California State Oriental Medical Association

BLUE SHIELD OF CALIFORNIA GRIEVANCE LETTER

August 30th, 2018

Appeals & Grievance Department
Blue Shield of California
P.O Box 927
Woodland Hills, CA 91365-9856

Dear Blue Shield of California:

The undersigned California and national acupuncture associations are writing to express concerns about recent directives by Blue Shield of California (BSC). These directives are having profoundly detrimental effects on the ability of our practitioners to practice, and on the opportunity for patients to receive care. We represent the largest licensed group of practitioners offering acupuncture, which is one of the most widely recognized, non-pharmacologic pain management strategies discussed in current times, especially in relation to the opioid epidemic. We feel that it is of immediate importance that BSC rescind the destructive policies which stand in the way of patients receiving acupuncture care, and which fuel the opioid crisis rather than help to solve it.

KEY POLICY CONCERN:

> The key policy of concern is Policy # 0055: Acupuncture When Billed with Evaluation and Management. This policy states, "[it] will be effective for claims processed on and after [January 1, 2018]. E&M services performed by a physician or other health care professional and billed with Acupuncture services will not be eligible for reimbursement. This policy followed another announcement: Adjustments to Fee Allowance Schedule for Acupuncturists, effective December, 1, 2017. This policy downgraded or eliminated the reimbursement for all E/M codes for acupuncture and acupuncture treatment related services. This policy change was sent on Sept. 21, 2017. A copy of that letter is attached hereto. "Attachment A1 and A2."

These policies highlight a failure on the part of BSC to revise payment coverage policies which would encourage healthcare providers to prioritize non-opioid pain management treatments. The recent downgrading of E/M Codes for acupuncture services has dramatically gone against the National Association of Attorney General's recommendation, being emblematic of policy that forces providers Out-of-Network with BSC due to insurance reimbursements that are insufficient to cover the cost of providing care for patients. "Attachment B." The non-allowance of E&M codes in conjunction with acupuncture codes is arbitrary and does not reflect the care that may commonly be provided in clinics.

BACKGROUND:

On September 18th, 2017 the National Association of Attorneys General (NAAG) sent a correspondence to Marilyn Tavenner, President and CEO of America's Health Insurance Plans regarding the Prescription Opioid Epidemic, specifically recommending, "that AHIP take proactive steps in revising their payment and coverage policies to encourage healthcare providers to prioritize non-opioid pain management options over opioids. A copy of that letter is attached hereto signed by California's Attorney General, Xavier Becerra. Shortly thereafter, BSC sent a correspondence dated September 21, 2017 dramatically reducing reimbursement rates for all E/M codes for acupuncture services.

The AG letter was quite specific in its understanding of the opioid epidemic and included, "We have witnessed firsthand the devastation that the opioid epidemic has wrought on our States in terms of lives lost and the costs it has imposed on our healthcare system and the broader economy." They then present the importance of non-opioid care for chronic pain, "When patients seek treatment for any of **the myriad conditions that cause chronic pain**, doctors should be encouraged to explore and prescribe effective non-opioid alternatives, ranging from non-opioid medications (such as NSAIDs) to physical therapy, **acupuncture**, massage, and chiropractic care."

The NAAG then presented the most sobering argument related to insurance company social responsibility for such non-opioid alternatives, "Insurance companies can play an important role in reducing opioid prescriptions and making it easier for patients to access other forms of pain management treatment. Indeed, simply asking providers to consider providing alternative treatments is **impractical in the absence of a supporting incentive structure**. All else being equal, providers will often favor those treatment options that are most likely to be compensated, either by the government, an insurance provider, or a patient paying out-of-pocket. Insurance companies thus are in a position to make a very positive impact in the way that providers treat patients with chronic pain."

They conclude with a call to action for our nationwide insurance providers highlighting, "Adopting an incentive structure that rewards the use of non-opioid pain management techniques for chronic, non-cancer pain will have many benefits. Given the correlation between increased supply and opioid abuse, the societal benefits speak for themselves. Beyond that, incentivizing opioid alternatives promotes evidence-based techniques that are more effective at mitigating this type of pain, and, over the long-run, more cost-efficient. Thus, adopting such policies benefits patients, society, and insurers alike."

Not only the NAAG is making a strong case to insurance providers to increase the opportunity for their insureds to be treated for **the myriad conditions that cause chronic pain**, and with a citation that such treatments are more cost effective. This is further supported by the Consortium Task Force White Paper, "Evidence-Based Nonpharmacologic Strategies for Comprehensive Pain Care" as well as many other published studies and journal articles related to acupuncture treatment in the opioid epidemic. "Attachment C."

The Dec. 1, 2017 rate reductions have already significantly hindered the ability of our providers to offer care, and are having a destructive impact on the abilities of your insureds' to receive needed treatments. These policies affect numerous acupuncture specialists and a significant number of patients. Our organizations are deeply concerned with BSC's trend in policy regarding acupuncture coverage, and hence its trend to work against the public health community and Attorney's General in recommendations

to meaningfully support non-pharmacologic pain solutions. Our nation is in an opioid crisis, and BSC is taking deliberate steps to make that crisis worse. These policies create obstacles for Licensed Acupuncturists to practice medicine in California and other states in which they are licensed, and to be paid commensurate with the services they provide.

Given that the combination of these policies are already affecting numerous Licensed Acupuncturists and countless patients with varying clinical conditions that can lead to chronic pain, **we urge Blue Shield of California to rescind these policies and consider engaging the provider community in a concerted, serious dialogue on how to best deliver "alternative" medical care (which is no longer alternative) in a cost effective and efficient manner.** These issues are important priorities for our respective organizations, and we will continue to work collectively to accomplish a mutually agreeable solution that addresses our concerns. We, thereby, request a formal response to our concerns within 30 days of receipt of this letter. We are certain BSC did not intend to be the stand-out company working against national opioid crisis efforts, and together we can certainly find a way to make it instead a leader in solutions.

We look forward to working with you on these issues. Please do not hesitate to contact Tiffany Tuftee, President, CSOMA (president@csomaonline.org); 831-515-6049), or Ra Adcock, Executive Director, CSOMA(ra@csomaonline.org, 1800-477-4564) with any questions or concerns.

Respectfully yours,

Tiffany Tuftee
CSOMA President
president@csomaonline.org

Ra Adcock
CSOMA Executive Director
ra@csomaonline.org

The California State Oriental Medical Association

CC: California Governor, Governor Jerry Brown
California Attorney General, Xavier Becerra
California Insurance Commissioner, Dave Jones
Department of Managed Care

Anthem BlueCross

Attachment A1

SUMMARIES OF REIMBURSEMENT POLICY UPDATES EFFECTIVE January 1, 2018

Policy # 0008: Bundled Services and Supplies

We have updated the Bundled Services and Supplies Section 1 code list to reflect that transitional care codes 99495 and 99496 are eligible for separate reimbursement. Medical decision making and the date of the first face-to-face visit are used to select and report the appropriate Transitional Care Management (TCM) code. For 99496, the face-to-face visit must occur within 7 calendar days of the date of discharge and medical decision making must be high complexity. For 99495, the face-to-face visit must occur within 14 calendar days of the date of discharge and medical decision making must be of at least moderate complexity. Only one provider may report these services and only once per patient within 30 days of discharge.

Policy # 0016: Frequency Editing

HCPCS code A9276 (sensor; invasive, disposable, for use with interstitial continuous glucose monitoring system, 1 unit = 1 day supply) will have a unit limit of 1 per three (3) days of service for claims processed on and after January 1, 2018. Modifiers will not override this frequency limit edit.

Policy # 0026: Evaluation and Management Services and Related Modifiers -25 & -57

Beginning with claims processed on and after January 1, 2018, Evaluation and Management Services that are eligible for separate reimbursement when reported by the same provider on the same day as a minor surgery ("0" or "10" day global period) will be reduced by 50%.

