Vagus Nerve Stimulation

Background

Vagus nerve stimulation (VNS) or VNS therapy, helps prevent or reduce seizures by sending regular, mild electrical impulses to the brain via the vagus nerve. VNS has been approved for children at who are at least 4 years old, have focal (partial) epilepsy, or have refractory or drug-resistant epilepsy. It's not clear exactly how VNS works to aid in seizure control, but it is thought to improve blood flow to the brain and alter the brain's electrical pattern that occurs during a seizure.

The VNS, known as pulse generator, is an implantable device placed under the skin in the chest and connected to thin wires that are threaded around the vagus nerve in the neck. The VNS can be programmed to deliver electrical impulses along the vagus nerve to the brainstem and certain areas of the brain.

The licensed healthcare provider will set a certain pulse frequency strength (Hertz), for a certain length of time (seconds), and on a specific on/off cycle (seconds-minutes) per individual need. Additionally, a magnet mode setting allows a special hand-held magnet to be swiped across the device in the left chest to stop or shorten the duration of a seizure. In certain VNS models, an increase in heart rate prior to the start of a seizure can also trigger an additional burst of stimulation to stop a seizure known as an auto stimulation setting. Side effects can include hoarseness, difficulty swallowing, throat pain, and neck discomfort with the electrical stimulation.

The device will not have specific notification alarms to signal a problem so changes in seizure activity or patterns must be reported. The device will require a battery replacement, usually about every three years. The device model should also be referenced for safety information including environmental hazards. Other devices with strong electromagnetic fields (e.g., tablet computers and their covers, loudspeakers) can potentially disrupt the VNS and may need to be kept a certain distance from the chest. Storage and magnet safety may also need to be considered specific to device brand/model.

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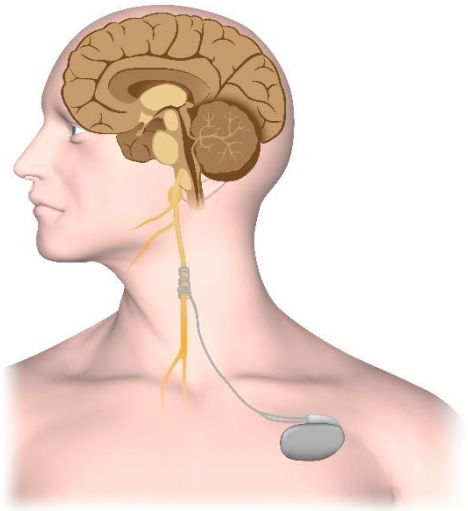

Top Takeaways for School

Vagus nerve stimulation (VNS) is sometimes referred to as the "pacemaker for the brain" and can be used as an additional treatment for individuals whose seizures are not well-controlled with medication.

The goal of VNS is to reduce the number, length and severity of seizures. VNS may also improve the post-seizure recovery period, memory, and mood.

The VNS should be included on the student's seizure action plan when applicable.

The specialty magnet can be used by the individual or trained caregiver. It can be worn as a watch or on a belt.

Any implanted medical device may require activity or environmental precautions or restrictions. Refer to the manufacturer or specific device manual for safety considerations (e.g., SenTiva™ Model, AspireSR® Model).

Considerations for the Individualized Healthcare Plan (IHP)

- Nursing diagnoses: Risk of ineffective airway clearance, impaired swallowing, and risk for injury
- Student-specific triggers, avoidance, or intervention strategies
- Assessment of implanted medical device (consider location, date of surgical placement, and device-specific information)
- Use of specialized equipment, adaptive equipment, orthotics
- Activity and positioning precautions and/or restrictions
- Equipment troubleshooting (consider equipment/device user manual, battery, charger)
- Consider emergency action plans (EAPs) and emergency evacuation plans (EEPs) related to special health care needs, including staff education/training

Discussion Starters for the Educational Team

1. Would the student benefit from evaluations or assessments in any of the following areas: physical therapy, occupational therapy, speech and language therapy, assistive technology, adapted physical education, functional behavior, psychology, hearing and vision?
2. Would the student benefit from additional academic support and/or modified education (e.g., copies of notes, extra time, reduced workload, simplified instructions, alternative formats for presentation of material, 504/IEP)?
3. Does the student need additional adult support to access the academic curriculum in the least restrictive environment?
4. Does the student require activity precautions to prevent injury?
5. Does the classroom environment support the student's needs and/or equipment (e.g., desk/seating options, maneuverability space, electrical outlets, flash pass for bathroom or nurse)?
6. Will staff receive education/training to implement the student-specific emergency plan?

Resources

Kennedy Krieger Institute: Neurology and Neurogenetics Clinic
https://www.kennedykrieger.org/patient-care/centers-and-programs/neurology-and-neurogenetics-clinics

Epilepsy Foundation– VNS
epilepsy.com/treatment/devices/vagus-nerve-stimulation-therapy

For more information, please scan the QR code or visit: KennedyKrieger.org/SHNIC

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