



Emergency Department Acupuncture Is a Promising Option That Deserves an Open Mind and Continued Rigor

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The emergency department (ED) treatment of acute musculoskeletal pain includes reassurance, pharmacologic therapies, and referral to a primary care physician or other specialists. Poorly controlled acute pain may lead to chronic pain and increased opioid use, frequent ED revisits, inability to work, and diminished wellbeing. The study by Eucker et al¹ in this issue of *Annals* offers new data supporting ED acupuncture as another useful option for analgesia.

In response to a National Institutes of Health call in the late 1990s, there have been gains in the volume and rigor of acupuncture research.² This modality of pricking the skin with needles (ie, “needling”) has been found to be effective for a variety of conditions, including osteoarthritis, fibroids, other gynecologic conditions, gastrointestinal complaints, psychiatric problems, and substance use disorders.³ A meta-analysis of 39 randomized controlled trials with approximately 20,000 patients with musculoskeletal, head, and osteoarthritis pain concluded that acupuncture was superior to sham or no acupuncture, with persistent treatment effects that could not be explained solely through placebo effects.⁴ In a recent randomized controlled trial, acupuncture produced greater pain reduction than usual care in cancer survivors.⁵ Acupuncture is recommended as an option for comprehensive pain care in several clinical practice guidelines, has been adopted by the United States (US) Department of Veterans Affairs Health System, and is endorsed by the US Agency for Healthcare Research and Quality, US Food and Drug Administration, US Department of Health and Human Services, and Joint Commission.^{3,6,7}

Despite the growing clinical evidence that acupuncture reduces pain and improves function in many settings, its mechanism of action is not fully understood. Traditional

Chinese medicine proposes that acupuncture affects the flow of qi energy, a concept without anatomic reference in Western medicine.⁸ Despite biologically plausible theories from animal models that needles from acupuncture stimulate endogenous opioid release, reduce muscle spasm, or modulate adenosine, endocannabinoid, and neuroendocrine signaling pathways involved in pain, researchers have been unable to demonstrate conclusive evidence for those mechanisms of action in humans.^{3,8-10} Functional magnetic resonance imaging (fMRI) studies identify brain responses to acupuncture in the limbic system, basal ganglia, brain stem, and cerebellum in a variety of settings and medical conditions, but how such needling works remains mysterious.^{11,12} Adverse effects are rare and are generally limited to minor discomfort or occasional bruising at sites of needling.^{13,14}

Previous ED acupuncture studies have generally been observational, of limited size, nonblinded, uncontrolled, or with scant or no follow-up.¹⁵⁻²⁰ In the current randomized controlled trial, Eucker et al¹ randomized ED patients with musculoskeletal pain to receive usual care alone at the discretion of the ED clinician as a control, usual care plus Battlefield auricular acupuncture, or usual care plus peripheral needle acupuncture. Both acupuncture groups received treatment from licensed acupuncturists in the ED. Although the patients could not be blinded to the treatment because of press needles in ears (auricular acupuncture) or peripheral needles (peripheral needle acupuncture) in the head or limbs, the ED staff were blinded to the intervention. This study assessed effectiveness in controlling pain, acceptability by patients, and feasibility in the busy ED environment.

Eucker et al¹ found that acupuncture was effective with improved pain scores after 1 hour in both the auricular acupuncture and peripheral needle acupuncture groups compared with usual care alone. The magnitude of such effect was modest, approximating the threshold for clinical

importance commonly used in ED pain research. Neither acupuncture style was superior to the other. Potential limitations to this investigation are the absence of a true placebo group, nonstandardized usual care, the heterogeneity of painful conditions studied, and limiting measurements to 1 hour. Other acupuncture randomized controlled trials have employed placebo or sham therapy, adjunctive treatments, differences in acupuncture point locations, and longer therapy.^{4,21} Pain is, of course, complex and involves social and psychological factors. The use of follow-up sessions after initial treatment in non-ED settings has shown extended pain relief and improved function.^{4,22-24} Further ED research is warranted that includes measures of pain control beyond the first hour and after the ED visit.