Policy # 0029: Laboratory and Venipuncture Services

For claims processed on and after January 1, 2018, when routine venipuncture CPT code 36415 is reported with Evaluation and Management (E/M) office visit codes (99201-99205 and 99211-99215), it is included in the reimbursement for office visit E/M services and is not eligible for separate reimbursement. CPT code 36415 is eligible for separate reimbursement when reported with a laboratory service. Modifiers will not override the edit.

Policy # 0038: Drug Screen Testing

Beginning with claims processed on and after January 1, 2018, G0480, G0481, G0482, or G0483 (definitive drug testing) will not be eligible for separate reimbursement when reported on the same date of service as 80307 (presumptive drug testing by instrumented chemistry analyzers) for the same patient by an independent clinical laboratory. In addition, to be considered for reimbursement, additional documentation must be provided specifying the rationale for the drug classes being tested for to support performing the higher level definitive drug testing codes G0482 (15-21 drug classes) and G0483 (22 or more drug classes).

Policy # 0055: Acupuncture When Billed with Evaluation and Management

A new policy titled "Acupuncture when billed with Evaluation and Management Services" will be effective for claims processed on and after [January 1, 2018]. E&M services performed by a physician or other health care professional and billed with Acupuncture services will not be eligible for reimbursement.

Anthem Blue Cross is the trade name of Blue Cross of California. Anthem Blue Cross and Anthem Blue Cross Life and Health Insurance Company are independent licensees of the Blue Cross Association. ANTHEM is a registered trademark of Anthem Insurance Companies, Inc. The Blue Cross name and symbol are registered marks of the Blue Cross Association.

blue of california

Attachment A2

September 21, 2017

Subject: Adjustments to Fee Allowance Schedule for Acupuncturists, effective December 1, 2017

Dear Valued Network Practitioner:

We appreciate your ongoing participation in Blue Shield of California's PPO Network and we continue to be proud of our long-standing relationship with our network of physicians, practitioners and provider organizations. We look forward to continuing in our efforts together to provide quality care at an affordable price for our members.

We are writing to inform you of some upcoming changes to Blue Shield's professional allowances, effective for services rendered on and after December 1, 2017. The changes reflect our consistent, value-based approach in reviewing and setting professional allowances[1] while ensuring our rates are competitive within the marketplace.

We encourage you to carefully review all the new allowances that will become effective December 1, 2017. Beginning October 1, 2017, you may view the fee schedule online to identify the applicable, specific changes at the individual CPT level that may pertain to your acupuncture practice. Please carefully review the schedule for Evaluation and Management services that will become effective December 1, 2017. Visit the home page at **blueshieldca.com/provider** and log in, then select the "Professional Fee Schedule" link located under the *Claims* section menu on the home page.

Additional applicable coding rules referenced in the *Independent Physician and Provider Manual* will apply to the revised payment policy, including the National Correct Coding Initiative (NCCI) guidelines and the Medically Unlikely Edits (MUE).

The new payment policy will appear on Provider Connection, at **www.blueshieldca.com/provider**, by the implementation date. Click the Claims tab, then click *Policies and Guidelines* and select *Payment Policies and Rules*.

If you would like to request a written list of up to 20 of the allowances that pertain to your practice, please complete and mail or fax the enclosed *Provider Allowance Review Form* or call our **Provider Information & Enrollment Department** at **(800) 258-3091** on or after October 1, 2017. Blue Shield will respond to your faxed inquiry within ten (10) business days.

Thank you, once again, for the care and services you provide to our Blue Shield members.

Sincerely,

Armine Papouchian

Armine Papouchian, M.B.A., F.L.M.I.
Senior Vice President,
Provider Network Management

Philip Baldi

Philip Baldi, M.D.
Lead Medical Director
Medical Care Solutions

Enclosure: *Provider Allowance Review Form*

[1] Blue Shield's allowances capture actual time, skill, training and costs associated with providing the service. A combination of methodologies and factors are used to determine fair reimbursement: clinician input, type of service, geography and regional factors, relative value units, the market and other industry sources.

T10175 (9/17)

National Association of Attorneys General

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September 18, 2017

Marilyn Tavenner
President and CEO
America's Health Insurance Plans
601 Pennsylvania Avenue, NW
Washington, DC 20004

Re: Prescription Opioid Epidemic

Dear Ms. Tavenner,

The undersigned State Attorneys General are sending you this letter to urge America's Health Insurance Plans (AHIP) to take proactive steps to encourage your members to review their payment and coverage policies and revise them, as necessary and appropriate, to encourage healthcare providers to prioritize non-opioid pain management options over opioid prescriptions for the treatment of chronic, non-cancer pain. We have witnessed firsthand the devastation that the opioid epidemic has wrought on our States in terms of lives lost and the costs it has imposed on our healthcare system and the broader economy. As the chief legal officers of our States, we are committed to using all tools at our disposal to combat this epidemic and to protect patients suffering from chronic pain or addiction, who are among the most vulnerable consumers in our society.

The opioid epidemic is the preeminent public health crisis of our time. Statistics from the Surgeon General of the United States indicate that as many as 2 million Americans are currently addicted to or otherwise dependent upon prescription opioids.[1] Millions more are at risk of developing a dependency—in 2014, as many as 10 million people reported using opioids for nonmedical reasons.[2] The economic toll of the epidemic is tremendous, costing the U.S. economy an estimated $78.5 billion annually.[3] State and local governments alone spend nearly 8 billion dollars a year on criminal justice costs related to

[1] Surgeon General of the United States, *Opioids*, https://www.surgeongeneral.gov/priorities/opioids/index.html (last updated June 1, 2017); Nora D. Volkow, M.D., *America's Addiction to Opioids: Heroin and Prescription Drug Abuse*, National Institute on Drug Abuse (May 14, 2014), https://www.drugabuse.gov/about-nida/legislative-activities/testimony-to-congress/2016/americas-addiction-to-opioids-heroin-prescription-drug-abuse.

[2] *See* Surgeon General, *supra* fn. 1 (citing *National Survey on Drug Use and Health*, Substance Abuse and Mental Health Services Administration, 2014).

[3] Healthday News, *Opioid Epidemic Costs U.S. $78.5 Billion Annually: CDC* (Sept. 21, 2016), http://www.health.com/healthday/opioid-epidemic-costs-us-785-billion-annually-cdc.

opioid abuse.[4] The human cost is even more staggering: Opioid overdoses kill 91 Americans *every single day*.[5] More than half of those deaths involve prescription opioids.[6]

The unnecessary over-prescription of opioid painkillers is a significant factor contributing to the problem. Although the amount of pain reported by Americans has remained steady since 1999, prescriptions for opioid painkillers have nearly quadrupled over the same timeframe.[7] This four-fold increase in prescriptions has contributed to a commensurate increase in the number of opioid overdose deaths.[8] The dramatic increase in supply has also made it relatively easy to obtain prescription opioids without having to resort to the black market: Over 50% of people who misuse opioids report that they obtained them for free from a friend or relative, while another 22% misused drugs that they obtained directly from a doctor.[9] While illegal opioids like heroin remain a serious problem that also must be addressed, the role played by prescription opioids cannot be ignored. While there is no panacea, any comprehensive effort to address and end the opioid epidemic must tackle the ever-increasing number of prescriptions for opioid painkillers.

