

## Microcurrent Electrical Therapy Clinical Proof of Concept

Microcurrent electrical stimulation has been used or studied for many different therapeutic applications. Studies have been conducted which demonstrate the efficacy of microcurrent electrical stimulation for:

- ◆ Reduction in pain improvement scores with accompanying substantial reduction in serum levels of the inflammatory cytokines IL-1, IL-6, and TNF-X, and neuropeptide substance P. Beta-endorphin release and increases in serum cortisol.<sup>1</sup>
- ◆ Significant pain reduction and increased range of motion in chronic back pain, fibromyalgia, cervical pain, Carpal Tunnel Syndrome, and arthritis patients<sup>1,4,6,8,20,21,23</sup>
- ◆ Reduction of pain in degenerative joint disease of the temporomandibular joint<sup>12</sup>
- ◆ Lasting reduction in myofascial pain of the head, neck and face<sup>13</sup>
- ◆ Reduction in pain and increased mobility in peritendinitis calcarea of the shoulder<sup>5, 28</sup>
- ◆ Reduction in post-operative pain and edema,<sup>3,10</sup>
- ◆ Reduction in healing time in soft tissue injury<sup>9,11,14,15,19,22</sup>
- ◆ Reduce in treatment and rehabilitation time and reduction in worker down time<sup>14,27</sup>
- ◆ Increasing range of motion in ankle dorsiflexion in CP,<sup>2</sup>
- ◆ Increase the rate of healing in injured athletes, control pain, increase the rate of fracture repair, and treat myofascial pain and dysfunction<sup>16, 24,25,26</sup>
- ◆ Reduction in pain at power-grip and lifting a weight load with pronated forearm, improvement in grip-strength in chronic lateral epicondylitis patients,<sup>17</sup>
- ◆ Superiority to conventional physical therapy in number of treatments required to relieve pain, severity of side effects, total cost of treatment and patient satisfaction,<sup>27</sup>
- ◆ Reduce severity of muscle damage signs and symptoms,<sup>7</sup>

<sup>1</sup>McMakin C, Gregory W, Phillips T. Cytokine Changes with Microcurrent Treatment of Fibromyalgia Associated with Cervical Spine Trauma. *Journal of Bodywork and Movement Therapies* (2005) 9, 169-176

<sup>2</sup>Mäenpää H, Jaakkola R, Sandström M, Von Wendt L. Does microcurrent stimulation increase the range of movement of ankle dorsiflexion in children with cerebral palsy? *Disability & Rehabilitation*. Volume 26, Number 11 / June 3, 2004. Pages 669 – 677

<sup>3</sup>Jarit, GJ, Mohr KJ, Waller R, Glousman RE. The effects of home interferential therapy on post-operative pain, edema, and range of motion of the knee. *Clin J Sport Med*. 2003 Jan; 13(1):16-20.

<sup>4</sup>McMakin C. Microcurrent therapy: a novel treatment method for chronic low back myofascial pain. *Journal of Bodywork and Movement Therapies*. Volume 8, Issue 2, April 2004, 143-153.

<sup>5</sup>Wallace, L. Results of Microamp Therapy on 234 Shoulder Impingement Cases. *Ohio Physical Therapy and Sports Medicine*, Cleveland, OH. (To be submitted to APRA)

<sup>6</sup>Wallace, L. Results of Microamp Therapy on 421 Patients with Lumbar Pain. *Ohio Physical Therapy and Sports Medicine*, Cleveland, OH USA. Submitted and accepted by the International Physical Therapy Association for presentation.

<sup>7</sup>Lambert, M, Marcus P, Burgess T, Noakes T. Electro-membrane microcurrent therapy reduces signs and symptoms of muscle damage. *Med. Sci. Sports Exerc*. Vol 34, No. 4, Pp. 602-607, 2002.

<sup>8</sup>Naeser M, et al. Carpal Tunnel Syndrome Pain Treated With Low-Level Laser and Microamperes Transcutaneous Electric Nerve Stimulation: A Controlled Study. *Arch Phys Med Rehabil* Vol 83, July 2002.

