



'Veterinary Application of Pulsed Magnetic Field Therapy'

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Research into Pulsed Magnetic Field Therapy

Although the therapeutic use of pulsed magnetic fields has long been in existence, understanding of its mode of action has been poorly understood. As early as 1940, Nagelshmidt proposed that its action was at the cellular level and this has now been supported by research. It has been shown that damaged cells have a reduced negative charge, with subsequent effect on the flow of ions. This causes a build-up of fluid and prevents the normal cellular metabolism from taking place. Research by Bauer and more recently by Sansaverino (1980), confirmed that pulsed electromagnetic fields can restore the ionic balance and return the cell to its normal functions.

Initially, pulsed magnetic fields were applied mainly to fractures, where it was shown that they could bring about a reduction in the time needed for resolution of the fractures. It has been shown that under the influence of a pulsed magnetic field, osteoblasts are attracted to treatment sites, where small eddy currents are then induced into trace elements of ferro-magnetic material within the bone. Also, work by Madronero has shown that calcium salts are purified, hence bone crystals become stronger. More recently, research by Bassett has been investigating the wider applications of pulsed magnetic fields in the area of orthopaedics.

Bassett also foresaw the extension of pulsed magnetic field therapy to other areas of medicine. This has now taken place, with an increase in scientific research and clinical trials in the UK, and throughout Europe, Russia and the USA.

The range of applications has covered :-

Treatment of vascular disorders (Steinberg 1964)

Reduction of inflammation and oedema (Golden et al 1980)

Enhancement of the rate of healing in skin grafts (Golden et al 1981)

Reduction of pain (Warnke 1983)

Treatment of neuropathy (Lau)

Nerve regeneration (Hayne)

Reduction in symptoms of Multiple Sclerosis (Guseo 1987)

Research into these and other areas have shown good rates of success, with no detrimental side effects. For optimum results, low-frequency sustained pulsed magnetic fields should be applied, with specific problems responding best to specific



frequencies. For example, pain can be blocked using a base frequency of 200Hz as this brings about hyperpolarisation of nerve cells and inhibits transmission of pain signals. For wound healing, a base frequency of 50Hz is most effective, with a pulse rate of 17.5Hz.

The role of Pulsed Magnetic Field therapy in veterinary practice

Initially, pulsed magnetic field therapy was used primarily in treating horses for resolution of back and leg injuries. This was followed by widespread use with greyhounds, since these incur frequent sprains, ligament injuries and fractures, all of which respond well to pulsed magnetic field therapy. It is now used with other animals for similar injuries and has also been used to improve metabolism. The range of animals treated is wide - from elephants to buzzards! Pulsed magnetic field therapy has been found to be particularly effective in treating leg and wing fractures of small birds, as they often are difficult to splint and, in the worst cases, difficult to pin because of splintering of small bones. These injuries show a good response given daily treatment with pulsed magnetic field therapy.

The use of a 200Hz base frequency as a pain block also has been beneficial in facilitating the examination of an injured animal. Practitioners have found that an initial 10 minute treatment reduces an animal's distress, so that it will then tolerate further handling in order to apply treatment or to enable the manipulation of an injury.

German shepherd dogs are noted for suffering symptoms which resemble those of Multiple Sclerosis. In the UK, some success has been achieved by treating these symptoms with pulsed magnetic field therapy. There is also evidence from research that nerve regeneration has been achieved under the influence of pulsed magnetic fields.

Once a diagnosis has been made and the desired therapeutic frequency determined, pulsed magnetic field therapy is simple to apply and can safely be administered by the owner. This means that treatment can be given more than once a day on a regular basis between visits to the surgery - thus speeding up the rate of healing and reducing demands on the time of the practitioner. In the UK, trained animal therapists operate under the direction of veterinary surgeons to provide pulsed magnetic field therapy as part of a physiotherapy programme for animals. Students come from all over the world to a training centre to be taught the methods and how to use the equipment to optimum effect.

Equipment

There is a range of equipment available. The larger units have a blanket applicator on which the animal can lie during treatment. These also are particularly useful for treating back injuries in large animals. There are also strap-on applicator pads available. The desired frequency range and treatment time is selected on the control panel of the unit. Current research shows that long treatment sessions are not essential, as maximum therapeutic effect is generally achieved in a 10 minute session. Naturally the duration over which treatment is required is dependent on the severity of the injury. Fractures require longer treatment.



The latest equipment now coming onto the market is a smaller, battery operated unit which is particularly useful for small animals or where a small area is to be targeted for treatment, such as the legs and wings of birds. These units have a dual advantage. Firstly, the operator can easily transport the equipment, allowing prompt treatment anywhere at any time and removing the need to take the animal to the surgery. Secondly, this type of unit can be left with the owner on a hire basis to allow regular support treatment to be given between visits.