Reducing the frequency with which opioids are prescribed will not leave patients without effective pain management options. While there are certainly situations where opioids represent the appropriate pain remedy, there are many other circumstances in which opioids are prescribed despite evidence suggesting they are ineffective and even dangerous. For example, the American Academy of Neurology has explained that while the use of opioid painkillers can provide "significant short-term pain relief," there is "no substantial evidence for maintenance of pain relief or improved function over long periods of time."[10] Another recent study concluded that the use of opioids to treat chronic, non-cancer related pain lasting longer than three months is "ineffective and can be life-threatening."[11] When patients seek treatment for any of the myriad conditions that cause chronic pain, doctors should be encouraged to explore and prescribe effective non-opioid alternatives, ranging from non-opioid medications (such as NSAIDs) to physical therapy, acupuncture, massage, and chiropractic care.

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[4] *Id. See also Costs of US Prescription Opioid Epidemic Estimated at $78.5 Billion*, Wolters Kluwer (Sept. 14, 2016),http://wolterskluwer.com/company/newsroom/news/2016/09/costs-of-us-prescription-opioid-epidemic-estimated-at-usd78.5-billion.html

[5] *Understanding the Epidemic: Drug overdose deaths in the United States continue to increase in 2015*, Centers for Disease Control and Prevention, https://www.cdc.gov/drugoverdose/epidemic/ (last updated Dec. 16, 2016).

[6] *Prescription Opioid Overdose Data*, Centers for Disease Control and Prevention, https://www.cdc.gov/drugoverdose/data/overdose.html (last updated Dec. 16, 2016).

[7] See *Surgeon General*, supra fn. 1; *Opioid Addiction 2016 Facts and Figures*, American Society of Addiction Medicine (2016), https://www.asam.org/docs/default-source/advocacy/opioid-addiction-disease-facts-figures.pdf.

[8] Vivek Murthy, *The Opioid Crisis: Our Solution*, TIME (Oct. 13, 2016), http://time.com/4521562/2016-election-opioid-epidemic/

[9] *Opioids*, Substance Abuse and Mental Services Administration, https://www.samhsa.gov/atod/opioids (last updated Feb. 23, 2016).

[10] Gary M. Franklin, MD, MPH, *Opioids for chronic noncancer pain: A position paper of American Academy of Neurology*, 83 Neurology 1277 (2014).

[11] Eric Scicchitano, *Geisinger doctors: Opioids ineffective for chronic pain put patients at risk*, The Daily Item (Dec. 7, 2016), http://www.dailyitem.com/news/local_news/geisinger-doctors-opioids-ineffective-for-chronic-pain-put-patients-at/article_2d66014f-511e-554f-bed5-768886b48616.html (citing, generally, Mellar P. Davis & Zankhana Mehta, *Opioids and Chronic Pain: Where is the Balance?* 18 Current Oncology Reports 71 (2016), *available at* https://link.springer.com/epdf/10.1007/s11912-016-0558-1)

Insurance companies can play an important role in reducing opioid prescriptions and making it easier for patients to access other forms of pain management treatment. Indeed, simply asking providers to consider providing alternative treatments is impractical in the absence of a supporting incentive structure. All else being equal, providers will often favor those treatment options that are most likely to be compensated, either by the government, an insurance provider, or a patient paying out-of-pocket. Insurance companies thus are in a position to make a very positive impact in the way that providers treat patients with chronic pain.

Adopting an incentive structure that rewards the use of non-opioid pain management techniques for chronic, non-cancer pain will have many benefits. Given the correlation between increased supply and opioid abuse, the societal benefits speak for themselves. Beyond that, incentivizing opioid alternatives promotes evidence-based techniques that are more effective at mitigating this type of pain, and, over the long-run, more cost-efficient.[12] Thus, adopting such policies benefit patients, society, and insurers alike.

The undersigned Attorneys General serve an important role in combating the opioid epidemic. As the chief legal officers of our States, we are charged with protecting consumers, including patients suffering from chronic pain and opioid addiction. Among other things, we are committed to protecting patients from unfair or deceptive business practices and ensuring that insurers provide consumers with transparent information about their products and services.

We are thus committed to utilizing all the powers available to our individual offices to ameliorate the problems caused by the over-prescription of opioids and to promote policies and practices that result in reasonable, sustainable, and patient-focused pain management therapies. In the near future, working in conjunction with other institutional stakeholders (such as State Insurance Commissioners), we hope to initiate a dialogue concerning your members' incentive structures in an effort to identify those practices that are conducive to these efforts and those that are not. We hope that this process will highlight problematic policies and spur increased use of non-opioid pain management techniques. The status quo, in which there may be financial incentives to prescribe opioids for pain which they are ill-suited to treat, is unacceptable. We ask that you quickly initiate additional efforts so that you can play an important role in stopping further deaths.

We look forward to having this discussion with you.

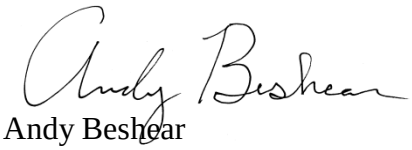
Sincerely,

Leslie Rutledge
Arkansas Attorney General

Pamela Jo Bondi
Florida Attorney General

[12] Harrison Jacobs, *Pain doctors: Insurance companies won't cover the alternatives to opioids*, Business Insider (Aug. 10, 2016), http://www.businessinsider.com/doctors-insurance-companies-policies-opioid-use-2016-6 ("If you look at the long-term cost of [opioids], plus monitoring, office visits and drug screenings . . . it's cheaper long-term to do the more advanced therapy,") (quoting Dr. Timothy Deer, co-chair, West Virginia Expert Pain Management Panel).

Derek Schmidt
Kansas Attorney General



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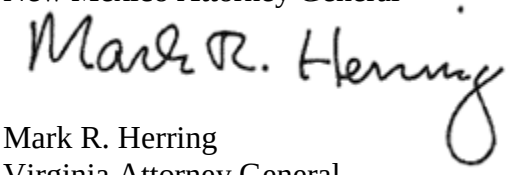

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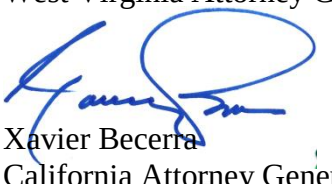

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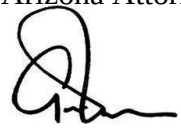

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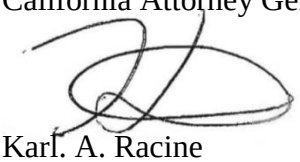

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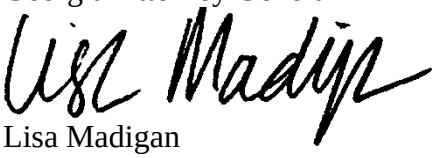

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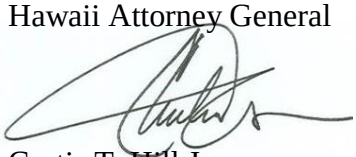

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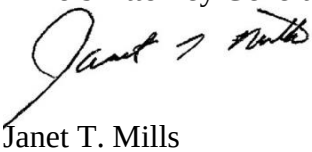

Janet T. Mills
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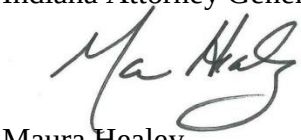

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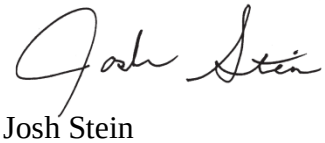
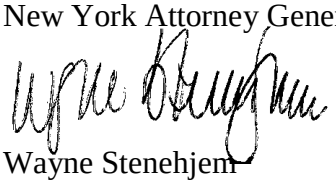
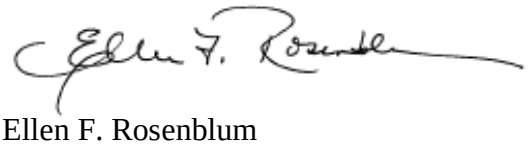


