PEMF Facts and Treatments

PEMF stands for pulsed electromagnetic field. It's field increases energy balance and vitality, stress-relief, the synchronization of the body, psychological and physiological equilibrium. Pulsed magnetic fields have 3 main components: frequency, intensity, and waveform. Different cell types, organ systems, and pathologies all communicate in different ways, creating their own biological windows that create or respond to unique frequencies. The 4 brain wave states (Beta, Alpha, Theta, and Delta) An MRI machine, for example, produces a truly high-intensity magnetic field – between 20,000 and 60,000 gauss (or 2 and 6 Tesla), where PEMF systems, delivers range of 2,000-4,000 gauss range. Frequency of PEMFs look a lot like the frequencies you encounter in nature, so your body knows how to deal with it. Most PEMF treatments and maintenance will fall in the 5-30 Hz range, which is less than you get from a thunderstorm. **The idea is that pulses at low frequencies will pass through the skin and penetrate 3 feet deep into muscle, bones, tendons, and even organs to activate the cell's energy and encourage its natural repair mechanisms. A healthy cell has a transmembrane potential of about 80 or 100 millivolts. A cancer cell, for comparison, has a transmembrane potential often as low as 20 or 25 millivolts. When a cell becomes damaged or sick, the voltage of the membrane drops.**

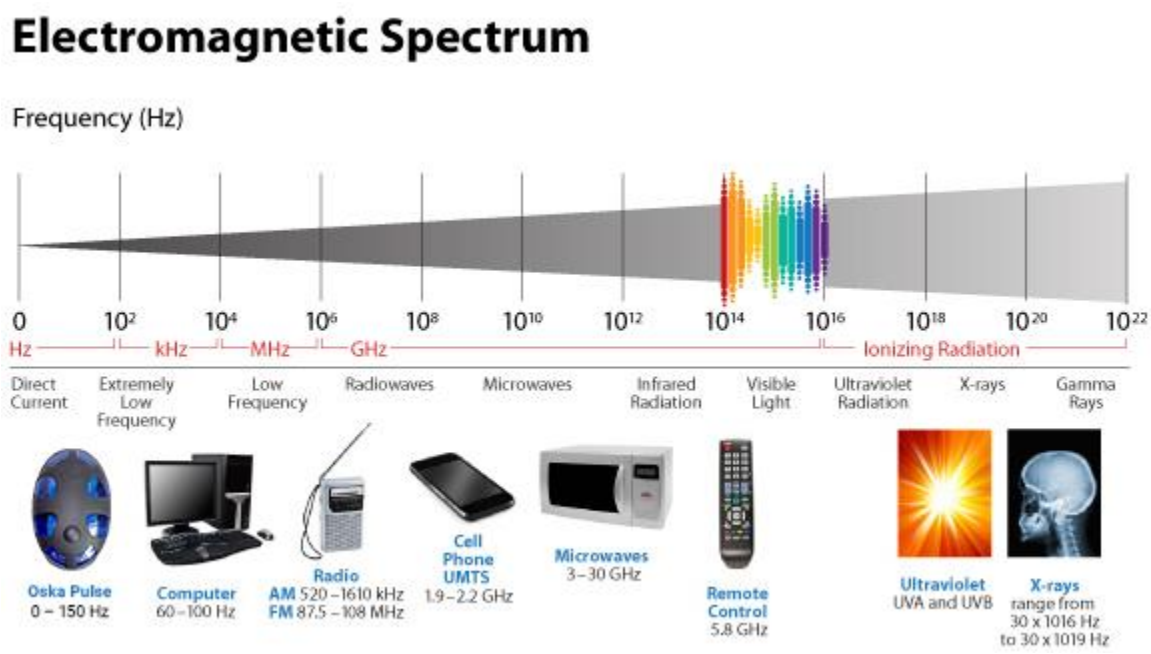
It was originally used in the Russia and later in United States for bone repair, Bone healing and density Circulation, seemed to activate lysozyme, which is a major step in the bone regeneration process athletes to repair damaged tissues, ligaments and bones, 1979, the FDA approved PEMF therapy for use in non-union, 1979, the FDA approved PEMF therapy for use in non-union bone fracture. PEMF promotes healing, easing pain, and inflammation reduction helped regenerate the liver faster. It has also been used in the successful treatment of arthritis, wound healing, broken bones, and the pain and fatigue of fibromyalgia and Lyme disease, rheumatoid arthritis and fibromyalgia patients. Chronic pain, Fibromyalgia, Musculoskeletal pain, Neuromodulation.

