

# “Magna Wave, a New Wave in Horse Therapy” by Christine Woodford, DVM

Early this year, I learned about a new therapy for horses called *Magna Wave pulsed electromagnetic field therapy* (PEMF). Magna Wave is widely used in the hunter/jumper circuit to help horses perform better and recover faster from competition. PEMF has been used for over fifty years to treat pain and swelling, to speed wound healing and to repair bone fractures in humans, and studied extensively in human medicine. This paper describes the mechanism of action of PEMF, discusses the benefits of the therapy, and compares different PEMF devices.

## Pulsed Electromagnetic Field (PEMF) Therapy

Living cells depend on an electrical component to aid in metabolism. A cell produces its own energy through the complex ATP (Adenosine Triphosphate) biochemical pathway. The cell needs a membrane potential of 70 to 90 mV (millivolt) for active cellular transport. When the electrical potential drops, active metabolism is impaired. If the cell cannot let the nutrients in or the waste products out, the cell will become damaged. Impaired cell metabolism and



cellular damage can lead to decreased performance levels, injuries, illness, and chronic disease. A pulsating electromagnetic field (PEMF) helps to increase cell membrane permeability. The mechanism of action of PEMF uses electrical energy to direct a series of

magnetic pulses through injured tissue to stimulate cellular repair. The pulsating magnetic field displaces hydrogen ions (H<sup>+</sup>), which leads to the normalization of the membrane potential. The cell membrane is able to transport more oxygen and nutrients into the cell. The cell is also able to remove carbon dioxide and other waste products from inside the cell. Studies show that the PEMF increases the binding of calcium ions (Ca<sup>2+</sup>) to the protein Calmodulin to increase the tissue repair mechanisms. When calcium binds to calmodulin, an enzyme is stimulated to release nitric oxide. Nitric oxide is an important signaling molecule to signal the body's anti-inflammatory cascade. It continues the natural healing process by reducing initial pain, decreasing swelling, and improving blood and lymph flow. Nitric oxide also stimulates the production of a molecule called cGMP, a growth factor producer. cGMP helps in the body heal by stimulating blood vessel growth, tissue regeneration, and remodeling.

The effects of PEMF are:

1. Cell membrane potential is normalized



2. Oxygen partial pressure increases
3. Calcium influx enters the cell
4. Blood circulation is affected and normalized

### **What is the difference between regular magnets & PEMF Therapy?**

Electromagnetism is defined in science as the magnetic effect caused by the flow of electrical current. An electromagnet consists of a piece of soft iron with electrical wire wrapped around it. When an electric current flows through the wire, it produces a magnetic field. By coiling the wire many times, a stronger magnetic field is produced. Electromagnets are very widely used as components of other electrical devices, such as motors, generators, recording devices, MRI machines, and scientific instruments.

The magnetic strength of regular static magnets (expressed in Gauss value) is around 300-16000 gauss at the surface, only 10 gauss at 2 cm distance, and almost 0 gauss at 10 cm distance. Static magnets cannot create any electrical induction, and thus do not affect tissue at the cellular level.

There are low voltage, low frequency magnetic blankets on the market for horse physical therapy. The blankets are useful and effective; however, they are much slower to achieve the desired results. The high voltage, low frequency Magna Wave PEMF will achieve in 10 minutes what magnetic blankets will take a week or more of treatments to achieve. The direct effects of Magna Wave's electromagnetic fields are: neuron firing, calcium ion movement, membrane potentials, endorphin levels, nitric oxide, dopamine levels, and nerve regeneration. Indirect benefits of magnetic fields on physiologic function are on: circulation, muscle, edema, tissue oxygen, inflammation, healing, prostaglandins, cellular metabolism, and cell energy levels. All these affects help reduce inflammation and promote healing.

Magna Wave is safe, non-invasive and has no side effects. The coil is soft, flexible, and can touch the horse. The intensity of the Magna Wave's PEMF machine can be controlled to adapt to the reactivity of the horse. Other machines in the horse industry, such as the P3, have a hard coil and no intensity control. When the P3 machines are

turned on, they are on full power. This can be too intense for some horses, causing discomfort and a negative reaction by the animal.

### **Magna Wave PEMF Therapy for Horses**

PEMF is a viable alternative to drugs for the treatment of pain and inflammation in horses that is related to a variety of causes such as arthritis, surgery, and wounds. The Magna Wave PEMF therapy was first used on the thoroughbred race tracks to help prep the horses for the race and also to help their bodies recover after the race. The hunter jumper industry then started using the therapy to help increase performance in their animals. Their competitions have strict drug testing regulations. Without the use of drugs, Magna Wave therapy has proven to improve circulation, increase blood oxygen, relax muscle spasms, enhance muscle tone, and increase range of motion in high performance horses. For more information on how your horse could benefit from Magna Wave therapy, visit <http://magnawave.ws/> or [www.VIPsvet.net](http://www.VIPsvet.net)