Introducing PoNS™ (Portable Neuromodulation Stimulator)

PoNS Treatment™:

Restoring balance and gait through noninvasive neuromodulation[1-4]

The PoNS™ device is intended for use as an acute treatment of chronic balance deficit due to mild-to-moderate traumatic brain injury (mmTBI), and is to be used in conjunction with physical therapy (PT). The device is limited to prescription use.

Contraindications

The PoNS™ device delivers electrical stimulation directly to the surface of the tongue. Precautions for use are similar to those for transcutaneous electrical nerve stimulation (TENS). Electrical stimulation SHOULD NOT be used: if there is an active or suspected malignant tumor, in areas of recent bleeding or open wounds, or in areas that lack normal sensation. PoNS™ has not been tested on, and thus should not be used by, individuals under the age of 18 or who are pregnant. PoNS™ should not be used in patients sensitive to nickel, gold, or copper.

PoNS™ is an authorized medical device and commercially available in Canada.
PoNS™ is an investigational device under review for EU clearance by an EU notified body and by TGA in Australia; PoNS™ is not commercially available in the US, EU, or Australia.

Helius MEDICAL

PoNS™
HEALING IN MIND

In patients who have experienced an mmTBI

Chronic balance deficit is prevalent[5-8]

people in Canada are living with chronic balance deficit after an mmTBI[5-7]

new cases of chronic balance deficit from mmTBI are reported annually in Canada[6-8]

Rehabilitation therapy (physical therapy, occupational therapy, and vestibular therapy) is the current standard of care.[9]

However,
10%-40%

of patients plateau or lose functions gained from rehabilitation therapy[7,9-11]

In patients who have experienced an mmTBI

The moment of impact can have a lasting effect[9,11,12]

Chronic balance deficit often has a significant negative impact on functional status, capacity to return to work, and quality of life

Dizziness/ coordination[11]

Difficulty walking[11]

Trouble climbing stairs[11]

Difficulty completing everyday tasks[11]

High risk of falling[12]

When symptoms persist, evidence indicates that neurostimulation combined with physical therapy can potentially affect rehabilitation outcomes[9,13]

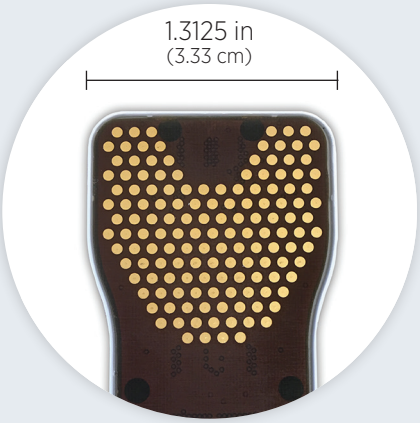
Visit **www.ponstreatment.ca** for more information.

PoNS™
HEALING IN MIND

PoNS Treatment™ provides an innovative and effective therapy[1]

The Treatment pairs the PoNS™ device with specific physical exercises

- The device is portable and simple to use, with software to capture patient adherence
- During each 20-minute session, the patient places a paddle-shaped mouthpiece on the tongue and wears a controller around the neck. Patients feel a mild sensation while using the device
- Patients have complete control over the intensity throughout the training
- PoNS Treatment™ is conducted by PoNS™ Trainers—rehabilitation therapists who complete specialized training through a certification course



