No therapy can be effective until after accurate diagnosis; to this end the confines of the Veterinary Act apply to all offering treatment to animals by whatever means. Examination and subsequent diagnosis requires training and skill. These are supplied by the veterinary profession, with their ability to question, look, feel and smell, nerve block, X-ray, digital image, blood test, scan and scope – the latter enabling internal examination of many internal structures, including respiratory and gastric organs, the uterus, and certain joints. Due to the specialised nature of modern, sophisticated diagnostic apparatus, in-depth examination requires, in many cases, that the horse be examined at a veterinary centre, rather than, as many owners expect, the vet coming to the horse. Haphazard treatment without a diagnosis can be costly in both time and money, and in many cases is ineffective. Once a diagnosis has been made the vet should decide, from the appropriate forms of therapy on offer, the treatment which is appropriate for the diagnosed condition. There is a large choice of treatments embracing machine therapy, massage, water therapy and exercise therapy. The pertinent choice of each individually named electrotherapy device is not discussed in depth; appropriate selection is best left to the individual therapist. Discussed are the perceived effects achieved by application of varied current wave forms – sound, light and magnetism supplied by therapeutic ultrasound, magnetic fields, low level lasers, TENS (transcutaneous electrical nerve stimulators) and muscle stimulators. Specialist yards abound, many are attached to veterinary practices and employ chartered physiotherapists or trained masseurs. Contrary to general belief, it is rare to find a member of the veterinary profession will not cooperate with responsible, knowledgeable, appropriately trained machine owners. On the other hand, and quite reasonably, it is annoying for professionals to be called in to sort out problems caused by irresponsible treatments and unfortunately many people without the benefits of a scientific training have, through no fault of their own, no understanding of the intricate processes involved in situations involving tissue damage, recovery and subsequent repair. The first parameter to consider is the fact that the body has its own inbuilt repair programme, this programme, activated by commands from the autonomic nervous system (ANS), in response to signals transmitted as a result of the electrical and electrical changes occurring at the site of injury, initiates repair.

1. **Control early haemorrhage and associated oedema**

Control of the acute inflammatory phase is typically addressed by the use of cold supplied either by local application of ice, commercial packs, or water immersion.

The effects of the cold achieve:

• vasoconstriction: reduction of local blood flow and so reduction of fluid loss from damaged vessels, which in turn reduces oedema. Oedema in tissue creates pain, due to an increase in local pressure, the pain causes spasm in muscle tissue associated with or adjacent to the area of damage and the spasm further reduces circulatory flow. The effects of ice are temporary and, to a degree, transient. The body's thermal regulating mechanism ensures

that the area does not become unacceptably cold for too long and the body responds by directing blood to the area to restore equilibrium of temperature (Hunting Rush).

A reduction in tissue temperature reduces the local oxygen requirement as cellular metabolism slows down. Without adequate oxygen cells die and secondary hypotoxic injury results. The time length advocated for each ice application varies, in human literature times of between ten and thirty minutes for each application, with a similar break period between applications, is suggested. Cold therapy is considered useful for two to three days after injury, to control the acute inflammatory response. Cold does not enhance the next programmed cellular responses, necessary for progression of repair, namely collagen synthesis and fibroblast proliferation, at this stage of healing heat, or alternate heat and cold application is advocated to improve blood flow within the affected area.

2. **Alleviate pain and muscle spasm**

Control of oedema reduces the pain associated with pressure, in turn, control of pain limits muscle spasm. The guarding response of muscle tissue, secondary to pain, must be carefully considered before removal. In some cases muscle spasm acts as a necessary splinting mechanism.

3. **Enhance the natural physiological mechanisms of tissue repair**

As previously discussed, healing of tissue follows a predetermined pattern. All tissue types possess their own particular ‘scaffold’ or matrix pattern. The ‘clot’ formation at the injury site provides a structural framework for the rebuilding process of this matrix. As the acute inflammatory phase subsides, chemicals, released by macrophages, attract fibroblasts to the damaged area, their role is to form collagen, the main supporting protein required by connective tissue. Slowly a matrix forms creating a temporary repair, the series of predetermined events within the repair mechanism continue, and a type of tissue, named granulation tissue, is laid down. This tissue does not possess the tensile or load-bearing strength of normal tissue.

4. **Prevent adhesions and contracture**

Disruption, resulting from interruption of the predetermined recovery pattern, lack of required repair material, infection, persistent inflammation, the presence of foreign material and recurrent damage, will all interfere with the recovery process. The end result of poor quality healing may result in contracture or adhesions and interfere with function. While small areas may not be detrimental to overall performance, large areas, such as those resulting from burns will affect tissue mobility. Mobilisation of tissue by appropriate means will, to some extent, reduce the extent or prevent adhesions.