Responsive neurostimulation (commonly called ‘RNS®’) is a type of specialized therapy which was approved by FDA in 2013 for use in patients with refractory epilepsy. The system continuously monitors brain electrical activity from selected parts of the brain, detects abnormal electrical activity and tries to stop this activity by delivering low intensity electrical current upon detection.

RNS® is an innovative approach towards seizure control. It may be able to offer improved seizure control in some patients in whom medications have failed, and resective epilepsy surgery is not an option.

**The RNS System is the first and only brain-responsive neurostimulation system designed to prevent epileptic seizures at their source.**

**How the RNS System Can Help**

**Constant Monitoring**
The RNS System continuously monitors brain activity at the seizure source. It works in the background, without the patient feeling anything.

**Personalized Detection**
The device is programmed by physicians to detect early, abnormal electrical patterns that can lead to seizures. These patterns are different for every individual, and the device can be personalized to recognize each brain’s unique “fingerprint.”

**Instant Treatment**
Within milliseconds of detecting abnormal brain activity, the RNS System sends tiny electrical pulses to disrupt the abnormal activity and normalize brainwaves. This real-time response is designed to prevent seizures from occurring.
THE RNS® SYSTEM ADVANTAGE

WHAT KIND OF SURGERY IS NEEDED FOR RNS® IMPLANTATION?
A trained neurosurgeon performs the RNS® implantation procedure. Using modern computer guided (stereotactic) techniques, thin electrodes, to record the brain electrical activity, are placed inside the brain. They are connected to the device which is placed in the skull. The procedure is performed under general anesthesia, meaning that you’d be sleeping throughout the whole surgery.

A WINDOW TO THE BRAIN
The RNS System is the only epilepsy therapy that also provides physicians clinically meaningful ongoing data about their patients’ seizure frequency and electrocorticographic activity. The patient uses a simple remote monitor at home to wirelessly collect and upload data from their neurostimulator. The data is made available to their doctor to review and analyze, so that they can improve patient care.

HOW EFFECTIVE IS THE RNS® DEVICE?
In one of the early trials, the system resulted in slightly more than 40% reduction and disabling seizures as compared to the nearly 10% reduction in control group. The seizure control tends to be maintained and may gradually improve over time. At 2 years, median seizure reduction was seen by more than 50% and by 6 years it was slightly more than 65%. Seizure reduction by at least half was reported by 55% of the patients at 2 years, and nearly 60% at 6 years.

WHAT COMPLICATIONS OR SIDE EFFECTS CAN THE RNS® CAUSE?
The risk and complications tend to be rare, and device tends to be well tolerated. Implant site pain is the most commonly reported adverse effect noted in about one third of the patients. Bleeding into the brain, with or without head injury, is rare and was seen in about 2-5% of patients. Infection can also be seen at the implantation site and may require removal of the device.

Learn more:

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