

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT

Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): December 04, 2023



HELIUS MEDICAL TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of incorporation)

642 Newtown Yardley Road, Suite 100
Newtown, PA
(Address of principal executive offices)

001-38445
(Commission File Number)

36-4787690
(IRS Employer Identification No.)

18940
(Zip Code)

Registrant's telephone number, including area code: (215) 944-6100

N/A

(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Class A Common Stock, \$0.001 par value	HSDT	The Nasdaq Stock Market LLC

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§ 230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§ 240.12b-2 of this chapter).

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Item 7.01 Regulation FD Disclosure

On December 4, 2023, the Company posted an updated corporate presentation to its website at <https://ir.heliusmedical.com/>, which the Company may use from time to time in communications or conferences. A copy of the corporate presentation is attached as Exhibit 99.1 to this Current Report.

The information in this Current Report, including Exhibit 99.1 hereto, is furnished pursuant to Item 7.01 and shall not be deemed “filed” for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities of that Section, nor shall it be deemed incorporated by reference in any filing under the Securities Act or the Exchange Act, except as expressly set forth by specific reference in such a filing. The Company’s submission of this Current Report shall not be deemed an admission as to the materiality of any information required to be disclosed solely to satisfy the requirements of Regulation FD.

This Current Report and Exhibit 99.1 hereto contain forward-looking statements within the meaning of the federal securities laws. These forward-looking statements are based on current expectations and are not guarantees of future performance. Further, the forward-looking statements are subject to the limitations listed in Exhibit 99.1 and in the other reports of the Company filed with the Securities and Exchange Commission, including that actual events or results may differ materially from those in the forward-looking statements.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
99.1	Corporate Presentation, dated December 2023.
104	Cover Page Interactive Data File (embedded within Inline XBRL document).



Empowering Neuroplasticity
PoNS Therapy™ for Balance and Gait Deficits in Patients with
Neurological Disorders

December 2023

NASDAQ:HSDT

Legal Disclaimers

This presentation contains forward-looking statements, including statements regarding the Company's future strategic and operational execution, the success of the Company's PoNS device and related treatment, the next phase of the Company's market development activities, clinical and regulatory development plans for the PoNS device, future decisions and approvals from applicable regulatory entities in the U.S. and Canada, the pursuit of commercial and government reimbursement programs, and the success of the Company's continued commercialization efforts in the United States and Canada. These statements involve substantial known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make.

Risk Factors:

Factors that may cause actual results to differ materially from any future results expressed or implied by any forward looking statements uncertainties regarding the Company's capital requirements to achieve its business objectives, disruptions in the banking system and financial markets, lingering impacts, the impact of the COVID-19 pandemic, the effect of macroeconomic conditions and the Company's ability to access capital markets, the Company's ability to train physical therapists in the supervision of the use of the PoNS Treatment, the Company's ability to secure contracts with rehabilitation clinics, the Company's ability to obtain national Medicare coverage and to obtain a reimbursement code so that the PoNS device covered by Medicare and Medicaid, the Company's ability to build internal commercial infrastructure, secure state distribution licenses, build a commercial team and build relationships with Key Opinion Leaders, neurology experts and neurorehabilitation centers, market awareness of the PoNS device, availability of funds, manufacturing, labor shortage and supply chain risk disruptions in the manufacturing process of the PoNS device due to the transition to a new manufacturer, ability to maintain and enforce its intellectual property rights, clinical trials and the clinical development process, the product development process, the regulatory submission review and approval process, operating costs and use of cash, and the Company's ability to achieve significant revenues, ongoing government regulation, and other risks described in the "Risk Factors" section of Company's Annual Report on Form 10-K for the year ended December 31, 2022, its Quarterly Report on Form 10-Q for the quarter ended September 30, 2023 as well as those set forth from time to time in the Company's other filings with the securities and exchange commission and the Canadian securities regulators available at <http://www.sec.gov> or www.sedar.com.

The forward-looking statements in this presentation represent our views as of the date of this presentation. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this presentation.

Certain data in this presentation was obtained from various external sources. Neither the Company nor its affiliates, advisers or representatives have verified such data with independent sources. Accordingly, neither the Company nor any of its affiliates, advisers or representatives make any representations as to the accuracy or completeness of that data or commits to update such data after the date of this presentation. Such data involves risks and uncertainties and is subject to change based on various factors.

The Company's first product, PoNS, is indicated for use in the United States as a short term treatment of gait deficit due to mild-to-moderate symptoms from multiple sclerosis ("MS") and is used as an adjunct to a supervised therapeutic exercise program in patients 22 years of age and over by prescription only. The PoNS device is authorized for sale in Canada as a class II non-implantable, medical device intended as a short term treatment (14 weeks) of gait deficit due to mild and moderate symptoms from MS, chronic balance deficit due to mild-to-moderate traumatic brain injury ("mTBI"), and gait deficit due to mild and moderate symptoms from stroke and is to be used in conjunction with physical therapy. The PoNS device is authorized for sale in Australia as a non-implantable neurostimulator intended for short term use by healthcare professionals as an adjunct to a therapeutic exercise program to improve balance and gait.

