



June 16, 2020

Robert R. Redfield, MD  
Department of Health and Human Services  
Centers for Disease Control and Prevention  
1600 Clifton Road NE  
Atlanta, Georgia 30329

Re: Management of Acute and Chronic Pain

Dear Dr. Redfield:

The American Society of Acupuncturists (ASA) and National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM)<sup>®</sup> appreciate the opportunity to respond to the Centers for Disease Control and Prevention's (CDC) April 2020 request for comments on managing acute and chronic pain [85 FR 21441].<sup>1</sup>

Together, the ASA and the NCCAOM represent over 20,000 professional acupuncturists across the United States. As the CDC seeks feedback to inform its *Guideline for Prescribing Opioids for Chronic Pain*, the ASA and the NCCAOM encourage the CDC to more fully consider and facilitate viable pathways to non-opioid and non-pharmacological pain-management treatments including acupuncture.

The ASA and the NCCAOM appreciate the CDC's efforts to explore acute and chronic pain-management pathways and encourage the CDC to delve further into acupuncture research, to more meaningfully explore the evidence base for acupuncture's effects on acute pain. The CDC and other entities within the Department of Health and Human Services (HHS) could most effectively achieve this by initiating and funding more specific and thorough acupuncture studies that include, and are led by, nationally certified, licensed, and physician acupuncturists.

Acupuncture is an Effective Acute and Chronic Pain-Management Option

Below, the ASA and the NCCAOM include summaries of research that show how acupuncture is a safe and effective pain-management option for acute and chronic pain.

In January 2020, the Centers for Medicare and Medicaid Services (CMS) announced that it would cover acupuncture services for chronic low-back pain (cLBP) for Medicare beneficiaries [CAG-00452N]. In its decision memo, CMS recognized that non-pharmacologic treatments

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<sup>1</sup> Centers for Medicare and Medicaid Services (CMS). Decision Memo for Acupuncture for Chronic Low Back Pain (CAG-00452N). <https://www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=295>

“...may potentially decrease the need for, and the side effects of, assorted medications which are used to treat cLBP.” The Memo continues by stating that these non-pharmacologic treatments “...have included various physical treatments, including acupuncture.”

Research also shows that acupuncture can effectively stimulate the production of the body’s own “endogenous opioids” as well as natural anti-inflammatory compounds.<sup>2 3 4</sup> Acupuncture can facilitate the body’s natural chemistry to create the potential for similar—or sometimes better—benefits than synthetic drugs, without the risks of addiction or side effects. Research demonstrates that acupuncture has the potential to reduce, or even in some cases, eliminate the need for opioids and non-opioid drugs while also helping to treat opioid addiction.<sup>5 6 7 8</sup>

According to a large observational study with more than 216,500 patient encounters published in the *BMJ*, patients who initially sought care from a licensed acupuncturist were 91 percent less likely to use opioids in the short and long-term. This finding was similar to reductions seen in those receiving chiropractic care (90 percent), and physical therapy (85 percent). The study concluded that therapists such as chiropractors and acupuncturists are more protective of early and long-term opioid use for new cLBP episodes compared with primary care physicians.”

The CDC’s current guidelines related to opioids and chronic pain dramatically undervalue evidence-based, non-pharmacologic pain-management alternatives. While entities within HHS have acknowledged the detrimental impact opioid misuse and overuse has had on the United States, the ensuing national conversation overlooks the role non-pharmacologic treatments have in mitigating this crisis.

The national conversation has identified overprescribing and overreliance on opioids for acute and chronic pain-management as the main pathway to opioid addiction. It is critical that entities such as the CDC update recommendations to align with the evidence base, and firmly support non-pharmacologic strategies for pain care.

Acupuncture, in particular, is one of the—if not the most—evidence-based methods of non-pharmacologic pain control available. The ASA and the NCCAOM strongly encourage the CDC to revise its guidelines on prescribing opioids to acknowledge, incorporate, and provide more information on non-pharmacologic pain-management alternatives and their associated evidence.

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<sup>2</sup> Zhang R, Lao L, Ren K, Berman BM. Mechanisms of acupuncture-electroacupuncture on persistent pain. *Anesthesiology*. 2014; 120(2):482-503.

<sup>3</sup> 35. Zhao ZQ. Neural mechanism underlying acupuncture analgesia. *Progress in neurobiology*. 2008; 85(4):355-75.

<sup>4</sup> McDonald JL, Cripps AW, Smith PK. Mediators, Receptors, and Signalling Pathways in the Anti-Inflammatory and Antihyperalgesic Effects of Acupuncture. *Evidence-based complementary and alternative medicine: eCAM*. 2015; 2015:975632.

<sup>5</sup> Wen H, Cheung SYC. Treatment of drug addiction by acupuncture and electrical stimulation. *Asian J Med*. 1973; 9:138-41.

<sup>6</sup> Association NAD. National Acupuncture Detoxification Association <http://www.acudetox.com/about-nada/12-faqs2013>.

<sup>7</sup> Raith W, Schmolzer GM, Resch B, Reiterer F, Avian A, Koestenberger M, et al. Laser Acupuncture for Neonatal Abstinence Syndrome: A Randomized Controlled Trial. *Pediatrics*. 2015; 136(5):876-84.

<sup>8</sup> Wu LZ, Cui CL, Tian JB, Ji D, Han JS. Suppression of morphine withdrawal by electroacupuncture in rats: dynorphin and kappa-opioid receptor implicated. *Brain research*. 1999; 851(1-2):290-6.

## Recommendations

The ASA and the NCCAOM respectfully call upon the CDC to explore financial imbalances and the financial incentives that inhibit the conversation around, and the movement toward, viable non-pharmacologic pain-management options.

Data show that acupuncture consistently provides significant improvements in common, chronic-pain conditions. A frequent criticism is that “real” (verum) acupuncture often does not statistically outperform the sham control. This criticism has been debunked in a landmark meta-analysis undertaken to reduce some of the common disparities found in acupuncture trial-reporting standards.<sup>9</sup> Vickers et al. found that when key reporting data were standardized, verum acupuncture outperformed sham. It is also critical to note that despite a lack of variance between sham and verum acupuncture in smaller studies, both often outperform usual care.

Further, questions around acupuncture’s clinical benefits and placebo effects overlook the evidence base demonstrating acupuncture’s risk-to-benefit ratio for common chronic-pain conditions compared to opioid medications and other non-opioid therapies, regardless of mechanism. A systematic review and network meta-analyses of 21 different interventions for sciatica found that acupuncture produced better outcomes for global effect and pain reduction than all other therapies except a cytokine-modulating procedure still in experimental stages.<sup>10</sup>

In light of the magnitude of the opioid crisis, the existing evidence-base shows that non-opioid alternative approaches to managing acute and chronic pain are safer, while of equal or superior clinical effectiveness to opioids. The CDC should not merely categorize acupuncture as a “possible option,” but as an important, recommended, and viable mainstream treatment option for acute and chronic pain.

## Conclusion

When qualified healthcare professionals deliver acupuncture, the treatment is a safe, cost-effective, and evidence-based option for mitigating chronic pain and reducing opioid use. The ASA and the NCCAOM collaborate to provide a well-developed system to educate, train, certify, and regulate acupuncturists.

Increasing acupuncture-specific research to further clarify its evidence base might also enable more individuals to enter the workforce. CMS’ cLBP coverage decision will contribute to the profession’s growth and enable an expanding, reliable workforce to provide the service.

The existing evidence effectively demonstrates that acupuncture is a valuable component to the universal efforts to reduce opioid reliance and overuse. Acupuncture also offers promising secondary benefits that may further boost the health of seniors, their quality of life, as well as potentially increase their satisfaction with the Medicare program. Acupuncture has been well

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<sup>9</sup> Vickers AJ, Cronin AM, Maschino AC, Lewith G, MacPherson H, Foster NE, et al. Acupuncture for chronic pain: individual patient data meta-analysis. *Archives of internal medicine*. 2012; 172(19):1444-53.

