



## Neuro-muscular stimulation

**There are various types of neuro-muscular stimulation that can be used in animal treatment. Many readers will have heard about “faradic” treatment but this is now a not very popular treatment modality for animals, especially horses.**

Most types of neuro-muscular stimulation were devised for human treatment. Some equine muscle groups are large and very deep, particularly over the quarters. To get sufficient penetration to those deep muscle groups, faradic machines had to be turned up to a high intensity which actually made the treatment painful for the horse. Veterinary Physiotherapists now have much more subtle and effective ways of neuro-muscular stimulation, such as Hoffman Reflex Wave (H-wave) therapy used by Gail and shown in the picture being used on an event horse with soft tissue injuries in the pelvic region.



H-wave is a bi-polar, exponentially decaying wave form first described by Hoffman in 1926. It provides a monosynaptic reflex response to electrical stimulation of spindle afferent (1a) fibres. This is produced at a very low intensity and therefore is ideal for use in horses particularly. The electrical stimulus

penetrates through large muscle groups, and was originally used to treat the large muscle groups (gluteals and thigh) of human sprinters and footballers.

H-wave overcomes the disadvantages of other electrotherapy machines.

It allows the veterinary physiotherapist to apply two treatments at the same time - Low frequency muscle stimulation and high frequency deep analgesic pain control. The dramatic increase in blood and lymph flow accelerates the removal of toxins, improves oxygen supply to an injury and promotes excellent drainage of oedema.

### By contrast to some other electrical modalities, H-Wave:

- can be used simultaneously with hands-on treatment and/or exercise therapy
- can treat a large area and/or two injury sites
- re-usable self-adhesive electrodes can easily be applied to awkward sites
- effectively used over acupuncture points
- uniquely provides muscle stimulation or pain relief or both

### At a frequency of 60Hz:

- Analgesia is achieved without muscle stimulation.
- Pain is transmitted along the slower conducting C-fibres, whilst H-Wave stimulates the fast-conducting A fibres.
- The message carried by the A fibres reaches the brain first, causing closure of the postulated ‘pain gate’ of Melzack and Wall.
- Because H-Wave is bipolar with both positive and negative elements stimulating the sensory nerve, a frequency of 60Hz (rather than 120Hz) is sufficient to recruit the pain gate.

### At a combination of frequencies:

- 2 Hz, 16Hz and 60Hz therapy given together allows the veterinary physiotherapist to stimulate the muscle pump and give pain relief at the same time.
- 16Hz therapy can be given on its own resulting in pain relief and some muscle stimulation.

- The veterinary physiotherapist can treat two injury sites, e.g. bruising from a badly fitting saddle and muscle spasm, simultaneously.
- Due to no crossfire and re-usable self adhesive electrodes the physiotherapist can actively and passively exercise the patient concurrently.

### **At a frequency of 2Hz H-wave promotes healing**

- Electrodes are placed on the muscle bellies surrounding the injury site.
- Unlike Faradism, only one electrode is needed per muscle belly.
- Stimulation of the motor point causes muscle contraction which compresses surrounding lymphatic and venous vessels.
- This pump-action accelerates the body's ability to mechanically flush out excess fluids and unwanted substances.
- The end result is a dramatic reduction of oedema and removal of inflammatory products without appreciable muscle fatigue to the patient.