Nerve Stimulator Therapy Offers Relief for Neurological Disorders

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Technology description

Medical Device Offers a Non-Invasive and Optimized Electroceutical Treatment for Symptoms of Anxiety and Sleep Disorders, Chronic Pain, and Epilepsy

This closed-loop neural prosthesis offers therapy for individuals suffering from conditions such as anxiety, chronic pain, sleep disorders, epilepsy, and post-traumatic stress disorder. An estimated 70 million adults in the United States suffer from at least one of these disorders. Available treatments for these diseases include pharmaceutical therapy, surgery, psychotherapy, and limited nerve stimulation approaches. Researchers at the University of Florida have proposed a closed loop, individually tailored vagal nerve stimulation therapy for these conditions and others that affect limbic and autonomic nervous system disposition that will be less invasive, safer, and more effective than available methods. This closed-loop neural prosthesis is compatible with existing stimulator devices, particularly approaches that alter parasympathetic and sympathetic nervous system function (e.g., vagal or trigeminal nerve stimulation), including both external and surgically implanted solutions. This device enables efficient stimulation to achieve optimized balance of efficacy with minimal side effects.

Technology

Available nerve stimulation therapy is used for epilepsy and depression, but these treatments are rather arbitrary with how and when the nerve is stimulated. Researchers at the University of Florida have created a closed loop neural prosthesis that enhances existing nerve stimulation technology, in particular vagal nerve stimulation, optimizing the efficacy and efficiency of treatments. Since this treatment utilizes a closed loop circuit that monitors patients’ nervous systems, stimulation will only occur when physiological signals indicate the need. In existing neuro-stimulation treatment, a patient receives stimulation according to a predetermined program, which often leads to side effects due to over-stimulation or inefficacy due to under-stimulation. This technology works to enhance both internal and external vagal nerve stimulation and is adaptable for treating mental illness, sleep disorders, chronic pain, and even cosmetic neurology.

Application area

Device-based therapy that regulates the symptoms of neurological based disorders

Advantages

Incorporates dynamic measure of the autonomic nervous system in real time, making treatment more effective, safer and better tolerated.
Triggers nerve stimulation based on indices of autonomic nervous system function (e.g., vagal tone), allowing titration based on dynamic stimulation efficacy
Allows appropriate treatment shift in response to the activity level of the person (e.g., sleep, exercise)
Limits stimulation to only the minimum levels necessary (including intensity, time, or frequency), lowering frequency and intensity of side effects
Applicable to both internal and external vagal nerve stimulation, broadening treatment possibilities spanning mental illness, sleep disorders, chronic pain and even cosmetic neurology

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