

VNS: Vagus Nerve Stimulator

Definition of Terms

Aura – An individual specific warning sign or signal that a seizure is about to occur. Auras can include visions, smells, sounds, movements or a feeling the person has that a seizure is coming.

Epilepsy – a neurological disorder marked by recurrent episodes of sensory disturbance, loss of consciousness, or convulsions; caused by abnormal electrical activity in the brain.

Magnet – a specialized magnetic device used to activate the implanted vagus nerve stimulator.

Seizure – abnormal electrical activity in the brain.

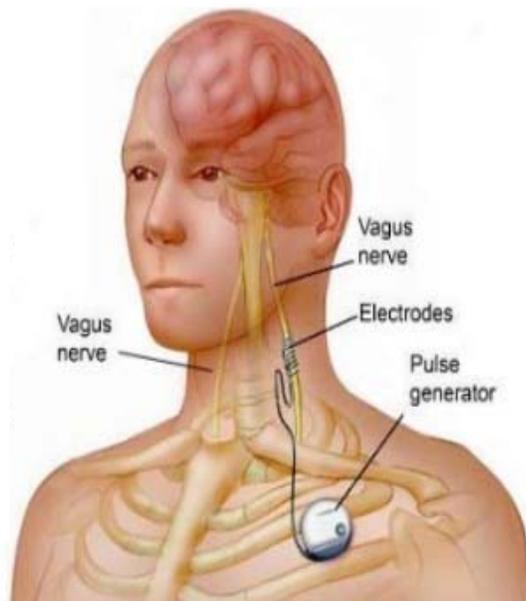
Stimulation – signals sent to the brain by the implanted device to ward off or shorten seizure activity.

Vagus Nerve – 10th cranial nerve that supplies signals to the brain and many other organs in the body (e.g. heart, lungs, stomach, intestine, liver, spleen, kidneys).

VNS – a device implanted just below the surface of the skin in the upper chest for the purpose of sending signals to selected areas of the brain affected by abnormal electrical activity.

VAGUS NERVE STIMULATION (VNS)

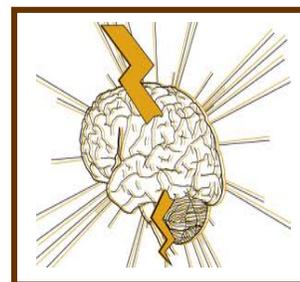
- ◆ Sends tiny electrical signals to the vagus nerve
- ◆ Three pieces of equipment used in VNS therapy:
 - ◀ Programmable generator
 - ◀ Lead with two coils at the end
 - ◀ Hand-held magnet



Seizures

Introduction

A seizure occurs when there is abnormal electrical activity in the brain. The brain's cells misfire, causing a wide range of behaviors, depending on where the "misfiring" occurs. Some seizures cause the person to fall to the ground and have strong, uncontrolled movements. Other seizures cause the person to stare off into space for a few seconds or minutes or to engage in unusual behaviors. All seizures are involuntary. The person cannot control their seizure.



What Happens During a Seizure?

- ◆ The person may experience a warning (aura) that the seizure is about to happen
- ◆ Seizures are individual specific. A given person with a seizure disorder, will consistently exhibit the same behaviors each time he / she has a seizure. You **MUST** become familiar with what behavior(s) the individual exhibits during a seizure. Common behaviors exhibited during a seizure can include:
 - ↳ Sudden falling
 - ↳ Clenched teeth
 - ↳ Eye movements
 - ↳ Grunting and snorting
 - ↳ Temporary halt in breathing
 - ↳ Loss of bladder or bowel control
 - ↳ Drooling or frothing at the mouth
 - ↳ Uncontrollable muscle spasms with twitching and jerking limbs
 - ↳ Brief blackout (staring into space) followed by confusion for a brief period of time
 - ↳ Unusual behavior such as sudden anger, sudden laughter, or picking at one's own clothing

IF THE PERSON'S SEIZURE IS DIFFERENT FROM PREVIOUS SEIZURES, CALL 911.