<sup>10</sup> Lewis RA, Williams NH, Sutton AJ, Burton K, Din NU, Matar HE, et al. Comparative clinical effectiveness of management strategies for sciatica: systematic review and network meta-analyses. *The spine journal: official journal of the North American Spine Society*. 2015; 15(6):1461-77.

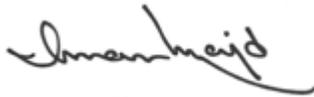
documented to improve symptoms of anxiety, depression, and insomnia--all healthcare challenges common in seniors.

The ASA and the NCCAOM commend the CDC for seeking information on acute and chronic pain-management options and look forward to opportunities to enhance the current research protocol for acupuncture.

Sincerely,



Olivia Hsu Friedman, DACM, Lac  
Chair, American Society of Acupuncturists



Iman Majd, MD, Lac  
Chair, The National Certification Commission for Acupuncture and Oriental Medicine

## Appendix A: Acupuncture Evidence-Base

### **1. Acute Back Pain (Including Back Pain with Radiculopathy)**

Please note there are comparatively few studies for acute pain. There have been some pilot acupuncture programs for Emergency Departments to treat acute pain. Continued emphasis on funding research in these categories is warranted given the pattern of initial findings demonstrating acupuncture as a viable, cost-effective option to treat acute pain without the potential for addiction or abuse.

Acute back pain in pregnancy is one of the few categories addressed for special-populations data.

- Ee, C. C., Manheimer, E., Pirotta, M. V., & White, A. R. (2008). Acupuncture for pelvic and back pain in pregnancy: a systematic review. *American journal of obstetrics and gynecology*, 198(3), 254-259.
  - The objective of this study was to review the effectiveness of needle acupuncture in treating the common and disabling problem of pelvic and back pain in pregnancy. Two small trials on mixed pelvic/back pain and one large high-quality trial on pelvic pain met the inclusion criteria. Acupuncture, as an adjunct-to-standard treatment, was superior to standard treatment alone and physiotherapy in relieving mixed pelvic/back pain.
  - Women with well-defined pelvic pain had greater pain relief with a combination of acupuncture and standard treatment, compared to standard treatment alone, or stabilizing exercises and standard treatment. The study used a narrative synthesis due to significant clinical heterogeneity between trials. Few and minor adverse events were reported. The researchers concluded that limited evidence supports acupuncture use in treating pregnancy-related pelvic and back pain. Additional high-quality trials are necessary to test the existing promising evidence for this relatively safe and popular complementary therapy.
- Kvorning, N., Holmberg, C., Grennert, L., Åberg, A., & Åkeson, J. (2004). Acupuncture relieves pelvic and low back pain in late pregnancy. *Acta obstetrica et gynecologica Scandinavica*, 83(3), 246-250.
  - Following individual informed consent, 72 pregnant women reporting pelvic or low-back pain were randomized during pregnancy weeks 24-37 to an acupuncture group (n = 37) or to a control group (n = 35) at three maternity wards in southern Sweden. Traditional acupuncture points and local tender points were chosen according to individual pain patterns and stimulated once or twice a week until delivery or complete recovery in acupuncture patients. Control patients were given no sham stimulation. Throughout the study period, each patient made weekly visual analog scale (VAS) evaluations of maximal and minimal pain intensity, as well as three-point pain-intensity assessments during various activities.

- During the study period, VAS pain-intensity score decreased over time for 60 percent of patients in the acupuncture group and for 14 percent of those in the control group ( $p < 0.01$ ). At the end of the study period, 43 percent of the acupuncture patients were less bothered by pain during activity compared with 9 percent of control patients ( $p < 0.01$ ). No serious adverse effects of acupuncture were found in the patients, and there were no adverse effects in the infants.
- Wedenberg K, Moen B, Norling A. A prospective randomized study comparing acupuncture with physiotherapy for low-back and pelvic pain in pregnancy. *Acta Obstet Gyn Scan.* 2000;79:331–5.[PubMed] [Google Scholar]
  - Sixty pregnant women were allotted to acupuncture or physiotherapy. The women estimated the severity of their pain using a visual analog scale (VAS) from 0 to 10 and disability in performing 12 common daily activities using a disability-rating index (DRI) from 0 to 10.
  - All 30 women in the acupuncture group completed the study (two exclusions) and only 18 women in the physiotherapy group completed the study. Before treatment, the two study groups were similar with respect to pain and disability. After treatment, the mean morning VAS had declined from 3.4 to 0.9 ( $p < 0.01$ ) in the acupuncture group and from 3.7 to 2.3 (NS) in the physiotherapy group. The corresponding evening values had declined from 7.4 to 1.7 ( $p < 0.01$ ) and 6.6 to 4.5 ( $p < 0.01$ ), respectively. The mean VAS values were lower after acupuncture than after physiotherapy, both in the morning ( $p = 0.02$ ) and in the evening ( $9p < 0.01$ ).
  - After treatment, the mean DRI values had also significantly decreased in the acupuncture group for 11 of 12 activities, and the values were significantly lower for all activities than in the physiotherapy group in which no significant changes had taken place. Overall satisfaction was good in both groups. There were no serious adverse events in any of the patients.
- Glauser, Jonathan & Myslenski, Maya & Money, Sarah. (2019). Acupuncture in the Emergency Management of Painful Conditions. *Current Emergency and Hospital Medicine Reports.* 7. 10.1007/s40138-019-00193-2.
  - Purpose of Review: A high percentage of patients present to the emergency department for management of painful conditions. It is in society's interest to provide pain relief without contributing to the ongoing opioid crisis.
  - Recent Findings: Acupuncture is an ancient therapy dating from more than 4,000 years. It has not historically been shown in rigorous duplicated studies to be effective in managing acutely painful conditions. Literature that is more recent has shown its promise in treating a variety of defined and common complaints.
  - Non-opioid treatment options for managing moderate-to-severe acute pain in the emergency department are limited. Recent reports and comparative studies utilizing acupuncture show promise for the emergency care of acute painful conditions.
- Kazis, L. E., Ameli, O., Rothendler, J., Garrity, B., Cabral, H., McDonough, C., Carey, K., Stein, M., Sanghavi, D., Elton, D., Fritz, J., & Saper, R. (2019). Observational retrospective study of the association of initial healthcare provider for new-onset low back pain with early and long-term opioid use. *BMJ open*, 9(9), e028633.