Patient satisfaction with treatment in this study was high. ED patients seeking pain relief are often willing to try any new strategy, especially when usual medications have not provided immediate relief and with repeated visits for pain. These patients can sometimes feel rushed or not heard, and having a therapist provide hands-on treatment while listening to their pain experience can consequentially influence their experience relative to medicines alone. Will ED staff be similarly satisfied, given the time and added resources required? Several years ago, we implemented an acupuncture option in our urban ED (130,000 annual visits) by partnering with our health system acupuncturists during weekdays from 7:00 AM to 7:00 PM. We were initially met with some resistance and skepticism. However, 3 years later, our ED staff have embraced it and requested expanded hours because they believe that ED revisits and hospital admissions for intractable pain have been reduced.²⁵ A recent qualitative study of pediatric emergency physicians showed supportive attitudes toward acupuncture.²⁶

Finally, the authors concluded that it is feasible to recruit patients and provide acupuncture in a busy ED setting—an observation confirmed by our experience. Although this study was pragmatic in design, sustainability in this ED and generalizability elsewhere are fair questions. Barriers in most settings include access to a licensed acupuncturist, dedicated ED space for treatment, clinician education to promote this option, and institutional support. However, further research to operationalize acupuncture will align us with other specialties with active adoption.^{2,27} In addition, the expansion of acupuncture might aid marginalized populations that rely on the ED for their health care needs.²⁸ An alternative to ED acupuncture during off hours or for EDs without access to a licensed acupuncturist is post-discharge referral to a suitable clinic because improved function and pain relief from

acupuncture typically require more than one treatment session. Until recently, acupuncture was only paid for out of pocket or by select insurance for certain outpatient conditions. However, it is now covered by the Veteran's medical package for various conditions, and since 2020 by Medicare for back pain.^{6,29} In Germany, insurers also cover acupuncture for back pain.³

The study by Eucker et al,¹ although promising, leaves many questions to be answered. Emergency physicians should be open-minded about acupuncture to improve ED pain management. We look forward to future work from these authors and others who will build on this important new study.

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REFERENCES

1. Eucker SA, Glass O, Knisely MR, et al. An adaptive pragmatic randomized controlled trial of emergency department acupuncture for acute musculoskeletal pain management. *Ann Emerg Med*. 2024;84:337-350.
2. NIH consensus conference. Acupuncture. *JAMA*. 1998;280:1518-1524.
3. Briggs JP, Shurtleff D. Acupuncture and the complex connections between the mind and the body. *JAMA*. 2017;317:2489-2490.
4. Vickers AJ, Vertosick EA, Lewith G, et al. Acupuncture for chronic pain: update of an individual patient data meta-analysis. *J Pain*. 2018;19:455-474.
5. Mao JJ, Liou KT, Baser RE, et al. Effectiveness of electroacupuncture or auricular acupuncture vs usual care for chronic musculoskeletal pain