What is an aura?

- ◆ A warning that a seizure is about to occur. The aura is specific to the person and is typically the same with every seizure that person experiences.
- ◆ Auras can include (but not limited to):
 - ↳ A smell
 - ↳ Headache
 - ↳ Confusion
 - ↳ Fear
 - ↳ Anxiety
 - ↳ A noise
 - ↳ Nausea

How long does a seizure last?

- ◆ From seconds to minutes

BECOME FAMILIAR WITH HOW LONG THE PERSON'S SEIZURE NORMALLY LASTS.

When do I report the seizure to the doctor or nurse?

- ◆ When the seizure lasts longer than normal for that person.
- ◆ If the person has been seizure free for 12 months or longer, then has a seizure, report this to the appropriate healthcare professional.

What can Trigger (bring on) a Seizure?

- ◆ Fever
- ◆ Bright sunlight
- ◆ Medication Errors
- ◆ Being tired / not getting enough rest
- ◆ Getting too hot (hot tubs, sauna, strenuous exercise)
- ◆ Flickering lights (TV, strobe lights, fireworks, rotating ceiling fans, blinking Christmas lights)
- ◆ Hunger / low blood sugar

How often does a seizure occur?

The frequency varies from person to person.

You **MUST** know how often the person "normally" has a seizure. Some people have seizures every day and others only once or twice a year.

IF THE PERSON'S SEIZURES OCCUR MORE OFTEN THAN IS "NORMAL" FOR HIM / HER, REPORT TO THE APPROPRIATE HEALTHCARE PROFESSIONAL

Website: [epilepsyfoundation](http://epilepsyfoundation.org)

What precautions should be taken?

- ◆ Always be aware of the environment and avoid potential triggers
- ◆ Wear a life jacket while swimming and never swim alone
- ◆ Shower rather than take a tub bath to avoid the risk of drowning if a seizure occurs when bathing
- ◆ Set the hot water heater temperature to avoid burns from a seizure that occurs in the shower
- ◆ Prevent falls and be aware of potential sources of injury

What should YOU DO for the person during a seizure?

- ◆ Provide for safety by moving the person to the floor if possible
- ◆ Provide a cushion for the person's head
- ◆ Move furniture or other items that could cause injury if arms / legs are flailing
- ◆ If possible, position the person on his / her side to maintain the airway and prevent aspiration in case the person vomits
- ◆ Use the VNS magnet as ordered

What should you NOT DO for the person during a seizure?

DO NOT:

- ◆ Restrain the person
- ◆ Place anything (including your fingers) in the person's mouth
- ◆ Move the person unless he / she is in danger or near something hazardous
- ◆ Give the person anything to eat or drink until the seizure has stopped and the person is fully awake and alert

When Should You call 911?