- According to a large observational study with more than 216,500 patient encounters published in the *BMJ*, patients who initially sought care from a licensed acupuncturist were 91 percent less likely to use opioids in the short and long-term periods. This finding was similar to reductions seen in those receiving chiropractic care (90 percent), and physical therapy (85 percent).
- The study concluded that therapists such as chiropractors and acupuncturists are more protective of early and long-term opioid use for new cLBP episodes compared with primary care physicians.
- Liu, Y. T., Chiu, C. W., Chang, C. F., Lee, T. C., Chen, C. Y., Chang, S. C., ... & Lo, L. C. (2015). Efficacy and safety of acupuncture for acute low back pain in the emergency department: a pilot cohort study. *Evidence-Based Complementary and Alternative Medicine*, 2015.
  - This clinical pilot cohort study assessed the efficacy and safety of acupuncture for treating acute lower back pain (LBP) in the emergency department (ED).
  - Materials and methods. The study recruited 60 participants from the ED, and divided them into experimental and control groups with one dropout during the study. The study excluded anyone with life-threatening conditions or severe neurological defects. The experimental group (n=45) received a series of fixed points of acupuncture. The control group (n=14) received sham acupuncture by pasting seed-patches near acupoints.
  - The study measured back pain using the visual analog scale (VAS) at three time points: baseline and immediately after and three days after intervention as the primary outcome. The secondary outcomes were heart rate variability (HRV) and adverse events. Results. The VAS demonstrated a significant decrease (P-value <0.001) for the experimental group after 15 minutes of acupuncture. The variation in HRV showed no significant difference in either group. No adverse events reported.
- Chia, K. L., Lam, R. P. K., Lam, C. K., & Tsui, S. H. (2018). Acupuncture in the emergency department: a systematic review of randomised controlled trials. *Acupuncture in Medicine*, 36(3), 183-192.
  - Four English databases (Embase, PubMed, AMED, and CENTRAL) and two Chinese databases (CNKI and Wanfang) were systematically searched using the keywords 'acupuncture' and 'emergency department', followed by a bibliographic search of references.
  - In total, 1461 articles were screened and six RCTs involving 651 patients were included. For various acute-pain conditions, acupuncture was superior to sham acupuncture, more effective than intravenous morphine, comparable to conventional emergency department (ED) treatment, and superior to standard ED care alone when used on an adjuvant basis; however, the overall level of evidence was low. Studies that applied acupuncture in hypertension and cardiac arrest were deemed to be at high risk of bias, and the level of evidence for these outcomes was very low. No major adverse events were reported in the included studies.

- Grissa, M. H., Baccouche, H., Boubaker, H., Beltaief, K., Bzeouich, N., Fredj, N., ... & Nouira, S. (2016). Acupuncture vs intravenous morphine in the management of acute pain in the ED. *The American Journal of Emergency Medicine*, 34(11), 2112-2116.
  - This was a prospective, randomized trial of using acupuncture vs. morphine to treat emergency department (ED) patients with acute-onset, moderate-to-severe pain.
  - Primary outcome consists of the degree of pain relief with significant pain reduction, defined as a pain-score reduction greater than, or equal to, 50 percent of its initial value. The study also analyzed the pain-reduction time and the occurrence of short-term adverse effects in the 300 patients with acute pain: 150 in each group.
  - The two groups had significantly different success rates (92 percent in the acupuncture group vs. 78 percent in the morphine group  $P < .001$ ). Resolution time was  $16 \pm 8$  minutes in the acupuncture group vs  $28 \pm 14$  minutes in the morphine group ( $P < .005$ ). Overall, 89 patients (29.6 percent) experienced minor adverse effects: 85 (56.6 percent) in morphine group and four (2.6 percent) in acupuncture group ( $P < .001$ ).
  - No major adverse effects were recorded during the study protocol. In patients with acute pain presenting to the ED, acupuncture was associated with more effective and faster analgesia with better tolerance.
  
- Adam S. Reinstein, Lauren O. Erickson, Kristen H. Griffin, Rachael L. Rivard, Christopher E. Kapsner, Michael D. Finch, Jeffery A. Dusek, Acceptability, Adaptation, and Clinical Outcomes of Acupuncture Provided in the Emergency Department: A Retrospective Pilot Study, *Pain Medicine*, Volume 18, Issue 1, January 2017, Pages 169–178, <https://doi.org/10.1093/pm/pnv114>
  - What is the comparative effectiveness of non-pharmacologic treatments (acupuncture) for outcomes related to pain, function, pain-relief satisfaction, and quality of life after follow up at the following intervals: Less than one day; one day to less than one week; one week to less than two weeks; two weeks to less than four weeks; four weeks or longer?
  - A total of 182 patients presented in the emergency department (ED) with pain (pre-pain $>0$ ) with over half reporting that their pain was an 8 or above. These subjects had a mean pre-pain of 6.80 (SD = 2.58) and reported an average decrease of 2.52 points (95-percent CI: 2.20, 2, 85; p-value $<0.001$ ) after acupuncture therapy (Table 3). Of those patients, 43 percent reported at least a 50-percent pain reduction and 57 percent reported at least a 30-percent pain reduction.
  - Furthermore, 160 patients with high pain (pre-pain  $\geq 4$ ) had a mean pre-pain of 7.47 (SD = 1.93) and reported an average decrease of 2.71 points (95 percent CI: 2.36, 3.07). Of those patients, 39 percent reported at least a 50-percent pain reduction and 54 percent reported at least a 30-percent pain reduction.
    - How does non-pharmacologic therapy effectiveness vary depending on: (1) patient demographics (e.g. age, gender); (2) patient-medical and psychiatric comorbidities? No differences noted.



percent of participants in the sham acupuncture group, and 9 percent of participants in the control group became pain-free (VAS-P score = 0) at day seven (P = .003).

- Participants, regardless of their group assignment, reported improvement in the functional status after the first week (F = 126; P < .0001). Participants in the acupuncture group reported a significant improvement of functional status compared with those of sham acupuncture and control groups: P = .03 and P = .001, respectively. In contrast, the differences of functional status between the sham acupuncture and control groups did not reach statistical significance (P = .60). A mixed-model analysis reveals a significant group × time interaction (F = 7; P < .0001).
  - At day 14, 68 percent of participants in the acupuncture group had a clinically significant reduction of pain, whereas only 32 percent of participants in the sham acupuncture group (P = .02), and 18 percent of participants in the control group had a clinically significant reduction of pain (P < .001). However, the number of participants who remained pain free at day 14 did not show a significant difference among the groups (16 percent vs. 9 percent vs. 6 percent; P = .25).
  - No adverse events reported. No differences with efficacy based on demographics.
- Hasegawa, T. M., Baptista, A. S., de Souza, M. C., Yoshizumi, A. M., & Natour, J. (2014). Acupuncture for Acute Non-Specific Low Back Pain: A Randomised, Controlled, Double-Blind, Placebo Trial. *Acupuncture in Medicine*, 32(2), 109–115.  
<https://doi.org/10.1136/acupmed-2013-010333>
    - A prospective, randomized, parallel-group, double-blind, placebo-controlled trial was performed in 80 men and women with acute non-specific low back pain who were randomly assigned to five acupuncture sessions (intervention group (IG), n=40) and to five non-penetrating acupuncture sessions (sham group (SG), n=40). Patients were evaluated at baseline and at 3, 7, 14, 21 and 28 days. The measurements used were: visual analogue scale (VAS) for cumulative pain (before intervention, VAS1) and immediate pain (after intervention, VAS2); function (Roland–Morris Disability Questionnaire (RM)); quality of life (SF-36); improvement rating; and number of anti-inflammatory tablets taken. The primary endpoint was a decrease of at least 2 cm in VAS1.
    - Pain VAS improved significantly in the IG from day 14 onward compared with the SG, but the difference did not reach the pre-specified clinically relevant value of 2 cm. The IG was significantly superior to the SG in the following outcomes: cumulative pain, function, pain (SF-36), and vitality (SF-36) at days 14, 21, and 28 (p<0.05); limitation in physical aspects (SF-36) at all times (p=0.007 and p=0.02); and functional capacity (SF-36) at days 21 and 28 (p<0.05). The IG also took significantly fewer anti-inflammatory tablets than the SG (p=0.004) at all evaluation times and the improvement rating was better than the SG (p<0.001).

