


Discerning Seizures and Understanding VNS Therapy© Delia Nickolaus, CPNP-PC/AC

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Program Handouts

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Discerning Seizures and Understanding VNS Therapy


April 3, 2008

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Seizures



A sudden, episodic, involuntary alteration in consciousness, motor activity, behavior, sensation, or autonomic function due to abnormal neuronal discharges as evidenced by the EEG recording

A convulsion is an involuntary muscular contraction and relaxation; terms seizure and convulsions may be used synonymously


Abnormal neuronal discharges can be due to infections, lesions, pressure, chemical imbalances, and medications

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Types


- Partial: involves part of the brain
 - Simple: able to respond to the environment
 - Complex: unable to respond to the environment
- Generalized: involves the whole brain
 - Convulsive: motor movements (tonic, clonic, myoclonic)
 - Nonconvulsive: movement arrest (absence)
- Status Epilepticus: a prolonged seizure lasting more than 5 to 10 minutes or several successive seizures without recovery between them lasting more than 30 minutes
- Febrile: occur around the time of a fever
 - Typically with higher fever (>100.1 F or 37.8 C)

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Assessment (Immediate)


- Note Type of seizure by description
 - What body parts move
 - Quality of the movement (clonic, tonic, atonic)
 - Timing of the event (how long)
 - Level of consciousness and ability to respond
 - Whether or not incontinence is present
 - Triggers for the event
- Preictal symptoms (aura) or postictal symptoms (sleepiness, orientation to person, time, place, and coordination)

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Providing Care During a Seizure


- Remember your ABC's
- Never attempt to put anything into the mouth
- Maintain a Safe environment
 - Place on padded floor or a bed with padded side rails
 - Remove any objects that could cause injury
 - Place a pad under the head to prevent it from banging on the floor
- Do not restrain the child, but rather watch to be sure s/he doesn't get close to something where s/he could be hurt (steps, radiator, bed)
- Place on the side to prevent aspiration of secretions/emesis or blocking airway with the tongue
- Assist child to regain orientation after the seizure

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Many Common Anti-Epileptic Medication (Old-timers)

- Phenobarbital
 - Hypotension
 - Drowsiness
- Dilantin (phenytoin/fosphenytoin)
 - Gingival Hyperplasia
 - Rash
- Tegretol (carbamazepine)
 - Avoid grapefruit juice; increases bioavailability of drug
- Depakene (depakote, valproic acid)
 - Liver enzyme inducers
 - Interferes with other medications

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Seizures

Many Common Anti-Epileptic Medication (Newbies)

- Keppra (levetiracetam)
 - Behavior issues, especially if previous issues
- Lamictal (lamotrigine)
 - Rash if titrated up too quickly
- Neurontin (gabapentin)
 - Sedation
- Topamax (topiramate)
 - Cognitive issues
- Tripleptal (oxcarbazepine)
 - Electrolyte and liver concerns, similar to Tegretol
- Zonegran (zonisamide)
 - Anorexia

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Teaching Needs

- Compliance with medications
- Water safety
- Safety during a seizure
- When to call 911
- Long term health condition

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Alternative Treatments

- Ketogenic Diet
 - Diet high in fat, low in carbohydrates and protein to promote ketosis
- Surgery
 - Resection of seizure locus
 - Vagus Nerve Stimulator

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Vagus Nerve Stimulator (VNS)

What is it?

Consists of a pulse generator and vagus nerve leads



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Vagus Nerve Stimulator

How does it work?

- Don't really know exactly how it works
- Electrical impulses are generated at specific strengths and intervals
- It is thought that through these electrical impulses that the neurotransmitter levels are affected and therefore decrease the seizure activity
- It does take a while to see an effect
- Only about 50 % of patients with a VNS see results

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Vagus Nerve Stimulator

How do you use the VNS?

- Depending on the settings determined by their Neurology Provider, the device will send impulses every 1.1 to every 5 minutes (sometimes more frequently)
- The intensity of the impulse is programmed specifically for each patient
- These settings can only be changed by their Neurology Provider
- Additionally, a special magnet can be used to provide a stronger and longer impulse in the event of a seizure

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Vagus Nerve Stimulator



How is it programmed?

- A Neurology provider uses a special programming wand with a handheld computer to prescribe and program the appropriate settings transcutaneously

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Vagus Nerve Stimulator

What about the magnet for the VNS?

- Swiping a special VNS magnet over the pulse generator device will activate an impulse that is stronger and longer than usual impulses. The specifics of the setting are determined by the Neurology provider.



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Vagus Nerve Stimulator

When is the magnet used?

- The magnet is used when a person with a VNS has an aura of their seizure or at the beginning of their seizure
- It can be repeated every 2 minutes based on the recommendation of the Neurology provider
- Occasionally it may be used after a seizure to decrease the postictal time
- Maximum number of swipes is usually 5 times

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How is the magnet used?

- By swiping the magnet over the left shoulder area and counting "one one-thousand, two one-thousand, three one-thousand" (CHRM protocol)
- May repeat every 2 minutes until seizure stops or up to 5 times total
- May be helpful to palpate area and identify edges of pulse generator before swiping

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What does the magnet actually do?

- When the magnet is swiped over the device, it tells the pulse generator to deliver a stronger and longer pulse of current when the magnet is pulled away
- After the stronger and longer pulse, the device returns to normal functioning
- If the magnet does not come into contact with the device, it will not send a pulse
- If the magnet is over the device greater than 65 seconds and then taken away, the generator returns to normal functioning immediately
- While the magnet is over the device, all stimulation is suspended

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Vagus Nerve Stimulator

What do the VNS settings look like?

- Output Current = 2.0 mA
 - Signal Frequency = 30 Hz
 - Pulse Width = 500 microseconds
 - On Time = 30 seconds
 - Off Time = 5 minutes
- Magnet Settings**
- Output Current = 2.25 mA
 - Pulse Width = 500 microseconds
 - On Time = 60 seconds

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VNS Precautions

- MRI
- Surgery with electrocautery
- Diathermy: therapeutic ultrasound

Magnet Precautions

- Credit Cards
- Cell phones
- Computers



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Where can I find more information?

The Cyberonics website has a patient handbook that can be printed out or just read online

www.vnstherapy.com

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Questions?



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