

STATE SPINAL CORD INJURY PROGRAMS

A BEST PRACTICES REPORT FOR THE
COLORADO DEPARTMENT OF
HEALTH CARE POLICY AND
FINANCING

bailit
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Introduction

This report examines evidence-based or nationally-recognized best practices for:

- Service delivery of acupuncture, chiropractic care, and massage therapy for individuals with spinal cord injury;
- Amount, duration, scope, and frequency of these services for individuals with spinal cord injury; and
- Any other alternative therapies for individuals with spinal cord injury.

“The acupuncture effects appear to result from stimulation of appropriate spinal cord segmental levels or peripheral nerves, and the known release of endogenous opioids at the spinal cord level produced by acupuncture treatment and electrical stimulation of peripheral nerves provides a plausible mechanism for its effects in pain relief and limiting SCI after acute trauma.”ⁱ

Bailit Health conducted an extensive literature review, examining study findings on the efficacy of acupuncture, chiropractic care, and massage therapy for individuals with long term physical disabilities, with a special focus on evidence to support the Department’s future decision making related to the provision of these services. Currently, these services are only provided within the state’s HCBS-SCI waiver program, which is limited in geographic scope to the five county area surrounding Denver. This report also investigates the efficacy of these therapies for the treatment of pain, in order to inform the Department’s interest in exploring these therapies as a possible alternative to the use of opioid prescriptions for the treatment of pain within the state’s Medicaid program.

Review of Studies on Efficacy of Acupuncture, Chiropractic Care, and Massage Therapy for Treating Individuals with Long Term Physical Disabilities

Overall, research indicates some positive evidence for the efficacy of acupuncture and massage therapy as a treatment for SCIs, specifically in: a) addressing pain associated with SCI; and b) in alleviating medical complications such as bladder dysfunction resulting from SCI.

a. Efficacy of acupuncture in treating SCI

- A 2008 review of literature related to traditional Chinese medicine – literature available on MEDLINE, PubMed and eCAM searches – examined the potential for acupuncture to treat spinal cord injuries, and the “neurophysiologic mechanisms for acupuncture’s beneficial effects.” The authors noted that acupuncture has the potential to improve long-term neurologic recovery including “motor, sensory and bowel/bladder function;” acupuncture can also help manage chronic neuropathic and musculoskeletal pain associated with SCI. The authors concluded that electroacupuncture (also known as electronic stimulation or e-stim) may “significantly improve long-term neurologic recovery” from SCI, especially for motor, sensory, and bowel/bladder functioning, and noted that acupuncture posed “essentially no risk.”ⁱⁱ The authors commented, however, that literature on acupuncture for the treatment of spinal cord injuries was limited, and types of acupuncture vary among the studies that are available.

- A 2013 meta-analysis of randomized controlled trials (RCTs) that used acupuncture in treatment of SCI and its complications, found “positive results for the use of acupuncture combined with conventional treatments for the functional recovery in terms of motor ASIA (American Spinal Cord Injury Association) scores and total FIM (Functional Independence Measure) scores when compared to conventional treatments alone.”ⁱⁱ The authors’ review also found positive results for treatment of bladder dysfunction, when measured by the total efficacy rate, comparing acupuncture to conventional treatments. In the first systematic review of its nature, the authors searched 19 electronic databases, and identified 16 relevant studies, including two high-quality RCTs; of the 16 studies, 8 examined the effects of acupuncture on functional recovery and 8 examined the effect of acupuncture on complications resulting from SCI (6 trials studied bladder dysfunction and 2 studied pain levels). The two RCTs for pain control showed mixed results.

The authors conclude that their systematic review of RCTs for use of acupuncture in treating SCI “found encouraging albeit limited evidence for functional recovery, bladder dysfunction, and pain in SCI.” Interestingly, 14 of the 16 RCTs studied by the authors originated from Chinese sources; in fact, the authors raise the possibility of publication bias, noting that the majority of Chinese studies on the efficacy of acupuncture report positive results. Finally, the authors make an important point, which is that a “standardized prescription of acupuncture for SCI or its complications is necessary,” and does not yet exist. They note that acupuncture treatments vary by “acupuncture point, degree of stimulation, frequency of treatment, and ... number of treatments;” in fact, a standardized or optimal course of acupuncture treatment for SCI is “a controversial issue amongst acupuncture experts.”

Of note, the authors comment that some SCI patients may “need a safe nonpharmacological treatment” and that acupuncture might be an especially useful treatment for SCI, particularly for individuals who have had a weak or no response to conventional therapies.

