Portable neuromodulation stimulator for multiple sclerosis

TIMEFRAME: Estimated earliest commercial availability in the UK

<table>
<thead>
<tr>
<th>Currently</th>
<th>Now</th>
<th>6 months</th>
<th>1 year</th>
<th>18 months</th>
<th>2 years</th>
<th>Over 2 years</th>
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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 improve balance and gait in patients with advanced multiple sclerosis (MS).

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 MS is confidential at present.

POTENTIAL FOR IMPACT

Multiple sclerosis (MS) is a condition of the central nervous system (the brain and spinal cord) where the coating around nerve fibres (myelin) is damaged. This disrupts or blocks messages travelling along nerve fibres. MS can cause a range of symptoms including problems with vision, arm or leg movement or balance and co-ordination. MS a lifelong condition and can cause serious disability and premature death. There is currently no cure.
for MS, but drugs can help to control symptoms and slow progression of the disease. Rehabilitation is a key component of care for people with MS and aims to improve and maintain function.

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. Neuromodulation 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 the balance, postural stability and gait in patients with advanced MS. 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 patients’ 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

PUBLISHED PAPERS AND ABSTRACTS


RELEVANT PAPERS

http://proceedings.spiedigitallibrary.org/proceeding.aspx?articleid=1880676

http://www.scirp.org/journal/PaperInformation.aspx?PaperID=43482#.VDWgBWSwKhg
The Portable Neuromodulation Stimulator (PoNS™) is a new device to treat balance and other physical problems caused by multiple sclerosis (MS). The stimulator is used in combination with physiotherapy and occupational therapy. MS is a condition where cells in the brain and spine are damaged or destroyed. This damage stops nerve cells from passing messages on to other parts of the body, such as muscles. This new 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 MS. It is thought that using the device with specific exercises will improve the patient’s balance and walking and their quality of life.