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# Musculoskeletal Pain

# Douleurs musculo-squelettiques

## 1. Systematic Reviews and Meta-Analysis

### 1.1. Generic Acupuncture

#### 1.1.1. Xiong 2024

Xiong J, Zhou X, Luo X, Gong X, Jiang L, Luo Q, Zhang S, Jiang C, Pu T, Liu J, Zhang J, Li B, Chi H. Acupuncture therapy on myofascial pain syndrome: a systematic review and meta-analysis. Front Neurol. 2024 May 3;15:1374542. https://doi.org/10.3389/fneur.2024.1374542

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| **Purpose** | Traditional Chinese medicine (TCM) therapies, especially acupuncture, have received increasing attention in the field of pain management. This meta-analysis evaluated the effectiveness of acupuncture in the treatment of myofascial pain syndrome. |
| **Methods** | A comprehensive search was conducted across a number of databases, including PubMed, Cochrane Library, WOS, CNKI, WANFANG, Sinomed, and VIP. Furthermore, articles of studies published from the inception of these databases until November 22, 2023, were examined. This systematic review and meta-analysis encompassed all randomized controlled trials (RCTs) on acupuncture for myofascial pain syndromes, without language or date restrictions. Based on the mean difference (MD) of symptom change, we critically assessed the outcomes reported in these trials. The quality of evidence was assessed using the Cochrane Risk of Bias Tool. The study is registered with PROSPERO under registration number CRD42023484933. |
| **Results** | Our analysis included **10 RCTs in which 852 patients** were divided into two groups: an acupuncture group (427) and a control group (425). The results of the study showed that acupuncture was significantly more effective than the control group in treating myofascial pain syndromes, which was reflected in a greater decrease in VAS scores (MD = -1.29, 95% [-1.65, -0.94], $p < 0.00001$). In addition, the improvement in PRI and PPI was more pronounced in the acupuncture group (PRI: MD = -2.04, 95% [-3.76, -0.32], $p = 0.02$) (PPI: MD = -1.03, 95% [-1.26, -0.79], $p < 0.00001$) compared to the control group. |
| **Conclusions** | These results suggest that acupuncture is effective in reducing myofascial pain. It is necessary to further study the optimal acupoints and treatment time to achieve the best therapeutic effect. |

#### 1.1.2. Lenoir 2020 ★★★

Lenoir D, De Pauw R, Van Oosterwijck S, Cagnie B, Meeus M. Acupuncture Versus Sham Acupuncture: A Meta-Analysis on Evidence for Longer-term Effects of Acupuncture in Musculoskeletal Disorders. Clin J Pain. 2020;36(7):533-549. [221040]. #https://doi.org/10.1097/ajp.0000000000000812

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| **Objective** | Acupuncture is a common modality in the therapy of musculoskeletal disorders. The evidence for acupuncture has been examined frequently, but a clear synthesis of previous research is currently lacking. This meta-analysis aimed to summarize the evidence for nonimmediate effects of acupuncture on pain, functionality, and quality of life in patients with musculoskeletal disorders, when compared with sham acupuncture. |
| **Methods** | Search results from PubMed and Web of Science were brought together. All screening procedures were executed twice by 2 independent researchers. The pooled standardized mean difference (SMD) with its confidence interval (CI) was estimated at follow-up at <1 month, 1 to 3 months, 3 to 6 months, and >6 months. |
| **Results** | For pain, the SMD equalled respectively -0.47 (CI -0.76 to -0.19), -0.27 (CI -0.44 to -0.11), -0.32 (CI -0.51 to -0.13) and -0.12 (CI -0.36 to 0.11) for <1 month, 1 to 3 months, 3 to 6 months, and >6 months follow-up. For functionality, the pooled SMD equalled -0.43 (CI -0.76 to -0.10), -0.41 (CI -0.76 to -0.05), 0.07 (CI -0.22 to 0.36), and -0.13 (-0.46 to 0.19). In the area of QOL, pooled SMD of respectively 0.20 (CI 0.04 to 0.35), 0.19 (CI -0.01 to 0.39), 0.02 (CI -0.09 to 0.14) and -0.04 (CI -0.25 to 0.16) were obtained. |
| **Discussion** | A significant difference in therapy effect, favoring acupuncture, was found for pain at <1 month, 1 to 3 months, and 3 to 6 months, as well as on quality of life at <1 month, and on functionality at <1 month and 1 to 3 months. |

### 1.1.3. Vickers 2018 ★★★

Vickers AJ, Vertosick EA, Lewith G et al, Acupuncture Trialists' Collaboration. Acupuncture for Chronic Pain: Update of an Individual Patient Data Meta-Analysis. J Pain. 2018 May;19(5):455-474. [168043]

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| **Purpose** | Our objective was to update an individual patient data meta-analysis to determine the effect size of acupuncture for 4 chronic pain conditionss. |
| **Methods** | We searched MEDLINE and the Cochrane Central Registry of Controlled Trials randomized trials published up until December 31, 2015. We included randomized trials of acupuncture needling versus either sham acupuncture or no acupuncture control for nonspecific musculoskeletal pain, osteoarthritis, chronic headache, or shoulder pain. Trials were only included if allocation concealment was unambiguously determined to be adequate. Raw data were obtained from study authors and entered into an individual patient data meta-analysis. |
| **Results** | The main outcome measures were pain and function. An additional 13 trials were identified, with data received for a total of 20,827 patients from 39 trials. **Acupuncture was superior to sham as well as no acupuncture control for each pain condition (all P < .001) with differences between groups close to .5 SDs compared with no acupuncture control and close to .2 SDs compared with sham. We also found clear evidence that the effects of acupuncture persist over time with only a small decrease, approximately 15%, in treatment effect at 1 year.** In secondary analyses, we found no obvious association between trial outcome and characteristics of acupuncture treatment, but effect sizes of acupuncture were associated with the type of control group, with smaller effects sizes for sham controlled trials that used a penetrating needle for sham, and for trials that had high intensity of intervention in the control arm. **We conclude that acupuncture is effective for the treatment of chronic pain, with treatment effects persisting over time.** Although factors in addition to the specific effects of needling at correct acupuncture point locations are important contributors to the treatment effect, decreases in pain after acupuncture cannot be explained solely in terms of placebo effects. Variations in the effect size of acupuncture in different trials are driven predominantly by differences in treatments received by the control group rather than by differences in the characteristics of acupuncture treatment. |

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| **Perspective** | **Acupuncture is effective for the treatment of chronic musculoskeletal, headache, and osteoarthritis pain. Treatment effects of acupuncture persist over time and cannot be explained solely in terms of placebo effects.** Referral for a course of acupuncture treatment is a reasonable option for a patient with chronic pain.. |

### 1.1.4. Wang 2017 ★★

Wang R, Li X, Zhou S, Zhang X, Yang K, Li X. Manual acupuncture for myofascial pain syndrome: a systematic review and meta-analysis. Acupunct Med. 2017. 35(4):241-50. [191058].

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| **Objectives** | To assess the efficacy of manual acupuncture (MA) in the treatment of myofascial pain syndrome (MPS). |
| **Methods** | We searched for randomised controlled trials (RCTs) comparing MA versus sham/placebo or no intervention in patients with MPS in the following databases from inception to January 2016: PubMed; Cochrane Library; Embase; Web of Science; and China Biology Medicine. Two reviewers independently screened the literature extracted data and assessed the quality of the included studies according to the risk of bias tool recommended by the Cochrane Handbook (V.5.1.0). Then, a meta-analysis was performed using RevMan 5.3 software. |
| **Results** | **Ten RCTs** were combined in a meta-analysis of MA versus sham, which showed a favourable effect of MA on pain intensity after stimulation of myofascial trigger points (MTrPs; standardised mean difference (SMD) -0.90, 95% CI -1.48 to -0.32; p=0.002) but not traditional acupuncture points (p>0.05). Benefit was seen both after a single treatment (SMD -1.05, 95% CI -1.84 to -0.27; p=0.009) and course of eight sessions (weighted mean difference (WMD) -1.96, 95% CI -2.72 to -1.20; p<0.001). We also found a significant increase in pressure pain threshold following MA stimulation of MTrPs (WMD 1.00, 95% CI 0.32 to 1.67; p=0.004). Two of the included studies reported mild adverse events (soreness/haemorrhage) secondary to MA. |
| **Conclusions** | Through stimulation of MTrPs, **MA might be efficacious in terms of pain relief and reduction of muscle irritability in MPS patients.** Additional well-designed/reported studies are required to determine the optimal number of sessions for the treatment of MPS. |

### 1.1.5. Yuan 2016 ★★★

Yuan QL, Wang P, Liu L, Sun F, Cai YS, Wu WT, Ye ML, Ma JT, Xu BB, Zhang YG. Acupuncture for musculoskeletal pain: A meta-analysis and meta-regression of sham-controlled randomized clinical trials. Sci Rep. 2016. [164489].

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| **Aims** | The aims of this systematic review were to study the analgesic effect of real acupuncture and to explore whether sham acupuncture (SA) type is related to the estimated effect of real acupuncture for musculoskeletal pain. |
| **Methods** | Five databases were searched. The outcome was pain or disability immediately (≤1 week) following an intervention. Standardized mean differences (SMDs) with 95% confidence intervals were calculated. Meta-regression was used to explore possible sources of heterogeneity. |

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| **Results** | Sixty-three studies (6382 individuals) were included. Eight condition types were included. The pooled effect size was moderate for pain relief (59 trials, 4980 individuals, SMD -0.61, 95% CI -0.76 to -0.47; P < 0.001) and large for disability improvement (31 trials, 4876 individuals, -0.77, -1.05 to -0.49; P < 0.001). In a univariate meta-regression model, sham needle location and/or depth could explain most or all heterogeneities for some conditions (e.g., shoulder pain, low back pain, osteoarthritis, myofascial pain, and fibromyalgia); however, the interactions between subgroups via these covariates were not significant (P < 0.05). |
| **Conclusions** | Our review provided low-quality evidence that real acupuncture has a moderate effect (approximate 12-point reduction on the 100-mm visual analogue scale) on musculoskeletal pain. SA type did not appear to be related to the estimated effect of real acupuncture. |

### 1.1.6. Vickers 2012 ★★★

Vickers AJ, Cronin AM, Maschino AC, et al; Acupuncture Trialists'Collaboration. Acupuncture for chronic pain: individual patient data meta-analysis. Arch Intern Med 2012;172:1444-53. [157530]

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| **Purpose** | We aimed to determine the effect size of acupuncture for 4 chronic pain conditions: **back and neck pain**, osteoarthritis, chronic headache, and shoulder pain. |
| **Methods** | We conducted a systematic review to identify randomized controlled trials (RCTs) of acupuncture for chronic pain in which allocation concealment was determined unambiguously to be adequate. Individual patient data meta-analyses were conducted using data from **29 of 31 eligible RCTs, with a total of 17 922 patients** analyzed. |
| **Results** | In the primary analysis, including all eligible RCTs, **acupuncture was superior to both sham and noacupuncture control for each pain condition** (P< .001 for all comparisons). After exclusion of an outlying set of RCTs that strongly favored acupuncture, the effect sizes were similar across pain conditions. Patients receiving acupuncture had less pain, with scores that were 0.23(95% CI, 0.13-0.33),0.16 (95% CI, 0.07-0.25), and 0.15 (95% CI, 0.07-0.24) SDs lower than sham controls for **back and neck pain**, osteoarthritis, and chronic headache, respectively; the effect sizes in comparison to noacupuncture controls were 0.55 (95% CI, 0.51-0.58), 0.57(95% CI, 0.50-0.64), and 0.42 (95% CI, 0.37-0.46) SDs. These results were robust to a variety of sensitivity analyses, including those related to publication bias. |
| **Conclusion** | **Acupuncture is effective for the treatment of chronic pain and is therefore a reasonable referral option. Significant differences between true and sham acupuncture indicate that acupuncture is more than a placebo**. However, these differences are relatively modest, suggesting that factors in addition to the specifice effects of needling are important contributors to the therapeutic effects of acupuncture.]. |

### 1.1.7. Pfefer 2009 (tendinopathy) ★

Pfefer Mt, Cooper Sr, Uhl Nl. Chiropractic management of tendinopathy: a literature synthesis. J Manipulative Physiol Ther. 2009;32(1):41-52. [153243].