Actual size

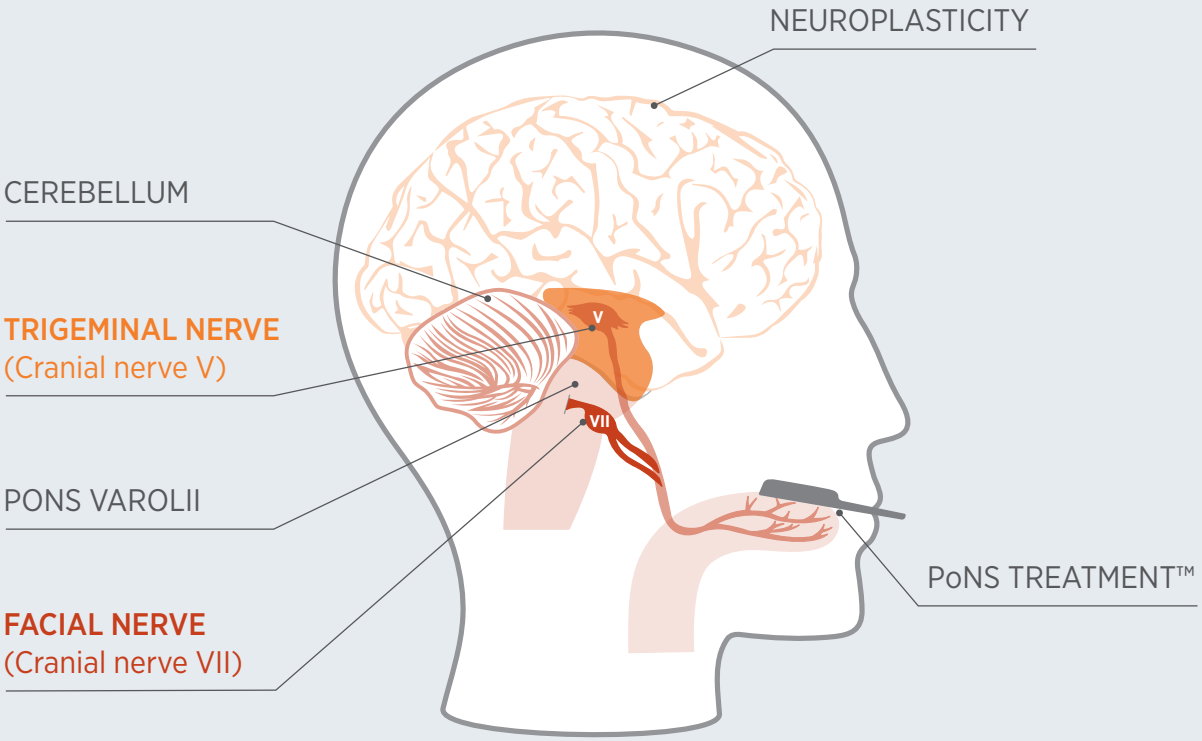
Warnings

The intensity should only be adjusted while the Mouthpiece is on the tongue. The patient should be the one who adjusts the intensity level. In case the patient needs assistance in pressing the buttons on the Controller, the person assisting should use care to adjust the intensity by small increments. Check with the patient each time you press the INTENSITY UP/DOWN buttons, before pressing them again.

PoNS Treatment™ is believed to promote neuroplasticity[14,15]

How it works

- PoNS Treatment™ combines mild stimulation of the tongue with targeted training[1]
- Translingual stimulation of the trigeminal and facial nerves initiates a cascade of neural activity, resulting in neuromodulation[14,15]
- Multiple sequential training sessions lead to reduction of symptoms[1,14,15]
- The combination of stimulation with targeted training may enhance the neuroplastic effect, which results in functional improvements in balance and gait[14]



PoNS™ is for use by a single individual and must not be shared.

Visit **www.ponstreatment.ca** for more information.

PoNS™
HEALING IN MIND

In patients with chronic balance deficit due to mmTBI

PoNS™ was studied in conjunction with targeted physical therapy in 2 clinical trials involving 163 patients[2,3]

TBI-001 TRIAL

A 5-week, multisite study in 120 patients

Long-Term Treatment TRIAL

A 26-week, single-site study in 43 patients

Both trials used the same criteria to enroll a challenging patient population, defined as:

Were
≥1 year
post-injury

Deemed to have
plateaued
with previous PT

Sensory Organization Test (SOT)
≥16 points
below normal
(composite score)

Use with caution

Electrical stimulation should only be used after seeking professional medical advice, and with caution in patients with any of the following:

- *Implanted electronic devices, including: cardiac pacemakers, cardioverter defibrillators, deep brain stimulators, vagal nerve stimulators, sacral nerve stimulators, and cochlear implants*
- *Metal in the mouth (e.g. piercings, braces, retainers, or other orthodontic appliance)*
- *Seizure disorders*
- *Epilepsy*

