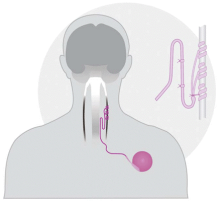

Vagal Nerve Stimulation

Overview

Vagus nerve stimulation involves the implantation of a generator that stimulates the vagus nerve and thus reduces seizure activity. The **vagus nerve** is one of 12 pairs of cranial nerves (i.e., nerves that originate in the brain). It has motor functions in the larynx (voice box), diaphragm, stomach, and heart, and sensory functions in the ears and tongue. It has both motor and sensory functions in the pharynx (sinuses) and esophagus. Stimulation of the vagus nerve is thought to affect some of its connections to areas in the brain that are prone to seizure activity.

Patients who suffer from complex partial seizures or generalized seizures where consciousness is lost, and who do not respond to anticonvulsant medication, and patients who cannot undergo brain surgery are considered good candidates for vagus nerve stimulation therapy. It also may be recommended as a treatment for photosensitive epilepsy and epilepsy resulting from head injury.

Procedure

The procedure is performed under general anesthesia. A neurosurgeon implants the device, a generator about the size of a small tape measure, in the upper left area of the chest. A connecting wire is run under the skin from the device to the vagus nerve in the left side of the neck. Three small leads are then carefully attached to the nerve. Implantation is usually accomplished within 1 to 2 hours.

For a few days following the procedure, the generator is programmed to stimulate the vagus nerve at regular intervals (e.g., for 30 seconds every 5 minutes) at a frequency determined by the doctor and patient. The physician adjusts the frequency using a computer. If a seizure begins between intervals, the patient activates the stimulater by swiping a magnet over their chest at the location where the device is implanted.

Risks include possible surgical injury to the vagus nerve, carotid artery, and internal jugular vein.

Results

Many patients experience 50% reduction in seizure frequency, and seizures are less severe. Vagus nerve stimulation eliminates seizures in approximately 15% of patients, according to some studies, and a small number experience no improvement.