Josh Stein
North Carolina Attorney General



Wayne Stenehjem
North Dakota Attorney General



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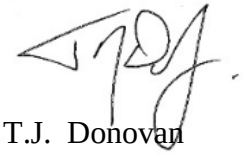

T.J. Donovan
Vermont Attorney General

Brad Schimel
Wisconsin Attorney General

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• Global Views

Acupuncture's Role in Solving the Opioid Epidemic: Evidence, Cost–Effectiveness, and Care Availability for Acupuncture as a Primary, Non–Pharmacologic Method for Pain Relief and Management—White Paper 2017

Arthur Yin Fan[1], David W. Miller[2,3,4], Bonnie Bolash[3], Matthew Bauer[3,5], John McDonald[3,6], Sarah Faggert[2,7], Hongjian He[2,8,9], Yong Ming Li[10], Amy Matecki[9,11], Lindy Camardella[2,3], Mel Hopper Koppelman[3,6], Jennifer A.M. Stone[2,12], Lindsay Meade[2,3], John Pang[13]

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6. The Acupuncture Evidence Project, Providence, RI 02860, USA
7. The Acupuncture Society of Virginia, Vienna, VA 22182, USA
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ABSTRACT

The United States (U.S.) is facing a national opioid epidemic, and medical systems are in need of non-pharmacologic strategies that can be employed to decrease the public's opioid dependence. Acupuncture has emerged as a powerful, evidence-based, safe, cost-effective, and available treatment modality suitable to meeting this need. Acupuncture has been shown to be effective for the management of numerous types of pain conditions, and mechanisms of action for acupuncture have been described and are understandable from biomedical, physiologic perspectives. Further, acupuncture's cost-effectiveness can dramatically decrease health care expenditures, both from the standpoint of treating acute pain and through avoiding addiction to opioids that requires costly care, destroys quality of life, and can lead to fatal overdose. Numerous federal regulatory agencies have advised or mandated that healthcare systems and providers offer non-pharmacologic treatment options for pain. Acupuncture stands out as the most evidence-based, immediately available choice to fulfil these calls. Acupuncture can safely, easily, and cost-effectively be incorporated into hospital settings as diverse as the emergency department, labor and delivery suites, and

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neonatal intensive care units to treat a variety of commonly seen pain conditions. Acupuncture is already being successfully and meaningfully utilized by the Veterans Administration and various branches of the U.S. Military, in some studies demonstrably decreasing the volume of opioids prescribed when included in care.

Keywords: acupuncture; opioid epidemic; pain; opiate dependency; effectiveness; safety; cost-effectiveness; mechanism; United States

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1 Introduction

In 2015 it was estimated that 25.3 million Americans suffered from chronic pain, while an estimated 126 million American adults reported some type of pain in the prior three months.[1] As a result, more than 240 million prescriptions were written for opioid medications during that year.[2] An unfortunate consequence of this high use and availability of opioids, is a growing number of opioid-related deaths from addiction and overdose. More than 33 000 Americans died from opioid drugs in 2015, and more than 64 000 died in 2016.[3] Due to the severity of this epidemic, a White House panel urged the United States (U.S.) president to declare the opioid crisis a national emergency, and August 31, 2017 was designated as "International Overdose Awareness Day" by the Centers for Disease Control and Prevention (CDC).[4]

To cope with the opioid crisis, various federal regulatory and oversight agencies, including the U.S. Food and Drug Administration (FDA), the National Academies of Sciences, Engineering, and Medicine (NASEM), and the Joint Commission have started to advise or mandate that healthcare systems and providers offer non-pharmacologic treatment options for pain control.[5–7] Acupuncture stands as the most evidence-based, immediately available choice to fulfil these calls.

The aim of this white paper is to summarize for academic scholars, healthcare professionals, administrators, policymakers, and the general public the available evidence for acupuncture as a treatment for various pain conditions as well as for opiate dependency. This includes evidence on the safety, cost-effectiveness, mechanisms of action, and provider availability for acupuncture.

2 Acupuncture is an effective, safe, and cost–effective treatment for numerous types of acute and chronic pain; acupuncture should be recommended as a first line treatment for pain before opiates are prescribed, and may reduce opioid use

2.1 Effectiveness/Efficacy of acupuncture for different types of pain

There is growing research evidence to support the effectiveness and efficacy of acupuncture for the relief of numerous types of pain, especially chronic pain, as well as for the use of acupuncture for a diverse array of medical conditions. In an independently published work, which is the largest and most comprehensive of its kind for the period evaluated, McDonald and Janz[8] summarized the research from March 2013 to September 2016 for acupuncture, published and available in all languages on PubMed and in the Cochrane Library. They looked at systematic reviews, meta-analyses, network meta-analyses, overviews of systematic reviews (NHMRC level I evidence), and a number of narrative reviews. They performed meta-analyses on 62 of the non-Cochrane systematic reviews, representing pooled data from more than 1 000 randomized controlled trials (RCTs). They assessed and graded the quality of evidence, and noted the strength of evidence for acupuncture for numerous conditions (Box 1, Appendix 1).

Acupuncture has been found to be effective for treating various types of pain, with the strongest evidence emerging for back pain, neck pain, shoulder pain, chronic headache, and osteoarthritis. In an individual patient meta-analysis of 17 922 people from 29 RCTs, patients receiving acupuncture had less pain, with scores that were 0.23 (95% confidence interval (CI) [0.13–0.33]), 0.16 (95% CI [0.07–0.25]), and 0.15 (95% CI [0.07–0.24]) standard deviations (SDs) lower than sham controls for back and neck pain, osteoarthritis, and chronic headache, respectively; the effect sizes in comparison to non-acupuncture 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. A variety of pain severity and disability scores were used, including Visual Analog Scale (VAS) ratings, the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and the Roland Morris Disability Questionnaire. These results were robust to a variety of sensitivity analyses, including those related to publication bias.[9]

In the largest study of its kind to date, 454 920 patients were treated with acupuncture for headache, low-back pain, and/or osteoarthritis in an open pragmatic trial. Effectiveness was rated by the 8 727 treating physicians as marked or moderate in 76% of cases.[10]

In a network meta-analysis comparing different

physical interventions for pain from knee osteoarthritis, acupuncture was found to be superior to sham acupuncture, muscle-strengthening exercise, *Tai Chi*, weight loss, standard care, and aerobic exercise (in ranked order). Acupuncture was found to be more effective than muscle-strengthening exercises, with a statistically significant difference = 0.49, 95% CI [0.00–0.98].[11]

In early 2017, the American College of Physicians (ACP) published guidelines based on the evidence for the non-invasive treatment of low-back pain. For acute or subacute low-back pain, the ACP recommends non-pharmacologic treatment with acupuncture, along with superficial heat, massage, or spinal manipulation, and nonsteroidal anti-inflammatory drugs or skeletal muscle relaxants. For chronic low-back pain, the ACP also recommends acupuncture, in addition to exercise, multidisciplinary rehabilitation, mindfulness-based stress reduction, *Tai Chi*, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioral therapy, and spinal manipulation, etc.[12]

A systematic review and meta-analysis on acupuncture for the treatment of sciatica reported that acupuncture was superior to standard pharmaceutical care (such as ibuprofen, diclofenac, and prednisone) in reducing pain intensity (mean difference (MD) = –1.25, 95% CI [–1.63 to –0.86]) and pain threshold (MD = 1.08, 95% CI [0.98–1.17]). Effectiveness, pain intensity, and pain threshold scales were used.[13]

A systematic review and network meta-analyses of 21 different interventions for sciatica found that acupuncture was second in global effect only to biological agents, and superior to all other interventions including non-opioid and opioid medications.[14]

A systematic review on acupuncture and moxibustion for lateral elbow pain found moderate-level evidence that acupuncture and moxibustion were more effective than sham, and found low-level evidence that acupuncture and moxibustion may be superior or equal to standard care.[15]

