



Neuromodulation: Vagus Nerve Stimulation

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What is Vagus Nerve Stimulation (VNS)?

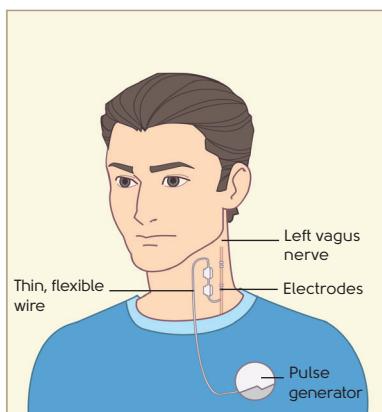
- VNS is a brain stimulation procedure. It is approved by the U.S. Food and Drug Administration for depression that is chronic and resistant to treatment.
- A pulse generator similar to a heart pacemaker is implanted in your chest, under your skin. This pulse generator sends an electric current into the brain.
- The electric current first activates the vagus nerve in your neck and then the brain cells, which are thought to be associated with depression.

What is VNS used for?

- VNS is used as an alternative or an additional treatment for depression when you have not benefitted from standardized treatments including:
 - a. Antidepressant medications
 - b. Psychotherapy
 - c. Electroconvulsive Therapy (ECT)
- VNS does not necessarily replace your medications. It may help reduce them over time. Your doctor will follow up with you regularly on your treatment regimen.
- VNS may or may not be effective for all patients with depression.
- VNS is an effective treatment for neurological disorders such as epilepsy.

How do I receive VNS?

- You will need surgery to implant the VNS device. This can be done as an outpatient procedure or you can be admitted to the hospital for one night only.
- The surgery lasts 1 to 2 hours. It can be done under local or general anesthesia.



- Two to three weeks after the surgery, your doctor will turn on the VNS device.
- The device will send intermittent (on and off) electrical pulses 24 hours a day, 7 days a week.
- You will be given a magnetic device that allows you to control the electrical current. You can also turn off the device temporarily during certain activities.

How can I benefit from VNS?

- VNS may improve your symptoms, but it will take several months before you start observing these improvements.
- VNS may protect you from future relapses of depression.
- VNS will not impair your memory or ability to concentrate.

What are the risks of VNS?

- Similar to any procedure using general anesthesia, there is a very low probability of death (1 in 10,000 patients).
- VNS has risks and side effects associated with the surgery and treatment after the surgery. Your doctor can help you assess your risks given your medical condition.
- You may feel a tingling sensation or mild pain in your neck.
- If you experience any side effects, the electric impulses can be adjusted to minimize them.
- If you cannot tolerate the side effects, the device can be shut off or removed.

Ask your doctor if you wish to know about ongoing research studies on VNS.

**This educational material provides general information only.
It does not constitute medical advice. Consult your health care provider to determine whether the information applies to you.**