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| **Background** | Chronic tendon pathology is a soft tissue condition commonly seen in chiropractic practice. Tendonitis, tendinosis, and tendinopathy are terms used to describe this clinical entity. The purpose of this article is to review interventions commonly used by doctors of chiropractic when treating tendinopathy. |

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| **Methods** | The Scientific Commission of the Council on Chiropractic Guidelines and Practice Parameters (CCGPP) was charged with developing literature syntheses, organized by anatomical region, to evaluate and report on the evidence base for chiropractic care. This article is the outcome of this charge. As part of the CCGPP process, preliminary drafts of these articles were posted on the CCGPP Web site www.ccgpp.org (2006-8) to allow for an open process and the broadest possible mechanism for stakeholder input. A literature search was performed using the PubMed; Cumulative Index to Nursing and Allied Health Literature; Index to Chiropractic Literature; Manual, Alternative, and Natural Therapy Index System; National Guidelines Clearinghouse; Database of Abstracts of Reviews of Effects; and Turning Research Into Practice databases. The inclusion criteria were manual therapies, spinal manipulation, mobilization, tendonitis, tendinopathy, tendinosis, cryotherapy, bracing, orthotics, massage, friction massage, transverse friction massage, electrical stimulation, **acupuncture**, exercise, eccentric exercise, laser, and therapeutic ultrasound. |
| **Results** | There is evidence that ultrasound therapy provides clinically important improvement in the treatment of calcific tendonitis. There is limited evidence of the benefit of manipulation and mobilization in the treatment of tendinopathy. **Limited evidence exists to support the use of** supervised exercise, eccentric exercise, friction massage, **acupuncture, laser therapy**, use of bracing, orthotics, and cryotherapy in the treatment of tendinopathy. |
| **Conclusion** | Chiropractors often provide a number of conservative interventions commonly used to treat tendinopathy. |

### 1.1.8. Weiner 2004 Ø

Weiner Dk, Ernst E. Complementary and alternative approaches to the treatment of persistent musculoskeletal pain. Clinical Journal of Pain. 2004;20(4):244-55.[135602].

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| **Objective** | To review common complementary and alternative treatment modalities for the treatment of persistent musculoskeletal pain in older adults. |
| **Methods** | A critical review of the literature on acupuncture and related modalities, herbal therapies, homeopathy, and spinal manipulation was carried out. Review included 678 cases within 21 randomized trials and 2 systematic reviews of herbal therapies: 798 cases within 2 systematic reviews of homeopathy; 1,059 cases within 1 systematic review of spinal manipulation for low back pain, and 419 cases within 4 randomized controlled trials for neck pain. The review of acupuncture and related modalities was based upon a paucity of well-controlled studies combined with our clinical experience. |
| **Results** | **Insufficient experimental evidence exists to recommend the use of traditional Chinese acupuncture over other modalities for older adults with persistent musculoskeletal pain**. Promising preliminary evidence exists to support the use of percutaneous electrical nerve stimulation for persistent low back pain. While some herbals appear to have modest analgesic benefits, insufficient evidence exists to definitively recommend their use. Drug-herb interactions must also be considered. Some evidence exists to support the superiority of homeopathic remedies over placebo for treating osteoarthritis and rheumatoid arthritis. The benefits of spinal manipulation for persistent low back and neck pain have not been convincingly shown to outweigh its risks. |
| **Discussion** | While the use of complementary and alternative modalities for the treatment of persistent musculoskeletal pain continues to increase, rigorous clinical trials examining their efficacy are needed before definitive recommendations regarding the application of these modalities can be made. |

#### 1.1.9. Hodges 2002 Ø

Hodges I, Maskill C. Effectiveness of acupuncture for the treatment and rehabilitation of accident-related musculoskeletal disorders. A systematic review of the literature. Nzhta Report. 2002;5(3):106p.[141009]..

> This report systematically reviewed relevant randomised controlled trials of acupuncture therapy in order to assess the effectiveness of acupuncture for the treatment and rehabilitation of musculoskeletal injuries. **Six RCTs** met the inclusion criteria for the review, including the requirement that over 90 percent of trial subjects plainly had musculoskeletal disorders consistent with injury. In three of the trials, all the subjects had lateral elbow pain. In another two of the trials, all the subjects had rotator-cuff tendinitis. In the remaining trial, all the subjects had patellofemoral pain syndrome. Other RCTs were identified where all the subjects had injury-related musculoskeletal disorders such as carpal tunnel syndrome, plantar fasciitis, sciatica or whiplash. However, none of these trials fully met the inclusion criteria for the review. The same was the case for RCTs assessing the effectiveness of needle acupuncture for treating patients with pain of diverse or unknown aetiology in the back, neck or shoulder. Given the very small number of eligible RCTs identified, and their heterogeneity, it is not possible for this review to reach any strong conclusions about the effectiveness of acupuncture for the treatment and rehabilitation of musculoskeletal injuries. Acupuncture is considered by practitioners to be useful for treating a wide range of musculoskeletal disorders, including many common disorders thought to be caused primarily by injury. **However, RCTs have investigated acupuncture's effectiveness for treating only a very limited subset of these disorders.** Of the injury-related conditions covered to date in acupuncture RCTs, the most frequently studied has been lateral elbow pain. Altogether, six trials consisting entirely of patients with this condition have been published. However, only three of these qualified for inclusion in this review.

## 1.2. Special Acupuncture Techniques

### 1.2.1. Sham Acupuncture

#### 1.2.1.1. Yu 2023

Yu C, Zhang R, Shen B, Li X, Fang Y, Jiang Y, Jian G. Effects of sham acupuncture for chronic musculoskeletal pain syndrome: A systematic review and network meta-analysis of randomized controlled trials. Medicine (Baltimore). 2023 Nov 17;102(46):e35275. https://doi.org/10.1097/MD.0000000000035275

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|---|---|
| **Background** | Acupuncture has been widely used for chronic musculoskeletal pain syndrome (MPS). Due to the strong influence of sham acupuncture (SA) in clinical trials, the treatment of MPS by acupuncture remains controversial. Different types of SA procedures might produce different responses. The purpose of this systematic review was to assess the effect of SA on MPS. |
| **Methods** | We searched 8 literature databases for randomized controlled trials (RCTs) on acupuncture for chronic MPS with SA as a control from database inception to November 29, 2022. SA included superficial acupuncture on non-acupoints (SANAs), non-penetration on acupoints (NPAs), and non-penetration on non-acupoints (NPNAs). Two independent reviewers assessed the risk of bias and conducted the research selection, data extraction, and quality assessment of the included RCTs. We conducted data analysis using the RevMan 5.3 and STATA 14 software packages, and traditional meta-analysis was adopted for direct comparison. A network meta-analysis (NMA) was executed using frequency models in which we combined all available direct and indirect evidence from RCTs. The pain-related indicators were set as primary outcomes, and GRADEpro online was implemented for the assessment of evidence quality. |

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| **Results** | Forty-two RCTs were included in this study, encompassing a total of 6876 patients and incorporating 3 types of SA procedures. In our traditional meta-analysis, true acupuncture (TA) was more effective than SANAs, NPAs, and NPANAs concerning MPS. In the NMA, TA was the most effective modality, followed by SANAs, NPAs and NPANAs, and then the blank control (BC). In this NMA and according to the therapeutic effects in the pain indicators, the rankings of SA were as follows: SANA (surface under the cumulative ranking curve [SUCRA], 65.3%), NPA (SUCRA, 46.2%), and NPANA (SUCRA, 34.2%). The quality of the evidence for outcomes ranged from “low” to “moderate.” |
| **Conclusions** | Compared with SA, TA was effective in treating MPS. The effects produced by different SA procedures were different, and the order of effects from greatest to least was as follows: SANA, NPA, and NPANA. |

### 1.2.2. Comparison of Acupuncture techniques

#### 1.2.2.1. Liu 2025

Liu Z, Cheng Z, Zhang K, Lin X, Fu Y, Wang L, Zhang Q, Zhang F, Wu X, Dong B. Comparison of the efficacy of acupoint stimulation therapy in the treatment of pain in musculoskeletal diseases: A network meta-analysis based on randomized controlled trials. J Back Musculoskelet Rehabil. 2025 Jul 15:10538127251358729. https://doi.org/10.1177/10538127251358729

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| **Background** | Orthopedic patients often present with significant pain symptoms, which can impact both the physical and mental well-being of patients, emerging as a significant concern. Given its safety, effectiveness, and absence of side effects, acupoint therapy is being increasingly utilized in the pain management of orthopedic patients. This study conducted a network meta-analysis to compare analgesic efficacy, safety, and effectiveness of acupuncture (AP), electroacupuncture (EA), moxibustion, and acupressure, so as to provide a reference for the clinical application of acupoint therapies in managing orthopedic pain. |
| **Methods** | Eight databases, including PubMed, Embase, Cochrane Library, Web of Science, CNKI, Wanfang Data, and VIP, were searched for clinical randomized controlled trials (RCTs) investigating the effects of AP, EA, moxibustion, and acupressure on orthopedic pain. The quality of the included documents was evaluated using the Cochrane Risk of Bias Tool, and graphs regarding the risk of bias and network meta-analysis were drawn by Revman 5.2, Stata 18.0 and R software (v4.3.2). Intervention ranking probabilities were quantified using SUCRA values derived from a Bayesian random-effects model. |
| **Results** | 1) For decreasing Visual Analogue Scale (VAS) scores in patients with orthopedic pain, moxibustion therapy was identified as the optimal intervention (SUCRA=94.84%); 2) For decreasing VAS scores in patients with orthopedic pain undergoing surgical intervention, AP therapy was identified as the optimal intervention (SUCRA=76.99%); 3) For decreasing VAS scores in patients with orthopedic pain not undergoing surgical intervention, moxibustion therapy was identified as the optimal intervention (SUCRA=90.26%); 4) AP therapy (SUCRA=83.73%) demonstrated the most favorable safety profile; 5) Acupressure therapy (SUCRA=77.93%) was identified as the most effective therapeutic method. |
| **Conclusion** | It is recommended to select differentiated acupoint therapies tailored to the type of orthopedic pain. Specifically, post-operative patients with orthopedic pain should prioritize AP, while moxibustion is advised for non-surgical patients. |

