Clinical Guidance

Care of a child admitted to hospital with a Vagus Nerve Stimulator (VNS)

Summary

This guideline highlights how to manage VNS device when a child is admitted to ELCH, especially for a surgical procedure.

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Change History		
Date	Change details, since approval	Approved by
January 2019	Device upgrade to SenTiva 106SR model from August 2018 which can be programmed with parameters to detect a rise in heart rate associated with a seizure and deliver automatic stimulation; can be programmed remotely to minimise patient visits. There is no change in how to manage, switch on / off the device, when a child is admitted to hospital for an unrelated procedure. Manufacturer name has changed from Cybernonics to Livanova.	ELCGC chair

Care of Child admitted to hospital with a Vagus Nerve Stimulator (VNS)

What is Vagus Nerve Stimulation Therapy?
Vagus Nerve Stimulation Therapy (VNS) is a treatment for seizure disorders that are not controlled by medication alone; it can be used alongside medication to help improve seizure control.
VNS therapy delivers stimulation to the left vagus nerve via a device implanted just under the skin in the left chest area. The 'pace-maker' like device sends mild, intermittent, electrical impulses through a lead to the left vagus nerve, which then sends signals to the brain.
Each device is programmed for the individual patients and the patient or care giver has the ability to initiate or abort stimulation with the use of a hand held magnet.

The VNS Magnets, Information booklet and ID cards.

The patient has 2 magnets and parents are aware they should bring the magnets with them if the child is to be admitted to hospital. A spare magnet set is kept in the sister's office on Savannah ward. These are expensive and difficult to procure, so please return it immediately once it is no longer required. (They are in a white box with VNS Therapy® Patient Essentials written on the box).

The magnet should not be placed near mobile phones, credit cards, televisions, computers, computer disks, microwave ovens and other magnets. Keep at least 25cms (10 inches) away from these items.
The magnet may often be recommended to be used as a first step in the child's emergency seizure protocol. Swiping the magnet over the VNS generator will trigger the VNS to deliver a stimulation at the programmed magnet settings. For some, this extra stimulation may stop, shorten, reduce severity or improve recovery time from the seizure, and may reduce the need for emergency medication such as Midazolam.

From August 2018 all new or replacement devices will be the SenTiva 106SR model. This device can be programmed with parameters to detect a rise in heart rate associated with a seizure and can then deliver automatic stimulation. It is also possible to remotely programme the device to minimise patient visits to the hospital. There is no difference in how to manage, switch on or off the device.

Should the device need re-programming, contact the Paediatric Epilepsy Team at either ELCH or Kings College Hospital. If unavailable please contact Livanova.

External defibrillation may damage the pulse generator. Livanova recommends using the lowest amount of appropriate energy during each defibrillation and placing defibrillator paddles as far removed from the generator and implanted lead as possible.

General Anaesthetic

The VNS device does not routinely need to be switched off during General Anaesthetic
Should the child/family/caregiver or surgeon have a preference that the device is switched off for a procedure, this can be done by placing the VNS magnet on top of the generator situated on the left side of the chest. The magnet should then be secured firmly in place with plaster/tape. The VNS device will remain switched off until the magnet is removed and it will then automatically commence stimulating again.
Paediatric Neurosciences

MRI (Magnetic Resonance Imaging)
This should not be carried out at ECH at this time.
MRI may only be performed in a scanner with a 'transmit and receive head coil'. At the present time this is not available at ELCH and patients requiring MRI scans should have these performed at King's College Hospital.

Surgical Considerations
Diathermy
Shortwave, microwave or therapeutic ultrasound diathermy should not be used. Diathermy of any type poses a real risk of damage to the VNS and should therefore be avoided.
Electro surgery (Electrocautery or radio frequency (RF) ablation devices) may damage the VNS device. The manufacturer, Livanova recommends the following precautions:

- Position the electrosurgery electrodes as far as possible from the pulse generator and lead.
- Avoid electrode placement that puts the pulse generator or lead in the direct path of current flow or within the part of the body being treated.
- Confirm that the pulse generator functions as programmed after electro surgery.

Extracorporeal shockwave Lithotripsy may damage the pulse generator. Avoid positioning the generator in the water bath or any other position that would expose it to ultrasound therapy. If the generator must be submerged in water for the treatment, program it to 0mA before the treatment. After the treatment reprogram it to original settings.

Ultrasound
Diagnostic Ultrasound is not expected to affect the VNS therapy system.
Therapeutic Ultrasound could damage the pulse generator and may be inadvertently concentrated by the device, causing harm to the patient and therefore would not be recommended without first speaking with the manufacturer (Livanova)

Other considerations

Most routine diagnostic procedures, for example x-ray and fluoroscopy should not affect the system operation.
The pulse generator may affect the operation of other implanted devices, such as cardiac pacemakers and implantable defibrillators.
Strong electric or magnetic fields may affect the Pulse Generator.

The patient/family has a copy of the patient information booklet which includes information concerning medical devices and any potential problems. A spare copy of this is also available with the spare magnet on Savannah ward.

References
LivaNova Belgium NV www.VNSTherapy.com tel: 0032 2 720 9593
LivaNova Territory Manager 07741320560
For all safety information please visit www.VNSTherapy.com

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