## 2. Acute Neck Pain (Including Neck Pain with Radiculopathy)

- Grissa, M. H., Baccouche, H., Boubaker, H., Beltaief, K., Bzeouich, N., Fredj, N., ... & Nouira, S. (2016). Acupuncture vs intravenous morphine in the management of acute pain in the ED. *The American Journal of Emergency Medicine*, 34(11), 2112-2116.
  - This was a prospective, randomized trial of acupuncture vs. morphine to treat emergency department (ED) patients with acute-onset moderate to severe pain.
  - Primary outcome consists of the degree of pain relief with significant pain-reduction defined as a pain-score reduction  $\geq 50$  percent of its initial value. The study also analyzed the pain-reduction time and the occurrence of short-term adverse effects. The study protocol included 300 patients with acute pain: 150 in each group.
  - Success rate was significantly different between the two groups (92 percent in the acupuncture group vs. 78 percent in the morphine group  $P < .001$ ). Resolution time was  $16 \pm 8$  minutes in the acupuncture group vs.  $28 \pm 14$  minutes in the morphine group ( $P < .005$ ). Overall, 89 patients (29.6 percent) experienced minor adverse effects: 85 (56.6 percent) in morphine group, and 4 (2.6 percent) in acupuncture group ( $P < .001$ ). No major adverse effects recorded during the study protocol. In patients with acute pain presenting to the ED, acupuncture was associated with more effective and faster analgesia with better tolerance.
  
- Adam S. Reinstein, Lauren O. Erickson, Kristen H. Griffin, Rachael L. Rivard, Christopher E. Kapsner, Michael D. Finch, Jeffery A. Dusek, Acceptability, Adaptation, and Clinical Outcomes of Acupuncture Provided in the Emergency Department: A Retrospective Pilot Study, *Pain Medicine*, Volume 18, Issue 1, January 2017, Pages 169–178, <https://doi.org/10.1093/pm/pnv114>
  - What is the comparative effectiveness of non-pharmacologic treatments (acupuncture) for outcomes related to pain, function, pain-relief satisfaction, and quality of life after follow up at the following intervals: Less than one day; one day to less than one week; one week to less than two weeks; two weeks to less than four weeks; four weeks or longer?
    - “A total of 182 patients presented in the emergency department with pain (pre-pain  $> 0$ ) with over half reporting that their pain was an 8 or above. These subjects had a mean pre-pain of 6.80 (SD = 2.58) and reported an average decrease of 2.52 points (95 percent CI: 2.20, 2, 85;  $p$ -value $<0.001$ ) after acupuncture therapy (Table 3). Of those patients, 43 percent reported at least a 50-percent pain reduction and 57 percent reported at least a 30-percent pain reduction.”
    - “Furthermore, 160 patients with high pain (pre-pain  $\geq 4$ ) had a mean pre-pain of 7.47 (SD = 1.93) and reported an average decrease of 2.71 points (95 percent CI: 2.36, 3.07). Of those patients, 39 percent reported at least a 50-percent pain reduction and 54 percent reported at least a 30-percent pain reduction.”
    - How does effectiveness of non-pharmacologic therapy vary depending on: (1) Patient demographics (e.g. age, gender); (2) patient medical and psychiatric comorbidities? No differences noted.

- How do harms vary depending on: (1) Patient demographics (e.g. age, gender); (2) patient medical and psychiatric comorbidities; (3) the type of treatment used; (4) the frequency of therapy; (5) the duration of therapy? No harms noted.
- Trinh K, Graham N, Gross A, Goldsmith CH, Wang E, Cameron ID, Kay TM. Acupuncture for neck disorders. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD004870. DOI: 10.1002/14651858.CD004870.pub3.
  - Neck pain is one of the three most frequently reported complaints of the musculoskeletal system. Treatments vary, as are their perceived benefits. Acupuncture has been used as an alternative to more traditional treatments for musculoskeletal pain. This review summarizes the most current scientific evidence on the effectiveness of acupuncture for acute, subacute, and chronic neck pain.
  - To determine the effects of acupuncture for individuals with neck pain. The study searched CENTRAL (2006, issue 1) and MEDLINE, EMBASE, MANTIS, CINAHL from their beginning to February 2006. The study also searched reference lists and the acupuncture database TCMLARS in China. Researchers included any published trial using randomized or quasi-randomized assignment to the intervention groups, either in full-text or abstract form. Two reviewers made independent decisions for each step of the review: article inclusion, data abstraction, and trial methodological quality assessment.
  - Study quality was assessed using the Jadad criteria. Consensus was used to resolve disagreements. When clinical heterogeneity was absent, the study combined studies using random-effects meta-analysis models. Researchers did not find any trials that examined the effects of acupuncture for acute or subacute pain, but found 10 trials that examined acupuncture treatments for chronic neck pain. Overall, methodological quality had a mean of 2.3/5 on the Jadad Scale.
  - For chronic mechanical neck disorders, there was moderate evidence that acupuncture was more effective for pain relief than some types of sham controls, measured immediately post-treatment. There was moderate evidence that acupuncture was more effective than inactive, sham treatments measured immediately post-treatment and at short-term follow-up (pooled standardized mean difference (SMD) -0.37, 95-percent confidence interval (CI) -0.61 to -0.12). There was limited evidence that acupuncture was more effective than massage at short-term follow-up. For chronic neck disorders with radicular symptoms, there was moderate evidence that acupuncture was more effective than a wait-list control at short-term follow-up.
  - There is moderate evidence that acupuncture relieves pain better than some sham treatments, measured at the end of the treatment. There is moderate evidence that those who received acupuncture reported less pain at short-term follow-up than those on a waiting list. There is also moderate evidence that acupuncture is more effective than inactive treatments for relieving pain post-treatment, which is maintained at short-term follow-up.

- Davis, R. T., Badger, G., Valentine, K., Cavert, A., & Coeytaux, R. R. (2018). Acupuncture for chronic pain in the Vermont Medicaid population: a prospective, pragmatic intervention trial. *Global advances in health and medicine*, 7, 2164956118769557.
  - A total of 156 Medicaid patients with chronic pain were offered up to 12 acupuncture treatments within a 60-day period at the offices of 28 Vermont-licensed acupuncturists. Patient-Reported Outcomes Measurement Information System (PROMIS)® questionnaires were administered prior to, and at the end of, the treatment period to assess changes in pain intensity, pain interference, physical function, fatigue, anxiety, depression, sleep disturbance, and social isolation. Questionnaires also captured patients' overall impressions of treatments as well as self-reported changes in medication use and work function.
  - The study included 111 women (71 percent) and 45 men (29 percent) with a wide range of pain complaints who received a mean of 8.2 treatments during the intervention period. Measurements captured prior to, and at the end of, the treatment period showed significant improvements in group mean-pain intensity, pain interference, physical function, fatigue, anxiety, depression, sleep disturbance, and social isolation as assessed by PROMIS measures (paired t tests,  $P < .01$ ).
  - Fifty-seven percent of patients using analgesic (non-opioid) medication reported reductions in use. Thirty-two percent of patients using opioid medication reported reductions in use of opioid medication following the intervention. Seventy-four percent of employed patients reported improved capacity to work. Ninety-six percent of patients said that they would recommend acupuncture to others with chronic pain, and 91 percent reported qualitative improvements, including physical (31 percent), functional/behavioral (29 percent), and psycho-emotional (24 percent) improvements.
  
- H.-Y. Kwak, J.-I. Kim, J.-M. Park et al., "Acupuncture for Whiplash-associated disorder: a randomized, waiting-list controlled, pilot trial," *European Journal of Integrative Medicine*, vol. 4, no. 2, pp. e151–e158, 2012.
  - Kwak et al. tested the effectiveness of six sessions of AT plus usual care (UC) compared with UC alone in 40 patients with whiplash-associated disorders (WAD). At the two-week follow-up, the authors reported significant reductions in pain intensity (VAS) in the treatment group ( $MD = -1.85$ ; 95%CI  $-2.67$  to  $-1.02$ ) compared with controls ( $MD = -0.40$ ; 95 percent CI  $-1.18$  to  $0.38$ ) and concluded that AT was associated with a significant alleviation of pain.
  - Tobbackx et al. compared the effect of one session of AT with relaxation in 38 patients with WAD grades I-III. The authors reported significant reductions in pressure pain sensitivity (PPS) and PPS during CPM (both at ; no CIs) following AT compared with the controls and concluded that one session of AT results in acute improvements in PPS in the neck and calf of patients with chronic WAD; AT had no effect on CPM or the temporal summation of pressure pain.
  - Cameron et al. investigated the effectiveness of 12 sessions of EA compared with sham EA in 116 patients with WAD grade I or II. The authors reported significant reductions in pain intensity (VAS) at the three- ( $MD = -1.0$ ; 95 percent CI  $-1.0$  to  $-0.3$ ) and six-month ( $MD = -1.2$ ; 95 percent CI  $-1.2$  to  $-0.1$ ) follow-ups in the EA group compared with

controls. The authors found no significant reductions in NDI or SF-36 at three or six months. They concluded that real EA was associated with a significant reduction in pain intensity, albeit clinically insignificant; and there were no changes in disability or quality of life.

