Applied Physiology of Electrotherapy

Biological tissues can be excited by relatively low frequencies of stimulation, typically below 150 Hz. When cell membranes are excited, transient changes in their permeability occur allowing the rapid movement of ions across the membranes. A flow of ions is an electrical current, and when moving through a resistance, in this case bodily tissue, an electrical field is created. Measuring this field on the surface of the skin is possible, such as in an EKG (electrocardiogram) or EMG (electromyogram), used diagnostically to record and assess the excitable tissue producing this field.

However, different types of bodily tissue react differently to stimulation frequencies. This is due to the speed that the stimulation is able to move through the different types of tissue and due to the amount or the duration of stimulation necessary to excite the different tissues.

The result is that different tissue types are effectively and optimally stimulated by different therapeutic frequencies. Tissues that are commonly desired for stimulation in effective rehabilitation are listed below:

Sympathetic nerves	0 – 5 Hz
Parasympathetic nerves	10 – 150 Hz
Motor nerves	10 – 50 Hz
Sensory nerves	90 – 110 Hz
Nociceptive system	130 Hz
Unstriped muscle	0 – 10 Hz

Applying this to interferential stimulation, it is intuitive that each therapeutic protocol is intended to create a different effect – i.e. pain management, muscle stimulation, etc. – and gives rise to therapeutic clinical consequences such as reduction in pain, reduction in edema, increase in range of motion, as reported in the literature (Jarit et al).

Similarly, the ability of Duet and Quartet to consistently and repeatedly deliver precise, accurate stimulation frequencies, should lead to predictable, consistent and repeatable therapeutic efficacy.

Reference: Chapter 1, pages 15 - 17: Interferential Therapy, Brenda Savage, MSc, MCSP, DipTP, Faber and Faber, Ltd., 1984, acknowledging contributions from (Chapter 1) Alastair G. McC. Deller, MSc, CEng, MBES, and (Chapter 2) John R. Roberts, BSC, PhD, CEng, MIERE, MBES.