### 1.2.3. Acupotomy

#### 1.2.3.1. You 2026

You J, Luo J, Huang C, Lai W, Zou Y, Li Y. Acupotomy for myofascial pain syndrome: A systematic review and meta-analysis with trial sequential analysis. Eur J Integr Med. 2026;86:102700. https://doi.org/10.1016/j.eujim.2026.102700

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| **Introduction** | Myofascial pain syndrome (MPS) is one of the most common causes of musculoskeletal pain. Acupotomy has been widely used in the management of musculoskeletal pain. However, its efficacy for MPS remains inconclusive. The purpose of this study was to evaluate the current evidence on the effectiveness of single acupotomy for MPS. |
| **Methods** | Eight databases were searched to identify randomized controlled trials (RCTs) of acupotomy for MPS published before March 2026. The methodological quality of the included trials was assessed by the Cochrane Risk of Bias 2.0 tool. A meta-analysis was performed using R 4.3.2 and the strength of evidence was graded using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. The Trial Sequential Analysis (TSA) was performed to assess the sufficiency of evidence. |
| **Results** | **Thirteen studies involving 959 MPS participants** were included in this review. Meta-analyses showed a favorable effect of acupotomy in debasing Visual Analogue Scale pain score (mean difference [MD] = -1.32, 95% confidence interval [CI] = [-1.67, -0.97], P < 0.0001) and Roland-Morris Disability Questionnaire scores (MD = -4.15, 95% CI = [-5.92, -2.38], P < 0.0001) compared with the control group. Acupotomy also appeared to significantly reduce Neck Disability Index scores (MD = -3.54, 95% CI = [-4.54, -2.53], P < 0.0001) compared to the acupuncture group. In addition, no adverse reactions involving acupotomy were reported in any of the included RCTs. The TSA results again confirmed the robustness of the findings in this study. The certainty of evidence was all graded as very low. |
| **Conclusions** | Based on limited evidence, acupotomy might have some positive effects on MPS, but its safety remains uncertain. Given the considerable heterogeneity and the low level of evidence in this review, these findings should be interpreted with caution. |

#### 1.2.3.2. Liu 2016

Liu T, Peng Y, Zhu S, Chen H, Li F, Hong P, Cao B, Peng B, Fan Y, Chen Y, Zhang L. Effect of miniscalpel-needle on relieving the pain of myofascial pain syndrome: a systematic review. J Tradit Chin Med. 2015;35(6):613-9.[181860]..

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| **Objective** | To evaluate the effect and safety of miniscalpel-needle (MSN) on reducing the pain of myofascial pain syndrome (MPS). |
| **Methods** | We reviewed the available literatures inception up to February 2014 using Pubmed, EMBASE, Cochrane Library, Chinese National Knowledge Infrastructure Database, Chinese Biomedical Database and Wanfang Database. |
| **Results** | **Eight randomized controlled trials** were finally identified. The main controls involved acupuncture, medications, injection, massage and cupping. We found that all of the studies agreed on the potential benefit of MSN as a strategy for MPS and the superiority compared to the controls, however, randomized methods applied in most of the trials could be criticized for their high or unclear risk of bias. Further research is also needed to clarify questions around the appropriate frequency and number of treatment sessions of MSN. |
| **Conclusion** | This review shows that **MSN might have the effect on MPS**, even though there were some limitations in the studies included in the review. Studies with robust methodology are warranted to further test its pain-relieving effect on MPS. |

### 1.2.4. Bee Acupuncture

#### 1.2.4.1. Sung 2025

Sung SH, Jang S, Lee G, Park JK, Lee S, Shin BC. Bee venom acupuncture for musculoskeletal pain conditions: an updated systematic review and meta-analysis. BMC Complement Med Ther. 2025 Apr 28;25(1):161. https://doi.org/10.1186/s12906-025-04891-1

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| **Background** | An updated systematic review of randomized controlled trials (RCTs) was conducted to evaluate the clinical evidence for the use of BVA for musculoskeletal pain. |
| **Methods** | We searched 13 electronic databases up to December 2024 with no language restrictions. Since 2008, nine RCTs have been additionally identified, so a total of **20 trials** were included in our updated review. |
| **Results** | In a meta-analysis of 2 RCTs, pain was significantly reduced with BVA compared to sham injection of normal saline (10-cm visual analog scale [VAS]; mean difference [MD]: -16.93; 95% confidence interval [CI] = -26.35 to -7.51, P = 0.0004, n = 85; heterogeneity: I2 = 0%). The meta-analysis of 5 RCTs comparing BVA plus acupuncture to saline injection plus acupuncture showed significant improvements in the 10-cm VAS (MD: -1.24; 95% CI = -1.63 to -0.85, P < 0.00001, n = 152; heterogeneity: I2 = 16%). No severe side effects such as anaphylaxis were observed in any of the eight trials. |
| **Conclusion** | BVA appeared to improve musculoskeletal pain conditions compared to sham injections. However, the meta-analysis included only a limited number of RCTs with small sample sizes, and there was considerable clinical heterogeneity in terms of pain types, dosage, and concentration of BVA, which restricts the ability to draw definitive conclusions. |

#### 1.2.4.2. Lee 2008

Lee MS, Pittler MH, Shin BC, Kong JC, Ernst E. Bee venom acupuncture for musculoskeletal pain: a review. J Pain. 2008. (4):289-97. doi: 10.1016/j.jpain.2007.11.012.[147970].

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| **Purpose** | The objective of this systematic review was to evaluate the evidence for the effectiveness of BVA in the treatment of musculoskeletal pain. |
| **Methods** | Seventeen electronic databases were systematically searched up to September 2007 with no language restrictions. All randomized clinical trials (RCTs) of BVA for patients with musculoskeletal pain were considered for inclusion if they included placebo controls or were controlled against a comparator intervention. Methodology quality was assessed and, where-possible, statistical pooling of data was performed. |
| **Results** | A total of 626 possibly relevant articles were identified, of which **11 RCTs** met our inclusion criteria. Four. RCTs that tested the effects of BVA plus classic acupuncture compared with saline injection plus classic acupuncture were included in the main meta-analysis. Pain was significantly lower with BVA plus classic acupuncture than with saline injection plus classic acupuncture (weighted mean difference: 100-mm visual analog scale, 14.0 mm, 95% Cl = 9.5-18.6, P < .001, n = 112; heterogeneity: 72 = 0, x2 = 1.92, P = .59, 12 = 0%). |
| **Conclusion** | Our results provide suggestive evidence for the effectiveness of BVA in treating musculoskeletal pain. However, the total number of RCTs included in the analysis and the total sample size were too small to draw definitive conclusions. |

### 1.2.5. Laser acupuncture

#### 1.2.5.1. Lee 2026

Front Neurol. 2026 Jan 12;16:1672380. Laser acupuncture in the treatment of musculoskeletal disorders: systematic review and meta-analysis. Lee S, Son E, Bae Y, Kim HJ, Lee S, Kim J, Kim JG, Chae Y, Jang IS, Lee IS. https://doi.org/10.3389/fneur.2025.1672380

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| **Background** | Laser acupuncture, which involves laser stimulation of acupuncture points including traditional acupoints, Ashi, and trigger points, combines the benefits of photobiomodulation and acupuncture effects. Evidence from randomized controlled trials and systematic reviews suggests that laser acupuncture and lowlevel laser therapy can reduce pain, improve functional outcomes, and decrease disability in patients with musculoskeletal disorders. However, the field is relatively new and involves complex mechanisms, leading to varied opinions on its benefits. Standardized, condition-specific stimulation protocols for laser acupuncture have not yet been established, as existing studies report heterogeneous parameters and lack consistent reporting practices. One major challenge in validating the clinical effects of laser acupuncture is the inconsistency in nomenclature and the lack of consensus on critical parameters and clinical guidelines. |
| **Objective** | This study aims to provide a descriptive synthesis of existing clinical evidence on laser acupuncture for musculoskeletal disorders and to describe the range and reporting quality of laser-related parameters used in these studies. In doing so, it offers a basis for future efforts to harmonize reporting and clinical practice. |
| **Methods** | We reviewed **28 randomized controlled trials** focused on laser acupuncture for musculoskeletal disorders and conducted a meta-analysis on 14 of these studies. Key variables included laser type, wavelength, mode, duration, frequency, irradiance, power density, area, density/probe, total exposure energy, exposure time, treatment frequency and duration, and clinical outcomes. |
| **Results** | Our findings revealed that many studies did not distinguish terms like Low-Intensity Laser Therapy from laser acupuncture, and lacked detailed descriptions of laser parameters, which could affect outcomes. The complexity of laser acupuncture mechanisms and its diverse variables make it challenging to understand which factors impact therapeutic effects. |
| **Conclusion** | Therefore, it is crucial to detail all possible variables in future research to clarify the relationship between dosage and treatment effects. Finally, due to challenges in applying current guidelines, new guidelines specifically for laser acupuncture research may be necessary. |

#### 1.2.5.2. Hung 2021

Hung YC, Lin PY, Chiu HE, Huang PY, Hu WL. The Effectiveness of Laser Acupuncture for Treatment of Musculoskeletal Pain: A Meta-Analysis of Randomized Controlled Studies. J Pain Res. 2021:1707-1719. [219489]. doi

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| **Objective** | To evaluate the treatment effectiveness of laser acupuncture (LA) in patients with musculoskeletal pain. |

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| **Methods** | Major electronic databases, including Medline, PubMed, Embase, Cochrane Library, CINAHL, and Scopus were searched to identify double-blind, randomized controlled trials of LA in musculoskeletal disorders. The primary outcome was the treatment efficacy for pain. The secondary outcomes included the comparison of disability, functional impairment, and dropout rate between LA and sham treatment, as well as the effect of sham treatment for pain. The results from included studies were synthesized with the random effects model. |
| **Results** | In total, **20 articles** comprising 568 patients receiving LA and 534 patients receiving sham treatment were included in the current study. Our analysis showed LA significantly reduced pain (g=0.88, 95% confidence interval [CI]=0.35 to 1.42, p=0.001), disability (g=0.68, 95% CI=0.29 to 1.08, p<0.001), and functional impairment (g=0.67, 95% CI=0.32 to 1.03, p<0.001). Through meta-regression analysis, we found these effects were not moderated by mean age, the percentage of females, or treatment duration. Additionally, there was no significant difference between the two groups in dropout rate (risk ratio=0.73, p=0.08), and the sham treatment significantly reduced only pain intensity (g=0.54, 95% CI=0.32 to 0.77, p<0.001). |
| **Conclusion** | Our findings supported that LA significantly reduced pain, disability, and functional impairment in patients with musculoskeletal disorders. Further researches are required to determine the optimal therapeutic parameters and the suitable patients for receiving LA. |

#### 1.2.5.3. Law 2015 ★

Law D, McDonough S, Bleakley C, Baxter GD, Tumilty S. Laser acupuncture for treating musculoskeletal pain: a systematic review with meta-analysis. J Acupunct Meridian Stud. 2015 Feb;8(1):2-16. doi: 10.1016/j.jams.2014.06.015. [176028].