- Han et al. compared the effect of eight sessions of EA plus Wuji-san (a Chinese herbal mixture) with that of sham EA plus the mixture in 58 WAD patients. At the four-week follow-up, the authors reported a significant reduction in pain intensity (VAS) compared with controls (no CIs) and no significant reduction in disability. The authors concluded that concomitant treatment with EA could be recommended as a useful therapy for WAD patients.
- Tough et al. tested the feasibility of a phase III RCT of DN in addition to physiotherapy (PT) (unknown number of sessions) versus sham DN in addition to PT in 34 females with grade II WAD. After six weeks, the authors reported no between-group differences in SF-MPQ (; no CIs), m-BPI-sf (; no CIs), or NDI (; no CIs) and concluded that a large random-controlled trial is both feasible and clinically relevant.
- Aigner et al. compared the effect of AT (unknown number of sessions) with that of PT plus drugs (chlormezanone and paracetamol) in 61 patients with grades I-II WAD. At the eight- and twelve-month follow-ups, the authors reported increased ROM and decreased duration of acute complaints and drug intake following AT. However, no statistical tests were performed between the two groups.
- Stuart, Sam, Armstrong, Michael, Sewell, Jennifer, Dixon, Cheryl and Morris, Rosie (2019) Acupuncture for whiplash-associated disorder following a road traffic collision: a physiotherapy service evaluation. *Acupuncture in Medicine*.
  - Background: Whiplash associated disorder (WAD) is a common musculoskeletal condition that frequently occurs following a road-traffic collision. Physiotherapy is often prescribed to help with the symptoms and injuries. Research evidence has demonstrated that acupuncture may be beneficial, but no studies have examined the routine clinical use of acupuncture by physiotherapists for treatment of WAD. Therefore, a physiotherapy service evaluation was conducted to examine the effects of acupuncture on WAD following a road-traffic collision.
  - Methods: This study involved 87 patients who attended a private physiotherapy practice following a road-traffic collision after referral by their solicitor as part of a personal-injury claim. Patients were included if they had been diagnosed with WAD (Grade I-III) and received acupuncture as part of treatment. Each received an average of three sessions of acupuncture, which primarily involved needling traditional acupuncture points and/or myofascial trigger points of the neck and upper/lower back.
  - Results: Pain significantly reduced ( $p < 0.001$ ). Musculoskeletal outcome measures including neck disability index, Oswestry Low-Back Pain Disability Scale and Quick disabilities of the arm, shoulder, and hand (Quick-DASH) scale also significantly improved (all  $p < 0.001$ ). Adverse events were minor. The majority of the patients ( $n=66$ ) returned to full work duties following treatment.

- Conclusion: Acupuncture appears to be an effective clinical treatment for WAD following a road-traffic collision, and should be considered by physiotherapists working with such patient groups.
- Fattori, B., Ursino, F., Cingolani, C., Bruschini, L., Dallan, I., & Nacci, A. (2004). Acupuncture treatment of whiplash injury. *Int Tinnitus J*, 10(2), 156-160.
  - The study used computerized static posturography to evaluate the postural changes after acupuncture treatment in a group of 27 patients (12 men and 15 women; mean age, 35.7+/-6.8 SD) having balance disorders caused by cervical torsion due to whiplash injury. Acupuncture was performed by piercing deeply and bilaterally acupuncture points bladder 10 and gall bladder 20 with steel needles that were twirled manually for 20 seconds. All patients underwent posturographic evaluations before and just after each session of acupuncture. The posturography was performed with open eyes, closed eyes (CE), and closed eyes with retroflexed head (CER).
  - The control group consisted of 25 patients complaining of the same symptoms as those recorded by the study group due to whiplash injury but treated with nonsteroidal anti-inflammatory drugs and myorelaxation or with physiotherapy only. The data presented in this study revealed a considerable difference between the two groups with regard to the reduction of the CE and CER length of the statokinesigram just before each session of acupuncture. The frequency oscillation on the sagittal plane in CER was reduced in the study group, whereas the researchers noticed a progressive increase of its values in the control group. The high percentage of positive results in whiplash-injury patients demonstrates acupuncture as an effective treatment balance disorders due to cervical pathology.

### **3. Other Musculoskeletal Pain. Musculoskeletal Pain not Otherwise Included in KQ1 or KQ2 (Including Fractures)**

- Yuan, Q. L., Wang, P., Liu, L., Sun, F., Cai, Y. S., Wu, W. T., ... Zhang, Y. G. (2016). Acupuncture for musculoskeletal pain: A meta-analysis and meta-regression of sham-controlled randomized clinical trials. *Scientific reports*, 6, 30675. doi:10.1038/srep30675
  - 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. Five databases were searched.
  - The outcome was pain or disability immediately ( $\leq 1$  week) following an intervention. Standardized mean differences (SMDs) with 95-percent confidence intervals were calculated. Meta-regression was used to explore possible sources of heterogeneity. Sixty-three studies (6382 individuals) were included and eight condition types were included. The pooled effect size was moderate for pain relief (59 trials, 4980 individuals, SMD -0.61, 95 percent 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 ( $P < 0.05$ ). The 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.
- Zhen Zheng, Stephen Gibson, Robert D Helme, Yanyi Wang, David Shao-Chen Lu, Carolyn Arnold, Malcolm Hogg, Andrew A Somogyi, Cliff Da Costa, Charlie Chang Li Xue, Effects of Electroacupuncture on Opioid Consumption in Patients with Chronic Musculoskeletal Pain: A Multicenter Randomized Controlled Trial, *Pain Medicine*, Volume 20, Issue 2, February 2019, Pages 397–410, <https://doi.org/10.1093/pm/pny113>
  - All participants received pain- and medication-management education. Participants were randomly allocated to electroacupuncture (N = 48), sham electroacupuncture (N = 29), or education alone (N = 31) to receive relevant treatment for 12 weeks. The last group received electroacupuncture during the three-month follow-up. Analysis of covariance and paired t-tested were used.
  - Results: Opioid dosage, that is, the primary outcome measure, was reduced by 20.5 percent ( $P < 0.05$ ) and 13.7 percent ( $P < 0.01$ ) in the two acupuncture groups and by 4.5 percent in the education group at the end of the treatment phase, but without any group difference. Intensity of pain in all three groups did not change over time. No group differences were found in dosage of nonopioid analgesics, pain intensity, function, and opioid-related adverse events. During follow-up, the education group had a 47-percent reduction of opioids after a course of electroacupuncture. Adverse events to electroacupuncture were minor.
  - Conclusion: It is safe to reduce opioid medication use in patients with chronic pain. Due to the small sample size, we could not confirm if electroacupuncture offers extra benefit in addition to education. This non-drug therapy could be a promising adjunct to facilitate opioid tapering in patients who are willing to reduce opioids.