Most people are familiar with the EEG (electroencephalograph) test which measures the electromagnetic activity of the brain, and the EKG (electrocardiogram) which measures the electromagnetic activity of the heart. Electromagnetic energy controls everything down to the chemical interactions at a cellular level for the trillions of cells in the body.

Enhanced detoxification of the body induces the removal of old, damaged cells that clog the system and lengthen the repair time of tissues. This allows new cells to be born into a much healthier environment.

Depression, anxiety, fatigue, concentration problems, insomnia and other neurological ailments has stimulated by PEMF in the brain's pineal gland for higher melatonin

production which aids in the sleep cycle. The results are a better night's sleep leading to a more energized day.



FACTS between EMF vs PEMF

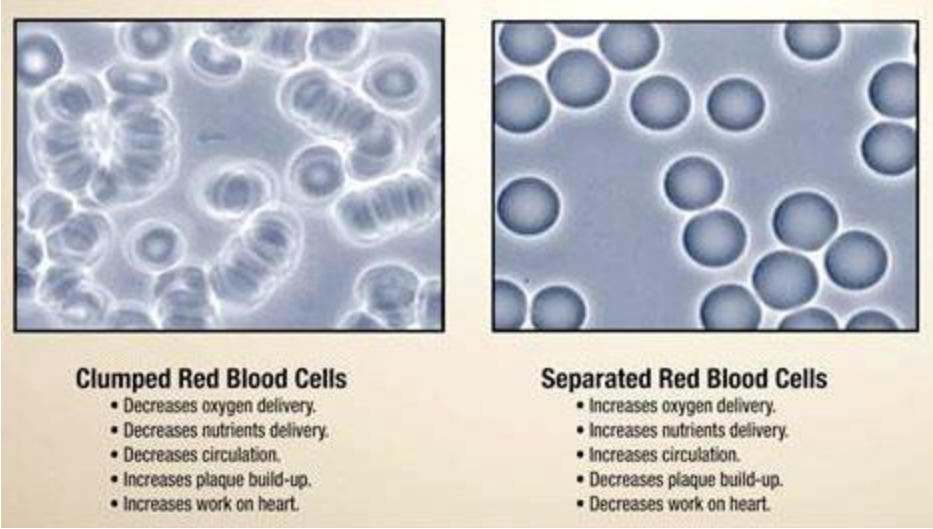
Electromagnetic radiation is classified into two types (ionizing and non-ionizing) based on the radiation's capability of ionizing atoms and disrupting chemical bonds. Ultraviolet and high frequencies, like x-rays or gamma rays, are ionizing – they cause heating. They pose their own health hazards, the most common of which is sunburn. Non-ionizing radiation doesn't carry enough energy to disrupt chemical bonds. It only has enough energy to excite electrons into a higher energy state. (below 10,000 Hz) do not induce heating actions. **PEMF holds a long wavelength and a low frequency.**

ELECTROMAGNETIC FIELD:

Another source of magnetic field is Schumann resonances are a set of peaks in the extremely low frequency portion of the Earth's electromagnetic spectrum, **between about 3Hz and 60HzAn electric field** is the force field created by the flow of electricity (caused by the attraction and repulsion of electric charges). **A magnetic field is the force field created as a consequence of the flow of electricity**. Electric charges can either be positive or negative. **Our bodies are fundamentally electric**. When a person goes into cardiac arrest, for example, a defibrillator is used to apply electrical energy to the heart so that it can re-establish a normal rhythm. Electric and magnetic fields control our chemistry by changing and influencing the motion of charged particles. This movement stimulates a vast array of chemical and electric actions in tissues, helping them rebalance or heal themselves where necessary. Additionally, this increased

motion of ions and electrolytes helps cells increase their available energy by as much 500%.

