Vagus nerve stimulation therapy in epilepsy

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Introduction

This information explains what vagus nerve stimulation therapy is and how it can help you if you have epilepsy. Vagus nerve stimulation is usually referred to as VNS, and that is how we refer to it throughout this information.

About VNS therapy

The aim of VNS therapy is to stop seizures or make them less severe. VNS therapy involves sending electrical impulses from a small generator in the chest. The impulses go first to the vagus nerve in the neck, and then to the brain. By stimulating the vagus nerve, the generator makes the vagus nerve send its own electrical signal to the brain.

There are three pieces of equipment used in VNS therapy.

- A small programmable generator
- A lead with two coils at the end
- A hand-held magnet

How VNS therapy works
The vagus nerve carries messages between the body and the brain. During VNS therapy, a generator is programmed to send impulses to the vagus nerve at regular intervals, all day, every day. This is to stop excessive electrical activity in the brain that causes seizures. If need be, you can also sweep the hand-held magnet over the generator to send more impulses to the vagus nerve. This could be when you feel a seizure starting, or when you are having a seizure. A carer, or family member, can also use the magnet, if they see you having a seizure. The magnet can also be used to stop the stimulation for a short time. You do this by holding it over the generator for at least 65 seconds. Your epilepsy nurse or doctor will be able to tell you more about this.

Although the generator is programmed when it is fitted, it can also be adjusted afterwards if necessary. This would probably be at an outpatient appointment with a doctor or epilepsy specialist nurse.

**People who may be considered for VNS therapy**

The National Institute for Health and Clinical Excellence (NICE) is an independent organisation that provides guidelines for treatment and care for people using the NHS in England, Northern Ireland and Wales. NICE say that VNS can be used as an add-on therapy for difficult to control epilepsy in children, young people and adults in the following two groups. Group 1 looks at people who have focal (partial) seizures. Group 2 looks at people with generalised seizures.

**Group 1**

If you are in this group, you must meet *all* of the following four requirements.

1. You have seizures that are not controlled with the right dose of the right epilepsy medicine or your epilepsy medicine causes you too many side-effects.
2. You are not suitable for epilepsy brain surgery or you have had epilepsy brain surgery but you are still having seizures.
3. You have at least two focal (partial) seizures each month where your consciousness is affected or you have had more than one period of life-threatening status epilepticus.
4. You have tried three first-line epilepsy medicines over a period of at least two years. First-line medicines are usually the first ones prescribed when you are starting epilepsy treatment.

**Group 2**

If you are in this group, you must meet *all* of the following four requirements.

1. You have seizures that are not controlled with the right dose of the right epilepsy medicine or your epilepsy medicine causes you too many side-effects.
side-effects.
2. You are not suitable for epilepsy brain surgery or you have had epilepsy brain surgery but you are still having seizures.
3. You have at least one generalised seizure each month or you have had more than one period of life-threatening status epilepticus.
4. You have tried three first-line epilepsy medicines over a period of at least two years. First-line medicines are usually the first ones prescribed when you are starting epilepsy treatment.

If you think VNS therapy might help you, you should talk to your epilepsy specialist.

Epilepsy Action has more information about NICE [1] and epilepsy surgery [2].

About VNS surgery

VNS surgery is carried out by a neurosurgeon. The operation takes approximately one hour and you usually go home the same day, or the next day. The neurosurgeon makes two small cuts, one in a natural crease on the left of your neck, and one in the left-hand side of your chest, below your collarbone. The generator is placed under the skin in your chest. A thin, flexible wire connects the generator to the left vagus nerve in the neck. The small scars from the two cuts fade over time.

The generator is usually left switched off for two weeks after surgery. This is to help your body heal. After that, it is usually switched on by a specialist nurse in a clinic. They will gradually increase the settings over a number of weeks. This gives you chance to get used to the stimulation over time.

Benefits of having VNS surgery

It can take from a couple of months to two years after the VNS is implanted to notice a difference in seizure control. The benefits of having the VNS can include the following:

- Having fewer seizures
- Having less severe seizures
- Having improved quality of life

Risks of having VNS surgery

The VNS operation is usually done under a general anaesthetic. As with any type of operation, there is a slight risk of reaction to the anaesthetic. There is also a small risk of bleeding and infection. There can be other rare complications. Your surgeon will give you more information before the operation takes place.
You might have some pain for a while from the area of the implant after VNS surgery. Your doctor can prescribe something for this.

**Side-effects of VNS therapy**

VNS therapy is not a drug, so doesn’t have the same sort of side-effects as epilepsy medicines, and it doesn’t interact with other medicines.

These are the most common side-effects reported from having the VNS implant.

- Temporary hoarseness/change in voice tone
- Sore/tickling throat
- Shortness of breath
- Coughing

These side-effects happen during stimulation periods, and usually get less over time. If you continue to have side-effects, talk to your epilepsy nurse, to see if they can help.

**Epilepsy medicines after VNS surgery**

Your doctor is likely to recommend that you take your epilepsy medicines as usual for several months after the operation. They will then talk to you about any possible changes to them.

**Replacing the generator battery**

At some point, the generator will need replacing when the battery runs low. The generator usually lasts for around three to six years, depending on the settings used. The higher the frequency and output of the settings, the faster the battery will run down. Your doctor or nurse can tell when the battery is running down during your follow up appointments. They will then arrange for a new generator to be fitted. This involves a small operation, which lasts less than an hour.

**Further information**

Further information is available from Cyberonics, [3] who make the VNS devices.

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Links:

About this publication

This information is written with input from people with epilepsy and professionals. Epilepsy Action makes every effort to ensure the accuracy of information but cannot be held liable for any actions taken. If you want to know our sources, or give us feedback, contact us.

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