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| **Purpose** | This systematic review aims to evaluate the effects of laser acupuncture on pain and functional outcomes when it is used to treat musculoskeletal disorders and to update existing evidence with data from recent randomized controlled trials (RCTs). |
| **Methods** | A computer-based literature search of the databases MEDLINE, AMED, EMBASE, CINAHL, SPORTSDiscus, Cochrane Library, PubMed, Current Contents Connect, Web of Science, and SCOPUS was used to identify RCTs comparing between laser acupuncture and control interventions. A meta-analysis was performed by calculating the standardized mean differences and 95% confidence intervals, to evaluate the effect of laser acupuncture on pain and functional outcomes. Included studies were assessed in terms of their methodological quality and appropriateness of laser parameters. **Fortynine RCTs** met the inclusion criteria. |
| **Results** | Two-thirds (31/49) of these studies reported positive effects, were of high methodological quality, and reported the dosage adequately. Negative or inconclusive studies commonly failed to demonstrate these features. For all diagnostic subgroups, positive effects for both pain and functional outcomes were more consistently seen at long-term follow-up rather than immediately after treatment. |
| **Conclusion** | **Moderate-quality evidence supports the effectiveness of laser acupuncture in managing. musculoskeletal pain when applied in an appropriate treatment dosage**; however, the positive effects are seen only at long-term follow-up and not immediately after the cessation of treatment. |

### 1.2.6. Dry needling

#### 1.2.6.1. Zhao 2025

Zhao Y, Yang Y, Kong X, Liu J, Hong J, Yang Y, Zhao Y, Huang X, Ma X. Needling trigger points for treating myofascial pain syndrome: A systematic review and meta-analysis. Complement Ther Clin Pract. 2025 Mar 26;59:101978. https://doi.org/10.1016/j.ctcp.2025.101978

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| **Background** | Myofascial pain syndrome (MPS) is a widespread musculoskeletal disorder characterized by myofascial trigger points. Needling trigger points is one of the most common therapeutic interventions to treat MPS. However, it is unclear whether needling trigger points is superior to other non-pharmacological interventions. |
| **Methods** | Randomized clinical trials (RCTs) which compared the effectiveness of needling trigger points and other non-pharmacological therapies for treating MPS, were searched in the databases of PubMed, Web of Science, Embase, Cochrane Library, CNKI, WanFang, VPCS, and Sinomed, from their inception to August 25th, 2024. Two independent reviewers extracted relevant data on study characteristics and assessed the risk of bias using the Cochrane Risk of Bias Tool. |
| **Results** | Of the 1968 articles initially screened, **13 RCTs were included**. Needling trigger points treatment were more efficacious than non-pharmacological therapies in reducing Visual Analog Scale (VAS) scores (MD = -1.32; 95 % CI = -1.84 to -0.81; P < 0.0001) and the Roland-Morris Disability Questionnaire (RMDQ) scores (MD = -2.77; 95 % CI = -3.58 to -1.97; P < 0.0001). |
| **Conclusion** | This systematic review has shown that needling trigger points could be a more effective option than other non-pharmacological therapies to improve the symptoms of MPS. Clinical trials of robust quality are required to promote further the evidence-based application of needling trigger points for MPS. |

#### 1.2.6.2. Charles 2024

Charles D, Hudgins T, MacNaughton J, Newman E, Tan J, Wigger M. A systematic review of manual therapy techniques, dry cupping and dry needling in the reduction of myofascial pain and myofascial trigger points. J Bodyw Mov Ther. 2019 Jul;23(3):539-546. https://doi.org/10.1016/j.jbmt.2019.04.001

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| **Introduction** | Myofascial pain with myofascial triggers are common musculoskeletal complaints. Popular treatments include manual therapy, dry needling, and dry cupping. The purpose of this systematic review was to compare the efficacy of each treatment in the short-term relief of myofascial pain and myofascial trigger points. |
| **Methods** | Search engines included Google Scholar, EBSCO Host, and PubMed. Searches were performed for each modality using the keywords myofascial pain syndrome and myofascial trigger points. The inclusion criteria included English-language, peer-reviewed journals; a diagnosis of myofascial pain syndrome or trigger points; manual therapy, dry needling, or dry cupping treatments; retrospective studies or prospective methodology; and inclusion of outcome measures. |
| **Results** | Eight studies on manual therapy, twenty-three studies on dry needling, and two studies on dry cupping met the inclusion criteria. The Physiotherapy Evidence Database (PEDro) was utilized to assess the quality of all articles. |
| **Discussion** | While there was a moderate number of randomized controlled trials supporting the use of manual therapy, the evidence for dry needling ranged from very low to moderate compared to control groups, sham interventions, or other treatments and there was a paucity of data on dry cupping. Limitations included unclear methodologies, high risk for bias, inadequate blinding, no control group, and small sample sizes. |
| **Conclusion** | While there is moderate evidence for manual therapy in myofascial pain treatment, the evidence for dry needling and cupping is not greater than placebo. Future studies should address the limitations of small sample sizes, unclear methodologies, poor blinding, and lack of control groups. |

#### 1.2.6.3. Griswold 2024

Griswold D, Learman K, Ickert E, Clewley D, Donaldson MB, Wilhelm M, Cleland J. Comparing dry needling or local acupuncture to various wet needling injection types for musculoskeletal pain and disability. A systematic review of randomized clinical trials. Disabil Rehabil. 2024 Feb;46(3):414-428. https://doi.org/10.1080/09638288.2023.2165731

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| **Purpose** | Systematically evaluate the comparative effectiveness of dry needling (DN) or local acupuncture to various types of wet needling (WN) for musculoskeletal pain disorders (MPD). |
| **Methods** | Seven databases (PubMed, PEDro, SPORTDiscus, CINAHL, Scopus, Embase, and Cochrane Central Register of Controlled Trials) were searched following PROSPERO registration. Randomized clinical trials were included if they compared DN or local acupuncture with WN for MPD. Primary outcomes were pain and/or disability. The Revised Cochrane Collaboration tool (RoB 2.0) assessed the risk of bias. |
| **Results** | **Twenty-six studies** were selected. Wet Needling types included cortisone (CSI) (N = 5), platelet-rich plasma (PRP) (N = 6), Botox (BoT) (N = 3), and local anesthetic injection (LAI) (N = 12). Evidence was rated as low to moderate quality. Results indicate DN produces similar effects to CSI in the short-medium term and superior outcomes in the long term. In addition, DN produces similar outcomes compared to PRP in the short and long term and similar outcomes as BoT in the short and medium term; however, LAI produces better pain outcomes in the short term. |
| **Conclusion** | Evidence suggests the effectiveness of DN to WN injections is variable depending on the injection type, outcome time frame, and diagnosis. In addition, adverse event data were similar but inconsistently reported. |

#### 1.2.6.4. Khan 2021

Khan I, Ahmad A, Ahmed A, Sadiq S, Asim HM. Effects of dry needling in lower extremity myofascial trigger points. J Pak Med Assoc. 2021 Nov;71(11):2596-2603. https://doi.org/10.47391/JPMA.01398

#### 1.2.6.5. Sousa Filho 2021

Sousa Filho LF, Barbosa Santos MM, Dos Santos GHF, da Silva Júnior WM. Corticosteroid injection or dry needling for musculoskeletal pain and disability? A systematic review and GRADE evidence synthesis. Chiropr Man Therap. 2021 Dec 2;29(1):49. https://doi.org/10.1186/s12998-021-00408-y

#### 1.2.6.6. Gattie 2017 ★★

Gattie E, Cleland JA, Snodgrass S. The Effectiveness of Trigger Point Dry Needling for Musculoskeletal Conditions by Physical Therapists: A Systematic Review and Meta-analysis. J Orthop Sports Phys Ther. 2017;47(3):133-149. [195934] .

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| **Objectives** | To examine the short- and long-term effectiveness of dry needling delivered by a physical therapist for any musculoskeletal pain condition |

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| **Methods** | Methods Electronic databases were searched. Eligible randomized controlled trials included those with human subjects who had musculoskeletal conditions that were treated with dry needling performed by a physical therapist, compared with a control or other intervention. The overall quality of the evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation. |
| **Results** | The initial search returned 218 articles. After screening, **13 were included**. Physiotherapy Evidence Database quality scale scores ranged from 4 to 9 (out of a maximum score of 10), with a median score of 7. Eight meta-analyses were performed. In the immediate to 12-week follow-up period, studies provided evidence that dry needling may decrease pain and increase pressure pain threshold when compared to control/sham or other treatment. At 6 to 12 months, dry needling was favored for decreasing pain, but the treatment effect was not statistically significant. Dry needling, when compared to control/sham treatment, provides a statistically significant effect on functional outcomes, but not when compared to other treatments. |
| **Conclusions** | Very low-quality to moderate-quality evidence suggests that **dry needling performed by physical therapists is more effective than no treatment, sham dry needling, and other treatments for reducing pain and improving pressure pain threshold in patients presenting with musculoskeletal pain in the immediate to 12-week follow-up period**. Low-quality evidence suggests superior outcomes with dry needling for functional outcomes when compared to no treatment or sham needling. However, no difference in functional outcomes exists when compared to other physical therapy treatments. Evidence of long-term benefit of dry needling is currently lacking. Level of Evidence Therapy, level 1a. |

#### 1.2.6.7. Espejo-Antunez 2017 ★

Espejo-Antúnez L, Tejeda JF, Albornoz-Cabello M, Rodríguez-Mansilla J, de la Cruz-Torres B, Ribeiro F, Silva AG. Dry needling in the management of myofascial trigger points: A systematic review of randomized controlled trials. Complementary Therapies in Medicine. 2017;33:46-57. [171571]. doi

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| **Objectives** | This systematic review of randomized controlled trials aimed to examine the effectiveness of dry needling in the treatment of myofascial trigger points and to explore the impact of specific aspects of the technique on its effectiveness. |
| **Methods** | Relevant studies published between 2000 and 2015 were identified by searching PubMed, Scopus, The Cochrane Library and Physiotherapy Evidence Database. Studies identified by electronic searches were screened against a set of pre-defined inclusion criteria. |
| **Results** | **Fifteen studies** were included in this systematic review. The main outcomes that were measured were pain, range of motion, disability, depression and quality of life. The results suggest that dry needling is effective in the short term for pain relief, increase range of motion and improve quality of life when compared to no intervention/sham/placebo. There is insufficient evidence on its effect on disability, analgesic medication intake and sleep quality. |
| **Conclusions** | Despite **some evidence for a positive effect in the short term**, further randomized clinical trials of high methodological quality, using standardized procedures for the application of dry needling are needed. |

#### 1.2.6.8. Liu 2017 ★★

Liu L, Huang QM, Liu QG, Thitham N, Li LH, Ma YT, Zhao JM. Evidence for Dry Needling in the Management of Myofascial Trigger Points Associated with Low Back Pain: A Systematic Review and Meta-analysis. Arch Phys Med Rehabil. 2017 Jul 6. pii: S0003-9993(17)30452-5.