- An April 2016 systematic review examined studies of acupuncture as a treatment for chronic urinary retention (CUR) resulting from SCI – the first ever review of its kind. The authors examined the efficacy and safety of acupuncture for treatment of CUR due to SCI, drawing on the findings of three RCTs with 334 patients suffering from CUR due to SCI. The meta-analysis determined that acupuncture combined with rehabilitation was more effective than rehabilitation alone in decreasing postvoid residual (PVR) urine volume. Due to the lack of “high quality” RCTs, the authors did not draw any definitive conclusions but noted that no severe adverse events were reported, and that acupuncture may in fact “be safe in treating CUR caused by SCI.” The authors concluded that “acupuncture as a complementary therapy may have a potential effect in CUR due to SCI in decreasing PVR and improving bladder voiding.”ⁱⁱⁱ
- A 2015 survey of 103 patients with SCI in a Swiss rehabilitation center found that there was high demand among the patients for adjunctive complementary alternative medicine (CAM) treatments for medical complications resulting from SCI, – particularly for treatment of pain and urinary tract infections (UTI). The first systematic assessment of CAM treatments in the alleviation of symptoms

resulting from SCI, the study found that 73.8 percent of the study participants had used CAM treatments to address chronic pain since their injury. The two most prevalent CAM treatments utilized were acupuncture and homeopathy; these treatments were used in a supplementary manner rather than exclusively. The authors reported that CAM treatments consistently led to high overall satisfaction levels (85.1 percent). CAM treatments were viewed as effective in treating pain among 85 percent of the patients and against UTI symptoms in 90.5 percent of the patients. The researchers reported that acupuncture was the most frequently used CAM treatment for pain among the study participants (28 percent); and 78.1 percent of patients receiving acupuncture treatment expressed satisfaction with this particular CAM technique. In fact, 19 percent of the acupuncture treatment users reported pain relief that lasted for weeks. The authors state that none of the CAM interventions resulted in a worsening of symptoms for the SCI patients.

The authors conclude that “on the basis of these results, future research should systematically evaluate the therapeutic potential of the most popular CAM techniques, for example, acupuncture and homeopathy, for the treatment of secondary medical complications of SCI.” The study has limitations in terms of its relatively small size (103 SCI patients); surprisingly, no patient refused to complete the questionnaire and the responses of all 103 patients were included.^{iv}

- Chronic pain is a major problem among individuals with SCI. A 2006 study of patient self-reported experiences examined the relief experienced by 117 individuals with traumatic SCI, ages 18 years or older, in using a variety of treatments for chronic pain.^{vi} The study offers some support for the effectiveness of massage, acupuncture, and chiropractic services in the treatment of pain. While the study had a number of limitations, including a low response rate (48 percent), it does provide a glimpse at patient-reported efficacy of a range of pain relief treatments.

The survey respondents were asked to indicate whether or not they had received or were currently receiving one of 26 pain treatments, spanning the range from oral medications and other traditional pain treatments, to seven alternative pain treatments.

Of relevance to the Department’s inquiry, the authors reported on the average relief and length of relief for these alternative pain treatments, which included massage, acupuncture and chiropractic treatments.

On an average relief scale of 0 (no relief) to 10 (complete relief), massage rated a 6.05 (+/- 2.47) among respondents, acupuncture, rated a 3.48 (+/- 3.48) and chiropractor rated a 5.00 (+/-3.04). Relief

provided by marijuana offered the highest ranking of average relief, of 6.05 +/- 2.47. Further, the authors reported that the relief provided by the alternative pain treatments (massage, acupuncture, and hypnosis) lasted for days in 25 to 33 percent of survey respondents who had tried these

Data from the National Spinal Cord Injury Statistical Center indicates that pain is prevalent among more than half of the persons with SCI surveyed, and that this pain remains steady over the years following their injury. In 2015, the Center reported that 53.4 percent of those surveyed at post-injury year 1 reported that pain interfered with work; this figure remained relatively steady at 50.1 percent at 25 years.^v

treatments; in contrast, survey respondents indicated that pain relief from other types of treatments, including most medications, lasted only minutes or hours.

