Magnet Health

FORCES OF NATURE

Horse Sport July 1999

Understanding Magnetic Field Therapy
Condensed from the book "The New Equine Sports Therapy"
By Mimi Polter

Wherever there are moving electrical currents, a surrounding magnetic field exists. Because of the moving ions in our cytoplasm, humans and horses are electrical beings. Weak electrical currents are associated with wounds and can have either a positive or negative effect on healing. Cells oscillate at frequencies from the hertz (Hz) to the megahertz (MHZ) range, creating alternating current fields thought to form an intercellular communication system. Research shows that magnetic fields extend in all directions from all living organisms. Some life forms, including humans, are capable of detecting these fields. Birds use them to guide their north-south migratory routes. Whales use them for their sense of direction. And people who practice "energy healing" believe the process is based on interaction between the therapist and patient's electrical and magnetic fields.
An electrical field is created by voltage, or electrical pressure, in a wire. When an electrical device is plugged in, the wire carries voltage and emits an electrical field. The strength of the field is measured in volts per meter. A magnetic field is produced by the flow of electricity through the wire when the device is turned on. The strength of magnetic fields is measured in gauss (G), named after Karl Friedrich Gauss, the German mathematician and astronomer who discovered this method of measurement. The strength of the Earth's magnetic field (around 1 G) can be used as a reference for understanding the strength of therapeutic magnets (300 to 1,000 G).

Safety of Electromagnetic Fields

Over the past decade, public fears about the hazards of electrical and magnetic fields have risen, despite increased demand for electrical power and increased usage of computers and other electronic equipment. Millions of dollars have been spent studying the safety of these fields. Research from around the world, however; seems to conclude there is no concrete evidence that electromagnetic fields pose a health hazard. Indeed, there is a growing body of evidence linking them to health benefits.
Because therapists are exposed to electromagnetic fields emitted from equipment, a study sought to measure the field strength emitted from the Megapulse unit. The Megapulse, manufactured in England, produces electromagnetic radiation at 27.12 MHZ. Like the units popular in America, it delivers patient adjustable short pulses. This study looked at the unit's power output when there was no patient. With the unit at full power, the field strength was well within the safety limits set by the government. The authors point out that these units are usually operated at lower output settings with the field directed at the patient. They concluded that there appeared to be no health hazard to the staff.

Effects of Magnetic Fields

Should we separate permanent magnets from pulsed electromagnets in terms of effect? Much research still needs to be done to determine whether the body differentiates energy from different sources. When a permanent magnet is applied to living tissue, the magnetic field is then in motion because of the inherent movement of the cells. Perhaps the body acts as a transducer for all incoming energy. If the energy is within the window of usable strength, wavelength, or frequency, the tissues can make use of it.
In the studies cited below, both magnetic modalities have been found to provide a safe, non-invasive therapy.

Blood Flow

Equine therapy often seeks to increase metabolism and tissue repair because these things are associated with increased blood flow. In a study to determine whether static magnets alter flow characteristics, a saline solution and distilled water were exposed to a static magnetic pad. The saline flow increased to a statistically significant level, but the flow of distilled water was not affected. In my opinion, this study has little to do with the body, since it is non-dynamic, but it does point out a magnetic field's influence over ionic particles.
When magnetic pads are worn for an hour or more, the tissue under the pad can become quite warm, indicating an increase in local blood flow. The blood is composed of ions, which could be affected by the magnetic field. But there might be an even more interesting phenomenon going on here.
A 1981 report proposed a link between magnetic fields and infrared wavelengths. A magnetic or electrical field has a wavelength and frequency that determine the field's energy density. The scientists determined that a magnetic field of 0.1 to 1 G could have effects on the body equivalent to infrared wavelengths of 7.0 and 2.6 microns. The molecules in the body that detect this energy are the mitochondria, melanin, and retinal rods, those same molecules that detect infrared light. Recently the use of magnetic fields has expanded to include nerve regeneration, wound healing, skin graft integrity, and other conditions that are thought of a appropriate to photon therapy. Data on these uses is preliminary but intriguing.

