

## **How QRS assists in the healing of bones and ligaments**



QRS fact sheets are issued to explain the general application of QRS technology. It is envisaged that they will be supported by more detailed advice provided by QRS Consultants

**QRS can reduce the time for bone healing by as much as 50%.**

### **The Principle**

Bone is essentially a calcium structure that contains trace elements. One particular element recently identified is Alpha Quartz. This is the same type of material that is used in computers and digital or electronic watches. When this material is compressed, it develops a voltage across its two compressive faces, a phenomenon known as the piezo-electric effect. The old crystal pick-ups on record players used this effect to generate electrical sound signals. Gas appliances and some cigar lighters also utilise the same effect to generate a spark for ignition.

In bone, areas of stress generate small electric charges that are greater than those of less stressed areas, so that polarised bone-laying cells (osteoblasts) are believed to be attracted to these areas and begin to build up extra bone material to counter the stress.

With bone injuries, bleeding occurs to form a haematoma in which capillaries quickly form, transporting enriched blood to the injury site.

The pulsed electromagnetic field therapy applied using the QRS contains the exact frequency packages and the optimum intensity to cause vaso and capillary dilation, so helping to speed up the process of callus formation. Within the bone itself, pulsed electro-magnetism causes the induction of small eddy currents in the trace elements, which in turn purify and strengthen the crystal structures. These have the same effect as the stress-induced voltages caused by the alpha quartz and as such, attract bone cells to the area under treatment. This can therefore accelerate the bone healing process to allow earlier mobilisation and eventual full union. Ligaments and tendons are affected in similar ways to solid bone by pulsed electromagnetic therapy, since they are uncalcified bone structures in themselves.

Users can expect the time required for bone healing to be reduced by 20% to 50%. In elderly patients where it is often very difficult to initiate the healing process, results can be even more spectacular.

According to Bassett<sup>1</sup> (1983) the method of pulsed electromagnetic fields in bone repair has been used by more than 6,000 surgeons in the USA. The success rate was over 80% for tibial lesions. No patient suffered complications and biological side-effects included improved healing and increased neural function.

In depth research carried out to investigate this shows that magnetic fields influence the process of bone formation in the intercellular medium. Madonero<sup>2</sup> (1990) showed that bone healing was promoted by means of the influence of the magnetic field on the crystal formation of calcium salts.

References: 1. Bassett C.A., Professor of Orthopaedic Surgery, Columbia University, New York  
2. Madonero A. Influence of Magnetic Fields on Calcium Salts Chrystal Formation: "An explanation of the pulsed magnetic field technique for bone healing". BES Journal 1990

### **QRS Application**

The settings below are for a healthy person who has sustained an injury. A person who is not in a good state of health may find the high settings uncomfortable. If so, the settings should be reduced until the therapy is comfortable. It is the resonance effect from the frequency package (the same package for each setting) that has the major effect. The intensity (setting) is less important. QRS has been invented to be a gentle and longer term therapy and the "no pain no gain" principle is not valid with QRS (see Information Sheet Q2).

Mat Applicator

Morning

Setting 9

Mid-day

Setting 6

Late Afternoon

Setting 6

Pillow Applicator

Four (4) hourly to complement

Setting - see page 16 of the QRS User's manual