#### 4. Peripheral Neuropathic Pain (Related to Herpes Zoster and Trigeminal Neuralgia)

- Garrido-Suárez BB, Garrido G, Menéndex AB, et al. Combination of low frequency electroacupuncture plus subdissociative doses of ketamine in post-herpetic neuralgia patients. A pilot study. *J Pharm Pharmacogn Res.* 2017; 5(6):381–393.
  - To examine the potential anti-hyperalgesic effects of the electroacupuncture (EA) (and the combination EA-ketamine in patients with post-herpetic neuralgia (PHN)).
  - Methods: Sixty-eight patients with PHN irritable nociceptor type were randomly allocated to three groups: group I (n=26), that received treatment with EA (10 Hz, 2-3 mA, 0.5 ms, 20 min/15 sessions) alone, group II (n=21) with a combination EA-ketamine (0.25-0.5 mg/kg, i.m.), or group III (n=21) with sham EA-ketamine for 15 days. The average daily pain score (ADPS) using the Likert scale, area and rate of dynamic allodynia, the rate of thermal allodynia, and frequency of intermittent

lancinating pain were evaluated during five visits--before treatment and at 15, 30, 60, and 90 days.

- Results: ADPS and sensory abnormalities decreased significantly according to baseline data at 90 days in the three groups, but patients treated with the combination EA-ketamine significantly improved compared with the other groups.
  - Conclusions: These results suggest that the combination EA-ketamine shows an early and long-term anti-hyperalgesia effect in PHN patients. However, a controlled clinical trial is necessary to confirm this hypothesis.
- Ursini T, Tontodonati M, Manzoli L, et al. Acupuncture for the treatment of severe acute pain in herpes zoster: results of a nested, open-label, randomized trial in the VZV pain study. *BMC Complement Altern Med*. 2011;11:46 [published Online First: 2011/06/07]. doi:10.1186/1472-6882-11-46 [[PMC free article](#)][[PubMed](#)] [[CrossRef](#)] [[Google Scholar](#)]
    - Within the VZV Pescara study, pain was assessed in HZ patients on a Visual Analogue Scale and by the McGill Pain Questionnaire (MPQ) both at the beginning and at the end of treatment. Response rates, mean changes in pain intensity, differences in total pain burden with an area-under-the-curve (AUC) method over a one-year follow-up and differences in the incidence of Post-Herpetic Neuralgia (PHN) were evaluated.
    - One hundred and two patients were randomized to receive either AC (Acupuncture) (n = 52) or ST (Standard Treatment) (n = 50) for four weeks. Groups were comparable regarding age, sex, pain intensity at presentation and missed antiviral prescription. Both interventions were largely effective. No significant differences were observed in response rates (81.6 percent vs 89.2 percent, p = 0.8), mean reduction of VAS (4.1 +/- 2.3 vs 4.9 +/- 1.9, p = 0.12) and MPQ scores (1.3 +/- 0.9 vs 1.3 +/- 0.9, p = 0.9), incidence of PHN after three months (48.4 percent vs 46.8 percent, p = 0.5), and mean AUC during follow-up (199 +/- 136 vs 173 +/- 141, p = 0.4). No serious treatment-related adverse event was observed in both groups.
  - Takahashi, H. (2007). Effects of scalp acupuncture and auricular therapy on acute herpetic pain and postherpetic neuralgia: a case series. *Medical Acupuncture*, 19(2), 113-120.
    - Objective: To evaluate scalp acupuncture and auricular therapy for treatment of acute herpetic pain and post-herpetic neuralgia.
    - Design, Setting, and Patients: A retrospective case series study. Scalp acupuncture and auricular therapy were performed on 17 Japanese patients with acute herpetic pain or post-herpetic neuralgia. All patients had been treated with conventional pain therapies such as medication, nerve blocks, and electrical nerve stimulation, which resulted in little or no pain relief.
    - Interventions: Scalp acupuncture consisted of needling the corresponding “sensory” areas on the scalp with electrical stimulation at 150 Hz for 20 minutes. Auricular therapy with a stimulation device was performed concurrently.
    - Main Outcome Measures: The degree of pain relief was evaluated by each patient as excellent, good, fair, or poor.
    - Results: After the first session, pain-relief effects were excellent in five patients, good in six patients, fair in five, and poor in one. After the fourth session, six patients noted excellent pain relief, nine recorded good pain relief, while fair and poor pain

relief were reported by one patient each. No significant adverse effects were observed except for minor bleeding and local scalp pain at the needle entry points in some cases.

- Conclusions: Scalp acupuncture and auricular therapy may have promising results for herpetic pain and post-herpetic neuralgia without significant adverse effects.

## 5. Postoperative Pain after Discharge

- Wu, M. S., Chen, K. H., Chen, I. F., Huang, S. K., Tzeng, P. C., Yeh, M. L., ... Chen, C. (2016). The Efficacy of Acupuncture in Post-Operative Pain Management: A Systematic Review and Meta-Analysis. *PloS one*, 11(3), e0150367. doi:10.1371/journal.pone.0150367
  - Randomized controlled trials of adult subjects ( $\geq 18$  years) who had undergone surgery and who had received acupuncture, electroacupuncture, or acupoint electrical stimulation for managing acute postoperative pain were included.
  - The study found that patients treated with acupuncture or related techniques had less pain and used less opioid analgesics on Day One after surgery compared with those treated with control ( $P < 0.001$ ). Sensitivity analysis using the leave-one-out approach indicated the findings are reliable and are not dependent on any one study. In addition, no publication bias was detected.
  - Subgroup analysis indicated that conventional acupuncture and transcutaneous electric acupoint stimulation (TEAS) were associated with less postoperative pain one day following surgery than control treatment, while electroacupuncture was similar to control ( $P = 0.116$ ). TEAS was associated with significantly greater reduction in opioid analgesic use on Day One post-surgery than control ( $P < 0.001$ ); however conventional acupuncture and electroacupuncture showed no benefit in reducing opioid analgesic use compared with control ( $P \geq 0.142$ ).
  - The study findings indicate that certain modes of acupuncture improved postoperative pain on the first day after surgery and reduced opioid use. The study findings support using acupuncture as adjuvant therapy in treating postoperative pain.
- Sun Y., Gan T.J., Dubose J.W., Habib A.S.(2008). Acupuncture and related techniques for postoperative pain: A systematic review of randomized controlled trials. *British Journal of Anaesthesia*, 101 (2), pp. 151-160.
  - Postoperative pain management remains a significant challenge for all healthcare providers. The objective of this systematic review was to quantitatively evaluate the efficacy of acupuncture and related techniques as adjunct analgesics for acute-postoperative pain management. Researchers searched the databases of Medline (1966–2007), CINAHL, The Cochrane Central Register of Controlled Trials (2006), and Scopus for randomized-controlled trials (RCTs) using acupuncture for postoperative pain management and extracted data about postoperative opioid consumption, postoperative pain intensity, and opioid-related side effects. Combined data were analyzed using a random effects model. Fifteen RCTs comparing acupuncture with sham control in managing acute-postoperative pain

were included. Weighted mean difference for cumulative opioid analgesic consumption was  $-3.14$  mg (95 percent confidence interval, CI:  $-5.15, -1.14$ ),  $-8.33$  mg (95 percent CI:  $-11.06, -5.61$ ), and  $-9.14$  mg (95 percent CI:  $-16.07, -2.22$ ) at 8, 24, and 72 h, respectively. Postoperative pain intensity (visual analogue scale, 0–100 mm) was also significantly decreased in the acupuncture group at 8 and 72 h compared with the control group.

- The acupuncture treatment group was associated with a lower incidence of opioid-related side-effects such as nausea (relative risk, RR: 0.67; 95 percent CI: 0.53, 0.86), dizziness (RR: 0.65; 95 percent CI: 0.52, 0.81), sedation (RR: 0.78; 95 percent CI: 0.61, 0.99), pruritus (RR: 0.75; 95 percent CI: 0.59, 0.96), and urinary retention (RR: 0.29; 95 percent CI: 0.12, 0.74). Perioperative acupuncture may be a useful adjunct for acute postoperative pain management.

