

*Keynote Communication*

# Pain Management Using Acupuncture, old challenges and new opportunities - a narrative review.

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**Abstract:** Pain management is a crucial aspect of healthcare, affecting individuals both physically and emotionally. Acupuncture has emerged as a potential therapeutic approach for various pain conditions. We aim to summarize the effectiveness of acupuncture in pain management based on existing research, explore underlying mechanisms of its action and point future research opportunities and directions. Chronic pain still remains as one of the most prevalent chronic conditions worldwide with a significant portion of the population experiencing persistent pain. Acupuncture has shown promising results in addressing pain associated with osteoarthritis (OA), chronic low back pain, tension-type headaches, and migraines supported by numerous systematic reviews and meta-analyses. Those have demonstrated the superiority of acupuncture over sham or routine care in reducing pain frequency and intensity, as well as improving physical function. Understanding the mechanisms through which acupuncture exerts its effects is essential. Studies have indicated that acupuncture stimulates the release of endogenous opioids, such as endorphins, enkephalins, and dynorphins, which play a role in pain modulation. Additionally, acupuncture has anti-inflammatory effects by regulating the release of inflammatory cytokines and inhibiting the activation of microglia and astrocytes, thereby reducing neuroinflammation and pain sensitization. The modulation of neurotransmitters and receptors, as well as the regulation of central nervous system activity, have also been implicated in acupuncture's pain-relieving effects. Future research directions and opportunities in acupuncture for pain management includes investigating the impact of distal point stimulation and possible relation with the evidence of contralateral neurite loss on pain intensity and somatotopically-specific improvements in white matter microstructure, and studying the role of the fascial system and bio tensegrity in acupuncture stimulation propagation. Furthermore, communication pathways through the extracellular matrix, specifically involving proteoglycans and glycosaminoglycans, are proposed as potential areas of investigation. Acupuncture has shown promising efficacy in pain management, particularly in conditions such as OA, chronic low back pain, tension-type headaches, and migraines. The mechanisms underlying its effects involve the release of endogenous opioids, modulation of neuroinflammation, regulation of neurotransmitters, and modulation of central nervous system activity. Further research is needed exploring these mechanisms and to identify specific factors contributing to acupuncture's effectiveness in pain management.

**Keywords:** Acupuncture, Pain management, Chronic pain, Distal acupuncture, Biotensegrity.

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