

Laser Acupuncture Therapy (LAT): History and Recent Research

By Steve Liu, BSEE, LAc

History of the Laser

Last year marked the 100th anniversary of Albert Einstein's shattering discovery that the realms of matter and energy are inescapably linked by his famous equation $E=MC^2$. Next year is the 50th anniversary since the concept of laser first came into existence.

Early on a dark morning in November 1957, a young graduate school student by the name of Gordon Gould, based on a 1917 Einstein proposal on the physics of photons under stimulation, wrote down the theory of how a single photon can be stimulated and amplified to become a laser. Three years after the theory was proposed, Theodore Maiman, an American physicist, first successfully produced a functioning laser. However, the laser wasn't used on biological tissues for healing purposes until 1966 when a Hungarian physician, Dr. Endre Mester, first did experiments on rats and discovered the "biostimulation" effect of the low level laser light.¹ Since 1967, more than 2,000 clinical studies have been published worldwide, mainly in Russia and Europe, on low level laser therapy. The studies showed the light treatments are safe and effective. In 2002 FDA cleared the technology for treating carpal tunnel syndrome.²

History of Laser Acupuncture

Beginning in 1973, extensive clinical laser acupuncture was conducted and results were published in China. At the time, a Helium-Neon gas laser with 632.8 nm wavelength and 1.6 mW output power was used in the treatment of over 200 medical conditions from internal, gynecological, to pediatric and neurological disorders.³

In the United States, one of the most notable laser acupuncture researchers is Dr. Margaret Naeser, Ph.D., Lic.Ac., Dipl.Ac., a research professor of Neurology, Boston University School of Medicine, and a licensed acupuncturist in Massachusetts. Dr. Naeser has been doing laser acupuncture research since 1984 and has published a textbook and many papers on related topics. Dr. Naeser is also the chief investigator of a successful study on the treatment of carpal tunnel syndrome with laser acupuncture. Since the author published his first article on laser acupuncture in 2001, many significant laser acupuncture studies were developed and published.

Recent Research

In 2002, Dr. Naeser et al. published results from a controlled study at the VA Boston Healthcare System, where real laser and microcurrent, versus sham were investigated

to treat carpal tunnel syndrome. This truly landmark study involved laser acupuncture where a red-beam laser (continuous wave, 15 mW, 632.8 nm, HeNe gas tube laser) and an infrared laser (pulsed, 10W, 904 nm semiconductor diode laser) were used on acupuncture points located on fingers, hands, wrists, arms, and neck. The study results indicated that the real laser treatment group had 87.5% success rate compared to 27.3% in the sham laser group.⁴

Dr. May Loo, an assistant clinic professor at Stanford University and the author of the book *Pediatric Acupuncture*, was the first researcher to receive a National Institute of Health (NIH) research grant to study the efficacy of laser acupuncture in the treatment of children with Attention Deficit Hyperactivity Disorder (ADHD).⁵ In this unpublished preliminary pre-post single-blind study, data from students in grades K to 3 revealed improvement in Connors 10-item scores by teachers (n=7) from 17.0 to 12.0 and in analogous parent scores (n=6) from 23.1 to 15.5.

Dr. Peter Whittaker from the department of Emergency Medicine, University of Massachusetts Medical School, has recently published a study of laser acupuncture for pain treatment.⁶ A rodent model, which measures the time taken before a rat withdraws its tail from a heat source, provides a well-established and objective assessment of analgesia. Acupuncture needle and electroacupuncture at the acupoint Spleen-6 has been found to increase tail-flick time in rats. In this study, a 550 μ m diameter optic fiber was used to irradiate acupoint Spleen-6 for 2 minutes (690 nm, 130 mW) in rats. The baseline tail-flick time was measured and 15 minutes later the laser acupuncture or the control protocols were performed and tail-flick time re-measured 10 minutes after treatment. Additionally, experiments were done in which the opioid-blocker naloxone was administered one hour before laser acupuncture treatment. Tail-flick time increased after laser acupuncture ($P=0.0002$). In contrast, no increase was found after sham treatments. Pre-treatment with naloxone attenuated the increase in tail-flick time. The study proved laser acupuncture exerts an analgesic effect which may act via an opioid-mediated mechanism.

In 2005, the Medical University of Graz, Austria, published results of 3-year studies of laser acupuncture.⁷ This is believed to be the largest scale yet on laser acupuncture research. Research topics include brain function modulation, pain therapy, depression and anxiety, arthritis, gynecology, and

dentistry. The results of these studies show that non-invasive laser acupuncture stimulation can induce specific, reproducible effects in the brain. The cerebral effects induced by the painless technique lie within similar dimensions as those evoked by manual needle acupuncture. Based on these investigations the cerebral effects on laser acupuncture stimulation could be systematically objectified, specified, and optimized for the first time. These scientific findings do not only have extensive consequences in laser medicine, but also build an important bridge between traditional Eastern and Western medicine.

Currently studies with laser acupuncture are being performed in several University clinics in Germany, Austria, Switzerland, and France. Scientists generally agree that the 21st Century will be the Century of photons, like the 20th Century was the Century of Electrons.

The author will present, in addition to the topics covered in the article, the theory of low level laser biostimulation effects and the clinical applications of this new non-invasive, painless form of acupuncture at the AAOM's annual conference in Phoenix on October 22nd.

References

1. Tuner, J., and Hode, L. *Laser Therapy: Clinical Practice and Scientific Background*. 2002. Grangesberg, Sweden: Pima Books.
2. Lindstrom, Lois. *The Light Stuff – Cold Laser Therapy Is Joining the Injury Treatment Team*. 2004. www.loislindstrom.com.
3. *Laser Acupuncture and its Clinical Applications* (Chinese edition). 1993. 2-3.
4. Naeser, M. Photobiostimulation of Pain in Carpal Tunnel Syndrome: Review of Seven Laser Therapy Studies. *Photomed. Laser Surg.* April 2006; 24 (2): 101-110.
5. http://www.harryhong.com/index_files/Page1097.html
6. Whittaker, P. Laser Acupuncture and Analgesia: Preliminary Evidence for a Transient and Opioid-Mediated Effect. *Mechanisms for Low-Light Therapy*. January 2006; 7 (26): 61400B-1 – 61400B-5.
7. Litscher, G., and Schikora D. *Laserneedle Acupuncture: Science and Practice*. January 2005. Lengerich, Germany: Pabst Science Publishers.

Steve Liu, LAc, has a BS in Electrical Engineering, San Jose State University, San Jose, CA. He specializes in Laser Acupuncture in Tucson, Arizona and has written articles on Laser Acupuncture, published in the California Journal of Oriental Medicine (CJOM), by the California State Oriental Medical Association (CSOMA). Dr. Liu is President of the Arizona Society of Oriental Medicine and Acupuncture (AzSOMA).