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| **Objectives** | To evaluate the current evidence of the effectiveness of dry needling of myofascial trigger points (MTrPs) associated with low back pain (LBP). |
| **Methods** | DATA SOURCES: PubMed, Ovid, EBSCO, ScienceDirect, Web of Science, Cochrane Library, Cumulative Index to Nursing and Allied Health, and China National Knowledge Infrastructure databases were searched until January 2017. STUDY SELECTION: Randomized controlled trials (RCTs) that used dry needling as the main treatment and included participants diagnosed with LBP with the presence of MTrPs were included. DATA EXTRACTION: Two reviewers independently screened articles, scored methodological quality, and extracted data. The primary outcomes were pain intensity and functional disability at post-intervention and follow-up. |
| **Results** | A total of **11 RCTs involving 802 patients** were included in the meta-analysis. Results suggested that compared with other treatments, dry needling of MTrPs was more effective in alleviating the intensity of LBP (Standardized Mean Difference [SMD] = -1.06, 95% Confidence Interval [CI]: -1.77 to -0.36, P = 0.003) and functional disability (SMD = -0.76, 95% CI: -1.46 to -0.06, P = 0.03); however, the significant effects of dry needling plus other treatments on pain intensity could be superior to dry needling alone for LBP at post-intervention (SMD = 0.83, 95% CI: 0.55 to 1.11, P < 0.00001). |
| **Conclusions** | **Moderate evidence showed that dry needling of MTrPs, especially if associated with other therapies, could be recommended to relieve the intensity of LBP at post-intervention**; however, the clinical superiority of dry needling in improving functional disability and its follow-up effects still remain unclear. |

#### 1.2.6.9. Rodriguez-Mansilla 2016 ★

RodrIguez-Mansilla J, González-Sánchez B, De Toro García Á, Valera-Donoso E, Garrido-Ardila EM, Jiménez-Palomares M, González López-Arza MV. Effectiveness of dry needling on reducing pain intensity in patients with myofascial pain syndrome: a Meta-analysis. J Tradit Chin Med. 2016;36(1):1-13. [158454]. .

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| **Objective** | To summarize the literature about the effectiveness of dry needling (DN) on relieving pain and increasing range of motion (ROM) in individuals with myofascial pain syndrome (MPS). |
| **Methods** | Papers published from January 2000 to January 2013 were identified through an electronic search in the databases MEDLINE, Dialnet, Cochrane Library Plus, Physiotherapy Evidence Data-base (PEDro) and Spanish Superior Council of Scientific Research (CSIC). The studies included were randomized controlled trials written in English and/or Spanish about the effectiveness of DN on pain and ROM in individuals with MPS. |
| **Results** | Out of **19 clinical trials** that were potentially relevant, a total of 10 were included in the Meta-analysis. Regarding pain intensity reduction when measured before and immediately after the intervention, DN achieved improvement compared with the placebo treatment [d = - 0.49; 95% CI (- 3.21, 0.42)] and with the control group [d = - 9.13; 95% C (- 14.70, - 3.56)]. However, other treatments achieved better results on the same variable compared with DN, considering the measurements for pre-treatment and immediately after [d = 2.54; 95% CI (- 0.40, 5.48)], as well as the pre-treatment and after 3-4 weeks [d = 4.23; 95% CI (0.78, 7.68)]. DN showed a significantly increased ROM when measured before the intervention and immediately after, in comparison with the placebo [d = 2.00; 95% C (1.60, 2.41)]. However, other treatments achieved a significant better result regarding ROM when it was measured before the intervention and immediately after, as compared with DN [d = - 1.42; 95% CI (- 1.84, - 0.99)]. |

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| **Conclusion** | **DN was less effective on decreasing pain comparing to the placebo group.** Other treatments were more effective than DN on reducing pain after 3-4 weeks. However, on **increasing ROM, DN was more effective comparing to that of placebo group**, but less than other treatments. |

#### 1.2.6.10. Morihisa 2016 ★★

Morihisa R, Eskew J, McNamara A, Young J. Dry needling in subjects with muscular trigger points in the lower quarter: a systematic review. Int J Sports Phys Ther. 2016;11(1):1-14.[165351].

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| **Purpose** | To assess and provide a summary on the current literature for the use of dry needling as an intervention for lower quarter trigger points in patients with various orthopedic conditions. |
| **Methods** | CINAHL, NCBI-PubMed, PEDro, SPORTDiscus, Cochrane Library, and APTA's PTNow were searched to identify relevant randomized controlled trials. **Six studies** meeting the inclusion criteria were analyzed using the PEDro scale. |
| **Results** | Four of the studies assessed by the PEDro scale were deemed 'high' quality and two were 'fair' quality. Each of **the six included studies** reported statistically significant improvements with dry needling for the reduction of pain intensity in the short-term. Only one study reported a statistically significant improvement in short-term functional outcomes; however, there was no maintenance of improved function at long-term follow-up. Furthermore, none of the studies reported statistically significant changes regarding the effect of dry needling on quality of life, depression, range of motion, or strength. |
| **Conclusion** | A review of current literature suggests that **dry needling is effective in reducing pain associated with lower quarter trigger points in the short-term.** However, the findings suggest that dry needling does not have a positive effect on function, quality of life, depression, range of motion, or strength. |

#### 1.2.6.11. Ong 2014 ★

Ong J, Claydon LS. The effect of dry needling for myofascial trigger points in the neck and shoulders: a systematic review and meta-analysis. J Bodyw Mov Ther.;18(3):390-8. [155193]

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| **Background and purpose** | The aim of this systematic review with meta-analysis is to determine the effect of dry needling in the treatment of MTrPs. |
| **Methods** | Searches were performed using the electronic databases AMED, EBM reviews, Embase, and Ovid MEDLINE (all from database inception-February 2012). Study Selection: Randomized controlled trials (RCTs) were included if they compared dry needling with another form of treatment or placebo and included pain intensity as an outcome. Data Extraction: Two blinded reviewers independently screened the articles, scored their methodological quality and extracted data. Quality Assessment : Physiotherapy Evidence Database (PEDro) quality scale and the Cochrane risk of bias tool were used. |
| **Results** | **Four RCTs** compared dry needling to lidocaine and **one RCT** compared dry needling to placebo. Meta-analyses of dry needling revealed no significant difference between dry needling and lidocaine immediately after treatment standardized mean difference (SMD) 0.41 (95%CI -0.15 to 0.97), at one month (SMD -1.46; 95% CI -2.04 to 4.96) and three to six months (SMD -0.28; 95% CI -0.63 to 0.07). |

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| **Discussion** | Although not significant in the meta-analyses, **there were interesting patterns favoring lidocaine immediately after treatment and dry needling at three to six months.** |

#### 1.2.6.12. Kietrys 2013 ★★

Kietrys DM, Palombaro KM, Azzaretto E, Hubler R, Schaller B, Schlussel JM, Tucker M. Effectiveness of dry needling for upper-quarter myofascial pain: a systematic review and meta-analysis. J Orthop Sports Phys Ther. 2013. 43(9):620-34. [170908]

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| **Background** | Myofascial pain syndrome (MPS) is associated with hyperalgesic zones in muscle called myofascial trigger points. When palpated, active myofascial trigger points cause local or referred symptoms, including pain. Dry needling involves inserting an acupuncture-like needle into a myofascial trigger point, with the goal of reducing pain and restoring range of motion. OBJECTIVE: To explore the evidence regarding the effectiveness of dry needling to reduce pain in patients with MPS of the upper quarter. |
| **Methods** | An electronic literature search was performed using the key word dry needling. Articles identified with the search were screened for the following inclusion criteria: human subjects, randomized controlled trial (RCT), dry needling intervention group, and MPS involving the upper quarter. The RCTs that met these criteria were assessed and scored for internal validity using the MacDermid Quality Checklist. Four separate meta-analyses were performed: (1) dry needling compared to sham or control immediately after treatment, (2) dry needling compared to sham or control at 4 weeks, (3) dry needling compared to other treatments immediately after treatment, and (4) dry needling compared to other treatments at 4 weeks. |
| **Results** | The initial search yielded 246 articles. **Twelve RCTs** were ultimately selected. The methodological quality scores ranged from 23 to 40 points, with a mean of 34 points (scale range, 0-48; best possible score, 48). The findings of 3 studies that compared dry needling to sham or placebo treatment provided evidence that dry needling can immediately decrease pain in patients with upper-quarter MPS, with an overall effect favoring dry needling. The findings of 2 studies that compared dry needling to sham or placebo treatment provided evidence that dry needling can decrease pain after 4 weeks in patients with upper-quarter MPS, although a wide confidence interval for the overall effect limits the impact of the effect. Findings of studies that compared dry needling to other treatments were highly heterogeneous, most likely due to variance in the comparison treatments. There was evidence from 2 studies that lidocaine injection may be more effective in reducing pain than dry needling at 4 weeks. |
| **Conclusion** | Based on the best current available evidence (grade A), **we recommend dry needling**, compared to sham or placebo, **for decreasing pain immediately after treatment and at 4 weeks in patients with upper-quarter MPS**. Due to the small number of high-quality RCTs published to date, additional well-designed studies are needed to support this recommendation. |

#### 1.2.6.13. Tough 2011 ★

Tough EA, White AR. Effectiveness of acupuncture/dry needling for myofascial trigger point pain. Physical Therapy Reviews. 2011;16(2):147-54.[159547] .

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| **Background** | Myofascial trigger points (MTrPs) are widely accepted by clinicians and researchers as a primary source of pain. Needling is one common treatment, with dry needling as effective as injection. What is not clear is whether or not needling of any kind is superior to placebo. |

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| **Objectives** | To update a systematic literature review and meta-analysis (undertaken in 2007) investigating the effectiveness of direct MTrPs needling compared with placebo, and to discuss the variation in needling approaches adopted by randomized controlled trials (RCTs) investigating acupuncture/dry needling for MTrP pain. |
| **Methods** | An electronic database search of RCTs published since the original review and a critical review of the literature. |
| **Results** | **Three RCTs** of direct MTrP needling were identified as eligible for review. One concluded that needling was superior to standard care; two adopted a placebo control and were added to our original meta-analysis of four studies. Combining **six studies (n=183)**, **needling was found to be statistically superior to placebo** [weighted mean difference=16·67 (95% CI: 3·23–30·11)]; however, marked statistical heterogeneity was observed (I2=82·6%). |
| **Conclusion** | **There is limited evidence that direct MTrP dry needling has an overall treatment effect when compared with standard care**. While the results of the meta-analysis indicate that direct needling is superior to placebo, the results should be interpreted with caution due to the marked heterogeneity observed in this model. There remains a need for large-scale, adequately powered, high-quality placebo-controlled trials to provide a more trustworthy result. |

#### 1.2.6.14. Tough 2008 ★

Tough EA, White AR, Cummings TM, Richards SH, Campbell JL. Acupuncture and dry needling in the management of myofascial trigger point pain: a systematic review and meta-analysis of randomised controlled trials. Eur J Pain. 2009;13(1):3-10. [148652].