The adult body is comprised of more than 70 trillion individual cells. And that's not counting the millions of bacteria we carry in our gut. Each of those trillions of cells carries out several thousand metabolic processes every second. Every organ and cell in the human body has its own field. The human body produces complex electrical activity in several different types of cells.(neurons, endocrine, and muscle cells – all called "excitable cells".)**By allowing all cells to de-cluster, oxygen and nutrients are better able to enter the cell, and carbon dioxide and waste are more easily eliminated from the cell.** By restoring or maintaining cellular function, you will in turn restore or maintain organ function, allowing the entire body to function better. This is the basis for magnetic field therapy (https://www.drpawluk.com/education/magnetic-science/intro-to-electromagnetic-science/)



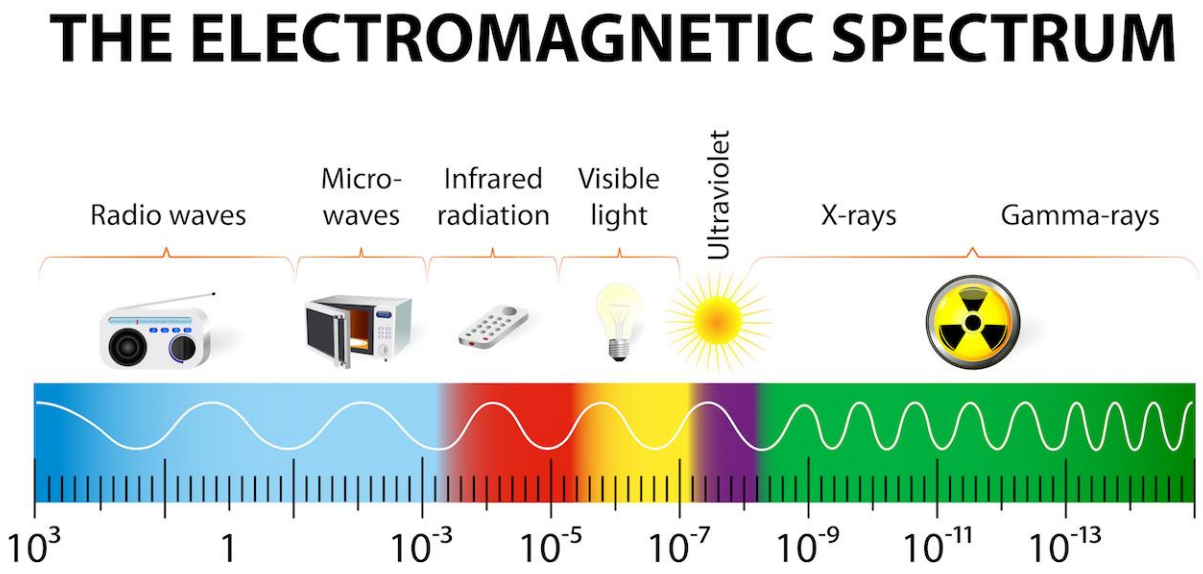
Cells normally go through at least 7,000 chemical reactions per second. Only certain ions flow in and out of a cell : sodium, calcium, and potassium (during which sodium flows into the cell via an entry channel and potassium flows out of a cell via an exit channel)

After PEMF therapy, the cells can be seen to be unstacked, and back to their healthy, free-flowing state which allows them to take in the nutrition they need and expel their toxins. Can it help with body detoxification? By stimulating the various functions of your body with PEMFs, it can more efficiently support and heal itself.

For example, treating arthritis will be a different therapy plan than treating inflammation pain. However, **it is perfectly safe to use a PEMF device** several times throughout the day.

PEMF should not be used for people with:

- If you are having chemotherapy or radiation
- In people who have magnetic metal in your body
- If you have a pacemaker or electronic device fitted
- If you either are pregnant
- After having an organ transplant
- If you have had a skin graft



The intended 50-60 Hz frequency of power lines is becoming increasingly contaminated with surges of radio frequency radiation, often referred to as "dirty electricity" Ordinary household appliances tend to generate larger cumulative EMF exposures than power lines, as most people do not live close enough to power lines to be dramatically affected by their EMFs. The first study to establish a direct link between EMFs and cancer came in 1979 from the University of Colorado, a risk of developing cancer, especially leukemia, increased incidence of heart disease, high blood pressure, Alzheimer's disease, headaches, sexual dysfunction, and blood disorders – the latter including up to a 50 percent increase in white blood cell count.

