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CRANIAL ELECTRICAL STIMULATION PROGRAM

Cranial Electrical Stimulation (CES) is an electrical transcranial therapy that requires a device known as a CES unit. This unit has the ability to deliver a very small electrical stimulus, which is conducted via electrical cables, to a site on the head or in some instances, on the body.

To better understand CES, keep in mind that our bodies are constantly producing electrical impulses. *Neurons* are the conducting cells that carry information within the structures of our nervous system. A typical neuron has a cell body, several short processes called dendrites and one long process called an *axon*. The axon, together with its covering (*myelin*), forms a *nerve fiber*. The axons are the “highways” of which electrical information travels. The myelin acts as an insulator and speeds the transmission of electrical signals. The neurons are responsible for providing our body with internal and external information. Based on that information, we elicit behaviors and respond.

The constant flow of electrical impulses must pass through two or more neurons for a sensory experience to form. Motor responses and thoughts also rely on the action of neurons. The neurons need to talk to each other and their messages must cross a space known as a *synapse*. The ability for the neurons to communicate with each other is very much dependent upon the chemical interactions that occur at the synapse. Each synapse is filled with a fluid that is rich in complex chemical compounds, called *neurotransmitters*. They are able to facilitate or inhibit the flow of information between neurons.

Research indicates that the function of neural pathways and structures is dependent on the presence of specific neurotransmitters and chemicals. The location, function, and amount of neurotransmitter substance available at the synapse plays a major role in whether or not the neurons are facilitated or inhibited. When the CES electrodes are applied to the head, a tiny flow of electrical impulses (.000,001 amperes) are transmitted to neurons in the gray matter, just underneath the skull. Depending on the placement of the electrodes, various neurotransmitters are produced and become available at the synapse to receive and send “a message”. The increased production of neurotransmitter compounds is supportive to regulating the function of the structures. CES has been shown to stimulate the axons to branch and enhance the development of myelin.

DTA now offers CES as a treatment modality for appropriate clients. For now, it is available during individual treatment sessions at DTA. If used during treatment, progress should be apparent within the first couple of applications. Using CES in treatment has many benefits and can support improved functional performance. It has been shown to be effective in treating children with sensory, neurological and learning disorders. As with any new program, there is always an initial period of problem solving and collecting data. Subsequently, if you think you would like to obtain more information regarding the use of CES with your child, please speak with your child’s therapist or contact Evelyn Bonano, OTR/L, CES Coordinator at 919-493-7002, ext. 141.