Based on the responses of the 117 individuals to a postal survey, the authors concluded that many first line, traditional treatments for pain provide only minimal relief; for example, the authors state that only one third of those experiencing pain had tried gabapentin, and of those fewer than half continued to use it; and those still using it reported low levels of pain relief. The authors found that while opioids provided the highest degree of pain relief, only one-third of those who tried opioids continued to use them, raising questions about their long term efficacy.

b. Efficacy of massage therapy in treating SCI

In addition to the 2006 Cardenas and Jensen study on the effectiveness of various alternative treatments for pain (discussed immediately above), we located one additional study that examined the efficacy of massage therapy in treating SCI.^{viii} The study looked at the experiences of a rehabilitation center that specializes in SCI, in providing broad compression massage (BCM) to 40 adults, ages 18 years and older, undergoing rehabilitation for SCI and reporting pain. Rehabilitation nurses received training in providing BCM. The authors' objective was to establish the feasibility of conducting an RCT on the efficacy of massage therapy for SCI patients.

This 2013 study reported in *Spinal Cord* sought to determine the feasibility of conducting an RCT of massage therapy for individuals with SCI during inpatient rehabilitation. "While efficacy was difficult to assess, broad compression massage was safe and well tolerated."^{vii}

The study randomized participants to a group that received BCM or a control group that received light contact touch (LCT) treatments -- six 20 minute treatments took place over a two week period. After a one week pause, study participants received the second treatment modality, again for a two-week long treatment period. The authors measured changes in pain intensity and fatigue; a secondary focus included the impact of treatment on depressive symptoms.

The authors reported that pain intensity rated higher at baseline for the group that received LCT first when compared to the group that received BCM first; however, this pattern was not repeated in the second testing period. The study's limited results found that almost no participants experienced a significant reduction in pain intensity over the study's five week period.

The authors concluded that their study shows the feasibility of using rehabilitation nurses to provide massage therapy to patients with SCI, and of conducting an RCT on the efficacy of massage therapy to address pain in patients with SCI. While the authors did not draw conclusions on the efficacy of BCM for these patients, they determined that it was a safe and well tolerated therapy. They also pointed to the Cardenas and Jensen study as evidence that massage therapy is gaining ground as an

alternative to traditional pain relief therapies - simply because traditional pain relief therapies lack a strong success rate for patients with SCI.

c. Efficacy of chiropractic services in treating SCI

Beyond the 2006 Cardenas and Jensen study, our search found few studies that examined the efficacy of chiropractic services in treating spinal cord injuries. The Cardenas and Jensen study findings are significant, however, in identifying chiropractic services as a treatment modality that provided relief to survey respondents; on an average relief scale of 0 (no relief) to 10 (complete relief), respondents gave chiropractic services a 5.00 rating (+/-3.04).^{ix}

Evidence for Efficacy of Acupuncture, Chiropractic Care and Massage Therapy in Treatment of Musculoskeletal and Chronic Pain

Some evidence exists to support the efficacy of alternative treatments such as acupuncture, chiropractic care and massage therapy in the treatment of pain. In 2014, the Veterans Administration's Evidence Synthesis Program conducted multiple reviews of systematic literature reviews and concluded that "yoga, tai chi, mindfulness, and acupuncture have 'strong' or 'promising' effects on pain."^x In fact, 60 percent of VA facilities offer acupuncture, and 37 percent offer chiropractic care.^{xi}

Acupuncture and chiropractic care have solid evidence to support their use for chronic musculoskeletal pain.^{xii} However, a 2000 study found "limited evidence that acupuncture is more effective than no treatment for chronic pain."^{xiii}

In terms of massage therapy and its effectiveness in treating chronic pain, a 2007 review of the scientific literature found "fairly robust support for the analgesic effects of massage for non-specific low back pain, but only moderate support for such effects on shoulder pain and headache pain." This study found "only modest, preliminary support for massage in the treatment of fibromyalgia, mixed chronic pain conditions, neck pain and carpal tunnel syndrome."^{xiv}

Research Update on Treatment of Spinal Cord Injuries

Research is underway to study new approaches to treating spinal cord injuries. Much of this research is conducted with the support of the National Institute of Neurological Disorders and Stroke (NINDS), a division of the National Institutes of Health. The NINDS website provides a description of four primary areas of investigation for spinal cord repair.^{xv}

- A. **Neuroprotection** is aimed at "preventing cell death," and "protecting surviving nerve cells from further damage." Areas of research include reducing inflammation at the injured spinal cord. The NIND reports on a recent clinical trial that found "slight improvement in motor function among some individuals who were given a steroid within 8 hours after injury."

