



## FACT SHEET No. 12

# Acupuncture for Acute Pain After Surgery

Acute pain management strategies have evolved over the past 15 years, becoming increasingly multimodal, with modern understanding of the benefits of combining analgesics with additive or synergistic effects (White & Kehlet, 2010). One non-pharmacologic modality—acupuncture—holds promise in providing postoperative pain relief and in diminishing the side effects associated with volatile anesthetics, opioids, and adjuvant analgesics.

### Acupuncture for Postoperative Pain: Mechanistic Evidence

- Electro-acupuncture stimulates the release of  $\beta$ -endorphin, enkephalin, and endomorphin, which in turn activates the  $\mu$ - and  $\delta$ -opioid receptors, key receptor sites in the management of acute, chronic, and neuropathic pain (Lin & Chen, 2008).
- High-frequency stimulation (100-200 Hz) provides rapid-onset analgesia that does not appear to be blocked by naloxone (a  $\mu$ -opioid antagonist), suggesting it may be mediated by norepinephrine, serotonin, and dynorphins (Chernyak & Sessler, 2005).
- Low-frequency (2-4 Hz) and medium-frequency stimulation (15-30 Hz) appear to produce an analgesic effect that is reversed by naloxone, suggesting it is mediated by enkephalins and endorphins (Chernyak & Sessler, 2005; Zhao, 2008). These frequencies also appear to produce analgesia that accumulates, lasting at least an hour after treatment (Chernyak & Sessler, 2005).

### Acupuncture for Postoperative Pain: Clinical Evidence

- A systematic review of 15 randomized controlled trials (RCT) comparing acupuncture versus sham in various surgeries revealed that postoperative pain intensity was significantly reduced in the acupuncture groups at 8 and 72 hours post-surgery compared with the sham control group. Significant difference was also found in mean opioid consumption at 8, 24, and 72 hours between acupuncture versus control groups (Sun et al., 2008).
- When preoperative acupuncture was analyzed as a subgroup, results showed that cumulative opioid consumption was lower in the acupuncture group compared with placebo, but this effect



© Copyright 2017 International Association for the Study of Pain. All rights reserved.

**IASP brings together scientists, clinicians, health-care providers, and policymakers to stimulate and support the study of pain and translate that knowledge into improved pain relief worldwide.**

was only statistically significant when acupuncture was administered prior to the operation, suggesting the potential role for acupuncture in securing preemptive analgesia (Sun et al., 2008).

### Acupuncture for Postoperative Pain: Additional Benefits

- One RCT for total knee arthroplasty found that patients who received acupuncture three times a week had significantly reduced pain and swelling compared with patients with usual care on postoperative days 14 and 21 (Mikashima et al., 2012). The acupuncture group also experienced a significantly faster return to preoperative range of motion levels (average difference=5.7 days;  $p<0.01$ ).
- In a systematic review of 21 articles, the addition of acupuncture and acupressure to standard care was found to significantly reduce the incidence of postoperative nausea and vomiting compared with antiemetic prophylaxis used alone (Pettersson & Wengstrom, 2012).
- A meta-analysis pooled 24 RCTs for nausea, 29 for vomiting, and 19 for the use of rescue antiemetics and found that compared with placebo and medication control groups, all acupoint stimulations (acupuncture, acupressure, or electrical stimulation) significantly reduced nausea, vomiting, and the use of rescue anti-emetics ( $p<0.0001$ ) (Shiao & Dune, 2006).

### REFERENCES

- Chernyak, G. & Sessler, D. (2005). Perioperative acupuncture and related techniques. *Anesthesiology*, 102(5): 1031-1078.
- Lin, J. & Chen, W. (2008). Acupuncture analgesia: a review of its mechanisms of actions. *American Journal of Chinese Medicine*, 36(4), 635-45.
- Mikashima, Y., Takagi, T., Tomatsu, T., Horikoshi, M., Ikari, K., and Momohara, S. (2012). Efficacy of acupuncture during post-acute phase of rehabilitation after total knee arthroscopy. *Journal of Traditional Chinese Medicine*, 32(4): 545-548.
- Pettersson, P., & Wengström, Y. (2012). Acupuncture prior to surgery to minimise postoperative nausea and vomiting: a systematic review. *Journal of Clinical Nursing*, 21(13/14), 1799-1805.
- Shiao, S. and Dune, L. (2006). Metaanalyses of acustimulations: effects on nausea and vomiting in postoperative adult patients. *Explore: The Journal of Science and Healing*, 2(3): 202-15.
- Sommer M., de Rijke J., van Kleef M., et al. (2008). The prevalence of postoperative pain in a sample of 1490 surgical inpatients. *European Journal Anaesthesiology*, 25:267–274.
- Sun, Y., Gan, T., Dubose, J., and Habib, A. (2008). Acupuncture and related techniques for postoperative pain: a systematic review of randomized controlled trials. *British Journal of Anesthesia*, 101(2): 1501-160.
- White, P. and Kehlet, H. (2010). Improving Postoperative Pain Management: What Are the Unresolved Issues? *Anesthesiology*, 112: 220–5.
- Zhao, Z. (2008). Neural mechanism underlying acupuncture analgesia. *Progress in Neurobiology*, 85(4): 355-375.



© Copyright 2017 International Association for the Study of Pain. All rights reserved.

**IASP brings together scientists, clinicians, health-care providers, and policymakers to stimulate and support the study of pain and translate that knowledge into improved pain relief worldwide.**

## AUTHOR

Kathryn Walker, MS, MAOM, Lic. Ac.  
Clinical Acupuncturist, Neurosurgical Consultants, Norwood Hospital  
Norwood, Mass., USA  
Research Acupuncturist, Martinos Center, Massachusetts General Hospital  
Boston Mass., USA

## REVIEWERS

Chester 'Trip' Buckenmaier III, MD  
Program Director  
Defense and Veterans Center for Integrative Pain Management  
Professor of Anesthesiology  
Uniformed Services University  
Bethesda, Md., USA

Lynn Teo, MS, Lic. Ac.  
Senior Research Associate  
Thought Leadership & Innovation Foundation  
Leesburg, Va., USA

### About the International Association for the Study of Pain®

IASP is the leading professional forum for science, practice, and education in the field of pain. [Membership is open to all professionals](#) involved in research, diagnosis, or treatment of pain. IASP has more than 7,000 members in 133 countries, 90 national chapters, and 20 Special Interest Groups.

**As part of the Global Year Against Pain After Surgery, IASP offers a series of Fact Sheets that cover specific topics related to postsurgical pain. These documents have been translated into multiple languages and are available for free download. Visit [www.iasp-pain.org/globalyear](http://www.iasp-pain.org/globalyear) for more information.**



© Copyright 2017 International Association for the Study of Pain. All rights reserved.

**IASP brings together scientists, clinicians, health-care providers, and policymakers to stimulate and support the study of pain and translate that knowledge into improved pain relief worldwide.**