High-frequency EMFs, like X-rays that register frequencies in the hundred quintillion Hz range (yes, that's a number and it's big) are the most disruptive to your body. That's because they are ionizing — which means they have enough energy to break electrons off of atoms, which charges them. This changes the way your cells work. microwaves register around ten billion Hz) range can cause changes in your DNA Dr. Gary Ryan, known as "The Energy Doctor," explains, "Based on a lot of research that was done at Yale, it is apparent that just about any pathology in the body is preceded by a drop in

cell charge. **Because the faulty metabolism of an impaired cell is caused by the disruption of its electromagnetic energy, PEMF therapy works by replenishing that energy. If the energy is not replenished, the cell continues to malfunction and deteriorate, and eventually die.** Injured, unhealthy cells can cause multiple problems in the body, and disease conditions

Treatment:

PEMF therapy uses electromagnetic fields in the extreme low frequency (ELF) range. PEMF's can work as a stand-alone anti-inflammatory therapy. Even weak, low-frequency PEMF's induce apoptosis in activated T cells, thereby reducing chronic inflammation without negatively affecting acute inflammation. PEMFs appeared to induce prostate cancer cells to die. Research at the University of Louisville School of Medicine studied seizure frequency in a patient with partial seizures that were not responding to medications. They found that the number of seizures during the month of stimulation as compared to the month before stimulation, was reduced by 70% in frequency of seizures. It is a widely used therapy for multiple problematic issues and has been in use in Europe for over 50 years has been used for years in the former Soviet Republic, and was available in hospitals. It was developed to use on Russian cosmonauts because after long missions in space.

These waves pass through tissue, organs and bones without being absorbed or altered, but having passed through the body, they stimulate the electrical and chemical processes of the body.

Based on this plethora of clinical research, both with the express intention or determining safety, and the **thousands of studies done otherwise, magnetic field exposure has shown no adverse side effects.** PEMFs of wide ranges of intensity and treatment times are safe, **regardless of the area of the body being treated or the age of the patient.**

The FDA has also approved PEMF therapy for treating urinary incontinence and muscle stimulation in 1998, for treating depression and anxiety in 2006, and for brain cancer/tumors in 2011.

High TMP (Trans-membrane potential) results in cells that are highly functional and healthy. High TMP ensures optimal health so the cell's membrane channels can be opened to absorb nutrients and also to eliminate waste products. By contrast, low TMP results in an impaired metabolism. Because the cell is less able to take in nutrition and eliminate waste, manmade magnetic fields, such as the ones used in electric motors and generators. **Cell phones, Wi-Fi, microwaves, transformers and power lines all generate electromagnetic fields of a type that is unhealthy to human tissues**. This type

of harmful energy is referred to as "electronic smog". Electromagnetic energy is what makes your body run.

PEMF therapy causes more effective removal of cellular waste, which results in improved circulation, better nutrient transportation, and oxygenation of the cells. PEMF therapy can reduce the occurrence of chronic inflammation.

PEMF therapy stimulates the body's own natural systems to fight pain which often reduces dependence on pain medication. **Not only does PEMF therapy help with pain, it also helps to heal the underlying condition causing the pain**.

INFLAMATION

Inflammation is the net result of a cascade of biologic processes that is generated and supported by the interaction of a number of immune cell types, including lymphocytes, macrophages and neutrophils, with other cell types such as the fibroblasts, endothelial cells and vascular smooth muscle cells playing a regulatory role in the cascade. PEMFs have been found to affect ion flow through specific cell membrane channels, including those for sodium, potassium and calcium, that positively affect these enzymes. These appropriate effects help with reducing chronic inflammation. Pulsed PEMFs with intensities from 5-25 MilliTesla had no effects on normal T cells. This means there is no apparent damage to normal lymphocytes. Inflammatory T cells produce interleukin-2 (IL-2), which stimulates growth of T cells. When IL-2 levels are high enough, it increases desired early elimination of these chronic inflammatory cells.

In research settings, "low intensity" magnetic fields seem to be categorized as those at or around 15 gauss (1,500 microTesla). One study compared a 0.5 gauss (15 microTesla) PEMF with a 15 gauss (1,500 microTesla) PEMF system used for six hours per day for 90 days in the treatment of arthritis. They found that NSAID use was 26% in the higher intensity group and 75% in the lower intensity group. At a 3-year follow-up, the percent of patients reporting complete recovery was higher in the higher intensity group.