

An Extended Model of Physical Therapy Modes of Action

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References

1. Watson, T., *Narrative Review : Key concepts with electrophysical agents*. Physical Therapy Reviews, 2010. **15**(4): p. 351-359.
2. Leung, M.C., G.Y. Ng, and K.K. Yip, *Therapeutic ultrasound enhances medial collateral ligament repair in rats*. Ultrasound Med Biol, 2006. **32**(3): p. 449-52.
3. McBrier, N.M., et al., *Therapeutic ultrasound decreases mechano-growth factor messenger ribonucleic acid expression after muscle contusion injury*. Arch Phys Med Rehabil, 2007. **88**(7): p. 936-40.
4. Ostrowski, K., P. Schjerling, and B.K. Pedersen, *Physical activity and plasma interleukin-6 in humans--effect of intensity of exercise*. Eur J Appl Physiol, 2000. **83**(6): p. 512-5.
5. Zhang, S.P., et al., *Non-opioid-dependent anti-inflammatory effects of low frequency electroacupuncture*. Brain Res Bull, 2004. **62**(4): p. 327-34.
6. Bjordal, J.M., R.A. Lopes-Martins, and V.V. Iversen, *A randomised, placebo controlled trial of low level laser therapy for activated Achilles tendinitis with microdialysis measurement of peritendinous prostaglandin E2 concentrations*. Br J Sports Med, 2006. **40**(1): p. 76-80; discussion 76-80.
7. Petersen, W., et al., *Cyclic strain influences the expression of the vascular endothelial growth factor (VEGF) and the hypoxia inducible factor 1 alpha (HIF-1alpha) in tendon fibroblasts*. J Orthop Res, 2004. **22**(4): p. 847-53.
8. Gabbiani, G., *The myofibroblast in wound healing and fibrocontractive diseases*. J Pathol, 2003. **200**(4): p. 500-3.
9. Kido, S., et al., *Mechanical stress induces Interleukin-11 expression to stimulate osteoblast differentiation*. Bone, 2009. **45**(6): p. 1125-32.
10. Zhao, M., et al., *Electrical stimulation directly induces pre-angiogenic responses in vascular endothelial cells by signaling through VEGF receptors*. J Cell Sci, 2004. **117**(Pt 3): p. 397-405.
11. Bandow, K., et al., *Low-intensity pulsed ultrasound (LIPUS) induces RANKL, MCP-1, and MIP-1beta expression in osteoblasts through the angiotensin II type 1 receptor*. J Cell Physiol, 2007. **211**(2): p. 392-8.
12. Watson, T., *Electrical Properties of Tissues*, in *Electrotherapy : Evidence Based Practice*, T. Watson, Editor. 2008, Churchill Livingstone / Elsevier: Edinburgh. p. 37-52.
13. McCaig, C.D., B. Song, and A.M. Rajnicek, *Electrical dimensions in cell science*. J Cell Sci, 2009. **122**(Pt 23): p. 4267-76.
14. Poltawski, L. and T. Watson, *Bioelectricity and microcurrent therapy for tissue healing - a narrative review*. Physical Therapy Reviews, 2009. **14**(2): p. 104-114.
15. Kloth, L.C., *Electrical stimulation for wound healing: a review of evidence from in vitro studies, animal experiments, and clinical trials*. International Journal of Lower Extremity Wounds, 2005. **4**(1): p. 23-44.
16. Nuccitelli, R., *A role for endogenous electric fields in wound healing*. Current Topics in Developmental Biology, 2003. **58**: p. 1-26.
17. Watson, T., *Ultrasound in contemporary physiotherapy practice*. Ultrasonics, 2008. **48**: p. 321-329.
18. Isaacson, B.M. and R.D. Bloebaum, *Bone bioelectricity: what have we learned in the past 160 years?* J Biomed Mater Res A, 2010. **95**(4): p. 1270-9.