A systematic review on acupuncture for plantar heel pain found that evidence supporting the effectiveness of acupuncture was comparable to the evidence available

Box 1 Acupuncture for the Use of Numerous Conditions Including Pain Conditions: the Acupuncture Evidence Project (Mar 2013–Sept 2016)

Evidence of positive effect

- Allergic rhinitis (perennial & seasonal)
- Chemotherapy-induced nausea and vomiting (with anti-emetics)
- Chronic low-back pain
- Headache (tension-type and chronic)
- Knee osteoarthritis
- Migraine prophylaxis
- Post-operative nausea & vomiting
- Post-operative pain

Evidence of potential positive effect

- Acute low-back pain
- Acute stroke
- Ambulatory anaesthesia
- Anxiety
- Aromatase inhibitor-induced arthralgia
- Asthma in adults
- Back or pelvic pain during pregnancy
- Cancer pain
- Cancer-related fatigue
- Constipation
- Craniotomy anaesthesia
- Depression (with antidepressants)
- Dry eye
- Hypertension (with medication)
- Insomnia
- Irritable bowel syndrome
- Labor pain
- Lateral elbow pain
- Menopausal hot flashes
- Modulating sensory perception thresholds
- Neck pain (some types/non-whiplash)
- Obesity
- Peri-menopausal & post-menopausal insomnia
- Plantar heel pain
- Post-stroke insomnia
- Post-stroke shoulder pain
- Post-stroke spasticity
- Post-traumatic stress disorder
- Prostatitis pain/chronic pelvic pain syndrome
- Recovery after colorectal cancer resection
- Restless leg syndrome
- Schizophrenia (with antipsychotics)
- Sciatica
- Shoulder impingement syndrome (early stage) (with exercise)
- Shoulder pain
- Smoking cessation (up to 3 months)
- Stroke rehabilitation
- Temporomandibular joint disorder

for standard care interventions such as stretching, night splints, and dexamethasone.[16]

The use of acupuncture to relieve pain associated with surgical procedures captured the world's attention in the early 1970s. When in China, well-known *New York Times* journalist James Reston witnessed acupuncture's effectiveness on his post-operative pain. He published his personal experience with acupuncture shortly before President Richard Nixon's trip to China. Since then, reports in the scientific literature reveal that acupuncture has been used before, during, and after surgery to manage pain and to improve post-surgical recovery in a variety of contexts.[17–25] It is noteworthy to mention that acupuncture has been reported to be effective in pain relief during and after surgical procedures on children and animals as well.[19,20,26,27]

Nonetheless, over the past two decades in the U.S., post-operative pain management has come to rely increasingly on opioids, while underutilizing alternative analgesics such as acupuncture. In 2012, surgeons and dentists combined prescribed 16.2% of all opioids in the U.S., trailing only family practices as the leading source of opioid prescriptions at 18.2%.[28] Eighty to ninety-four percent of patients undergoing low-risk surgical procedures fill a prescription for opioids within 7 days.[29,30] Recent data has shown that opioid prescriptions vary widely and that the majority of surgical patients are over-prescribed opioids, as approximately 70% of pills go unused.[31] The risk of chronic opioid use after surgery in previously non-dependent patients is determined to be 5.9%–6.5%,[32] although in select populations such as head and neck cancer patients, the risk is up to 40%.[33] The increase in post-operative opioid use is somewhat paradoxical considering that known adverse effects such as sedation, pneumonia,[34,35] ileus, urinary retention, and delirium prolong patient recovery and delay the meeting of discharge goals.[36]

Acupuncture has emerged as a promising adjunctive analgesic modality to reduce the risk of post-operative opioid dependence. A meta-analysis published in late 2017 in *JAMA Surgery* focused on non-pharmacological treatments in reducing pain after total knee arthroplasty. Thirty-nine RCTs were included in the meta-analysis (2 391 patients). Moderate-certainty level evidence showed that electrotherapy reduced the use of opioids (MD = −3.50; 95% CI [−5.90 to −1.10] morphine equivalents in milligrams per kilogram per 48 hours; $P = 0.004$; $I^2 = 17\%$), and that acupuncture delayed opioid use (MD = 46.17; 95% CI [20.84–71.50] minutes to the first patient-controlled analgesia; $P < 0.001$; $I^2 = 19\%$). There was low-certainty level evidence that acupuncture improved pain (MD = 1.14; 95% CI [1.90–0.38] on a VAS at 2 days; $P = 0.003$; $I^2 = 0\%$). Evidence showed that acupuncture out-performed cryotherapy, continuous passive motion, and preoperative exercise in the studied condition.[37] Reduction in opioid use has been demonstrated across a wide range of both minor and major surgical procedures, including cardiac surgery,[38] thoracic surgery,[39] and craniotomy.[17,40] Additionally, it was reported that acupuncture may even reduce post-operative ileus and expedite bowel recovery after colorectal cancer resection.[41] Acupuncture is often combined with electric stimulation, and electro-acupuncture may have added clinical benefit in post-operative pain management.

A Cochrane systematic review on acupuncture or acupressure for primary dysmenorrhea found that both acupuncture and acupressure were more effective in reducing pain than placebo controls.[42] Five other systematic reviews and/or meta-analyses on various forms of acupoint stimulation including acupuncture, acupressure, and moxibustion for primary dysmenorrhea have reported similar outcomes.[43–47]

The effectiveness of acupuncture for labor pain is still unclear, largely due to the heterogeneity of designs and methods in studies, which have produced mixed results. While some studies reported no reduction in analgesic medications, some studies reported reduction of pain during labor, reduced use of opioid medications and epidural analgesia, and a shorter second stage of labor.[48–50]

A systematic review of acupuncture for trigeminal neuralgia suggests that acupuncture may be equal to or superior to carbamazepine, but the evidence is weakened by the low methodological quality of some included studies.[51]

A Cochrane systematic review on acupuncture for fibromyalgia found low- to moderate-certainty level evidence that acupuncture improves pain and stiffness compared with no treatment and standard therapy. Furthermore, electro-acupuncture is likely better than manual acupuncture for pain in fibromyalgia, although more studies with methodological rigor are warranted.[52]

A prospective, randomized trial of acupuncture *vs.* morphine to treat emergency department/emergency room patients with acute onset, moderate to severe pain was conducted. Acupuncture provided more effective and faster analgesia than morphine and was better tolerated. The study included 300 patients, with 150 patients in each group. Success rate was significantly different between the 2 groups (92% in the acupuncture group *vs* 78% in the morphine group, $P < 0.001$). Resolution time was (16 ± 8) minutes in

the acupuncture group *vs* (28 ± 14) minutes in the morphine group ($P < 0.005$). Overall, 89 patients (29.6%) experienced minor adverse effects; of these, 85 (56.6%) were in the morphine group and only 4 (2.6%) were in the acupuncture group ($P < 0.001$).[53]

The above mentioned meta-analysis included 29 trials and 17 922 patients with chronic pain conditions; data on longer-term follow-up (available for 20 trials, including 6 376 patients) suggests that approximately 90% of the benefit of acupuncture relative to controls would be sustained at 12 months post-treatment. Patients can generally be reassured that treatment effects persist for some duration.[54]

2.2 Safety and feasibility of acupuncture for pain management

Strong evidence for the safety of acupuncture in chronic pain management comes from an open pragmatic trial involving 454 920 patients who were treated for headache, low-back pain, and/or osteoarthritis. Minor adverse events were reported in 7.9% of patients while only 0.003% (13 patients) experienced severe adverse events. Minor adverse events included needling pain, hematoma, and bleeding, while serious adverse events included pneumothorax, acute hyper- or hypotensive crisis, erysipelas, asthma attack, and aggravation of suicidal thoughts.[10] In a prospective feasibility study, acupuncture was seen as feasible, safe, and acceptable in an intensive care unit setting by patients from diverse backgrounds.[55] A systematic review suggests that acupuncture performed by trained practitioners using clean needle technique is a generally safe procedure.[56] The medical literature also indicates that acupuncture may be used successfully on cancer patients for symptom management due to the low risks associated with its use.[57]