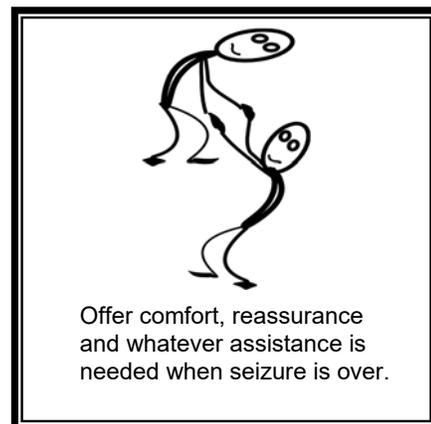
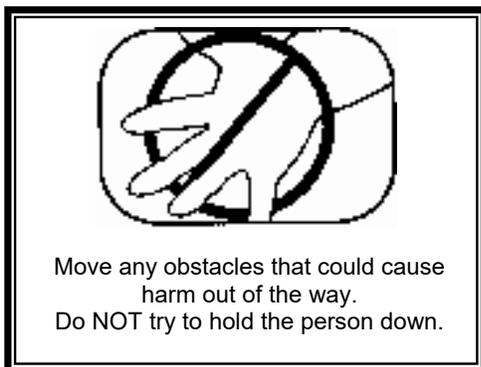
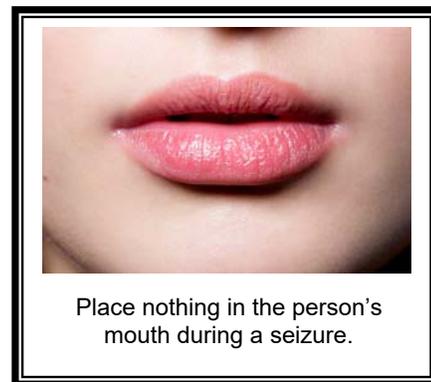
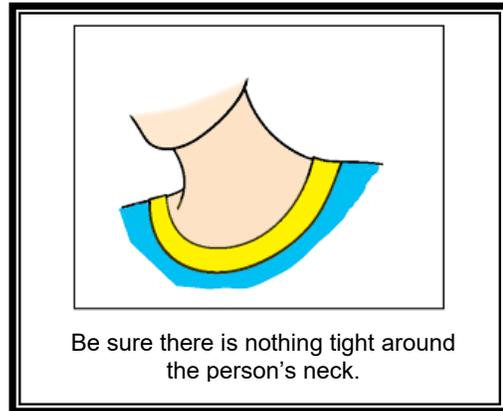
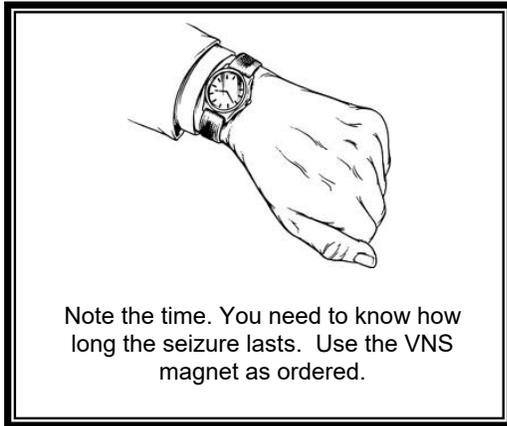
Call 911 if:

- ◆ The person stops breathing
- ◆ This is the first seizure the person has ever had
- ◆ The person sustains an injury during the seizure
- ◆ The person remains unconscious after the seizure ends
- ◆ The person has a seizure after being seizure free for 12 months or more.
- ◆ The seizure is different than the person's "normal" seizure (appearance / duration / frequency)

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Seizure: What to do



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Vagus Nerve Stimulator (VNS) and magnet

The VNS is a tiny device that measures about 1.5 inches across and is 10-13 mm (approximately 1/16 of an inch) thick. It is usually placed in the left chest below the collar bone. Attached to the device is a thin wire that is threaded up to the neck where it is attached to the vagus nerve leading to the brain.

The stimulator is programmed to automatically deliver stimulation to the vagus nerve. The frequency and intensity is set by the neurologist. The doctor programs the stimulator to deliver an electrical charge to the brain every X minutes.

When a seizure occurs or is about to occur, staff may use a specially designed magnet to activate the device to send additional impulses to the vagus nerve to interrupt seizure activity.

The VNS may not stop all seizures. VNS therapy is not effective for everyone. **When it works, VNS therapy may result in any of the following:**

- ◆ Improved sense of well-being
- ◆ The need for fewer seizure medications and fewer side effects from these medications
- ◆ Better recovery after a seizure
- ◆ Shorter or less severe seizures
- ◆ Fewer visits to the ER

It is important to keep the magnet in a handy place and know where it is at all times, so it's available when a seizure occurs. The location of the magnet must always be confirmed every time a person moves between settings, support persons, or is transported.