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| **Purpose** | We aimed to review the current evidence on needling without injection, by conducting a systematic literature review. |
| **Methods** | We searched electronic databases to identify relevant randomised controlled trials, and included studies where at least one group were treated by needling directly into the myofascial trigger points, and where the control was either no treatment, or usual care; indirect local dry needling or some form of placebo intervention. We extracted data on pain, using VAS scores as the standard. |
| **Results** | **Seven studies** were included. One study concluded that direct dry needling was superior to no intervention. Two studies, comparing direct dry needling to needling elsewhere in the muscle, produced contradictory results. Four studies used a placebo control and were included in a meta-analysis. Combining these studies (n = 134), needling was not found to be significantly superior to placebo (standardised mean difference, 14.9 [95%CI, —5.81 to 33.99]), **however marked statistical heterogeneity was present** (J2 = 8%). |
| **Conclusion** | In conclusion, **there is limited evidence deriving from one study that deep needling directly into myofascial trigger points has an overall treatment effect when compared with standardised care**. Whilst the result of the meta-analysis of needling compared with placebo controls does not attain statistically significant, the overall direction could be compatible with a treatment effect of dry needling on myofascial trigger point pain. However, the limited sample size and poor quality of these studies highlights and supports the need for large scale, good quality placebo controlled trials in this area. |

#### 1.2.6.15. Cummings 2002 ★

Cummings TM, White AR. Needling therapies in the management of myofascial trigger point pain: a systematic review. Arch Phys Med Rehabil. 2001;82(7):986-92. [70878].

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| **Objective** | To establish whether there is evidence for or against the efficacy of needling as a treatment approach for myofascial trigger point pain. |
| **Data Sources** | PubMed, Ovid MEDLINE, Ovid EMBASE, the Cochrane Library, AMED, and CISCOM databases, searched from inception to July 999. |
| **Study Selection** | Randomized, controlled trials in which some form of needling therapy was used to treat myofascial pain. Data Extraction: two reviewers independently extracted data concerning trial methods, quality, and outcomes. Data Synthesis: Twenty-three papers were included. No trials were of sufficient quality or design to test the efficacy of any needling technique beyond placebo in the treatment of myofascial pain. Eight of the 10 trials comparing injection of different substances and all 7 higher quality trials found that the effect was independent of the injected substance. All **3 trials** that compared dry needling with injection found no difference in effect. |
| **Conclusions** | **Direct needling of myofascial trigger points appears to be an effective treatment**, but the hypothesis that needling therapies have efficacy beyond placebo is neither supported nor refuted by the evidence from clinical trials. Any effect of these therapies is likely because of the needle or placebo rather than the injection of either saline or active drug. Controlled trials are needed to investigate whether needling has an effect beyond placebo on myofascial trigger point pain. Copyright 2001 by the American Congress of Rehabilitation Medicine and the American Academy of Physical Medicine and Rehabilitation. |

### 1.2.7. Auricular acupuncture

#### 1.2.7.1. Choi 2022

Choi SY, Kim YJ, Kim B. [Effect of Auriculotherapy on Musculoskeletal Pain: A Systematic Review and Meta-Analysis]. J Korean Acad Nurs. 2022 Feb;52(1):4-23. Korean. https://doi.org/10.4040/jkan.21121

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| **Purpose** | The aim of this study was to evaluate the effect of auriculotherapy on musculoskeletal pain in adults. |
| **Methods** | A total of 885 studies were retrieved from nine databases (PubMed, Scopus, CINAHL, Web of Science, Ovid Medline, Cochrane Library, RISS, KMbase, and KISS). Sixteen studies were selected for meta-analysis, which satisfied the inclusion criteria and the evaluation of risk of bias. Demographic data, auriculotherapy types, intervention characteristics, auricular points, and outcomes related to pain (subjective pain scale, and amount of analgesic) were extracted from all included studies. The effect size of auriculotherapy was analyzed through comprehensive meta analysis 3.0, and the presence of publication bias was analyzed through a funnel plot and Egger's regression. |
| **Results** | The results of the meta-analysis (**n = 16**) revealed that the auriculotherapy was significantly superior to the control group on present pain in adults (Hedges' g = -0.35, 95% Confidence Interval [CI] = -0.55~-0.15). According to the results of subgroup analysis, the effect size of auricular acupuncture therapy (Hedges' g = 0.45, 95% CI = -0.75~-0.15) was higher than the auricular acupuncture (Hedges' g = 0.27, 95% CI = -0.53~0.00): the longer the intervention period, the greater the effect size. |
| **Conclusion** | In this study, auriculotherapy demonstrates a significant reduction in musculoskeletal pain in adults. Therefore, it is necessary to refine the curriculum to include auriculotherapy as a nursing intervention to relieve musculoskeletal pain in adults and encourage its use in clinical settings. |

### 1.2.8. Cupping

#### 1.2.8.1. Charles 2024

Charles D, Hudgins T, MacNaughton J, Newman E, Tan J, Wigger M. A systematic review of manual therapy techniques, dry cupping and dry needling in the reduction of myofascial pain and myofascial trigger points. J Bodyw Mov Ther. 2019 Jul;23(3):539-546. https://doi.org/10.1016/j.jbmt.2019.04.001

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| **Introduction** | Myofascial pain with myofascial triggers are common musculoskeletal complaints. Popular treatments include manual therapy, dry needling, and dry cupping. The purpose of this systematic review was to compare the efficacy of each treatment in the short-term relief of myofascial pain and myofascial trigger points. |
| **Methods** | Search engines included Google Scholar, EBSCO Host, and PubMed. Searches were performed for each modality using the keywords myofascial pain syndrome and myofascial trigger points. The inclusion criteria included English-language, peer-reviewed journals; a diagnosis of myofascial pain syndrome or trigger points; manual therapy, dry needling, or dry cupping treatments; retrospective studies or prospective methodology; and inclusion of outcome measures. |
| **Results** | Eight studies on manual therapy, twenty-three studies on dry needling, and two studies on dry cupping met the inclusion criteria. The Physiotherapy Evidence Database (PEDro) was utilized to assess the quality of all articles. |
| **Discussion** | While there was a moderate number of randomized controlled trials supporting the use of manual therapy, the evidence for dry needling ranged from very low to moderate compared to control groups, sham interventions, or other treatments and there was a paucity of data on dry cupping. Limitations included unclear methodologies, high risk for bias, inadequate blinding, no control group, and small sample sizes. |
| **Conclusion** | While there is moderate evidence for manual therapy in myofascial pain treatment, the evidence for dry needling and cupping is not greater than placebo. Future studies should address the limitations of small sample sizes, unclear methodologies, poor blinding, and lack of control groups. |

#### 1.2.8.2. Mohamed 2023

Mohamed AA, Zhang X, Jan YK. Evidence-based and adverse-effects analyses of cupping therapy in musculoskeletal and sports rehabilitation: A systematic and evidence-based review. J Back Musculoskelet Rehabil. 2023;36(1):3-19. https://doi.org/10.3233/BMR-210242

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| **Backgound** | Cupping therapy has been used to treat musculoskeletal impairments for about 4000 years. Recently, world athletes have provoked an interest in it, however, the evidence to support its use in managing musculoskeletal and sports conditions remains unknown. |
| **Objective** | To evaluate the evidence level of the effect of cupping therapy in managing common musculoskeletal and sports conditions. |
| **Methods** | 2214 studies were identified through a computerized search, of which **22 met the inclusion criteria**. The search involved randomized and case series studies published between 1990 and 2019. The search involved five databases (Scopus, MEDLINE (PubMed), Web of Science, Academic Search Complete PLUS (EBSCO), and CrossRef) and contained studies written in the English language. Three analyses were included: the quality assessment using the PEDro scale, physical characteristic analysis, and evidence-based analysis. |

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| **Results** | The results showed that most studies used dry cupping, except five which used wet cupping. Most studies compared cupping therapy to non-intervention, the remaining studies compared cupping to standard medical care, heat, routine physiotherapy, electrical stimulation, active range of motion and stretching, passive stretching, or acetaminophen. Treatment duration ranged from 1 day to 12 weeks. The evidence of cupping on increasing soft tissue flexibility is moderate, decreasing low back pain or cervical pain is low to moderate, and treating other musculoskeletal conditions is very low to low. The incidence of adverse events is very low. |
| **Conclusion** | This study provides the first attempt to analyze the evidence level of cupping therapy in musculoskeletal and sports rehabilitation. However, cupping therapy has low to moderate evidence in musculoskeletal and sports rehabilitation and might be used as a useful intervention because it decreases the pain level and improves blood flow to the affected area with low adverse effects. |

#### 1.2.8.3. Woods 2020

Wood S, Fryer G, Tan LLF, Cleary C. Dry cupping for musculoskeletal pain and range of motion: A systematic review and meta-analysis. J Bodyw Mov Ther. 2020 Oct;24(4):503-518. https://doi.org/10.1016/j.jbmt.2020.06.024

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| **Objectives** | This review evaluated the efficacy and safety of western dry cupping methods for the treatment of musculoskeletal pain and reduced range of motion. |
| **Methods** | A systematic literature search was performed until April 2018 for randomised controlled trials (RCTs) pertaining to musculoskeletal pain or reduced range of motion, treated with dry cupping. Outcomes were pain, functional status, range of motion and adverse events. Risk of bias and quality of evidence was assessed using the modified Downs & Black (D&B) checklist and GRADE. |
| **Results** | A total of **21 RCTs with 1049 participants** were included. Overall, the quality of evidence was fair, with a mean D&B score of 18/28. Low-quality evidence revealed dry cupping had a significant effect on pain reduction for chronic neck pain (MD, -21.67; 95% CI, -36.55, to -6.80) and low back pain (MD, -19.38; 95%CI, -28.09, to -10.66). Moderate-quality evidence suggested that dry cupping improved functional status for chronic neck pain (MD, -4.65; 95%CI, -6.44, to -2.85). For range of motion, low quality evidence revealed a significant difference when compared to no treatment (SMD, -0.75; 95%CI, -0.75, to -0.32). |
| **Conclusion** | Dry cupping was found to be effective for reducing pain in patients with chronic neck pain and non-specific low back pain. However, definitive conclusions regarding the effectiveness and safety of dry cupping for musculoskeletal pain and range of motion were unable to be made due to the low-moderate quality of evidence. Further high-quality trials with larger sample sizes, long-term follow up, and reporting of adverse events are warranted. |