## 6. Dental Pain (Surgical and Nonsurgical after Discharge)

- Lao L, Bergman S, Hamilton GR, Langenberg P, Berman B. Evaluation of Acupuncture for Pain Control After Oral Surgery: A Placebo-Controlled Trial. *Arch Otolaryngol Head Neck Surg.* 1999; 125(5):567–572. doi:10.1001/archotol.125.5.567
  - Thirty-nine healthy subjects, aged 18 to 40 years, assigned to treatment (n=19) and control (n=20) groups.
  - Patients' self-reports of time until moderate pain, time until medication use, total pain relief, pain half-gone, and total pain medication consumption.
  - Mean pain-free postoperative time was significantly longer in the acupuncture group (172.9 minutes) than in the placebo group (93.8 minutes) ( $P=.01$ ), as was time until moderate pain ( $P=.008$ ). Mean number of minutes before requesting pain rescue medication was significantly longer in the treatment group (242.1 minutes) than in the placebo group (166.2 minutes) ( $P=.01$ ), as was time until medication use ( $P=.01$ ). Average pain medication consumption was significantly less in the treatment group (1.1 tablets) than in the placebo group (1.65 tablets) ( $P=.05$ ). There were no significant between-groups differences on total-pain-relief scores or pain-half-gone scores ( $P >.05$ ). Nearly half, or more of all, patients were uncertain of, or incorrect about, their group assignment. Outcomes were not associated with psychological factors in multivariate models.
  - Conclusion: Acupuncture is superior to the placebo in preventing postoperative dental pain; non-insertion placebo procedure is valid as a control.
- Ernst, E., & Pittler, M. H. (1998). The effectiveness of acupuncture in treating acute dental pain: a systematic review. *British dental journal*, 184(9), 443-447.
  - A systematic review that assessed the effectiveness of acupuncture in dental pain and involved 16 controlled clinical trials. Most of these trials implied that acupuncture was effective in dental analgesia.
  - However, there was considerable variation in methodological quality, and non-randomization, insufficient control for placebo effects and small sample sizes were common shortcomings. The reviewers concluded that acupuncture can alleviate dental pain.

- Tavares, Marconi Gonzaga, Machado, Ana Paula, Motta, Breno Gutierrez, Borsatto, Maria Cristina, Rosa, Adalberto Luiz, & Xavier, Samuel Porfírio. (2007). Electro-acupuncture efficacy on pain control after mandibular third molar surgery. *Brazilian Dental Journal*, 18(2), 158-162. <https://dx.doi.org/10.1590/S0103-64402007000200014>
  - The aim of this study was to evaluate the efficacy of electro-acupuncture (EAC) on postoperative pain control after mandibular third-molar surgery. Twenty-four young patients (12 male and 12 female) with symmetrically impacted mandibular third molars were selected. Each patient was submitted to two separate surgical procedures under local anesthesia. On one side, extraction was carried out employing both prior (24 hours) and immediately postoperative application of EAC, while on the contralateral side, surgery was carried out without any treatment.
  - EAC was applied on six bilateral systemic and two auricular points with a WQ10DI appliance using 40–60Hz frequency for 20 min and individually adjusted intensity. Postoperative pain intensity was rated on a 100 mm visual analog scale (VAS) between 2 and 72 hours and recording the analgesics intake amount after surgery.
  - Statistical analysis was performed using the Wilcoxon test. Postoperative pain VAS scores were significantly lower for the EAC group ( $p < 0.05$ ) and analgesic intake decreased ( $p < 0.05$ ) for all evaluated periods ( $p < 0.05$ ). Under the tested conditions, EAC therapy effectively controlled postoperative pain following mandibular third-molar surgical removal.
  
- de Matos, Nuno M.P. et al. (Sept 2019). Evaluating the Effects of Acupuncture Using a Dental Pain Model in Healthy Subjects – A Randomized, Cross-Over Trial. *Journal of Pain*. <https://doi.org/10.1016/j.jpain.2019.08.013>
  - This study compared the impact of manual acupuncture (real acupuncture), manual stimulation of a needle inserted at non-acupuncture points (sham acupuncture) and no acupuncture on experimentally induced dental pain in 35 healthy men who were randomized to different sequences of all three interventions in a within-subject design. BORG CR10 pain ratings and autonomic responses (electrodermal activity and heart rate variability) were investigated.
  - An initial mixed model with repeated measures included pre-intervention pain ratings and the trial sequence as covariates. The results showed that acupuncture was effective in reducing pain intensity when compared to no acupuncture ( $\beta = -.708$ ,  $P = .002$ ), corresponding to a medium Cohen's *d* effect size of .56.
  - The comparison to the sham acupuncture revealed no statistically significant difference. No differences in autonomic responses between real and sham acupuncture were found during the intervention procedure.

## 7. Kidney Stones

- Chen, Q., Chen, F., Zhang, P. J., & Mao, N. Y. (2017). Therapeutic Observation of Abdominal Acupuncture plus Chinese Medication for Ureteral Calculus. *Shanghai Journal of Acupuncture and Moxibustion*, 36(10).
  - The drugs plus herbal medicine group achieved a total effective rate of 73.6 percent. The group receiving identical drugs and herbal medicine plus the addition of acupuncture achieved a total effective rate of 88.7 percent. Adding acupuncture to

- the administration of tamsulosin and San Jin Tang increases the total effective rate by 15.1 percent. Notably, the group receiving acupuncture had faster pain relief.
- A total of 106 patients with ureteric calculi were treated and evaluated in this study. The patients were diagnosed between January 2015 and January 2017. They were randomly divided into an abdominal acupuncture group and a drugs plus herbal medicine group, with 53 patients in each group. The treatment group received acupuncture, herbs, and drug therapy. The control group received only herbs and drug therapy. Both groups received identical drugs plus Chinese herbal therapy, for two consecutive weeks.
  - The statistical breakdown for each randomized group was as follows. The treatment group consisted of 28 males and 25 females. The average age in the control group was 35 ( $\pm 6$ ) years. The control group consisted of 31 males and 22 females. The average age in the treatment group was 36 ( $\pm 6$ ) years. There were no significant statistical differences in age and gender relevant to patient outcome measures for patients initially admitted to the study.
- Kaynar, Mehmet & Koyuncu, Ferudun & Buldu, Ibrahim & Tekinarslan, Erdem & Tepeler, Abdulkadir & Karatag, Tuna & İstanbulluoğlu, Mustafa & Ceylan, Kadir. (2015). Comparison of the efficacy of diclofenac, acupuncture, and acetaminophen in the treatment of renal colic. *The American Journal of Emergency medicine*. 33. 10.1016/j.ajem.2015.02.033. 1186-1189.
    - What is the comparative effectiveness of non-pharmacologic therapy vs. sham treatment, waitlist, usual care, attention control, and no treatment after follow up at the following intervals: Less than one day; one day to less than one week; one week to less than two weeks; two weeks to less than four weeks; four weeks or longer?
    - Renal colic patients were divided randomly into three groups. Patients in group I (n = 40) were treated with intravenous acetaminophen, those in group II (n = 41) with acupuncture, and those in group III (n = 40) with a 75-mg intramuscular injection diclofenac sodium. Visual analogue scale (VAS) and verbal rating scale (VRS) were used to assess pain intensity after 10, 30, 60, and 120 minutes. No significant differences in baseline VAS or VRS were found with regard to age or sex.
    - After 10 minutes, all three groups experienced a significant decrease in VAS and VRS scores, with the most drastic decrease occurring in group II. After 30 minutes, there was a significantly higher decrease in group III than in group I (P = .001). After 60 minutes, mean VAS scores of groups I and III (P = .753) were similar. The mean VAS score of group III was lower than that of group II (P = .013). After 120 minutes, the difference in the VAS scores was (P = .000) between groups I and II and between groups II and III. Yet, the VAS evaluation made after 120 minutes revealed statistically similar outcomes for groups I and III (P = .488). The statistical findings for VRS evaluations made after 10, 30, 60, and 120 were similar to those for VAS.

