronic headache, or shoulder pain) found that acupuncture was superior to sham needling as well as no

acupuncture control for each pain condition. More importantly, they found clear evidence that the pain-relieving effects of acupuncture persisted at one year follow up, making acupuncture one of the only treatments in existence with strong evidence of long-term pain-relieving effects.⁸

The effects of manual acupuncture in reducing pain and improving physical functioning can further be enhanced using electroacupuncture, as shown by Chen et al.⁶ in their meta-analysis reporting that electroacupuncture was superior to manual acupuncture with a 12% greater chance of reducing pain and improving physical functioning.

STRENGTH OF EVIDENCE



REVIEWS & META-ANALYSES



RANDOMISED CONTROLLED TRIALS



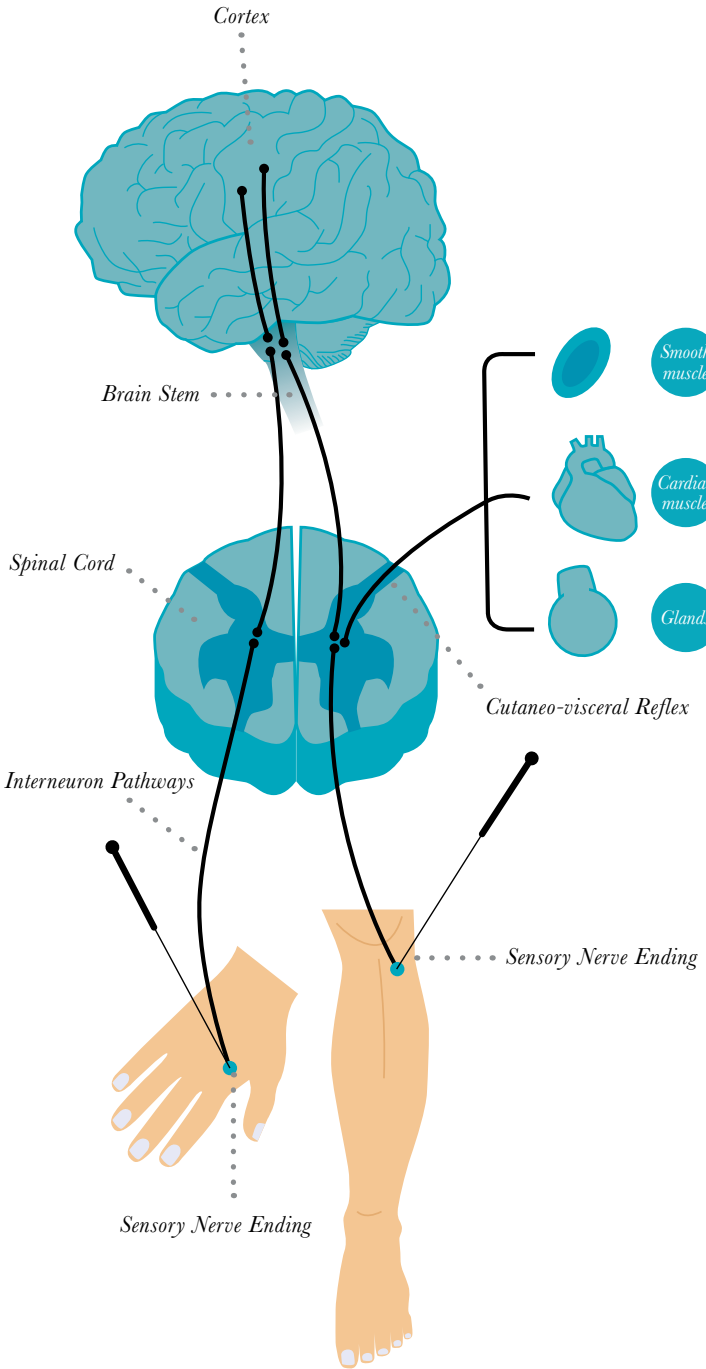
MANY REPORTS



SINGLE REPORTS



ANIMAL MODELS (Mechanisms)