Additional criteria[2,3]

- Patient inclusion criteria: age 18-65; balance disorder as a result of mmTBI*; ≥1 year since their TBI; deemed by themselves or their HCP to have plateaued in recovery with their PT program; SOT composite scores ≥16 points below normal after adjustment for their age and height
- Patient exclusion criteria: history of TBI due to disorders unrelated to TBI; penetrating injury, craniotomy, or subdural hematoma; oral health problems or history of oral cancer; other causes for balance disorder

Both trials had a high-frequency pulse (HFP) and low-frequency pulse (LFP) stimulation arm, in conjunction with PT[2,3]

- The HFP device is commercially available in Canada

SOT endpoint was measured by NeuroCom® SOT composite score. SOT is a validated, objective measure of balance[16,17]

- SOT measures and evaluates somatosensory, visual, and vestibular components of balance. A composite score is then calculated and compared with a database that takes age and height into account
- SOT scores range from 0-100, with ≥70 considered normal
- A change of 8-10 points is considered clinically meaningful[18]

*Defined as mild to moderate by the Armed Forces Health Surveillance Branch.

In patients with chronic balance deficit due to mmTBI

TBI-001 Trial: A 5-week, multicenter study in 120 patients[2]

There were 2 consecutive stages: in-clinic treatment and at-home treatment

2 weeks
IN CLINIC
(with PoNS Treatment™)

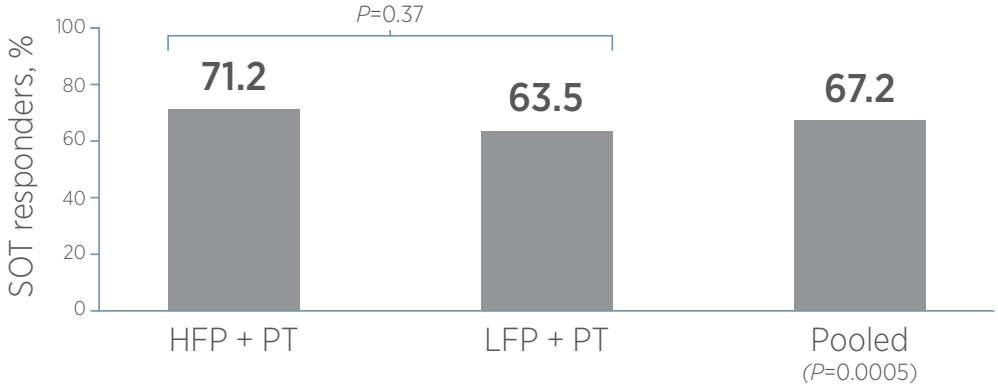
3 weeks
AT HOME
(with PoNS Treatment™)

- Performed at 7 centers in the US and Canada
- On average, patients were 5.7 years post-injury and completed 8.8 months of prior PT
- Baseline SOT score was 41.6

The primary endpoint was percentage of responders after 5 weeks of training[2,19]

- There was no statistical difference between the groups with regard to percentage of responders, as with many trials comparing HFP vs LFP stimulation
- The statistical analysis plan accounted for this possibility and specified combining the groups if this occurred

At 5 weeks, the pooled analysis showed a significant 67.2% of patients responding to treatment[19,20]



- ≥15 points=definition of responder in this study
- 8-10 points=clinically meaningful change[18]

Secondary endpoints[2]

- PoNS Treatment™ also demonstrated statistically significant improvements in SOT change from baseline, Dynamic Gait Index scores, and the 6-Minute Walk Test from baseline to Week 2 and Week 5

Important Information

Please see page 13 for TBI-001 Trial safety information.