<sup>9</sup>Akai M, Hayashi, K. Effects of Electrical Stimulation on Musculoskeletal Systems; A Meta-Analysis of Controlled Clinical Trials. *Bioelectromagnetics* 23:132-143 (2002)

- <sup>10</sup>The Effect of Microcurrent Stimulation on Postoperative Pain After Patellar Tendon-Bone Anterior Cruciate Ligament Reconstruction. Presented at the American Physical Therapy Association Annual Conference and Exposition, Indianapolis, Indiana; June, 2000. Sizer P, Sawyer S, Brismee J, Jones K\*, Bruce J\*, Slauterbeck J., Texas Tech University Health Sciences Center and \*University Medical Center, Lubbock, Texas, USA.
- <sup>11</sup>Smith, RB. Is Microcurrent Stimulation Effective in Pain Management? An Additional Perspective. *AJPM* 2001, 11:64-68.
- <sup>12</sup>Bertolucci LE, Grey T. Clinical comparative study of microcurrent electrical stimulation to mid-laser and placebo treatment in degenerative joint disease of the temporomandibular joint. *Cranio*. 1995 Apr; 13(2):116-20
- <sup>13</sup>McMakin, C. Microcurrent treatment of myofascial pain in the hand, neck and face. *Top Clin Chiropract*. 1998; 5: 29-35, 73-75.
- <sup>14</sup>Lathrop, PH. New technology speeds healing while cutting costs. *Worker's Comp Advisor*, February 1990. P. 7.
- <sup>15</sup>Pennington GM, Danley DL, Sumko MH, Bucknell A, Nelson JH. Pulsed, non-thermal, high-frequency electromagnetic energy in the treatment of grade I and grade II ankle sprains. *Mil Med* 1993 Feb; 158(2):101-4.
- <sup>16</sup>Mercola, JM, Kirsch, D. The Basis for Microcurrent Electrical Therapy in Conventional Medical Practice, *Journal of Advancement in Medicine*, 1995; 8(2): 83-97
- <sup>17</sup>Johannsen F, Gam A, Hauschild B, Mathiesen B, Jensen L. Rebox: an adjunct in physical medicine? *Arch Phys Med Rehabil*. 1993 Apr; 74(4):438-40
- <sup>18</sup>McMakin C. Treatment of Resistant Myofascial Pain with Microcurrent Using Specific Microcurrent Frequencies Applied with Graphite/Vinyl Gloves. Presented to the American Back Society, December 11, 1997.
- <sup>19</sup>Stanish, WD, Lai A. New concepts of rehabilitation following anterior cruciate reconstruction. *Clin Sports Med* 1993; Jan, 12(1):25-58.
- <sup>20</sup>Zizic TM, Hoffman KC, Holt PA, Hungerford DS, O'Dell JR, Jacobs MA, Lewis CG, Deal CL, Caldwell, JR, Cholewczynski JG, Free SM. The Treatment of Osteoarthritis of the Knee with Pulsed Electrical Stimulation. *The Journal of Rheumatology* 1995 1005:22:9
- <sup>21</sup>Zizic TM et al. The Treatment of Rheumatoid Arthritis of the Hand with Pulsed Electrical Fields. *Electricity and Magnetism in Biology and Medicine* 1999.
- <sup>22</sup>Stanish, WD, et al. The use of electricity in ligament and tendon repair. *Physician & Sportsmedicine* 1985; 13:190-116.
- <sup>23</sup>Lerner FN, Kirsh DL. A double blind comparative study of microstimulation and placebo effect in short term treatment of the chronic back pain patient. *J Chiropract*, 15: 101-106.
- <sup>24</sup>Manley Tehan, L, *Microcurrent Therapy, Universal Treatment Techniques and Applications*. Corona, CA: Manley and Associates; 1994
- <sup>25</sup>Rowley, BA; McKenna, JM; Wolcott, LE; The use of Low Level Electric Current for the Enhancement of Tissue Healing. *ISA BM*. 1974; 1974; 74322:111-114
- <sup>26</sup>Morgareidge, KR. Chipman, MR, *Microcurrent Therapy, Physical Therapy Today*, Spring 1990:50-53
- <sup>27</sup>Noto, K. Grant, P. Comparative Study of Micro-Amperage Neural Stimulation and Conventional Physical Therapy Modalities. Masters Thesis California State University, Long Beach.
- <sup>28</sup>Kadda, B. Treatment of Peritendinitis Calcarea of the Shoulder by Transcutaneous Nerve Stimulation. *Acupuncture & Electro-Therapeutics Res., Int. J., Vol. 9, pp. 115-125, 1984.*