- among cancer survivors: the PEACE randomized clinical trial. *JAMA Oncol.* 2021;7:720-727.
6. VA Whole Health Acupuncture. Accessed May 1, 2024. <https://www.va.gov/WHOLEHEALTH/professional-resources/Acupuncture.asp>
 7. Nielsen A, Dusek JA, Taylor-Swanson L, et al. Acupuncture therapy as an evidence-based nonpharmacologic strategy for comprehensive acute pain care: the academic consortium pain task force white paper update. *Pain Med.* 2022;23:1582-1612.
 8. Moss CA. Five element acupuncture: treating body, mind, and spirit. *Altern Ther Health Med.* 1999;5:52-61.
 9. Elliott T, Merlano Gomez M, Morris D, et al. A scoping review of mechanisms of auricular acupuncture for treatment of pain. *Postgrad Med.* 2024;136:255-265.
 10. Li HL, Zhang Y, Zhou JW. Acupuncture for radicular pain: a review of analgesic mechanism. *Front Mol Neurosci.* 2024;17:1332876.
 11. Huang W, Pach D, Napadow V, et al. Characterizing acupuncture stimuli using brain imaging with fMRI - a systematic review and meta-analysis of the literature. *PLoS One.* 2012;7:e32960.
 12. Yoon DE, Lee S, Kim J, et al. Graded brain fMRI response to somatic and visual acupuncture stimulation. *Cereb Cortex.* 2023;33:11269-11278.
 13. Macpherson H, Scullion A, Thomas KJ, et al. Patient reports of adverse events associated with acupuncture treatment: a prospective national survey. *Qual Saf Health Care.* 2004;13:349-355.
 14. Witt CM, Pach D, Brinkhaus B, et al. Safety of acupuncture: results of a prospective observational study with 229,230 patients and introduction of a medical information and consent form. *Forsch Komplementmed.* 2009;16:91-97.
 15. Sakamoto JT, Ward HB, Vissoci JRN, et al. Are nonpharmacologic pain interventions effective at reducing pain in adult patients visiting the emergency department? A systematic review and meta-analysis. *Acad Emerg Med.* 2018;25:940-957.
 16. Jan AL, Aldridge ES, Rogers IR, et al. Review article: Does acupuncture have a role in providing analgesia in the emergency setting? A systematic review and meta-analysis. *Emerg Med Australas.* 2017;29:490-498.
 17. Fox LM, Murakami M, Danesh H, et al. Battlefield acupuncture to treat low back pain in the emergency department. *Am J Emerg Med.* 2018;36:1045-1048.
 18. Johnston K, Bonjour T, et al. Battlefield acupuncture versus standard pharmacologic treatment of low back pain in the emergency department: a randomized controlled trial. *J Emerg Med.* 2021;61:406-415.
 19. Graff DM, McDonald MJ. Auricular acupuncture for the treatment of pediatric migraines in the emergency department. *Pediatr Emerg Care.* 2018;34:258-262.
 20. Tsai SL, Christie TD, Niemtow RC. Battlefield acupuncture instead of opioids for abscess drainage in the pediatric emergency department. *Am J Emerg Med.* 2022;53:12-15.
 21. MacPherson H, Altman DG, Hammerschlag R, et al. Revised STandards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA): extending the CONSORT statement. *PLoS Med.* 2010;7:e1000261.
 22. Rugg SI, Paterson C, Britten N, et al. Traditional acupuncture for people with medically unexplained symptoms: a longitudinal qualitative study of patients' experiences. *Br J Gen Pract.* 2011;61:e306-e315.
 23. Kligler B, Nielsen A, Kohrher C, et al. Acupuncture therapy in a group setting for chronic pain. *Pain Med.* 2018;19:393-403.
 24. Kligler B, Buonora M, Gabison J, et al. "I felt like it was god's hands putting the needles in": a qualitative analysis of the experience of acupuncture for chronic pain in a low-income, ethnically diverse, and medically underserved patient population. *J Altern Complement Med.* 2015;21:713-719.
 25. Zhao E, Seaman L, Yurasek F, et al. 271 Acupuncture treatment in the emergency department reduces pain and revisits. *Ann Emerg Med.* 2023;82:S120.
 26. Jackson J, Esparham A, Dilts J, et al. Physician perspectives on acupuncture use in the pediatric emergency department. *Pediatr Emerg Care.* 2022;38:e1433-e1439.
 27. Miller DW, Roseen EJ, Stone JAM, et al. Incorporating acupuncture into American healthcare: initiating a discussion on implementation science, the status of the field, and stakeholder considerations. *Glob Adv Health Med.* 2021;10:21649561211042574.
 28. Baker K, McDonald J, Steel A. Tackling health inequity: a commentary on the potential of acupuncture to improve health outcomes of marginalized populations. *Acupunct Med.* 2021;39:533-537.
 29. CMS finalizes decision to cover acupuncture for chronic low back pain for Medicare beneficiaries. Accessed April 25, 2024. <https://www.cms.gov/newsroom/press-releases/cms-finalizes-decision-cover-acupuncture-chronic-low-back-pain-medicare-beneficiaries>