Neurotransmitter Function

I recently have become interested in how magnetic fields affect mood, behaviour, and memory. Like other energetic modalities, magnetic fields apparently affect the activity of neurotransmitters, which are chemicals produced in the brain that determine sleep patterns, pain perception, healing rate, and mood.
One recent study looked at using magnetic fields to treat depression. Twelve adults whose depression did not respond to other forms of treatment received two weeks of transcranial magnetic stimulation at 20 Hz. A small but powerful electromagnet was placed on the scalp, causing cortical neurons just below the skull to depolarize. After five daily treatment sessions, 11 of the 17 patients showed a marked improvement that lasted for two weeks, and no one reported significant adverse effects. All the subjects eventually responded positively to the therapy. This study opens the door to serious thought about using magnetic stimulation for mood improvement. Related studies are exploring the treatment of neurologic disorders including epilepsy, Parkinson's disease, and learning disabilities.
My experience with horses is supported by the study just described. While wearing a magnet attached to a brow band, most horses experience profound mental quieting. The breathing and heart rate slow, and muscle tension eases.
The effects of the brow band magnet are illustrated in the following case report. A Thoroughbred mare required two long-acting tranquilizers, reserpine and prolixin, as well as '/2 to 3/4 cc of aceprOmazine before she would train. Using the brow band magnet immediately calmed her behavior, so the use of tranquilizers was cut back. After the mare had worn the magnet for three days, she trained willingly with no tranquilizers.

Horses using magnets cope well in many situations:

- When confined to a stall, these horses are calm and do not resort to vices such as stall walking or fretful behaviour.
- After a training session, they are able to relax, which is vital to recovery from strenuous exertion.
- They have less pre-show anxiety.
- They aren't as afraid of frightening obstacles, such as introduction to a trailer, starting gate or wash stall.
- They behave well around the veterinarian or blacksmith.
- Yearling colts have less biting and mouthy behavior around the vet or blacksmith.
- Mares and foals have less weaning stress.
- They learn new skills more easily.
- Horses which must be tranquilized will not require chemical restraint when the magnet is applied before the stressful activity.

Pain Relief

Studies on the therapeutic effects of magnets date back to 1938, when an electromagnet suppressed or removed pain from the skin of human patients. The use of magnets to relieve pain has become popular among athletes, especially golfers and football players. Professional golfers have been forced to quit playing because of chronic back pain. Magnets allowed these athletes to return to their sport and in some instances even improved their game. Professional athletic trainers have observed that athletes recover from football injuries or from surgeries faster hen magnets are worn. Chronic disabilities such as fibromyalgia, bursitis, and arthritis are relieved by wearing magnetic pads or sleeping on a magnetic mattress. Magnets are available in wraps that fit various body parts of both the human and the horse. Back support wraps can relieve chronic back pain, and magnetic blankets can relieve muscle discomfort in horses.

A double-blind study was designed to test the effects of magnets on 50 patients suffering from pain associated with post-polio syndrome. This study showed that static magnetic fields can effectively control pain in patients with postpolio syndrome. The authors found that myofascial and arthritic pain responded equally well to the treatment. Not only did the pain in the area immediately under the magnet respond, some patients felt pain relief in areas far from that site. The study also found that the benefits lasted days and weeks after the magnets were removed.

When magnets are used to relieve pain, there are no side effects and relief comes quickly. In addition to helping he specific problem, magnets can benefit the entire body. For example, when a horse wears magnetic hock wraps, back muscle tightness is reduced. Also, the use of magnetic bell boots often results in more flexibility in the horse's back. This effect probably is a relaxation response resulting from pain relief in the hock or foot. In an effort to protect the uncomfortable area, the horse maintains chronic muscle tension, which eventually becomes muscle contractures and spasm. When the area is no longer uncomfortable, the muscles can relax.

An unpublished study at the University of Kentucky's Gluck Equine Research Center tested pain relief in the horse. Permanent magnets were applied to the pastern and held in place with a wrap. Non-magnetized discs were applied to the control horses in the same manner. After the magnets had been in place for 12 hours, a pain reflex test was conducted to measure the amount of time between the onset of stimulus and hoof withdrawal. The limbs treated with magnets were slower to respond to the stimulus. The results of these two studies indicate that magnetic fields influence nerve conduction rate.