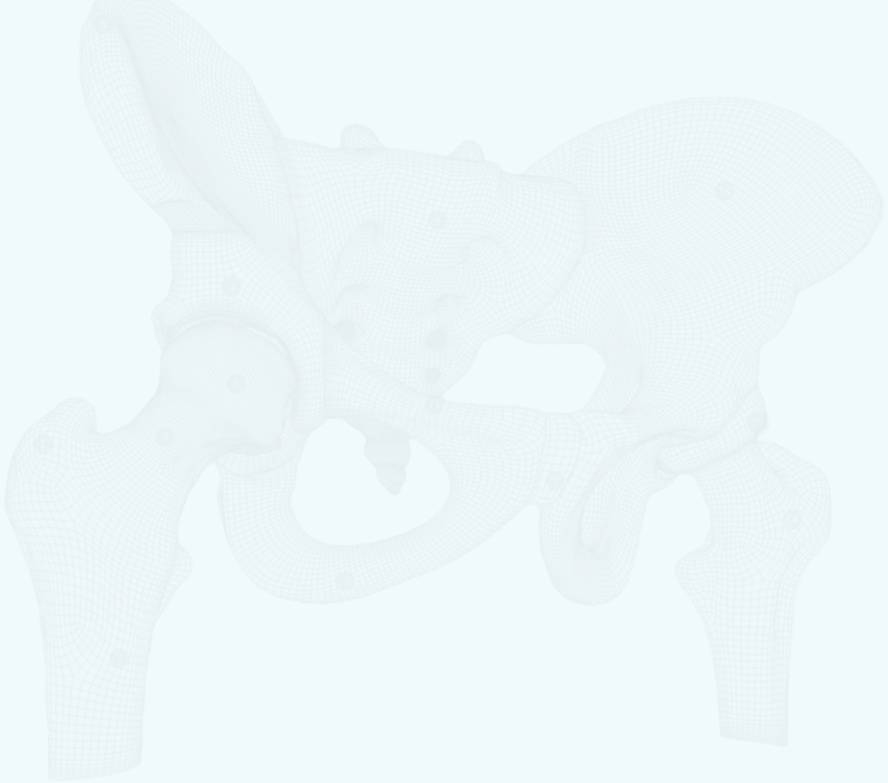
THE CENTRAL NERVOUS SYSTEM

HOW ACUPUNCTURE TREATS OSTEOARTHRITIS - BIOLOGICAL MECHANISMS

The mechanisms underlying how acupuncture works in treating pain have been researched extensively and the neural pathways from acupuncture point stimulation, to the spinal cord to the deactivation of the pain centres in the brain have been mapped. Acupuncture has been demonstrated to activate a number of the body's own opioids as well as improving the brain's sensitivity to opioids. A number of other biochemicals involved in pain reduction have been found to be released or regulated by acupuncture stimulation, including adenosine and adenosine triphosphate (ATP),

gamma-amino-butyric-acid (GABA) and substance P.⁹

A study by Salazar et al. ¹⁰ published in 2017 showed that electro-acupuncture triggers the release of stem cells that can help promote tissue repair and relieve injury-induced pain. This may further explain its beneficial effects in reversing OA in addition to improving symptoms.¹⁰





CONVENTIONAL TREATMENTS FOR OSTEOARTHRITIS

Typical options in the treatment of OA include pain medications, hyaluronate injections to lubricate the joint, corticosteroid injections and joint replacement surgery while protective measures include exercise and dietary advice. Some of these interventions are risky with a poor benefit to harm profile, especially for the elderly, and many people are reluctant to have them.

A review by Birch et al. in 2017 compared the effect size (ES) of common treatments for knee osteoarthritis, where an effect size of 0.3 or less is considered small; 0.5 is moderate yet clinically meaningful (as defined by the UK NICE) and 0.8 is large.

Commonly prescribed analgesics such as acetaminophen have a small ES (0.14-0.21), whereas stronger analgesics such as non-steroidal anti-inflammatory drugs (NSAIDs) and cyclooxygenase-2 (COX-2) inhibitors have a larger ES (0.29-0.44), but their adverse effects are substantial with ~2000 deaths in the UK alone as a result of using normal doses of NSAIDs¹³ and up to a 60% increase in the risk of heart attack.¹⁴ Topical NSAIDs have shown a moderate effect size (0.40), but their effect usually last for the first 1-2 weeks.

Opioids have shown the largest treatment effect with effect size of 0.78, but are not recommended due to their serious adverse effects and addiction. Since first approved by the FDA in 1996, it is estimated that 650,000 Americans have died due to opioid overdose, with more than half of those deaths occurring since 2016.

Acupuncture had a small effect size (0.16-0.35) when compared with sham acupuncture needling, which is in line with current understanding that sham acupuncture is not physiologically inert and has some level of beneficial effect, artificially reducing the magnitude of the ES in comparison with sham.¹⁵ However, when acupuncture was compared to standard therapy, including painkillers, it was second only to opioids with a meaningful moderate effect size of 0.57, and with a favourable safety profile and minimal side effects.

Acupuncture has also been shown to be cost-effective for the management of pain such as lower back pain, headaches and OA. A study by Woods et al. published in 2017 compared the cost and benefits of acupuncture, supports such as braces or insoles, manual therapy, electrotherapy (laser/light therapy, electrical and magnetic stimulation, transcutaneous electrical nerve stimulation), heat treatment, and usual care. Only transcutaneous electrical nerve stimulation (TENS) and acupuncture were considered cost-effective.

With proven clinical benefits and favourable safety and cost-effectiveness profiles, acupuncture is a recommended for OA management by the American College of Rheumatology and National Institute of Arthritis and Musculoskeletal and Skin Diseases.^{16,17} The UK National Institute for Health and Care Excellence (NICE) guidelines have also recognized acupuncture's potential benefits for chronic pain²², and while acknowledging evidence of clinical benefit and cost-effectiveness for electroacupuncture, have yet to recommend acupuncture specifically for osteoarthritis.¹⁸

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