Portable neuromodulation stimulator for traumatic brain injury

TIMEFRAME: Estimated earliest commercial availability in the UK

| Currently unclear | Now | 6 months | 1 year | 18 months | 2 years | Over 2 years |

TECHNOLOGY

The Portable Neuromodulation Stimulator or PoNS™, developed by Helius Medical Technologies, is a non-invasive device that is designed to deliver neurostimulation through the tongue to treat balance disorders caused by mild to moderate Traumatic Brain Injury (mTBI).

The device is intended to be used as part of targeted functional therapy called Cranial Nerve Non-Invasive Neuromodulation (CN-NINM) in combination with rehabilitation.

The PoNS™ is placed on the tongue, where it painlessly stimulates the tongue with electrical pulses. Stimulation of the trigeminal and facial nerves from the tongue delivers electrical signals directly into the brain stem and from there to the rest of the brain. The electrical stimulation is combined with physical, occupational, relaxation and cognitive exercises, based on the patient's needs. For example, the patient may be instructed to run on a treadmill or stand on one leg for a period of time whilst undergoing the stimulation.

The PoNS™ device has been shown to induce cranial nerve neuromodulation when combined with physical, cognitive or occupational therapy programs.

The timeframe for UK launch of the PoNS™ for mTBI is anticipated in early 2018.

POTENTIAL FOR IMPACT

TBI is an injury to the brain caused by a trauma to the head. There are many underlying causes of TBI, including road traffic accidents and falls. The effect of a TBI on an individual depends on a number of factors including the type, location and severity of injury. Symptoms can be wide-ranging, from physical effects such as balance problems, headaches and dizziness to cognitive, emotional and behavioural effects such as memory problems and...
problems with emotional control. Rehabilitation is a key component of care for many people with TBI and aims to improve and maintain function.

Unlike most other cells in the body, brain cells do not regenerate when they are destroyed. However, this does not mean that no recovery can occur. To an extent the brain is able to reorganise itself and regain lost function (known as brain 'plasticity' or ‘neuroplasticity’). During reorganisation other areas of the brain can take over some or all the activities of the damaged areas and/or new nerve pathways can be established using undamaged brain cells. Neurorrogulation through nerve stimulation and the engagement in activity are thought to enhance the development of these alternative pathways.

The PoNS™ device is the first non-invasive device designed to deliver neurostimulation through the tongue in combination with rehabilitation to improve balance disorders caused by mTBI as well as the effects of other neurological conditions such as multiple sclerosis. The use of PoNS™ in combination with physical, occupational, relaxation and cognitive exercises tailored to the specific needs of the patient may improve both the patient’s quality of life, and physical and cognitive abilities.

This technology is predicted to have an impact on the following domains of the NHS Outcomes Framework


Domain 2  Enhancing quality of life for people with long-term conditions;
Domain 3  Helping people to recover from episodes of ill health or following injury.

EVIDENCE

RELEVANT PUBLISHED PAPERS


Lay summary

The *Portable Neuromodulation Stimulator (PoNS™)* is a new device to treat balance and other physical problems caused by brain injury. The stimulator is used in combination with physiotherapy and occupational therapy. The device is placed in a patient’s mouth and sends painless electrical pulses from the tongue through to the brain. It is designed to help the brain recover from damage caused by an injury to the head. It is thought that using the device with specific exercises will improve the patient’s balance and their quality of life.