



“ELECTROTHERAPY”

Electrotherapy is the generic name given to electrical equipment that is used within physiotherapy for therapeutic purposes. It therefore includes machines such as ultrasound, TENS, neuromuscular electrical stimulation and biofeedback machines. The specialist sports physiotherapists at Pure Sports Medicine are manual therapists and this means that electrotherapy is not widely used and this reflects the trend in research and clinical practice within physiotherapy. Around the 1980s electrotherapy was very popular and all but replaced any other sort of physiotherapy treatment but we now know that electrotherapy is best used as an adjunct to manual physiotherapy because it cannot make an injury better in isolation. Appropriate manual and exercise therapy are essential to restore normal movement and function.

- **Ultrasound.** This is one of the most well known pieces of electrotherapy and is probably the strongest candidate for the myth of the quick fix and cure for all. Sadly this is not the case but it can be used effectively for some clinical conditions such as recent ligament sprains, alongside manual and exercise physiotherapy. Ultrasound is essentially a pro-inflammatory agent. Inflammation is our body's way of healing, so the ultrasound can help speed up this process. Ultrasound works by sound waves which 'excite' the cells in our body via something called cavitation and in theory this speeds up the rate that they heal tissue.
- **Laser.** Laser treatment uses the beneficial properties of light energy. When Laser is applied to the skin it can generate a heating effect, initiate chemical change, disrupt molecular bonds and produce free radicals. As with a lot of electrotherapy, these properties are used to stimulate healing. It is often used to treat skin conditions and open wounds but is also useful for the treatment of some soft tissue injuries. One of the main disadvantages with laser, though, is the lasers inability to penetrate deep into tissue.
- **Transcutaneous Electrical Nerve Stimulation (TENS).** TENS is a method of electrical stimulation which primarily aims to provide a degree of pain relief. It electrotherapy method works by exciting certain nerves and blocking the pain by getting the brain to focus on the tingling sensation that the TENS machine provides rather than the pain itself and this ultimately dampens down the pain signals being sent. The TENS machine can also stimulate the release of the body's natural pain killing chemicals. This can also sound like a cure for all pain and is often advertised as such but as with most electrotherapy techniques the most effective way to use a TENS machine is alongside other forms of physiotherapy.
- **Neuromuscular electrical stimulation (NMES)** works by placing electrodes onto the muscle and stimulating them to contract. NMES has been found to be very effective in preventing decreases in muscle strength and muscle size when a limb is immobilised for example when a bone is broken. As a result of this finding a lot of research went into testing healthy limbs to see if there could be an effect on training. Unfortunately no study has been able to prove this is possible because the NMES can only work the muscle to about 20% of its maximum voluntary contraction and in order to train, a muscle needs to be stimulated beyond a critical level. So achieving a six-pack whilst watching the TV and eating crisps is still not going to be possible!
- **Interferential (IF).** This is another method of electrical stimulation and uses the beneficial effects of a low frequency current by passing two medium frequency currents and making

Clinics at:

Point West, 116 Cromwell Road
Kensington, London.

The Lodge, Parkside Hospital
53 Parkside, Wimbledon, London.

them literally interfere with each other. This electrotherapy technique can be set up to function like TENS and NMES but is generally regarded to be more comfortable because the low frequency current is not applied directly. So, IF can be used for pain relief and muscle stimulation and it can also be used to reduced oedema (swelling) or increase blood flow to an area. The theoretical benefit of these last two electrotherapy techniques being the potential to encourage healing and repair. However, as IF stimulates the peripheral nerves, the strongest effect is likely to be pain relief and muscle stimulation.

- **Biofeedback** also uses electrodes and is used as an adjunct to help patients train a specific muscle group. Injury or immobilisation affects muscle function and it can be difficult to isolate specific muscles sometimes. The biofeedback machine works by giving you feedback, which may be a series of beeps from the machine, to let you know when you have isolated the muscle your physiotherapist is targeting. This facilitates your ability to train a particular muscle. An example of its use is with the quadriceps muscle in the thigh. This muscle is made of four different portions, hence its name, and a common clinical finding is that the inside portion, vastus medialis, is weak in comparison to the outside vastus lateralis. The biofeedback can be used to emphasise the vastus medialis contraction and help down train an overactive vastus lateralis.

Rebecca Christenson

BSc MMACP

Specialist Musculoskeletal Physiotherapist

If you have any specific questions regarding electrotherapy or any other medical treatment please contact us on **0870 2000 878** or reception@puresportsmed.com

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Kensington, London.

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53 Parkside, Wimbledon, London.