2.3 Cost-effectiveness of acupuncture for pain management

In a systematic review of 8 cost-utility and cost-effectiveness studies of acupuncture for chronic pain, the cost per quality-adjusted life-year gained was below the thresholds used by the UK National Institute for Health and Clinical Excellence for "willingness to pay." The chronic pain conditions discussed in the systematic review included low-back pain, neck pain, dysmenorrhoea, migraine and headache, and osteoarthritis.[58] In a cost-effectiveness analysis of non-pharmacological treatments for osteoarthritis of the knee, acupuncture was found to be the most cost-effective option when analysis was limited to high-quality studies.[59] Using acupuncture for pain management, patients and insurers can save money and successfully manage their pain and other symptoms without the adverse risks associated with prescription medications. A recent study from the Center for Health Information and Analysis in response to a piece of Massachusetts legislation seeking mandated coverage for acupuncture for some conditions, found that full insurance coverage for acupuncture would increase an average insured member's monthly health insurance premium only by $0.38 to $0.76. Acupuncture was noted to save $35 480, $32 000, $9 000, and $4 246 per patient for migraine, angina pectoris, severe osteoarthritis, and carpal tunnel syndrome respectively.[60] Compared to the large fees associated with imaging, prescription medications and surgery for pain conditions, acupuncture proved extremely cost-effective.

The Acupuncture Evidence Project also enumerates those conditions for which they found evidence of acupuncture being cost-effective (Box 2).[61]

Box 2 Conditions with Demonstrated Evidence of Cost-Effectiveness

- Allergic rhinitis
- Low-back pain
- Ambulatory anaesthesia
- Migraine
- Chronic pain: neck pain (plus usual medical care)
- Depression
- Osteoarthritis
- Dysmenorrhoea
- Post-operative nausea and vomiting
- Headache

A study by Da Silva[62] published in the journal *Headache* in 2015 showed acupuncture to be at least as effective as conventional drug preventative therapy for migraine and to be safe, long lasting, and cost-effective. A 2015 study by Liodden and Norheim[63] noted acupuncture to be potentially useful for post-operative pain and post-operative nausea and vomiting, and to be a low-cost intervention. A 2014 study by Spackman et al. [64] showed acupuncture to be cost-effective compared to counselling or usual care alone. Two studies demonstrated acupuncture's cost-effectiveness for the treatment of low-back pain. A study by Taylor et al.[65] from 2014 showed that acupuncture as a complement to standard care for the relief of chronic low-back pain was highly cost-effective, costing around $48 562 per disability-adjusted life-year (DALY) avoided. It also found that when comorbid depression was alleviated at the same rate as pain, the cost was around $18 960 per DALY avoided. A study by Andronis et al.[66] also identified acupuncture as likely to be cost-effective for low-back pain.

2.4 Can adjunctive acupuncture treatment reduce the use of opioid-like medications?

Some studies have reported reduced consumption of opioid-like medication (OLM) by more than 60% following surgery when acupuncture is used.[67,68] A pilot RCT also showed a reduction by 39% in OLM use in non-malignant pain after acupuncture, an effect which lasted fewer than 8 weeks after acupuncture treatment ceased.[69] The above mentioned meta-analysis, having moderate-certainty level evidence, showed that electro-acupuncture therapy reduced the use of opioids, and acupuncture delayed opioid use, with low-certainty level evidence indicating that acupuncture improved pain.[37] The conclusions suggest that electro-acupuncture may be effective in reducing or delaying the use of opioid medications.

In a study examining acupuncture's effectiveness in treating pain in a military cohort of 172 at a U.S. Air Force medical center, acupuncture dramatically decreased the use of opiates and other pain medications among personnel. Opioid prescriptions decreased by 45%, muscle relaxants by 34%, non-steroidal anti-inflammatory drugs by 42%, and benzodiazepines by 14%. Quality of life measures also showed impressive changes, with some measures of improvements showing statistical significance ($P < 0.001$).[70]

The Veterans Administration is increasingly looking to incorporate acupuncture into care, as is the U.S. Air Force and other military branches. Training of military physicians is increasing, and systems are being studied to further incorporate acupuncture. The military is rapidly incorporating this care into its offered services for service members.[71,72]

Studies of the effects of opioid analgesia in the elderly reveal a significant burden of disease due to falls from mental impairment. This is worsened when seniors are using multiple medications affecting cognition. In a recent study, serious falls as per Medicare Part A and B ICD/CPT codes were evaluated in 5 556 nursing home residents aged 65 or greater. Seniors taking three or more central nervous system (CNS) standardized daily doses were more likely to have a serious fall than those not taking any CNS medications (adjusted odds ratio = 1.83, 95% CI [1.35–2.48]), and the authors urge, "Clinicians should be vigilant for opportunities to discontinue or decrease the doses of individual CNS medications and/or consider non-pharmacological alternatives."[73]

A recent study in the *New Zealand Medical Journal* noted that medication-related harms were both common and created a substantial burden of disease for patients and the healthcare system. They listed opioids first among the six categories of medications causing the most significant burden.[74] In light of the findings of these studies and similar, utilization of non-pharmacologic treatment options such as acupuncture must be a priority of paramount status.

3 Acupuncture's analgesic mechanisms have been extensively researched and acupuncture can increase the production and release of endogenous opioids in animals and humans

Mechanisms underlying acupuncture's analgesic effects have been extensively researched for over 60 years. In animal models, acupuncture and/or electro-acupuncture has been shown to be effective for the alleviation of inflammatory, neuropathic, cancer-related, and visceral pain. Mechano-transduction of the needling stimulus at specific points on the body triggers the release of ATP and adenosine, which bind to local afferents.[75,76] Ascending neural pathways involving Aβ, Aδ, and C sensory fibres have been mapped (using techniques such as single fiber recordings with Evans blue dye extravasation), as have been a mesolimbic analgesic loop in the brain and brainstem, descending pathway mechanisms, dopaminergic contributors, and cytokine, glutamate, nitric oxide, and gamma-amino butyric acid (GABA) effects. Acupuncture analgesia has been shown to involve several classes of opioid neuropeptides including enkephalins, endorphins, dynorphins, endomorphins, and nociceptin (also known as orphanin FQ). Among the non-opioid neuropeptides, substance P, vasoactive intestinal peptide, and calcitonin gene-related peptide have been investigated for their roles in both the analgesic and anti-inflammatory effects of acupuncture.[77–80]

Given that acupuncture analgesia activates the production and release of endogenous opioids and activates μ and δ opioid receptors, it is feasible that acupuncture, used in conjunction with OLM, might alleviate pain with a lower OLM dose for patients already taking OLM.[81] This idea is further supported by evidence that acupuncture increases μ opioid receptor binding potential, allowing for effective analgesia at lower doses of OLM.[82] For patients not yet prescribed OLM, acupuncture should be recommended prior to OLM prescription commencing. This would be in-line with existing guidelines, such as those by the ACP[12] and the CDC,[83] which recommend that safe and effective non-opioid alternatives should first be exhausted before resorting to OLM.

It is important to note as well that opioids as a monotherapy are often not as successful as may be thought in the general public perception. A recent systematic review of opioid analgesics for low-back pain, which included 7 925 participants, found

that opioids were poorly tolerated and for those who tolerate them the effect is unlikely to be clinically important within guideline recommended doses.[84] The first ever RCT evaluating the long-term effectiveness of opioids, found that those on long-term opioid analgesia were actually in marginally more pain at 12 months than those in the non-opioid group.[85] Hence, complementary methods of pain control are critical to successful patient management.

