

# **Seizure and Vagus Nerve Stimulation**

## **Basic Facts When Someone is having a Seizure**

- Make sure clothing is loose around person's neck
- Do not try to restrain person during a seizure, as this may cause injury
- Make room for person having seizure, remove harmful/sharp objects from around the person (to avoid injury)
- May lay the person on their side to keep airway open (prevent inhalation of oral secretions)
- Remain with person after seizure (until stable), as they may experience confusion for a time after episode
- Notify EMS: If this is the first time person has had a seizure; if the seizure lasts longer than 5 minutes (if not normal duration for person); if another seizure takes place immediately following initial one (if abnormal for person); if the person will not awaken after seizure activity has stopped; (basically, if you are afraid that something else may be wrong or if other medical condition exists that causes concern, also notify emergency personnel immediately)

## **Definition of Vagus Nerve Stimulation/Background Info**

- Procedure used to treat epilepsy/decrease seizure activity; consists of implantation of device (similar to pacemaker) which generates electricity to stimulate the vagus nerve
- The vagus nerve is a cranial nerve (one of twelve; is the longest and extends to chest/abdomen organs) which sends information to and from the brain and has both motor and sensory functions (motor functions include muscle control while sensory function pertains to taking info like touch or sight to the brain)
- Placement of the device is done surgically, while patient is under general anesthesia; device is about the size of a 50 cent piece and is placed under the skin in the upper portion of the chest area
- A small incision is made to the neck and a connecting wire is also placed under the skin from the stimulator device to an electrode connected to the vagus nerve
- After placement, the stimulator is computer programmed to produce electric pulses on a regular basis (example: may stimulate nerve for 15 seconds every 10 minutes); the settings can be changed and as patient adjusts and is able to tolerate, the electric current is slowly increased
- The patient goes to the doctor for reprogramming
- A magnet is given to the patient which can produce an instant electric current when moved near the stimulator that can either cause seizure activity to stop or decrease the severity

## **When VNS can be used**

- Anti-convulsant/anti-seizure drugs and surgical removal of a portion of the brain (which causes seizures) are also treatment options; meds may not be effective for some individuals and surgery may not be an option
- Individuals who undergo VNS treatment continue to take their medications but often the dose may be decreased

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## **Theories of how VNS works**

- Although unsure, it is believed that when the vagus nerve is stimulated, electrical impulses travel to the brain which interrupts the abnormal brain activity that precipitates seizures
- Another belief is that when VNS occurs, this causes certain chemicals within the brain to be released and decrease the seizure activity

## **Risks involved**

- Vagus nerve itself or blood vessels may be damaged/injured
- General risks resulting from surgery (i.e., infection, excessive bleeding, and/or reaction to anesthesia)

## **Benefits**

- Decrease in the amount/severity of seizures (which helps improve overall quality of life for patient)

## **Possible side effects**

- Hoarse, cough, tingling in neck, swallowing difficulty which all tend to occur during actual stimulation and are usually mild and cease over time