- B. **Regeneration** that stimulates “the regrowth of axons and targeting their connections appropriately” is another area of research.
- C. **Cell replacement** involves “replacing damaged nerve or glial cells,” however controversy exists around this approach.
- D. **Retraining CNS circuits and plasticity** to restore body functions – rehabilitation and exercise are key components.

Conclusion

Overall, our exploration found some positive evidence for the efficacy of acupuncture, chiropractic care and massage therapy as a treatment in addressing chronic pain associated with SCI and in alleviating medical complications such as bladder dysfunction resulting from SCI. It is significant to note that in conjunction with these relatively positive findings, many of the studies discussed above point out the minimal to no risk associated with these therapies for individuals with SCI as well as high satisfaction levels. Further, potential complications arising from traditional long term treatments (analgesics, intermittent catheterization for bladder dysfunction) for secondary complications of SCIs has heightened interest in alternative treatments.^{xvi}

It is interesting to note that alternative therapies for treating pain in the general population are becoming more common. This trend is evidenced by the prevalence of alternative therapies such as acupuncture, yoga, and meditation across the VA’s health care system. The popular press has taken note of this trend in recent articles. The *Boston Globe* recently reported on the use of reflexology at the Dana-Farber Cancer Institute, where more than 3,000 patients scheduled appointments for acupuncture and massage in 2015, a 25 percent increase from the previous year.^{xvii} And while many states would like to reduce opioid use in their Medicaid programs, determining whether to cover alternative therapies, and to what extent, are key questions that remain largely unanswered.

ⁱDorsher, P.T. and McIntosh, P. “Acupuncture's Effects in Treating the Sequelae of Acute and Chronic Spinal Cord Injuries: A Review of Allopathic and Traditional Chinese Medicine Literature,” *Evidence-Based Complementary and Alternative Medicine* 2011. Click [here](#) to access.

ⁱⁱ Heo, In, et al. “Acupuncture for Spinal Cord Injury and Its Complications: A Systematic Review and Meta-Analysis of Randomized Controlled Trials,” *Evidence-Based Complementary and Alternative Medicine* 2013. Click [here](#) to access.

ⁱⁱⁱWang, J. et al. “Acupuncture for Chronic Urinary Retention due to Spinal Cord Injury: A Systematic Review,” *Evidence-Based Complementary Alternative Medicine* 2016; published online April 13, 2016. Click [here](#) to access.

^{iv}Pannek J., Pannek-Rademacher S., and Wollner J., “Use of complementary and alternative medicine in persons with spinal cord injury in Switzerland: a survey study,” *Spinal Cord* 2015, 53; page 569-72. Click [here](#) to access.

^v NSCISC National Spinal Cord Injury Statistical center, Spinal Cord Injury Model Systems, 2015 Annual Report. Click [here](#) to access.

^{vi} Cardenas, D.D. and Jensen, M.P., “Treatments for Chronic Pain in Persons with Spinal Cord Injury: A Survey Study,” *Journal of Spinal Cord Medicine* 2006; 29(2), page 109-17. Click [here](#) to access.

^{vii} Ibid.

^{viii}Chase et al. “A Pilot Feasibility Study of Massage to Reduce Pain in Patients with Spinal Cord Injury during Acute Rehabilitation,” *Spinal Cord*, 2013. Click [here](#) to access.

^{ix} Cardenas and Jensen.

^xStephanie Taylor and Karl Lorenz, "A VA Priority: Complementary and Integrative Health Approaches to Addressing Pain," VAHSR&D, *FORUM*, Spring 2016 issue. Click [here](#) to access.

^{xi} Ibid.

^{xii}DeBar L., et al. "Acupuncture and Chiropractic Care for Chronic Pain in an Integrated Health Plan: a Mixed Methods Study," *BMC Complementary and Alternative Medicine* 2011; 11:118. Click [here](#) to access.

^{xiii}Ezzo et al. "Is Acupuncture Effective for the Treatment of Chronic Pain? A systematic Review," *Pain* 2000; 86:3, p. 217-25. Click [here](#) to access.

^{xiv}Tsao, J. "Effectiveness of Massage Therapy for Chronic Non-malignant Pain: A Review," *Evidence Based Complementary Alternative Medicine* 2007; 4(2): 165-179. Click [here](#) to access.

^{xv} Click [here](#) for more information about advancements in SCI research.

^{xvi} Heo, In, et al.

^{xvii} "Easing a patient's pain – even without proof it works," Carlie Gonzalez, *Boston Globe*, June 20, 2016. Click [here](#) to access.