Oska Pulse - Sequential Protocol Programming

The Oska PEMF device is designed to speed recovery from injury and degenerative conditions (such as osteoarthritis). The treatment protocols used are designed to encourage cellular re-generation; thus not only speeding recovery but also reducing pain associated with an injury or degenerative condition. Oska can be used alongside traditional medication and to date there are no listed side effects from using PEMF treatment.

Oska treatment protocols use a unique delivery method called "**Sequential Protocol Programming**" and include four programs recognized for their effectiveness and which occur naturally in load bearing tissue. The wave forms and frequency structures used by the Oska correspond to the following:

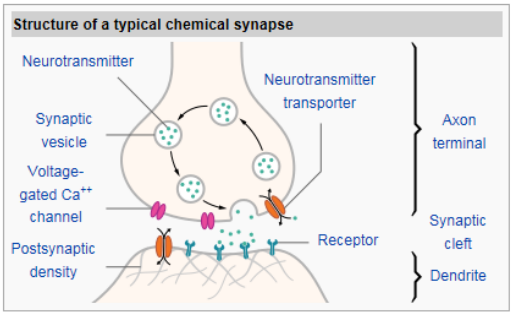
- **Angio** or **Angiogenesis** corresponds with the first phase of biological repair and is the physiological process through which new blood vessels form from pre-existing vessels and also the term used to describe capillary arcade; and dilation of capillaries. Apart from stimulating the lymph system, this helps to provide more oxygen and nutrients to the area being treated. Great for treating inflammation, bruising, varicose veins etc. [1.]

- **Osseous**: (*Having to do with bone, consisting of bone, or resembling bone)* relates to the third "remodeling" phase of biological repair. The third treatment phase is designed to speed the repair of bone fractures, non-union issues and to improve bone density[3.]

- **Chondro** or **Chondrogenesis** is the process by which cartilage is developed and corresponds with the second phase of biological repair. This second treatment protocol is beneficial to the promotion of proteoglycan extra-cellular matrix found in connective tissue and cartilage. [2].

- **Pain relief**: Whilst long term pain relief is effected through recovery, there is a need to deal with the effects of pain as soon as possible. While the use of pain blocking devices such as TENS is not recommended for obvious reasons, we have introduced the **Pain Reduction signal** to assist in pain relief. So that our philosophy is better understood, <u>Oska puts the fire out rather than just turning off the alarm</u> (as a TENS unit typically does).

The following explains the **Pain Block** sequence, the final treatment protocol in the 30 minute program; all electrical energy in the body is produced by chemical activity. Pain signals are transferred to the brain via chemical signals (Synapse)[5] that travel across what is called a "synaptic gap or cleft".[5.] The resting potential of the synaptic membrane is around -70 mV and a pain signal can raise this to a significant +20 mV. [6.] By applying a specially configured electromagnetic signal to the area being treated, we can lower the resting state to a hyper-polarized level of -90mV. The pain signal has difficulty in raising the potential enough to trigger the release of chemical transmitter signals (synapse), thus bringing about a reduction in perceived pain.



A word on power:

The resting state of the cell is roughly -70 millivolts. A huge amount of energy is not required to modulate cell membrane in order to open transporter channels that allow the exchange of important ionic compounds - sodium, potassium, magnesium, chloride and calcium. Oska is designed to mimic the body's own endogenous electrical energy, naturally produced when tissue is subject to dynamic loading, but compromised due to injury or degenerative issues.

Ref: 1. Lecture abstract Dr. D. Laycock, Ph.D. Med. Eng. MBES, MIPEM, B.Ed.

Ref: 2. **Healio.com/Orthopaedics' Effects of Pulsed Electromagnetic Field Frequencies on the Osteogenic Differentiation of Human Mesenchymal Stem Cells.** By Fei Luo, PhD; Tianyong Hou, PhD; Zehua Zhang, PhD; Zhao Xie, PhD; Xuehui Wu, PhD; Jianzhong Xu, PhD

And "**Effects of pulsed electromagnetic fields on articular hyaline cartilage"**
review of experimental and clinical studies http://media.wix.com/ugd/7eebe5_a5455991734941adaf016177e8d84363.pdf

Ref: 3 **The effect of low-frequency electromagnetic field on human bone marrow stem/progenitor cell differentiation.**
By Christina L. Ross, Mevan Siriwardane, Graça Almeida-Porada, Christopher D. Porada, Peter Brink, George J. Christ, Benjamin S. Harrison. "Science Direct" www.elsevier.com/locate/scr.

Ref: 4. Díaz-Ríos M, Miller MW (June 2006). "Target-specific regulation of synaptic efficacy: potential substrates for behavioral plasticity?". *Biol. Bull.* ***210*** *(3): 215–29.* doi:10.2307/4134559. PMID 16801496.

Ref: 5 **Synapses are functional connections between neurons, or between neurons and other types of cells· A typical neuron gives rise to several thousand synapses, although there are some types that make far fewer.**