PEMF Prime Academy

Certified PEMF Expert

Module 2

PEMF - The Basics (History and Parameters)

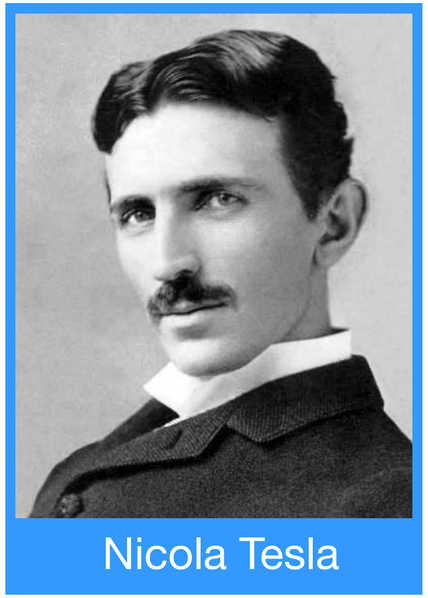
PEMF Prime Academy

PEMF Basics History & Parameters

The Evolution of PEMF (Pulsed ElectroMagnetic Fields)

Bio-electro-magnetics experienced the most contractionary evolution of all therapeutic disciplines

- Ancient Egyptians 300 B.C. used “Lodestones”
- Hippocrates 550 B.C. used magnetic stones to stop bleeding
- Magnetic Therapy practiced in China 2000 B.C. – magnetic stones to correct health imbalances
- The word magnet comes from the ancient Greek magnes lithos, meaning “stone from Magnesia”
- Tesla 1891: invented Tesla coils for devices (as we know them today)
- The discovery of the electron in the 19th century brought electro-magnetism into the realm of science
- At the same time Daniel David Palmer, Canadian fishmonger turned "magnetic healer“, founded Palmer's School of Magnetic Cure in Davenport, Iowa



Nicola Tesla

PEMF Basics History & Parameters

The Evolution of PEMF (Pulsed ElectroMagnetic Fields)

Historic events that put electro-magnetism under scrutiny

- 18th century: Mesmer Report (Franz Mesmer German Physician) alleged, that the body had magnetic poles
- 1908 Abraham Flexner Report: Medical Education in the US & Canada
- Adhere strictly to the protocols of mainstream science in their teaching and research
- Homeopathy, osteopathy etc. were eliminated and colleges of electrotherapy closed, because none had been scientifically tested
- Both events combined with the shift to almost 100% dependence on Pharma led to a 60-year dormancy of PEMF in North America

Abraham Flexner

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The Evolution of PEMF (Pulsed ElectroMagnetic Fields)

Europe and Japan forged ahead with PEMF

- Right after WW II Japan generated electromagnetic waves by changing electrical currents
- This modality quickly moved to Europe
- 1960-1985: almost every European country manufactured its own magnetic therapy system
- 1982 Todorova (Bulgaria) published the first book on electromagnetic field therapy

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The Evolution of PEMF (Pulsed ElectroMagnetic Fields)

Approvals of PEMF in North America

- 1979 FDA approval for bone growth
- 1991 FDA approval for postoperative pain
- 1998 FDA approval for urinary incontinence
- 2011 FDA approval for brain cancer & pain
- 2014 Health Canada Approval for pains, aches and to increase blood circulation (iMRS)
- There are more than 10,000 scientific papers and 2,000 double blind studies

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Magnetism

The force exerted by magnets when they attract or repel each other

- Magnetism is caused by the motion of electric charges
- Magnet: any object producing its own magnetic field that interacts with other magnetic fields. Magnets have a north and south pole
- Unlike a static magnet, the strength of an electromagnet can be altered by changing the amount of electric current flowing through it
- An electromagnetic field (also EMF or EM field) is a physical field produced by electrically charged objects
- An electromagnetic field extends indefinitely throughout space and describes the electromagnetic interaction
- The field is a combination of an electric and a magnetic field. The electric field is produced by stationary charges, and the magnetic field by moving charges

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The 5 parameters of electromagnetic signals

The 5 parameters to define signals are:

- Waveform or signal shape
- Field Strength
- Frequency
- Resonance
- Coherence (the situation when the parts of something fit together in a natural or reasonable way)

All 5 must be fine-tuned to produce health promoting effects and avoid negative effects.