## 1.3. Specific outcomes

### 1.3.1. Inflammatory Markers

#### 1.3.1.1. Lo 2026

Lo CN, Fung MKL, Leung BPL. Immunomodulatory Effects of Acupuncture on Inflammatory Markers in Patients with Musculoskeletal Pain: A Systematic Review of Randomized Controlled Trials. Muscles. 2026;5(2):36. https://doi.org/10.3390/muscles5020036

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| **Background** | Musculoskeletal pain remains a major cause of disability worldwide, encompassing disorders such as rheumatoid arthritis (RA), osteoarthritis (OA) and chronic back pain. Acupuncture and dry needling are increasingly used for symptom management, yet their effects on inflammatory modulation remain unclear. This systematic review and meta-analysis evaluated the influence of acupuncture on inflammatory biomarker regulation in musculoskeletal pain. |
| **Methods** | Following PRISMA and Cochrane methodological guidelines, comprehensive searches were conducted across MEDLINE (via PubMed), Web of Science, Cochrane Library, Scopus, Google Scholar, and OpenEvidence from inception to August 2025. Eligible studies were randomized controlled trials (RCTs) involving acupuncture or dry needling interventions with inflammatory biomarker outcomes. Screening, data extraction, and risk of bias assessment using ROB2 were performed by two reviewers independently. The certainty of evidence was appraised using GRADE criteria. The protocol was registered on PROSPERO (CRD420251011831). |
| **Results** | **Nineteen RCTs** and one randomized cross-over study (n = 1492) met inclusion criteria. Some studies demonstrated reductions in CRP, ESR, IL-1β, IL-6 and TNF-α following acupuncture. Random-effects meta-analysis indicated that modified acupuncture (electroacupuncture or needle-knife therapy) significantly reduced TNF-α in knee OA compared with traditional acupuncture (SMD = -1.63, 95% CI -2.47 to -0.80, $p < 0.01$) but not IL-1β. However, no significant effects were observed from acupuncture versus sham acupuncture for CRP or ESR in patients with arthritis. However, the findings are limited by high heterogeneity and the small number of studies included in each meta-analysis. |
| **Conclusions** | A moderate level of GRADE evidence suggests that modified acupuncture may be more effective than standard acupuncture in reducing TNF-α levels in patients with OA. Further high-quality biomarker-based RCTs are warranted to confirm these findings. This study received no external funding. |

### 1.3.2. Neuroimaging studies

### 1.3.3. Ha 2022

Ha G, Tian Z, Chen J, Wang S, Luo A, Liu Y, Tang J, Lai N, Zeng F, Lan L. Coordinate-based (ALE) meta-analysis of acupuncture for musculoskeletal pain. Front Neurosci. 2022 Jul 22;16:906875. https://doi.org/10.3389/fnins.2022.906875

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| **Background** | Neuroimaging studies have been widely used to investigate brain regions' alterations in musculoskeletal pain patients. However, inconsistent results have hindered our understanding of the central modulatory effects of acupuncture for musculoskeletal pain. The main objective of our investigation has been to obtain comprehensive evidence of acupuncture for musculoskeletal pain diseases. |
| **Methods** | The PubMed, Web of Science, Google Scholar, Embase, China National Knowledge Infrastructure (CNKI), VIP Database, China Biology Medicine disc Database, Clinical Trial Registration Platform, and Wanfang Database were searched for neuroimaging studies on musculoskeletal pain diseases published from inception up to November 2021. Then, the relevant literature was screened to extract the coordinates that meet the criteria. Finally, the coordinate-based meta-analysis was performed using the activation likelihood estimation algorithm. |
| **Results** | A total of **15 neuroimaging studies** with 183 foci of activation were included in this study. The ALE meta-analysis revealed activated clusters in multiple cortical and sub-cortical brain structures in response to acupuncture across studies, including the thalamus, insula, caudate, claustrum, and lentiform nucleus. |

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| **Conclusions** | The studies showed that acupuncture could modulate different brain regions, including the thalamus, insula, caudate, claustrum, and lentiform nucleus. The findings offer several insights into the potential mechanisms of acupuncture for musculoskeletal pain and provide a possible explanation for the observed clinical benefit of this therapy. |

## 1.4. Special Clinical Forms

### 1.4.1. Myofascial Head and Neck Pain

#### 1.4.1.1. Farag 2020

Farag AM, Malacarne A, Pagni SE, Maloney GE. The effectiveness of acupuncture in the management of persistent regional myofascial head and neck pain: A systematic review and meta-analysis. Complement Ther Med. 2020. [205768]. doi

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| **Background** | Persistent head and neck myofascial pain is among the most frequently reported pain complaints featuring major variability in treatment approaches and perception of improvement. Acupuncture is one of the least invasive complimentary modalities that can optimize conventional treatment. |
| **Objective** | The aim of this review was to determine the evidence for the effectiveness of acupuncture in the management of localized persistent myofascial head and neck pain. |
| **Methods** | Only randomized controlled clinical trials (RCTs) were included. The search was conducted in PubMed, Ovid Medline, Embase, Google Scholar, and Cochrane Library in addition to manual search. The main outcome measure was the comparison of the mean pain intensity score on VAS between acupuncture and sham-needling/no intervention groups. Safety data and adherence rate were also investigated. |
| **Results** | **Six RCTs** were identified with variable risk of bias. All included studies reported reduction in VAS pain intensity scores in the groups receiving acupuncture when compared to sham needling/no intervention. Meta-analysis, using a weighted mean difference as the effect estimate, included only 4 RCTs, revealed a 19.04 point difference in pain intensity between acupuncture and sham-needling/no intervention (95 %CI: -29.13 to -8.95). High levels of safety were demonstrated by the low rates of side effects/withdrawal. Inconsistency in reporting of outcomes was a major limitation. |
| **Conclusion** | In conclusion, moderate-quality evidence suggests that acupuncture may be an effective and safe method in relieving persistent head and neck myofascial pain. Optimizing study designs and standardizing outcome measures are needed for future RCTs. |

### 1.4.2. Musculoskeletal Disorders of the Extremities

#### 1.4.2.1. Cox 2016 ★

Cox J, Varatharajan S, Côté P, Optima Collaboration.. Effectiveness of Acupuncture Therapies to Manage Musculoskeletal Disorders of the Extremities: A Systematic Review. J Orthop Sports Phys Ther. 2016;46(6):409-29. [186515].

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| **Background** | Little is known about the effectiveness of acupuncture therapies for musculoskeletal disorders. |

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| **Objective** | To assess the effectiveness and safety of acupuncture therapies for musculoskeletal disorders of the extremities. |
| **Methods** | We searched MEDLINE, Embase, CINAHL, PsycINFO, and Cochrane Central Register of Controlled Trials from 1990 to 2015 for randomized controlled trials, cohort studies, and case-control studies. Eligible studies were appraised with Scottish Intercollegiate Guidelines Network criteria. A best-evidence synthesis was performed to synthesize results from included studies with a low risk of bias. A sensitivity analysis was conducted to determine the impact of excluding studies with a high risk of bias. |
| **Results** | The search revealed 5180 articles; **15 were included** (10 with a low risk of bias, 5 with a high risk of bias). The studies with a low risk of bias suggested that (1) traditional needle acupuncture was superior to oral steroids (1 RCT, n = 77) and may be superior to vitamin B1/B6 supplements (1 RCT, n = 64) for carpal tunnel syndrome (CTS), and was superior to exercise for Achilles tendinopathy (1 RCT, n = 64). Traditional needle acupuncture did not provide important benefit over placebo for upper extremity pain (1 RCT, n = 128), or no intervention for patellofemoral pain (1 RCT, n = 75), and was inconclusive for shoulder pain (2 RCTs, n = 849), suggesting no important benefit; (2) electroacupuncture may be superior to placebo for shoulder injuries (1 RCT, n = 130) and may not be superior to night splinting for persistent CTS (1 RCT, n = 78); and (3) dry needling may be superior to placebo for plantar fasciitis (1 RCT, n = 84). Sensitivity analysis suggests that including studies with a high risk of bias might have impacted the evidence synthesis in support of managing shoulder pain with traditional needle acupuncture, and that would suggest traditional needle acupuncture may be effective for lateral epicondylitis and piriformis syndrome. |
| **Conclusion** | **Evidence for the effectiveness of acupuncture for musculoskeletal disorders of the extremities was inconsistent**. Traditional needle acupuncture may be beneficial for CTS and Achilles tendinopathy, but not for nonspecific upper extremity pain and patellofemoral syndrome. Electroacupuncture may be effective for shoulder injuries and may show similar effectiveness to that of night wrist splinting for CTS. The effectiveness of dry needling for plantar fasciitis is equivocal. Level of Evidence Therapy, 1a-. |

### 1.4.3. Hand and Wrist Pain

#### 1.4.3.1. Trinh 2022

Trinh K, Zhou F, Belski N, Deng J, Wong CY. The Effect of Acupuncture on Hand and Wrist Pain Intensity, Functional Status, and Quality of Life in Adults: A Systematic Review. Med Acupunct. 2022 Feb 1;34(1):34-48. https://doi.org/10.1089/acu.2021.0046

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| **Objective** | This systematic review examined the effects of acupuncture on hand-and-wrist pain intensity, functional status, quality of life, and incidence of adverse effects in adults. |
| **Methods** | Searches of 6 databases and previous reviews for randomized controlled trials (RCTs) were performed. Each outcome was analyzed for participant conditions, interventions, controls, and follow-up times determined a priori. Active controls were excluded. Follow-up periods were based on Cochrane 5.1.0 guidelines. The results were tabulated and described narratively. |

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| **Results** | In the **10 included RCTs (622 participants)**, 6 had a low risk of bias. For cryotherapy-induced pain, 1 trial showed significant pain reduction post treatment. For rheumatoid arthritis, 1 trial shown significant pain reduction and function improvements post treatment and short-term. For carpal tunnel syndrome, 1 trial showed significant pain reduction and functional improvements intermediate-term, while 3 trials suggested no significant difference. For tenosynovitis, 1 trial showed significant pain reduction and function improvements short-term. For poststroke impairments, 1 trial showed significant function improvements post treatment and at short-term, while another trial suggested no significant difference. No significant improvements were noted for trapezio-metacarpal joint osteoarthritis. In 2 trials, adverse effects occurred in patients with carpal tunnel syndrome; yet acupuncture appeared to be relatively safe. |
| **Conclusions** | Acupuncture may be effective and safe for short-term pain reduction and functional improvement in hand-and-wrist conditions. Clinicians should interpret the results with caution due to small sample sizes and clinical heterogeneity. Future research is warranted. |

# 2. Overviews of Systematic Reviews

## 2.1. Ang 2025

Ang L, Song E, Choi TY, Jun JH, Lee B, Yim MH, Lee HW, Lee MS. Effects of acupuncture on musculoskeletal pain: an evidence map. Front Med (Lausanne). 2025 Aug 11;12:1575226. https://doi.org/10.3389/fmed.2025.1575226