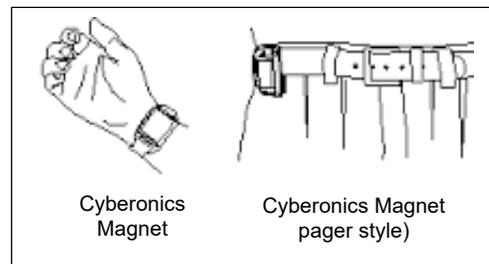
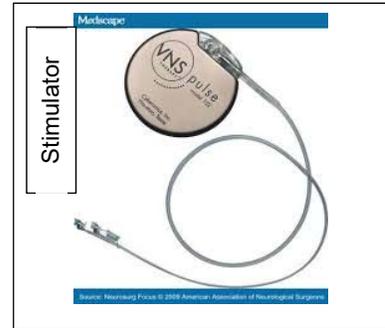
The magnet is most effective if used when an aura is observed or at the beginning of a seizure, however, it can be used at any time during a seizure. **You must receive individual specific training regarding use of the magnet on the person you are caring for.**

Carefully read the VNS manual for safety tips and other considerations for the magnet. The VNS manual will tell you how to hold the magnet, how to use the magnet for a seizure, how to store and care for the magnet, and about things in the environment that can be affected by this strong magnet such as credit cards and other things with a magnetic strip.

Using the VNS Magnet

The magnet is swiped over the VNS when needed to stop a seizure. To use the magnet:

- ◆ Feel for the edges of the VNS through the person's shirt. Keep your thumb and index finger of one hand on the edges of the stimulator.
- ◆ With your other hand, swipe the magnet across the stimulator in the chest area, counting "one - one thousand - two." That completes one swipe. You have activated the VNS as programmed.
- ◆ If the seizure is still going on after 1 minute, you can swipe the magnet again. Usually the stimulation that is triggered lasts 30-60 seconds, depending on how the stimulator is programmed.
- ◆ Continue to repeat swipes as specified for the person until the seizure stops.
- ◆ If the seizure continues longer than is typical for the person, follow the person's seizure first aid plan.



Side Effects of VNS Therapy

The most common side effects include:

- ◀ Hoarseness
- ◀ Coughing
- ◀ Throat tickling
- ◀ Shortness of breath

Other side effects of having a VNS:

- ◀ Voice changes
- ◀ Pain or infection at the insertion site
- ◀ Difficulty swallowing
- ◀ Increased drowsiness
- ◀ Worsening of sleep apnea in people with sleep apnea

These side effects may disappear over time. Report all side effects to the neurologist for evaluation of the of VNS therapy.

Other Concerns that must be reported to the neurologist

- ◀ Breathing difficulties
- ◀ Change in heart rate caused by the stimulation
- ◀ Choking incidents
- ◀ Increase in frequency or duration of seizures
- ◀ Any changes related specifically to seizure activity or use of the VNS magnet
- ◀ Signs that the VNS is not working properly or the battery is dead
- ◀ Stimulation which becomes painful or irregular

IST (individual specific training) MUST include:

- ◀ Review of the instruction manual
- ◀ The specific signs of oncoming or actual seizure for this individual
 - ◆ Duration of the seizure
 - ◆ What the seizure looks like
 - ◆ Frequency of seizure activity
 - ◆ Triggers and auras
- ◀ Where the magnet is kept
- ◀ Where to document that the magnet(s) is available at the beginning of the shift or whenever you start providing support services
- ◀ Where to find the implanted stimulator on the individual's chest wall
- ◀ When to swipe the magnet
 - ✓ How long to wait before repeating the swipe
 - ✓ How many times to repeat the swipe
 - ✓ When to call 911 if the seizure does not stop
- ◀ Where and how to document the time of the seizure, how long it lasted, how many times the magnet was swiped, and any other observations such as what the seizure looked like
- ◀ How to check the battery and how often it should be checked
- ◀ Things that need to be reported to the parent / guardian / nurse / doctor / provider; and contact information for those people
- ◀ What things in the person's environment can be affected by the magnet
- ◀ Any other prescribed treatments for the person's seizure disorder