4 Acupuncture is effective for the treatment of chronic pain involving maladaptive neuroplasticity

Adverse neuroplastic changes can present a challenge in pain management, as maladaptive neuroplasticity can be associated with severe chronic pain that is resistant to treatment. Via peripheral stimulation, acupuncture may relieve the symptoms of patients affected by problematic neuroplastic changes. There is evidence that acupuncture has the capacity to reverse adverse neuroplastic changes in the dorsal horns of the spine, as well as in the somatosensory cortex.[86–89] This suggests that acupuncture may have an important role in treating chronic pain which involves adverse neuroplastic changes.

5 Acupuncture is a very promising, already utilized adjunctive therapy in opiate dependency and rehabilitation

In 1973, Wen et al.[90] from Hong Kong published an accidental finding that ear acupuncture treatment for respiratory patients had apparently alleviated opioid withdrawal signs and symptoms. These findings were replicated by others around the world, including in New York and Sydney in the mid-1970s. In 1985, Dr. Michael Smith and colleagues in New York established the National Acupuncture Detoxification Association (NADA), which today operates in over 40 countries with an estimated 25 000 providers. There are more than 1 000 programs in the U.S. and Canada that now use acupuncture to help addicts overcome their addictions.[91]

Evidence for acupuncture's place in addiction treatment has been found in both animal and human studies. In 2009, Hu et al.[92] found that electro-acupuncture in rats appeared to affect dopamine neurons in the ventral tegmental area, meaningfully improving the deleterious effects caused to this area by opioid medication. In 2012 Lee et al.[93] demonstrated that electro-acupuncture could be used to decrease drug-seeking behaviour in rats. As far back as 1978 it was demonstrated that acupuncture decreased biochemical markers of stress in heroin addicts compared to observational controls.[94] In 2014 Chan et al.[95] demonstrated that acupuncture decreased the amount of morphine used by addicts in treatment, and simultaneously improved sleep in the treatment subjects. Acupuncture for addiction is a versatile modality that can be effortlessly integrated into many environments including prisons, in- and outpatient programs, community centers, disaster relief, and humanitarian aid efforts. Furthermore, acupuncture addiction protocols can address acute and prolonged withdrawal symptoms, stress and anxiety related to drug withdrawal, and help prevent relapse. Using drugs to treat those already drug-addicted is not a rational plan of action, and finding sound, non-pharmacologic treatment options is of paramount importance.

A meta-analysis done in 2012 concluded that "the majority [of studies] agreed on the efficacy of acupuncture as a strategy for the treatment of opiate addiction" and that "neurochemical and behavioral evidence has shown that acupuncture helps reduce the effects of positive and negative reinforcement involved in opiate addiction by modulating mesolimbic dopamine neurons. Moreover, several brain neurotransmitter systems involving opioids and GABA have been implicated in the modulation of dopamine release by acupuncture."[96] In a recent RCT involving 28 newborns with neonatal abstinence syndrome, laser acupuncture plus OLM significantly reduced the duration of oral morphine therapy when compared to OLM alone.[97] The mechanism for acupuncture in opiate withdrawal was found to be mediated by the endogenous opioid "dynorphin" binding to κ opioid receptors.[98] While considerable research on acupuncture's role in addiction is still greatly needed, long-standing and new data provide a sound foundation for that future research. Demonstration of trans-species effects with multiple, plausible mechanisms and documented clinical efficacy in humans for opioid addiction specifically, coupled with vast, existing clinical precedent of use in this realm, argues strongly for acupuncture's likely value in this domain.

6 Acupuncture has been recommended as a first line, non–pharmacologic therapy by the FDA as well as the NASEM in coping with the opioid crisis; the Joint Commission has also mandated that hospitals provide non–pharmacologic pain treatment modalities

The U.S. FDA released proposed changes to its opioid prescription guidelines in early May 2017. Entitled a "Blueprint for Prescriber Education for Extended-Release and Long-Acting Opioids," the

guidelines now recommend that doctors become informed about non-pharmacologic options for pain control to help avoid the overuse of opioids.[5] Per the FDA's request, the NASEM released a report to outline the state of the science regarding prescription opioid abuse and misuse, as well as the evolving role that opioids play in pain management. The new NASEM report on pain management and opioids recommends more public education, reimbursement models, and support for non-drug approaches to pain treatment. It systematically summarizes the evidence for acupuncture's clinical benefits in treating different pain conditions, and provides an overview of some of the basic science underlying acupuncture's mechanisms in pain management.[6] Further, effective January 1, 2018, the Joint Commission has mandated that hospitals provide non-pharmacologic pain treatment modalities.[7] Acupuncture is ideally suited to fulfil this mandate. These official, evidence-based clinical guidelines are in line with global healthcare trends. As of November 2015, acupuncture had over 870 recommendations in official clinical guidelines for over 100 conditions from institutions in over 30 countries.[99]

7 Among the most commonly recommended, non–pharmacological management options for pain relief, evidence supports acupuncture as the most specific and effective for opioid abuse and overuse

Several forms of non-pharmacological management options for acute and chronic pain have been examined, including physical therapy, spinal column manipulation, yoga, *Tai Chi*, cognitive behavioral therapy, as well as others. Among those therapies commonly recommended by medical authorities, evidence supports acupuncture as the most specific in targeting the endogenous opioid system. There is more evidence that acupuncture can induce endorphins to cope with acute and chronic pain in basic research than for any other non-pharmacological approach for pain.[12,37,53,60] Other mechanisms for acupuncture's effects have also been discussed above.

8 Acupuncture is widely available from qualified practitioners nationally

In 2013 more than 28 000 licensed acupuncturists were estimated to be practicing in the U.S., with many more in training.[100] A 2015 study found the number of professionals practicing as "Licensed Acupuncturists" (or state equivalent) to be approximately 34 400. The number of licensed acupuncturists was noted to have increased by 23.3% and 52.1% compared to the years 2009 (n = 27 965) and 2004 (n = 22 671) respectively, increasing about 1 266 per year.[101] Currently, the Council of Colleges of Acupuncture and Oriental Medicine has 57 schools in its membership,[102] with approximately ten schools offering doctoral degrees. The National Certification Council for Acupuncture and Oriental Medicine has certified more than 18 000 practitioners for minimal competency.[103] The practitioners emerging from this educational and testing infrastructure are the most highly trained in Chinese medicine as a complete system, and the training capacity is vastly underutilized. This system could produce many more practitioners were demand increased. The American Academy of Medical Acupuncture also represents more than 1 300 medical doctors trained to offer acupuncture services, and has approved nine programs for medical doctor certification in acupuncture.[104] One certification program alone has trained more than 6 000 physicians in medical acupuncture,[105] so a conservative estimate of the total number of physicians trained would be approximately 10 000, though the number actively practicing acupuncture is unknown. Most states allow physicians to practice acupuncture, with some specifying additional training.[106] Increased coverage and demand for acupuncture will lead to a greater supply of providers as well. As noted above, NADA providers are estimated at 25 000 individuals, with more than 1 000 programs in the U.S. and Canada.

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10 Competing interests

The authors declare that they have no competing interests. Comments or corrections are welcomed and appreciated.

