Questions and Answers About Vagus Nerve Stimulation
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1. WHAT IS VAGUS NERVE STIMULATION?

Therapeutic vagus nerve stimulation (VNS) is chronic, intermittent electrical stimulation of the mid-cervical segment of the left vagus nerve. The stimulation occurs automatically at set intervals, during waking and sleep. The electrical pulses are generated by a pacemaker-like device that is implanted below the clavicle and are delivered by a lead wire that is coiled around the vagus nerve.

2. WHAT IS THE EVIDENCE THAT VAGUS NERVE STIMULATION IS EFFECTIVE IN EPILEPSY?

The empirical evidence of antiepileptic efficacy arose sequentially from l) experiments in animal models of epilepsy; 2) anecdotal reports and small case series ofearly human trials, and 3) two prospec-tive, double-blind, controlled studies in large groups of patients with complex partial and secondarily generalized seizures.

3. HOW DOES VAGUS NERVE STIMULATION CONTROL SEIZURES?

The mechanisms by which therapeutic VNS reduces seizure activity in humans and in experimental models of epilepsy are unknown.

4. WHEN SHOULD ONE CONSIDER VAGUS NERVE STIMULATION?

Medically refractory complex partial and secondarily generalized seizures have been efficaciously treated with adjunctive VNS in the large, randomized studies. Children may benefit considerably from VNS, but large-scale, randomized, controlled studies have not been completed in young children. Thus, any adolescent or adult whose complex partial or secondarily generalized seizures have not been controlled with the appropriate first- and second -line antiepileptic drugs may be a good candidate for VNS. The FDA has specifically approved VNS with the Cyberonics device for adjunctive therapy of refractory partial-onset seizures in persons l2 years of age.

5. WHAT ARE THE CONTRAIN-DICTIONS TO VAGUS NERVE STIMULATION?

The only absolute contraindication to VNS is previous bilateral or left cervical vagotomy. In the absence of further information, some epileptologists may be reluctant to recommend VNS for patients with chronic obstructive pulmonary disease, asthma, cardiac arrhythmias, or other cardiovascular or pulmonary conditions that cannot be adequately controlled medically.

6. WHAT ARE THE POTENTIAL ADVERSE EFFECTS OF VAGUS NERVE STIMULATION?

Complications of VNS using the NCP, system implantation are rarely severe or persistent. Unilateral vocal cord paralysis occurs after approximately l% of implantations, is related to the vagalinnervation of the larynx, and fully recovers over several weeks in most cases. lower facial paresis occurs in approximately l% of implantations and also usually recovers over several weeks. Fluid accumulation at the pulse generator site with or without localized infection occurs in l to 2% of implantations and usually responds to aspiration and antibiotics. Rarely, the device must be deplanted because of infection that does not respond to medical therapy.

7. HOW IS THE DEVICE PLACED?

The NCP, system is implanted with the patient under general anesthesia.

8. CAN BRAIN MAGNETIC RESONANCE IMAGING BE PERFORMED SAFELY AFTER THE IMPLANTATION OF A VAGUS NERVE STIMULATION SYSTEM?

Probably so, with considerable attention to appropriate safety measures. Body coils cannot be used, but some head coils may be safe for use in MRI.