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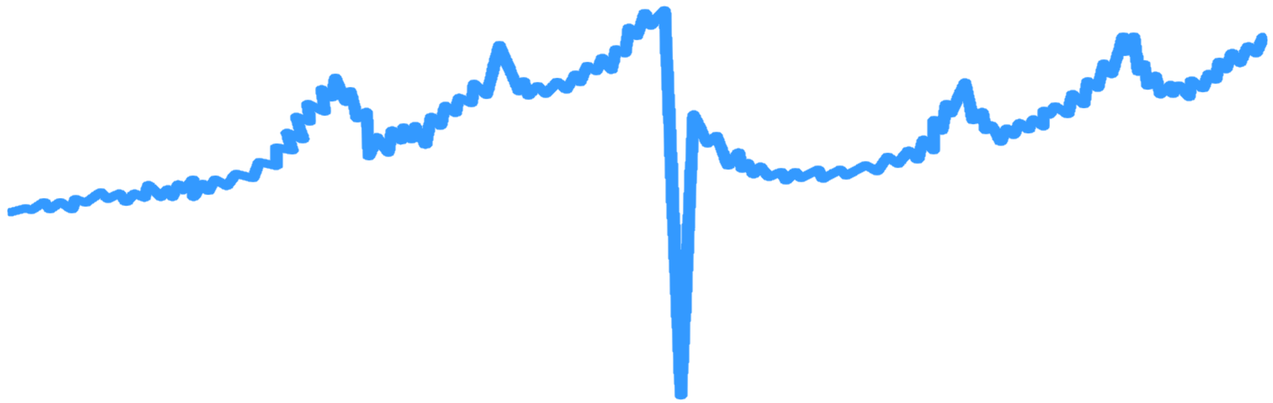
Waveforms

The most critical component of the waveform is its rise time and fall time

- Research shows that the value of a pulsed signal is dependent on how rapidly the rise and fall time happens
- Abrupt fall time represents a high peak voltage – ion replacement in the body
- The greater the ion replacement – the stronger the biological effect
- Triple-sawtooth or square wave – more effective than a simple sine wave or any static magnet (no frequency!)



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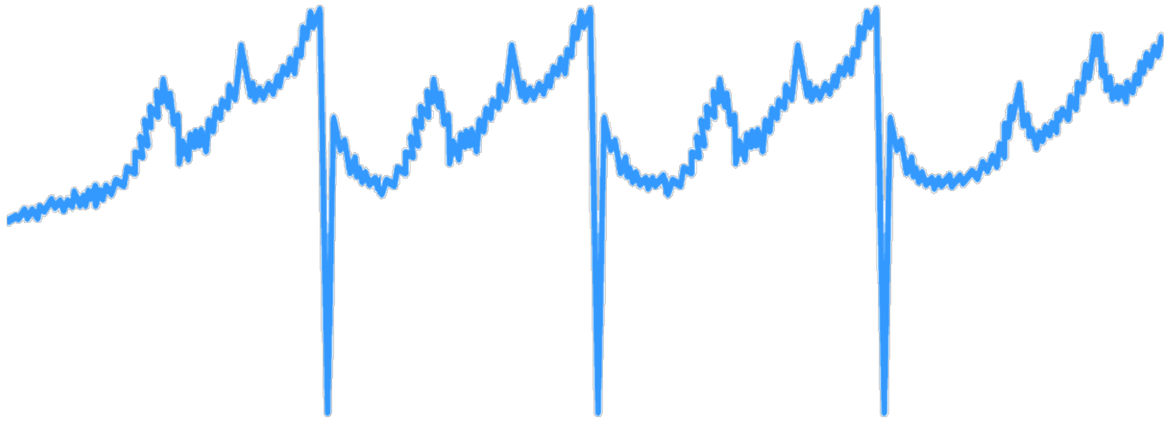
Waveforms