Appendix 1 Effectiveness of Acupuncture (to be continued)

Author, year	Topic/intervention	Participants/population	Primary outcomes	Key findings	Study quality
Vickers et al., 2012[9]	Acupuncture versus sham acupuncture and non-acupuncture in back, neck and shoulder pain, chronic headache, and osteoarthritis	Systematic review of 31 RCTs (17 922 subjects) and meta-analysis of individual patient data from 29 of these 31 RCTs in back, neck and shoulder pain; chronic headache; osteoarthritis	A variety of pain severity and disability scores such as VAS, WOMAC, Roland Morris Disability Questionnaire	Acupuncture was superior to sham acupuncture and non-acupuncture for each pain condition	High-quality evidence
Weidenhammer et al., 2007[10]	Acupuncture for headache, low-back pain, and osteoarthritis	Open pragmatic trial of 454 920 subjects with headache, low-back pain, and osteoarthritis	Treating physician rating of "marked, moderate, minimal or poor improvement (which included no improvement and worse)"	Physician ratings: 22% marked, 54% moderate, 16% minimal and 4% poor improvement	Low-quality evidence—open pragmatic trial with no blinding and no external assessors
Corbett et al., 2013[11]	Comparison of 22 physical therapies for knee osteoarthritis pain	Review of 152 trials and network meta-analysis of 12 RCTs with low risk of bias comparing 22 physical therapies in knee osteoarthritis pain	Knee pain	Acupuncture was equal to balneotherapy and superior to sham acupuncture, muscle-strengthening exercise, *Tai Chi*, weight loss, standard care and aerobic exercise (in ranked order)	110 of 152 studies analysed were of poor quality. Network meta-analysis included 12 RCTs with low risk of bias
Ji et al., 2015[13]	Acupuncture versus standard pharmaceutical care in sciatica	Systematic review and meta-analysis of 12 RCTs in sciatica	Effectiveness, pain intensity, and pain threshold	Acupuncture was superior to standard pharmaceutical care in effectiveness, reducing pain intensity and pain threshold	Low- to moderate-quality evidence
Lewis et al., 2015[14]	Comparison of 21 different interventions for sciatica	Systematic review and network meta-analyses of 122 studies including 90 randomized or quasi-randomized controlled trials comparing 21 different interventions for sciatica	Global effect, and pain intensity	In global effect and reduction in pain intensity, acupuncture was second only to biological agents (cytokine-modulating drugs), and superior to all other interventions tested including non-opioid and opioid medications	9% of studies had a strong overall quality rating; 7% of studies had a strong overall external validity rating; 21% of studies used both adequate randomization and adequate or partially adequate allocation concealment

Appendix 1 Effectiveness of Acupuncture (continuation 1)

Author, year	Topic/intervention	Participants/population	Primary outcomes	Key findings	Study quality
Gadau et al., 2014[15]	Acupuncture and/or moxibustion versus sham acupuncture, another form of acupuncture, or conventional treatment in lateral elbow pain	Systematic review of 19 RCTs	Pain, and grip strength	Acupuncture is more effective than sham acupuncture (moderate-quality studies); acupuncture or moxibustion is more effective than conventional treatment (low-quality studies)	Low- to moderate-quality evidence
Cho et al., 2015[20]	Real versus sham acupuncture in acute post-operative pain after back surgery	Systematic review and meta-analysis of 5 trials	24-hour post-operative pain intensity on VAS; 24-hour opiate demands	Real acupuncture was superior to sham in reducing pain intensity but not opiate demand at 24 hours	3 of 5 trials were high quality
Levett et al., 2014[48]	Acupuncture, standard care, sham acupuncture, acupressure and mixed controls in various combinations in labor pain	A critical narrative review of 4 systematic reviews in labor pain	Pain intensity, analgesic use, and length of labor	Acupuncture reduces pain intensity, analgesic use and length of labor	Conflicting evidence
Clark et al., 2012[16]	Acupuncture versus various comparators including standard care, sham acupuncture and other forms of acupuncture in plantar heel pain	Systematic review of 5 RCTs and 3 non-randomized comparative trials	Various pain and disability scales (morning pain, walking pain, and tenderness)	Acupuncture for plantar heel pain is supported by evidence which is equivalent to evidence supporting standard care (stretching, splints, and dexamethasone)	Evidence at levels I and II supporting the effectiveness of acupuncture for heel pain, leading to a recommendation at Grade B
Deare et al., 2013[52]	Manual and electro-acupuncture compared with sham acupuncture, standard therapy and no treatment in fibromyalgia	Cochrane systematic review of 9 RCTs in fibromyalgia	Pain, stiffness, sleep, fatigue and global wellbeing	Acupuncture improves pain and stiffness compared to standard therapy and no treatment, but not compared to sham acupuncture	Low- to moderate-quality evidence
Smith et al., 2011[42]	Acupuncture or acupressure versus placebo control, usual care or pharmacological treatment in primary dysmenorrhea	Cochrane systematic review of 10 RCTs (944 subjects) on acupuncture (6) or acupressure (4) for primary dysmenorrhea	Pain relief, analgesic use, quality of life, improvement in menstrual symptoms, and absenteeism	Acupuncture was superior to placebo and Chinese herbs in pain relief, and superior to medication and Chinese herbs in reducing menstrual symptoms. Acupressure was superior to placebo in pain relief and reducing menstrual symptoms	Low risk of bias in 50% of included RCTs

Appendix 1 Effectiveness of Acupuncture (continuation 2)

Author, year	Topic/intervention	Participants/population	Primary outcomes	Key findings	Study quality
Abaraogu et al., 2015[43]	Acupuncture or acupressure versus placebo control, wait list or pharmacological treatment in primary dysmenorrhea	Systematic review of 8 RCTs (> 3 000 subjects) and meta-analysis of 4 RCTs	Pain intensity (VAS, McGill scale), quality of life, and blood nitric oxide	Acupuncture and acupressure reduced pain, while acupuncture also improved quality of life	Moderate-quality evidence
Chen et al., 2013[47]	Acupuncture or acupressure at acupoint SP6 versus minimal stimulation at SP6 or stimulation of another point in primary dysmenorrhea	Meta-analysis of acupuncture (3) and acupressure (4) RCTs in primary dysmenorrhea	Pain intensity (VAS)	Acupuncture is effective and acupressure may be effective at SP 6 for pain relief	Acupuncture trials had low to moderate risk of bias; acupressure trials had high risk of bias
Cho et al., 2010[44]	Acupuncture versus sham acupuncture, pharmacological treatment or Chinese herbs in primary dysmenorrhea	Systematic review of 27 RCTs in primary dysmenorrhea	Pain intensity (VAS, Menstrual Pain Reduction Score, and other pain scores)	Acupuncture was superior to pharmacological treatment or Chinese herbs in pain relief	Only 5 out of 27 trials had low risk of bias
Chung et al., 2012[46]	Acupoint stimulation versus non-acupoint stimulation or medication in primary dysmenorrhea	Systematic review of 30 RCTs (> 3 000 subjects) and meta-analysis of 25 RCTs	Pain intensity, and plasma prostaglandin F2/ prostaglandin E2 ratio	Acupoint stimulation was superior in short-term pain relief to stimulation on non-acupoints. Non-invasive stimulation of acupoints was more effective than invasive stimulation	Some trials were of low quality
Xu et al., 2014[45]	Various forms of acupoint stimulation (including acupuncture, moxibustion and other methods) versus a variety of controls in primary dysmenorrhea	Meta-analysis of 20 RCTs (2 134 subjects) of acupoint stimulation for primary dysmenorrhea	Pain relief	Acupoint stimulation was more effective than controls for pain relief	Low- to moderate-quality evidence

RCT: randomized controlled trial; VAS: Visual Analog Scale; WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index.

There is currently debate within the scientific and academic communities on how to perform high-quality studies on acupuncture. It is widely recognized that standards applied to drug trials are inappropriate for acupuncture studies, as it is impossible to effectively blind patients to treatment with acupuncture as can be done with medications. Hence, this literature review, adhering to standards for drug studies, may undervalue some existing studies, and hence the strength of acupuncture for care may also be underestimated.

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Submission Guide

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