In patients with chronic balance deficit due to mmTBI

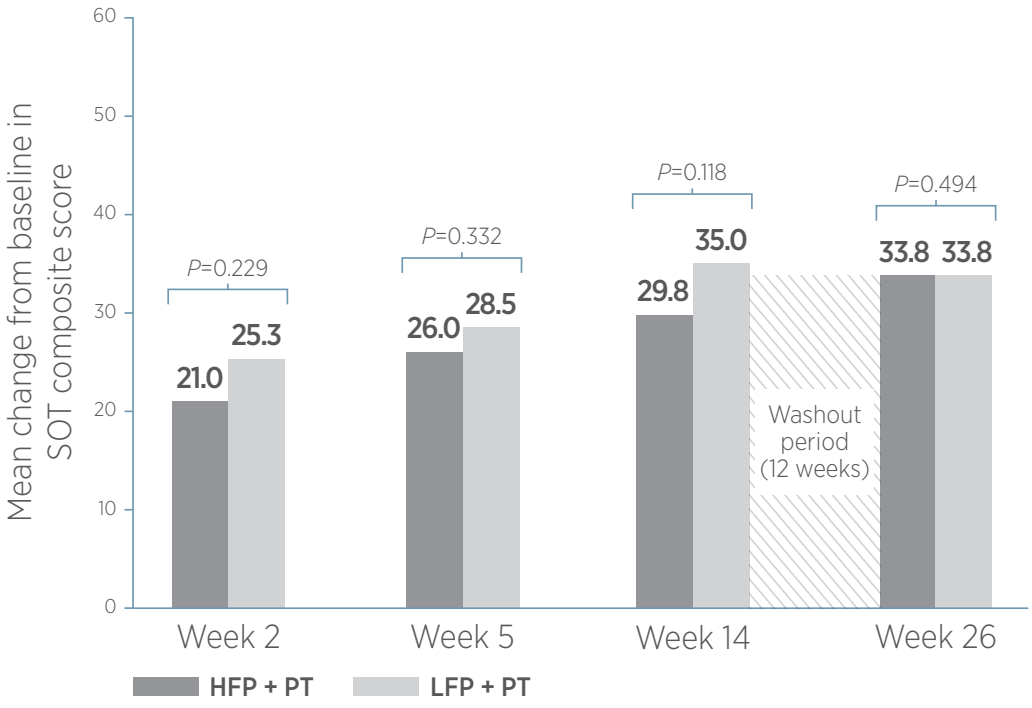
Long-Term Treatment Trial: A 26-week study in 43 patients[3]

There were 3 consecutive stages: in-clinic treatment, at-home treatment, and a follow-up without treatment

2 weeks	12 weeks	12 weeks
IN CLINIC	**AT HOME**	**FOLLOW-UP**
(with PoNS Treatment™)	(with PoNS Treatment™)	(without PoNS Treatment™)

- On average, patients were 6.5 years post-injury and completed 5.4 months of prior PT
- Baseline SOT score was 39.6

The primary endpoint was change in SOT composite score from baseline to Week 14[3,9,10]



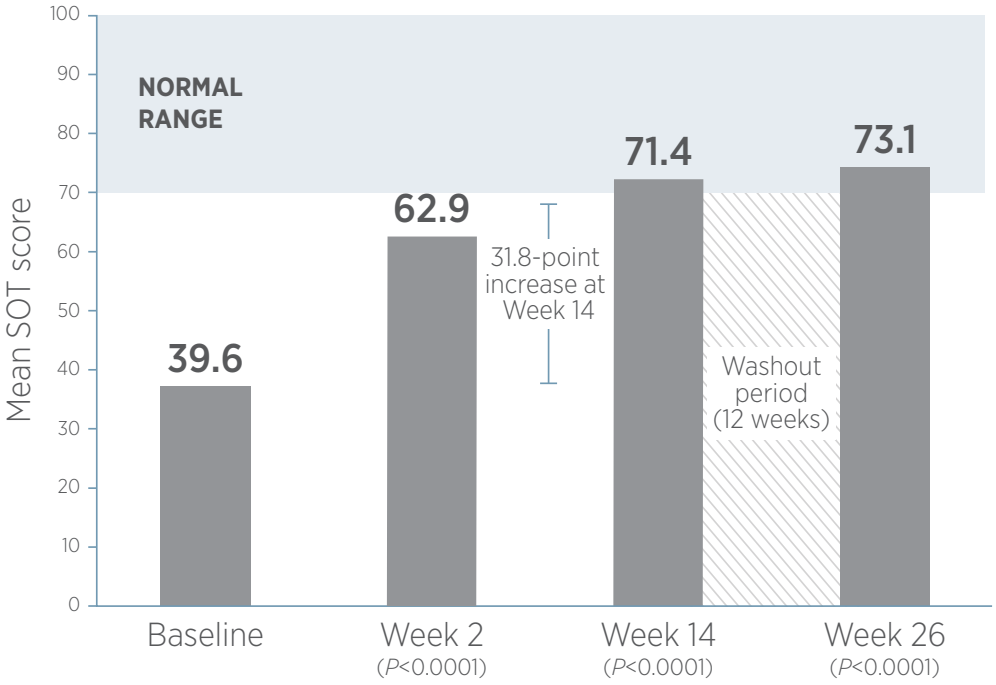
SIGNIFICANT IMPROVEMENTS
in SOT score from baseline to each timepoint for both treatment groups
(P<0.0001)

