LOS ANGELES UNIFIED SCHOOL DISTRICT
Office of the Chief Medical Director
District Nursing Services

# Vagus Nerve Stimulation (VNS)

## I. GENERAL GUIDELINES

### A. PURPOSE

1. To stop a seizure completely.
2. To reduce the frequency and/or intensity of seizures.
3. To lessen the postictal (period after seizure) recovery time.

### B. GENERAL INFORMATION

1. Vagus Nerve Stimulation is a non-drug treatment for epilepsy that utilizes the vagus nerve to send signals to the brain. The vagus nerve travels from the brainstem, down the neck, into the chest and abdomen to influence the activity in many organs. When a student has a VNS device, small electrical signals are sent from the device to the vagus nerve and travel up to the brain.
2. Vagus Nerve Stimulator (VNS) is a battery-operated device, similar in size to a pacemaker that is implanted underneath the skin in the left upper quadrant of the chest just below the clavicle.
3. The Licensed Healthcare Provider programs the settings of the device to stimulate or deliver the signals at periodic intervals based on the student's specific needs.
4. A hand-held magnet is used to activate the device. As the magnet is swiped over the device, the VNS turns "on" and delivers a stimulus. It may also be used to interrupt the stimulation to the vagus nerve.
5. There are two different techniques to activate the device: the diagonal swipe and the "paintbrush" technique.
6. The magnet may be used over clothing.
7. Common side effects include: change in voice quality (hoarseness or deepening), throat discomfort or tickle, feelings of shortness of breath and cough and change in swallowing. The side effects typically occur only during the stimulation cycle.
8. If the student experiences side effects related to VNS, deactivate the VNS. Call paramedics; notify the Licensed Healthcare Provider and the parent.

### C. PERSONNEL

1. School nurse or school physician
2. Designated school personnel under the direct or indirect supervision of the school nurse

### D. EQUIPMENT

1. Parent provided:
   a) VNS magnet

II. PROCEDURE

| ESSENTIAL STEPS | KEY POINTS AND PRECAUTIONS |
|---|---|
| 1. Observe student for seizure activity. | Provide first aid measures. |
| 2. Determine if VNS needs to be activated. | An extra burst of stimulation can be initiated using the magnet at the beginning of the seizure, during a seizure, or if the student has the sensation of an aura before a seizure. |
| 3. Explain procedure to the student. | Minimizes anxiety. |
| 4. Have magnet ready. | Magnet needs to be available at all times. It can be kept handy as a wrist pouch, waist pouch or in a book bag. |
| 5. Palpate the chest area where the VNS implant is located. | Ensures proper placement of the VNS magnet. |
| 6. Place the magnet in direct contact with the VNS implant. Magnet should be in direct contact with the skin or over light clothing. | Ensures proper placement of the magnet over the VNS implant. |
| 7. A. Swipe the magnet over the VNS implant from center chest to the left armpit for 1-3 seconds. (Count I, one thousand, 2 one thousand, 3 one thousand). **OR**<br>7. B. The magnet is swiped slowly over 3 seconds in a paintbrush technique of down and up from the left clavicle to the left armpit. | This will deliver an extra burst of stimulation which is stronger and lasts longer for 60 seconds. |
| 8. After 1-3 seconds have passed, remove the magnet from the VNS. | This causes the VNS to cycle on, thereby reducing length of seizure. |
| 9. You may swipe the magnet 2-3 times during a seizure. | Wait 60 seconds between each swipe. |
| 10. If the seizure stops, observe the student's response to the procedure, monitor for sleepiness or lethargy and allow to rest. | Other side effects: tingling in the neck and changes in voice, breathing and swallowing. Notify parent and school nurse for any unusual occurrences with protocol. |

| ESSENTIAL STEPS | KEY POINTS AND PRECAUTIONS |
|---|---|
| 11. In the event that the student experiences severe pain or unusual side effects in voice quality or cough, deactivate the VNS impulse either by:<br>**a.** Holding the magnet over the VNS implant for at least 60 seconds. **OR**<br>b. Taping the magnet securely on the chest over the VNS implant. | 1. This will temporarily turn off the stimulation.<br>2. The device will turn off until the magnet is removed. |
| 12. If student exhibits seizure activity with loss of consciousness lasting 5 minutes or longer OR the student becomes cyanotic or stops breathing…CALL 911 IMMEDIATELY. | Stay with the student and designate a staff person to call 911. |
| 13. Stay with the student until paramedics arrive and maintain an open airway. Administer CPR as necessary. | |
| 14. Document procedure including student's response in Welligent. | Indicate reason for procedure, date and time. Report any unusual observations to the school nurse and parent. |

APPROVED: March 1, 2019
Date

Rosina Franco, MD
Senior Physician, Student Medical Services

Ron Tanimura, Ed.D
Director, Student Medical Services

Sosse Bedrossian, MSN, MA, RN, FNP
Director, District Nursing Services

**REFERENCES:**


*Silkworth,C., Arnold, M., Harrigan, J., Shipley Zaiger,D. (2005). Individualized Healthcare Plans for the School Nurse. 827-839. Sunrise River Press, North Branch, MN55056 USA.*

*California School Nurses Organization. The Green Book: California Guidelines for Specialized Physical Healthcare Procedures in School Settings, Section 3. Page 4-10. 2nd Edition (4/11). Sacramento, CA.*

*Medical University of South Carolina Patient Handbook. Information on the Vagus Nerve Stimulator (VNS) for Schools. http://www.muschealth.com/epilepsy accessed September 15, 2014.*

*Childrens Hospital of Los Angeles. Division of Neurology. Vagus Nerve Stimulation (VNS). www.ChildrensHospitalLA.org.*

*Kaiser Permanente Los Angeles Medical Center. Neurology Department. Vagus Nerve Stimulator (VNS) Patient Guide. Los Angeles, CA.*

*Cyberonics. USA. VNS Therapy for Epilepsy. www.cyberonics accessed October 19, 2014*