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| **Background** | Musculoskeletal pain is a leading cause of disability and reduced quality of life worldwide. Given the growing interest in complementary and alternative therapies, acupuncture has been widely explored as a potential treatment for alleviating musculoskeletal pain. This evidence map aimed to identify, describe, and summarize the current available evidence about acupuncture interventions on musculoskeletal pain. |
| **Methods** | For this map, searches were conducted in PubMed, Embase, Cochrane Library, Allied and Complementary Medicine Database (AMED), Web of Science, and Epistemonikos to identify systematic reviews (SRs) with meta-analysis published up to 23 August 2024. Included SRs were independently assessed for eligibility in pairs. The data from the eligible SRs were extracted and evaluated for methodological quality using AMSTAR 2. The findings were tabulated and mapped using bubble plots. |
| **Results** | A total of **111 SRs** fulfilled the eligibility criteria and were included in this evidence map. All of the SRs included manual acupuncture or electroacupuncture. Comparators included in SRs involved active comparators, inactive comparators, sham acupuncture, and no intervention. The included 111 SRs were categorized into 35 musculoskeletal pain conditions. The short-term effects of acupuncture showed a positive effect across most comparators in major musculoskeletal pain. All included SRs were rated low or critically low in terms of methodological quality. |
| **Conclusion** | This evidence map demonstrated that acupuncture has favorable effects on major musculoskeletal disorders. Further improvements in the quality of evidence should be prioritized and more clinical trials on acupuncture for treating musculoskeletal pain are needed. |

#### 2.1.1. Lorenc 2018 (Musculoskeletal and Mental Health Condition)

Lorenc A, Feder G, MacPherson H, Little P, Mercer SW, Sharp D. Scoping review of systematic reviews of complementary medicine for musculoskeletal and mental health conditions. BMJ Open. 2018;8(10). [202395].

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| **Objective** | To identify potentially effective complementary approaches for musculoskeletal (MSK)-mental health (MH) comorbidity, by synthesising evidence on effectiveness, cost-effectiveness and safety from systematic reviews (SRs). |
| **Design** | Scoping review of SRs. |
| **Methods** | We searched literature databases, registries and reference lists, and contacted key authors and professional organisations to identify SRs of randomised controlled trials for complementary medicine for MSK or MH. Inclusion criteria were: published after 2004, studying adults, in English and scoring >50% on Assessing the Methodological Quality of Systematic Reviews (AMSTAR); quality appraisal checklist). SRs were synthesised to identify research priorities, based on moderate/good quality evidence, sample size and indication of cost-effectiveness and safety. |
| **Results** | We included 84 MSK SRs and 27 MH SRs. Only one focused on MSK-MH comorbidity. Meditative approaches and yoga may improve MH outcomes in MSK populations. Yoga and tai chi had moderate/good evidence for MSK and MH conditions. SRs reported moderate/good quality evidence (any comparator) in a moderate/large population for: low back pain (LBP) (yoga, acupuncture, spinal manipulation/mobilisation, osteopathy), osteoarthritis (OA) (acupuncture, tai chi), neck pain (acupuncture, manipulation/manual therapy), myofascial trigger point pain (acupuncture), depression (mindfulness-based stress reduction (MBSR), meditation, tai chi, relaxation), anxiety (meditation/MBSR, moving meditation, yoga), sleep disorders (meditative/mind-body movement) and stress/distress (mindfulness). The majority of these complementary approaches had some evidence of safety-only three had evidence of harm. There was some evidence of cost-effectiveness for spinal manipulation/mobilisation and acupuncture for LBP, and manual therapy/manipulation for neck pain, but few SRs reviewed cost-effectiveness and many found no data. |
| **Conclusions** | Only one SR studied MSK-MH comorbidity. Research priorities for complementary medicine for both MSK and MH (LBP, OA, depression, anxiety and sleep problems) are yoga, mindfulness and tai chi. Despite the large number of SRs and the prevalence of comorbidity, more high-quality, large randomised controlled trials in comorbid populations are needed. |

# 3. Clinical Practice Guidelines

⊕ positive recommendation (regardless of the level of evidence reported)
Ø negative recommendation (or lack of evidence)

## 3.1. American Psychological Association (APA, USA) 2024 ⊕

American Psychological Association (2024). Guideline for Psychological and Other Nonpharmacological Treatment of Chronic Musculoskeletal Pain in Adults. Retrieved from https://www.apa.org/practice/guidelines/nonpharmacological-treatment-chronic-musculoskeletal-pain.pdf

For patients with *chronic LBP*, the panel suggests offering patients the following interventions over usual care, attention control, or another intervention (Strength/Direction: Conditional For) :
Acupuncture for short-term pain management.
For patients *with chronic neck pain*, the panel suggests offering patients acupuncture over sham, placebo, or usual care for shortand intermediate-term pain relief (Strength/Direction: Conditional For).

## 3.2. Institute for Clinical Systems Improvement. (ICSI, USA) 2017 ⊕

Hooten M, Thorson D, Bianco J, Bonte B, Clavel Jr A, Hora J, Johnson C, Kirksson E, Noonan MP, Reznikoff C, Schweim K, Wainio J, Walker N. Pain: Assessment, Non-Opioid Treatment Approaches and Opioid Management. Institute for Clinical Systems Improvement. 2017:161p. [197014].

Chronic musculoskeletal pain : treatment options : [acupuncture].

## 3.3. Emblemhealth (insurance provider, USA) 2017 ⊕

Acupuncture — Medicare Dual-Eligible Members Emblemhealth. 2017. [111547].

Members with the Medicare Dual-Eligible benefit are eligible for acupuncture when performed by an individual licensed by New York State to perform acupuncture and when performed for the following diagnoses: 1. Adult postoperative nausea and vomiting 2. Chemotherapy related nausea and vomiting 3. Pregnancy related nausea and vomiting 4. Carpal tunnel syndrome 5. Epicondylitis (tennis elbow) 6. Headache 7. Low back pain 8. Menstrual pain 9. **Myofascial pain** 10. Osteoarthritis

## 3.4. South Australia Health (SAH, Australia) 2016 ⊕

SA Health. Model of Care for Chronic Pain Management in South Australia. Department of Health, Government of South Australia. 2016. [100838].

Consider the use of physical therapies for musculoskeletal pain and therapies such as TENS and **acupuncture** may be of benefit in some situations.

## 3.5. U.S. Navy Bureau of Medicine and Surgery (USA) 2013 ⊕

Acupuncture. U.S. Navy Bureau of Medicine and Surgery. 2013.17p. [180539].

Category B (limited evidence): Authorized but not recommended for routine use (consider as adjunct). Myofascial pain

## 3.6. Accident Compensation Corporation (ACC, New-Zealand) 2011 ⊕

Hardaker N, Ayson M. Pragmatic Evidence Based Review. The efficacy of acupuncture in the management of musculoskeletal pain. Accident Compensation Corporation (ACC, New-Zealand). 2011. [182414].

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| The evidence for the effectiveness of acupuncture is most convincing for the treatment of chronic neck and shoulder pain. In terms of other injuries, the evidence is either inconclusive or insufficient. The state of the evidence on the effectiveness of acupuncture is not dissimilar to other physical therapies such as physiotherapy, chiropractic and osteopathy.<br>*General*<br>- There is insufficient evidence to make a recommendation for the use of acupuncture in the management of acute neck, back or shoulder pain<br>- There is emerging evidence that acupuncture may enhance/facilitate other conventional therapies (including physiotherapy & exercise-based therapies)<br>- There is a paucity of research for the optimal dosage of acupuncture treatment for treating shoulder, knee, neck and lower back pain<br>- Studies comparing effective conservative treatments (including simple analgesics, physical therapy, exercise, heat & cold therapy) for (sub) acute and chronic non-specific low back pain (LBP) have been largely inconclusive.<br>*Lower back*<br>- The evidence for the use of acupuncture in (sub)acute LBP is inconclusive<br>- There is limited evidence to support the use of acupuncture for pain relief in chronic LBP in the short term (up to 3 months)<br>- The evidence is inconclusive for the use of acupuncture for long term (beyond 3 months) pain relief in chronic LBP<br>- There is no evidence to recommend the use of acupuncture for lumbar disc herniation related radiculopathy (LDHR)<br>*Neck*<br>- There is good evidence that acupuncture is effective for short term pain relief in the treatment of chronic neck pain<br>- There is moderate evidence that real acupuncture is more effective than sham acupuncture for the treatment of chronic neck pain<br>- There is limited evidence that acupuncture has a long term effect on chronic neck pain<br>Shoulder<br>- There is good evidence from one pragmatic trial that acupuncture improves pain and mobility in chronic shoulder pain<br>- There is limited evidence for the efficacy of acupuncture for frozen shoulder<br>- There is contradictory evidence for the efficacy of acupuncture for subacromial impingement syndrome<br>*Knee*<br>- There is no evidence to recommend the use of acupuncture for injury-related knee pain.<br>*Ankle:*<br>- There is no evidence to recommend the use of acupuncture for ankle pain |

# 4. Overviews of Clinical Practice Guidelines

## 4.1. Ho 2025

Ho L, Lai CNT, Chen H, Law SW, Yu ECL, Lam FPY, Cheung YC, Wu IX, Wong SYS, Sit RWS. Systematic review of clinical practice guidelines on acupuncture for chronic musculoskeletal pain. BMC Complement Med Ther. 2025 Sep 1;25(1):322. https://doi.org/10.1186/s12906-025-05070-y

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| **Background** | Acupuncture is increasingly utilised in primary care to manage chronic musculoskeletal pain, supported by a growing body of evidence. This rising adoption has driven demand for clinical practice guidelines (CPGs). We summarised the characteristics of recent acupuncture CPGs for osteoarthritis, low back pain, neck pain, and shoulder pain, and critically appraised their methodological quality. |

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| **Methods** | We searched nine databases to identify acupuncture CPGs published from January 2014 to November 2024. Eligible CPGs were required to be developed by guideline committees and to include evidence-informed recommendations linked to clearly defined levels of evidence. Two independent reviewers extracted CPG characteristics and assessed methodological quality using the Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument. |
| **Results** | Of the 1,999 records screened, **17 CPGs were included, encompassing 35 recommendations**. Shoulder pain was the most addressed condition (n = 14), followed by low back pain (n = 11), osteoarthritis (n = 8), and neck pain (n = 2). Various types of acupuncture were considered, with manual acupuncture featuring in most (n = 26) recommendations. Overall, 60% of the recommendations supported the use of acupuncture, comprising 5.7% strong recommendations and 54.3% weak or conditional recommendations. In contrast, 22.9% of recommendations offered no explicit guidance, while 17.1% advised against its use. Methodological assessment classified 10 CPGs as high quality, while seven were of moderate quality. |
| **Conclusion** | Contradictions exist among the included CPGs regarding whether acupuncture should be recommended for routine practice, potentially reflecting differences in clinical and cultural contexts. Local CPGs should be developed using rigorous methodology, ensuring the involvement of local stakeholders. An AGREE II extension should be developed for the methodological quality assessment of acupuncture CPGs. |

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