- There was no statistical difference between the HFP and LFP stimulation groups

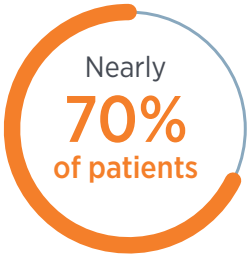
Results from a *post hoc* analysis combining both arms in the Long-Term Treatment Trial

PoNS Treatment™ significantly improved patients' SOT balance scores[4]

At Week 14, SOT composite scores improved by 31.8—more than 3x the results shown in studies using conventional physical therapy



IMPROVEMENTS PERSISTED for at least **12 WEEKS** after the treatment period (Weeks 14-26)



responded at Week 14 (*P*<0.0001)

- ≥15 points=definition of responder in this study
- 8-10 points=clinically meaningful change[18]

Important Information

Please see page 13 for Long-Term Treatment Trial safety information.

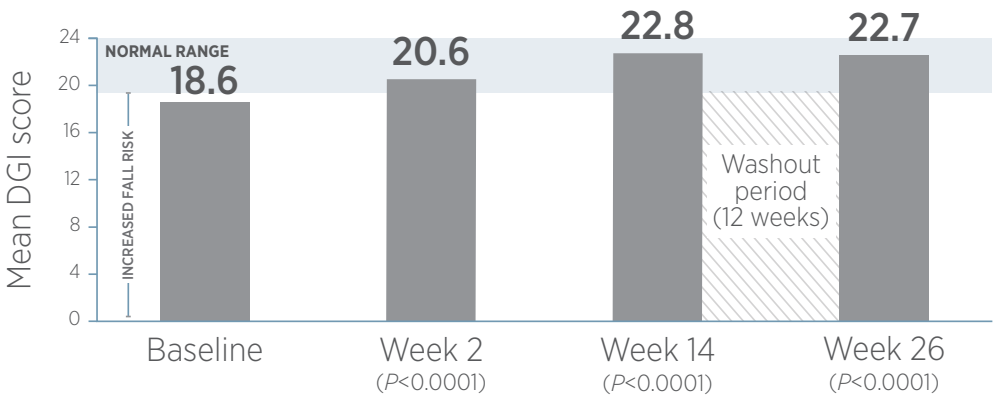
Results from a *post hoc* analysis combining both arms in the Long-Term Treatment Trial

PoNS Treatment™ also demonstrated significant improvements in gait[4]