◆ **This training on the use of the VNS does NOT qualify uncertified direct service personnel (DSP) to administer medications. DSP MUST have the DODD Medication Administration Certification before being allowed to administer medications.**

VNS: Checklist for Training

Content Covered	✓ Discussed	
1. Relevant Medical Terms (p. 1)		
2. Information about seizures (pgs. 2, 3, 4)		
3. Review parts of VNS therapy system (p. 1 & 5)		
4. Location of pulse stimulator (pgs. 1 & 5)		
5. Type, care, and storage of magnet (p. 5)		
6. How often magnet can be used (p. 5)		
8. How to use magnet with pulse stimulator (p. 5)		
9. Possible complications and side effects (p. 6)		
10. Problems to report with VNS (p. 6)		
11. When to call 911 (pgs. 2, 3, 4, 6)		
12. First aid for seizures (pgs. 3 , 4)		
13. Documentation that the magnet is available (pgs. 5, 6).		
14. Documentation of use of the VNS (p. 6)		
15. Documentation of seizure activity (pg. 6)		
◆ This training on the use of the VNS does NOT qualify uncertified DSP to administer medications. DSP MUST have the DODD Medication Administration Certification before being allowed to administer medications.		

Trainer Name : _____ **Signature** _____ **Date:** _____

Trainees:

Name

Signature

VNS: Checklist for Return Demonstration

Steps	Date Completed Satisfactorily	Needs more instruction and supervision Date
1. State the potential signs of a seizure		
2. State the steps of Seizure First Aid		
3. State possible locations of magnet(s)		
4. Show how to locate the implanted stimulator		
5. Hold magnet correctly to swipe across the implanted stimulator		
6. Swipe the magnet across the implanted stimulator saying slowly "one - one thousand - two" then remove the magnet from the chest		
7. State that IST will indicate when and how many times to repeat swipes		
8. Describe how to care for the person after the seizure is over or if it does not stop		
9. Return the magnet to where it is kept		
10. Document time of seizure, length of seizure, description of seizure, and use of the magnet on the stimulator		
11. State when to call 911		
12. List the potential side effects		
13. Identify potential problems and who to report them to		
14. State understanding that this VNS training does not permit them to administer medications.		

Trainee name: _____ Date: _____

_____ Instructor initials Instructor Name _____

Comments:

Individual Specific Training Form for

Use of VNS with: (Individual's Name) _____

<input type="checkbox"/>	1.	Review Instruction Manual
<input type="checkbox"/>	2.	Individual's Seizures
		◀ Typical frequency _____ ▶ Typical duration _____
		◀ What it looks like _____
		◀ Known triggers / auras _____
<input type="checkbox"/>	3.	Magnet location _____
<input type="checkbox"/>	4.	Where to document confirmation that magnet is available _____
<input type="checkbox"/>	5.	Location of person's implanted device _____
<input type="checkbox"/>	6.	Swipe magnet across pulse stimulator saying "one-one thousand-two" when _____ Wait _____ before repeating a swipe. Swipe up to _____ times, then _____
<input type="checkbox"/>	7.	Call 911 for seizures lasting longer than _____
<input type="checkbox"/>	8.	Where and how to document: _____
		◀ Time of seizure ▶ Length of seizure ▶ Number of Swipes
		◀ Description of seizure ▶ Other observations
<input type="checkbox"/>	9.	Other Special Instructions
		◀ How to check battery _____
		◀ How often to check battery _____
<input type="checkbox"/>	10.	Report any side effects or concerns to _____
<input type="checkbox"/>	11.	Things in the environment that may be affected by the magnet. _____
<input type="checkbox"/>	12.	Any other prescribed treatments for the person's seizure disorder. _____

IST provided by _____ to _____ on _____

IST provided by _____ to _____ on _____

IST provided by _____ to _____ on _____