

BRAIN STIMULATION FOR DISEASE TREATMENT AND MODIFICATION

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Brain stimulation entered the therapeutic arena in the 1990's when proven beneficial for symptoms of Parkinson's Disease. The low morbidity rates and dramatic responses led to investigations for stimulation in a variety of neurological and psychiatric conditions. A variety of targets have been explored, based upon animal models and lesional studies in humans. Effective treatments have developed for neurological conditions such as Parkinson's, essential tremor, and epilepsy, and stimulation has promise for treating memory disorders, obsessive-compulsive disorder, depression, anorexia, and perhaps others. Efficacy rates vary with disease state and response is variable. High frequency stimulation, which has an inhibitory effect on neurons thus far is typically utilized. However, new paradigms mimicking intrinsic gamma or theta frequency rhythms or complex patterns are being explored. Stimulation does not produce disease modification in degenerative neurological diseases using present stimulation paradigms, though it is hoped that stimulation might induce permanent alterations in connectivity and thereby restore normal function in other conditions such as epilepsy and psychiatric disorders.