



Synapse Article: Electricity and Medicine

When electricity first made its existence known to man such was its impact that Royal Society Fellows competed with showmen to demonstrate its wonders to the world. It was literally an entertainment fit for Kings and Queens and proved to be so when in the early eighteenth Century French scientist Nollé established its fascination to the King of France by passing a static charge of electricity along the line of two hundred French soldiers making them all involuntarily jump up in the air to great hilarity to on-lookers and considerable discomfort to the soldiers. Keeping with the royal theme it was Queen Elizabeth's I physician, a man called William Gilbert who first coined the phrase electricity in the early 1600's. The word electricity's origins, now so regularly used in international language, can be traced to the Greek word for Amber, electron. At this time it was believed that the entity belonged to the world of mineralogy and could not be made artificially by man - how little did they know or suspect!

It was a man called Francis Hawksbury, who was an apprentice to the great Isaac Newton and a former pupil of another great scientist Robert Boyle; the Robert Boyle who came up with Boyles law on gases and pressure. However, perhaps the most relevant thing to know about Hawksbury is not the illustrious company that he kept but his other occupational interest. As well as being a great scientist in the making Hawksbury was also a skilled draper. In those days that meant being skilled with handling cloth, without the mechanised mod cons of today, which meant that Hawksbury understood all about friction. For, example he would know that if wool was over handled or rubbed against the wrong work surface every piece of free floating dust, dirt, feathers or any other small debris would 'stick' to the cloth with the persistence of a leech to a leg.

By 1710 artificial electricity as it was referred to was known about. If a barometer tube, a thin glass tube with mercury in the bottom, was rubbed violently the space above the mercury would glow. However, Hawksbury went one step further and reported that not only did it glow but also it would repel and attract certain nearby objects, so although he did not know or appreciate it at the time, rather like the young and their youth, he had made a connection between electricity and magnetism.



Nowadays electricity is an accepted part of modern living but when it comes to modern medicine its potential has been somewhat over looked.

However, the return to the racing track of a racehorse in Great Britain called Be My Royal marks another page in the remarkable success Dr David Chapman-Jones has achieved in treating racehorses, elite athletes and other patients with tendon and other soft-tissue related problems with treatments based upon this very phenomenon. Trained at the Queens Medical Centre, Nottingham specialising in Sports and Exercise Medicine, Dr Chapman-Jones has been pioneering a new treatment that significantly changes the manner in which the body heals itself. It is a new direction for the clinical management of this type of pathology that triggers and accelerates the regenerative not reparative process which appears to be the key to a quick return to full function.

This treatment is helping Dr Chapman-Jones to gain a reputation for defying medical logic when it comes to the speed of recovery in people and horses with notoriously clinically difficult areas to treat such as tendon problems and chronic skin conditions such as ulcers and others. 'Tendons are really my speciality' he says, 'having spent four years researching them from every angle for my PhD'.

Electricity and the Treatment

Essentially, we treat cells as a messaging system that can function at a higher level collectively than they are able to individual. The treatment is based upon the theory that damaged or infected cells are not always fundamentally spoiled - but merely that vital communication pathways between them may have been knocked out or disrupted. Working on the theory that if an organ's functional capacity is greater than the sum of its parts, disruption to organs communication pathways can drastically affect its capacity to function normally. 'If you work on the individual cells at one level and biological community within which they exist at the other remarkable results can be seen' he states.

Using a \square , a medically approved device a minute and cell specific electric current is passed through the afflicted parts using carefully controlled sequences.



There is evidence, which suggests that cells stop passing on messages to each other when damaged, rather like radio transmission waves which are impeded when a transmitter is blown down. The passing of the electric current to the affected area appears to re-stimulate the communication pathways between cells - particularly those involved in repair work which, when functioning, reproduce faster than most other cells. However, it is important to stress that not any random electric current will do. It is rather like a medicine says Dr Chapman-Jones, using Paracelcus' quote as an example 'the difference between a medicine and a poison is the dose'. It is possible and just as easy to turn cells off as turn them on.

Dr Chapman-Jones says: 'If you can imagine that the injury or trauma sets up an electro-chemical 'knot' which it grinds a normal physiological process such as healing to a halt or slows it down; the treatment unties the knot and triggers the signal again. A good analogy, but at a much larger scale, to help understand this idea is when the heart beat gets out of sequence, (an ectopic beat) and an electric current is used to correct the imbalance'

Treating tendons

The treatment consists of introducing into the tendon (or other soft-tissue structures) a series of a cell-calibrated micro-current with the dual purpose of mimicking the normal processes of electro-chemical signalling and amplifying mitochondria A.T.P synthesis. This has the reported effect to significantly increase tenocyte activity and hence the capacity and level of the regenerative process. The aim of the treatment is to boost the production of type I collagen and accelerate the process of spatial fibrillar remodelling to reduce healing time and influence the expected prognosis.