Secondary endpoints

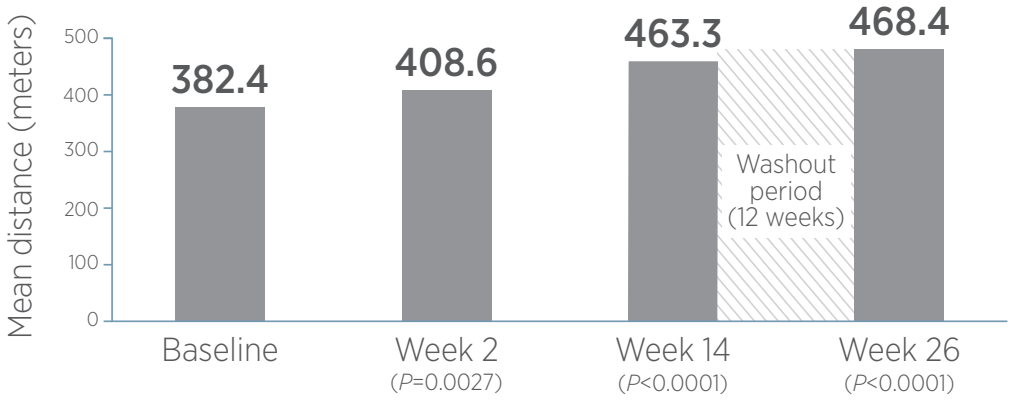
Dynamic Gait Index (DGI) – Assesses gait, balance, and fall risk during walking when presented with challenging obstacles

- 3 points is considered a clinically meaningful change[21]



A higher DGI score indicates a lower fall risk

6-Minute Walk Test (6MWT) – Measures walking speed



Noninvasive PoNS Treatment™ was shown to be well tolerated[2,3]

TBI-001 Trial[2]

- 22 device-related adverse events (AEs) were reported across 12 patients. The most common were burning sensation on the tongue (6), tongue tingling (4), sore tongue (3), and decrease in tongue sensation (2). All were mild
- 24 severe treatment-related AEs were reported across 9 patients. The most common were nausea (5), vomiting episode (multiple) (5), worsening nausea (2), and fainting episode (2). None were deemed to be device-related

Long-Term Treatment Trial[3]

- 2 mild device-related AEs were reported across 2 patients (prickly sensation on tongue; numb sensation on tongue and food taste disturbance)
- There were no severe treatment-related AEs reported

Excess salivation during training sessions often occurs but generally improves as patients get used to wearing the mouthpiece.[3,19]

All safety endpoints were met with PoNS Treatment™ in clinical trials[9,19]

Getting patients back to the moments that matter most[10]

Daily PoNS Treatment™ schedule (6 days a week)

Morning session (In clinic for 2 weeks, at home for 12 weeks)	Warm-up exercises	10 min
	Balance training with PoNS™	20 min
	Gait training with PoNS™	20 min
	Breathing awareness training with PoNS™	20 min (for first 2 weeks)
BREAK		3 TO 4 HRS
Afternoon session (In clinic for 2 weeks, at home for 12 weeks)	Balance training with PoNS™	20 min
	Movement control exercises	20 min
	Gait training with PoNS™	20 min
Evening session (At home)	Breathing awareness training with PoNS™	20 min

- Home training (12 weeks) requires 1 weekly morning or afternoon session in the clinic

In the Long-Term Treatment Trial (26 weeks), almost all of the patients (91%) participating completed the 14-week PoNS Treatment™ [9]

Rx

Evaluate and treat with PoNS™ and PT

Call **833-613-1175** for support, device purchase or replacement, or payment questions.

Visit **www.ponstreatment.ca** for more information.

Restoring balance and gait through neuromodulation[1-4]

PoNS Treatment™ is the first noninvasive neuromodulation therapy of its kind[1]

An innovative and effective treatment for patients with chronic balance deficit due to mmTBI[3,4]

- Efficacy was shown in a challenging patient population: patients ≥1 year post-injury who were deemed to have plateaued in recovery with prior PT
- Nearly 70% of patients responded at Week 14 (≥15 points=definition of response; 8-10 points=clinically meaningful change)
- Improvements persisted for at least 12 weeks after the treatment period ended

Shown to be well tolerated in 2 clinical trials[2,3]

Important Information

Please see page 13 for clinical trial safety information.

PoNS™ is an investigational device under review for EU clearance by an EU notified body and by TGA in Australia; PoNS™ is not commercially available in the US, EU, or Australia.