- Hodzic, J., Golka, K., Selinski, S. et al. [Analgesia with acupuncture in extracorporeal shock wave lithotripsy of kidney stones--first results] *Urologe* 46, 740–747 (2007).  
<https://doi.org/10.1007/s00120-007-1362-1> c b
  - The aim of this study was to investigate whether acupuncture at certain acupuncture points can lower or even substitute the demand for analgesics.
  - Extracorporeal shock wave lithotripsy (ESWL) treatments were selected for the two groups using the registration number for randomization. Both groups rated pain sensation prior to the ESWL treatment using a numeric pain scale. The subjects in the analgesic group received 50 mg pethidine and 10 mg diazepam whereas the subjects in the acupuncture group received acupuncture at the points colon for bilateral, liver three bilateral, urinary bladder 23 bilateral, gall bladder 25 contralateral to the stone, circulation 6 bilateral, and Ren Mai. Every minute until 21 minutes after starting the therapy and 10 minutes after termination, the pain sensation was rated. Analgesics were intravenously applied in all subjects reporting a pain sensation higher than five. Additionally, the pain management was rated with a non-evaluated questionnaire.
  - In the present study on 102 patients, analgesia by acupuncture was successfully applied to patients who underwent ESWL. The analgesic effect of acupuncture was significantly superior to the analgesic effect of analgesics. In the group treated by acupuncture, 20 subjects received additional analgesics. In general, these subjects presented bigger kidney stones and were younger. Subjects with left-sided kidney stones required more frequent analgesics. The results were not significant.

## 8. Sickle Cell Crisis (Episodic Pain)

- Lu, K., Cheng, M. C., Ge, X., Berger, A., Xu, D., Kato, G. J., & Minniti, C. P. (2014). A retrospective review of acupuncture use for the treatment of pain in sickle cell disease patients: descriptive analysis from a single institution. *The Clinical journal of pain*, 30(9), 825–830. doi:10.1097/AJP.0000000000000036
  - The study identified 47 sickle cell disease patients referred for acupuncture at the National Institutes of Health between January 2005 and September 2011. All patients were enrolled in a Study of the Natural History of sickle cell disease and signed consent. The researchers reviewed patient demographics, location of acupuncture treatment sessions (inpatient vs. outpatient), number of sessions received, sites of pain, patient pain reporting, and the use of other complementary therapies.
  - Of the 47 patients (60-percent women, median age 36 years) referred for acupuncture, 42 had homozygous SS (sickle cell) disease (89 percent) and five had SC (sickle cell carrier) disease (11percent). Over half of the patients (51 percent) reported >3 sites of pain. Only 24 patients (51 percent) underwent acupuncture treatment. Of those who elected not to receive acupuncture, a majority (87 percent) accepted some other forms of complementary therapies.
  - Nine patients underwent only inpatient acupuncture for acute vaso-occlusive crisis. Eleven patients received only outpatient acupuncture treatment for chronic pain, and four patients received both inpatient and outpatient treatments. For the patients who received inpatient acupuncture treatment for acute vaso-occlusive crisis, there was

a significant reduction of reported pain score immediately after acupuncture treatment with an average pain reduction of 2.1 points on the numeric pain scale ( $P < 0.0001$ ). Excluding the two outliers, 75 percent of patients ( $n = 13$ ) in the outpatient setting described their pain as improved compared with prior sessions.

- This may be the largest retrospective review of acupuncture use in the sickle cell population. This analysis describes the use of acupuncture and raises the possibility of its use as an adjuvant for pain management in this population. Future clinical trials are necessary to evaluate acupuncture's efficacy.
- Tsai S-Lin, Bombacie M, Licursi M, Qian Y, Stiles GM, Lee MT, Acupuncture for Pediatric Sickle Cell Pain Management: A Promising Non-Opioid Therapy, *Complementary Therapies in Medicine* (2020), doi: <https://doi.org/10.1016/j.ctim.2020.102314>
  - To describe the use of acupuncture for pain-management in children with sickle cell disease.
  - While this study addresses pain-management for children, the treatments are applicable to adults with sickle cell.
  - A retrospective chart review of a single-institution experience on acupuncture in pediatric patients with sickle cell disease evaluated within 2012-2019. Demographic characteristics, presenting pain location, pain scores pre- and post-acupuncture, and adverse events were collected.
  - Columbia University Medical Center/New York-Presbyterian Morgan Stanley Children's Hospital Pediatric Hematology outpatient and inpatient units.
  - Six licensed acupuncturists performed acupuncture. Point prescriptions were based on pain location, philosophies of Traditional Chinese Medicine and Japanese Style of Kiiko Matsumoto acupuncture.
  - Pain reduction measured by two Verbal Pain Scales.
  - Ninety acupuncture treatments were administered to 24 patients with sickle cell disease: median age 17.5 years, 62 percent female, 37.5 percent African American, 50-percent Hispanic. The mean treatment duration was  $18.5 \pm 4.8$  minutes.
  - Fifty-five treatments documented pre/post-acupuncture pain scores. Pain reduction was achieved in 65.5-percent of these treatments. A 0-10 pain scale used in 13 treatments reported a mean pre-acupuncture  $7.31 \pm 1.75$  score,  $6.08 \pm 1.85$  post-acupuncture score, and a mean-pain score change of  $1.23 \pm 1.09$  ( $p = 0.11$ ); A 0-4 pain scale used in 42 treatments reported a mean pre-acupuncture pain score of  $3.31 \pm 0.72$ , post-acupuncture score of  $2.33 \pm 0.98$ , and a mean pain score change of  $0.98 \pm 0.99$  ( $p < 0.0001$ ). No adverse events noted.
  - Conclusions: Acupuncture therapy can decrease pain for patients with sickle cell disease, providing a safe non-opioid therapeutic option.
- Junghans-Rutelonis AN, Moquist KL, Blaylark RM, Anderson N, Brown ML, Incorporating integrative medicine and patient preferences into a pilot interdisciplinary sickle cell wellness clinic, *Complementary Therapies in Medicine* (2020), doi: <https://doi.org/10.1016/j.ctim.2020.102333>
  - In 2016, key stakeholders collaborated to create a Sickle Cell Wellness Clinic (SCWC) clinic to provide families access to integrative medicine and wellness strategies. Design/structure, based on family focus group data and staff expertise,

included a half-day, seven-discipline clinic housed in the PPCIM space. Patients with SCD (Sickle Cell Disease), ages 8-20, learned strategies to improve healthcare utilization and increase overall quality of life.

- Feedback from two successful pilot clinics in 2017 was incorporated into the formal roll-out of SCWC in 2018. SCWCs continued monthly for one year, serving 20 families post-pilot. SCD patients increased follow-up appointment engagement in the PPCIM (Pain, Palliative Care and Integrative Medicine) clinic following SCWC and reported high levels of satisfaction with their healthcare experience.
  - It is possible to run a multidisciplinary clinic focused on pain management, coping skills, and healthy living with sickle cell disease. Providers benefited from the opportunity to collaborate with other disciplines. Patient and family feedback was positive, highlighted benefits of being introduced to new modalities, and reported advantages of meeting other patients/families in a new setting.
- \*Current clinical trials for acupuncture for individuals with SCD ages 8-22 evaluating efficacy of acupuncture for Sickle cell crises are underway:  
<https://clinicaltrials.gov/ct2/show/NCT04122378>