The Triple Sawtooth Wave

- The electromagnetic signal changes continuously
- Producing constant induction of electromagnetism into the body's tissues
- Maximizing ion displacement and preventing cellular membrane fatigue
- Cell membrane remains responsive to the signals, maximizing the beneficial effects of electromagnetic stimulation
- Research has shown that the sawtooth carrier waveform provides the most effective magnetic resonance stimulus of all the waveforms



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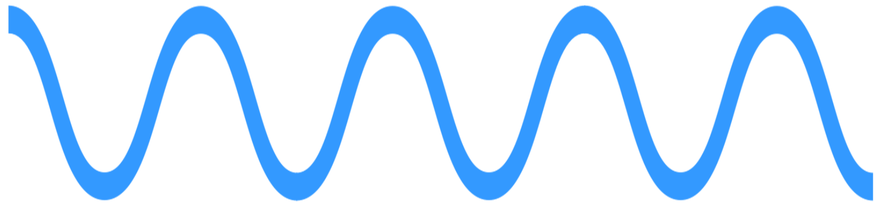
Waveforms

Square Wave

- Is an instantaneous rise to the maximum intensity, followed by a consistent peak and then an instantaneous fall to zero intensity
- NASA research* proved that square waves are extremely effective for repairing and regenerating cellular structures, particularly neurons

Sinusoidal Wave

- It gradually increases in intensity, then gradually decreases in intensity
- NASA research* showed, that the sinusoidal wave is one of the least effective waveforms for electromagnetic therapy (found in common PEMF devices)



** NASA/TP-2003-212054*

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Intensity / Field Strength

- Electromagnetic intensity is described as flux (or flow) density in unit of Tesla (T), after Nikola Tesla
- There is a “biological window” of electromagnetic intensities to which the body responds best
- Research of Goodman and Blank: Cells express a cell-preserving gene at 7-8 micro-Tesla rather then stronger fields above 70 micro-Tesla
- Diagnostic systems such as an MRI use field strength of 1.5 – 3 Tesla

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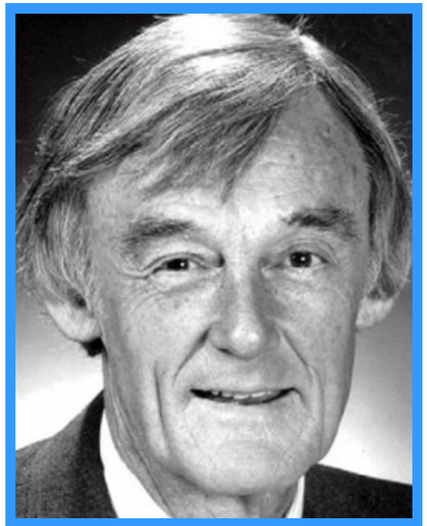
Frequency

- Is expressed in Hertz (Heinrich Hertz, German Physicist)
- 1 Hz – one cycle per second (cps) 25 Hz – 25 cycles per second
- The frequency rate is measured from one peak to the next
- Cells can be signaled to perform new functions with chemicals (drugs)
- Desirable cellular functions can be better stimulated with electromagnetic energy
- The body responds best to its own cell frequencies (Resonance)
- Dr. Ross Adey: Biological window of human cell frequencies 0.5 Hz – 30 Hz - also fall within the carrier frequencies of the earth magnetic field
- Triple Sawtooth waveforms producing equal carrier frequencies, create almost countless harmonics and increase probability to reach all 75 trillion cells



Ross Adey

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Schumann Resonance

- 7.83 Hz: These waves circumnavigate within the earth's ionosphere at an average of 7.83 cycles per second. This frequency correlates with the average frequency of alpha brain waves
- If our bodies are blocked or receive less of these natural frequencies, cell function is impaired and disease sets in.
- Electromagnetic impulses with matching frequencies can produce cellular resonance
- Electromagnetic impulses produce resonant vibrations to membrane receptors (neuropeptides) and stimulate vital functions within the cellular structure
- This results in improved intercellular communication produced through inductive resonance