References: 1. PoNS [instructions for use]. Newtown, PA: Helius Medical, Inc; October 2018. **2.** Helius Medical Technologies Data on File. TBI-001 Clinical Study Report. **3.** Helius Medical Technologies Data on File. UW Clinical Study Report. **4.** Helius Medical Technologies Data on File. UW post-hoc analysis. **5.** Brain Injury Canada. Acquired Brain Injury (ABI) - The Basics. https://www.braininjurycanada.ca/acquired-brain-injury/. Accessed March 18, 2019. **6.** Ma VY, Chan L, Carruthers KJ. Incidence, prevalence, costs, and impact on disability of common conditions requiring rehabilitation in the United States: stroke, spinal cord injury, traumatic brain injury, multiple sclerosis, osteoarthritis, rheumatoid arthritis, limb loss, and back pain. *Arch Phys Med Rehabil*. 2014;95(5):986-995.e1. **7.** Kleffelgard I, Roe C, Soberg HL, Bergland A. Associations among self-reported balance problems, post-concussion symptoms and performance-based tests: a longitudinal follow-up study. *Disabil Rehabil*. 2012;34(9):788-794. **8.** Helius Medical Technologies Data on File. Global Data. **9.** Helius Medical Technologies Data on File. Tyler et al. Manuscript in progress. **10.** Skinner K, Tyler M. Translingual noninvasive neuromodulation using the portable neuromodulation stimulator for treatment of chronic symptoms due to mild-to-moderate traumatic brain injury. Presented at the American Physical Therapy Association Combined Sections Meeting; January 23-26, 2019; Washington, DC. **11.** Centers for Disease Control and Prevention. *Report to Congress on Traumatic Brain Injury in the United States: Epidemiology and Rehabilitation*. National Center for Injury Prevention and Control; Division of Unintentional Injury Prevention. Atlanta, GA. 2015. http://www.cdc.gov/traumaticbraininjury/pdf/tbi_report_to_congress_epi_and_rehab-a.pdf. Accessed March 11, 2019. **12.** Peterson M, Greenwald BD. Balance problems after traumatic brain injury. *Arch Phys Med Rehabil*. 2015;96(2):379-380. **13.** Bolognini N, Pascual-Leone A, Fregni F. Using non-invasive brain stimulation to augment motor training-induced plasticity. *J Neuroeng Rehabil*. 2009;6:8. **14.** Danilov Y, Kaczmarek K, Skinner K, Tyler M. Cranial nerve noninvasive neuromodulation: new approach to neurorehabilitation. In: Kobeissy FH, ed. *Brain Neurotrauma: Molecular, Neuropsychological, and Rehabilitation Aspects*. Boca Raton, FL: CRC Press; 2015:605-630. **15.** Wildenberg JC, Tyler ME, Danilov YP, Kaczmarek KA, Meyer ME. High-resolution fMRI detects neuromodulation of individual brainstem nuclei by electrical tongue stimulation in balance-impaired individuals. *Neuroimage*. 2011;56(4):2129-2137. **16.** Balance Manager Systems Clinical Interpretation Guide: Computerized Dynamic Posturography. Clackamas, OR: NeuroCom International, Inc; 2008. **17.** Wrisley DM, Stephens MJ, Mosley S, Wojnowski A, Duffy J, Burkard R. Learning effects of repetitive administrations of the sensory organization test in healthy young adults. *Arch Phys Med Rehabil*. 2007;88(8):1049-1054. **18.** Broglio SP, Ferrara MS, Sopiarz K, Kelly MS. Reliable change of the sensory organization test. *Clin J Sport Med*. 2008;18(2):148-154. **19.** Helius Medical Technologies Data on File. TBI-001 Executive Summary. **20.** Papa L, Ptito A. Cranial nerve noninvasive neuromodulation through translingual stimulation with the portable neuromodulation stimulator for the treatment of chronic symptoms due to mild or moderate traumatic brain injury. Presented at the North American Neuromodulation Society Annual Meeting; January 17-20, 2019; Las Vegas, NV. **21.** Romero S, Bishop MD, Velozo CA, Light K. Minimum detectable change of the Berg Balance Scale and Dynamic Gait Index in older persons at risk for falling. *J Geriatr Phys Ther*. 2011;34(3):131-137.

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