

Ultrasound & Electrical Stimulation

In today's world of changing technology it can be difficult to keep up with the latest healthcare trends and have a thorough understanding of available services. There are several modalities utilized by therapists to enhance functioning; the two that will be discussed in this article are ultrasound and electrical stimulation.

Ultrasound & Electrical Stimulation

Although many people are familiar with the term ultrasound, there are a myriad of applications for its use. In the realm of therapy, ultrasound is used during treatment sessions to reduce edema, promote tissue and fracture healing, reduce pain, decrease muscle tone/muscle spasms, increase range of motion, increase circulation and remodel collagen.

Therapeutic ultrasound uses high frequency sound waves to generate tissue vibration that creates heat in the treatment field. Secondary effects from the production of heat include increasing blood flow to tissue, which delivers important nutrients and removes waste. When receiving ultrasound, the therapist uses a coupling medium (gel or water) to transmit sound waves to the treatment area.

Another common modality is electrical stimulation. Electrical stimulation is the application of electrical currents to specific muscles through strategic placement of electrodes. It is often used for neuro-muscular reeducation and decreasing pain through nerve blocks, atrophy and muscle spasms while increasing range of motion. It also reduces edema through sensory stimulation.

Often, therapists use combined modalities to maximize results. Four specific results that are often strived for through the use of ultrasound and/or electrical stimulation include: Managing contractures/increasing range of motion, managing pain, increasing strength and training muscles to increase continence.

Contracture management:

Abnormal tone decreases an individual's ability to move muscles through the full range of motion and often leads to contractures. Individuals with limitations in their passive range of motion can receive a combination of ultrasound, electrical stimulation, orthotic use and a range of motion program to decrease the risk of future contractures and/or increase their passive range of motion. In this scenario, ultrasound can apply



deep heat to the muscles with limited range, as well as stimulate the Golgi Tendon Organs to activate the Protective Relaxation Reflex. Electrical stimulation in this type of situation can be used to either reeducate muscles or perform a nerve block to decrease pain during treatment. Orthotics are utilized to perform a gradual, prolonged stretch over a longer amount of time than what can be completed during individual therapy sessions. It is also important that patients and caregivers are aware of the range of motion programs that need to be carried out throughout the day and fully understand the splinting schedule to maximize benefits.

If a patient has full passive range of motion, but a limited active range of motion, typical use of electrical stimulation will focus on increasing muscle strength and will be combined with therapeutic exercises and activities to retrain the muscles for proper movement patterns. When electrical stimulation is coupled with exercises, the muscles strengthen and the active range of motion increases.

Pain Management

Both ultrasound and electrical stimulation can be used to decrease pain. Ultrasound can increase circulation and blood flow to effected areas, decrease pain, as well as edema and muscle tightness. Electrical stimulation can be used for similar symptoms and for completing a nerve block. This reeducates the sensory systems to interpret input properly and reeducate pain receptors.

One important consideration when using electrical stimulation is to be aware of pain medications that a patient may be taking. Some medications decrease the effectiveness of electrical stimulation. To implement treatment successfully, adjust the

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timing of session to occur when pain medications are least present in the system, or have the prescribing physician select an alternative medication. One long-term benefit of electrical stimulation can be the decreased reliance on certain pain medications.

Increasing Strength

With the variety of impulses used during electrical stimulation, electrodes can be placed on weak muscles that need strengthening. This application is frequently used in sports medicine rehabilitation to increase muscle strength/power or to maintain muscle strength during inactivity due to injury.

Continenence Training

Another application is managing continence. The use of electrical stimulation combined with an exercise regime can aid in the reeducation of the bladder muscles, decreasing the frequency of incontinent episodes. Before using this treatment, patients need to relay their medical history so proper precautions can be taken. It is recommended that a physician prescription is obtained prior to beginning this modality so that there are clear communications regarding treatment protocols and any potential concerns can be discussed. ❖

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