Executive Team

Experienced Leadership With Healthcare and Commercialization Expertise

Dane Andreeff President & CEO

- 20+ years at Maple Leaf Partners as the General Partner and Portfolio manager, a value-based hedge fund which grew to over \$2b in assets
- Board member and advisor to Helius for over 6 years, Myocardial Solutions for 4 years and HDL Therapeutics, Inc. for over 15 years
- ~10.5% ownership of the company

Jeff Mathiesen, CPA Chief Financial Officer

- Vice Chair, Lead Independent Director, and Audit Committee Chair of Panbela Therapeutics, Inc. (Nasdaq: PBLA)
- Director and Audit Committee Chair of NeuroOne Medical Technologies Corporation Nasdaq: NMTC)
- Former Board Member and Audit Committee Chair of eNeura, Inc.
- Former CFO at Gemphire Therapeutics and Sunshine Heart

Antonella Favit-Van Pelt, MD, PhD Chief Medical Officer

- Board-certified neurologist with 20+ years in the health sciences industry
- Led U.S. Medical Strategy for the Neurology program of H. Lundbeck A/S
- Founded and led as President and CEO, Synaerion Therapeutics and its affiliate Thera Neuropharma, Inc.
- Served as Senior Director and Global Medical Lead at Shire Pharmaceuticals, Director of Medical Strategy at Bristol-Myers Squibb, and as Global Clinical Development Lead at GE Healthcare

Non-Executive Directors

Experienced Leadership With Healthcare and Commercialization Expertise

Blane Walter

Chairman of the Board

- Partner, Talisman Capital Partners
- Vice Chair of InVentiv Health
- Chair of the Governor of Ohio's Executive Workforce Board
- Former CEO of InVentiv Health
- Former Founder of InChord Communications

Sherrie Perkins

Director

- 20 years neuromodulation medical device experience in neurology, psychiatry, and sleep medicine
- Former Marketing and Business Development Executive, Cyberonics, Inc. (Nasdaq: CYBX) and LivaNova PLC (Nasdaq: LIVN)
- Former member Board of Directors, eNeura, Inc.
- Former member Board of Directors, ImThera Medical, Inc.

Ed Straw

Director

- Founder, Managing Partner of Osprey Venture Partners
- Chairman of Odyssey Logistics
- Member of the Board of Directors of Performance Equity Management, Capital Teas and Document Capture Technologies, Inc.
- Former President, Global Operations, Estee Lauder
- Former SVP, Global Manufacturing and Supply Chain Management at Compaq Computer Corporation
- Distinguished 3-star Admiral, US Navy

Paul Buckman

Director

- Thirty-nine years of medical device experience in general management, sales, marketing, finance, international and operations
- President, North America – LivaNova PLC
- Former President of the Cardiovascular Divisions of both Boston Scientific and St. Jude Medical
- Director on the Boards of NeuroOne (Chairman), Miromatrix (Chairman), Ablative Solutions, ActivOrtho, Inc. (Co-Founder), and Shoulder Innovations

About Helius



A neurotech company focused on delivering a novel therapeutic neuromodulation approach for balance and gait deficits



The Portable Neuromodulation Stimulator “PoNS” Device

The first and only orally applied therapy combining trigeminal nerve neurostimulation via the tongue with physical therapy to improve functional outcomes

Supported by an **extensive IP portfolio** (47 U.S. patents issued; 53 foreign patents issued) expiring between 2026 and 2041



Authorized and commercially available to treat gait deficit due to multiple sclerosis (“MS”) following FDA Breakthrough Designation
FDA Breakthrough Designation granted for the treatment of balance and gait deficits due to stroke



Authorized and commercially available in over 72 clinics for balance or gait deficit due to MS, stroke, or mild and moderate traumatic brain injury (“mTBI”) with continued expansion across the country



Authorized as an adjunct to a therapeutic exercise program to improve balance and gait

The Long-Lasting Impact of Balance Deficit^{1,2}

- Balance and gait deficits are commonly experienced by individuals with neurologic disorders
- These deficits can be particularly frustrating because they often profoundly impact a person's quality of life
- Balance and gait deficits have a significant negative impact on functional status, capacity to return to work, and quality of life



**Dizziness/
coordination**



**Difficulty
walking**



**Trouble
climbing
stairs**



**Difficulty
completing
everyday
tasks**



**High risk
of falling**

PoNS Therapy™

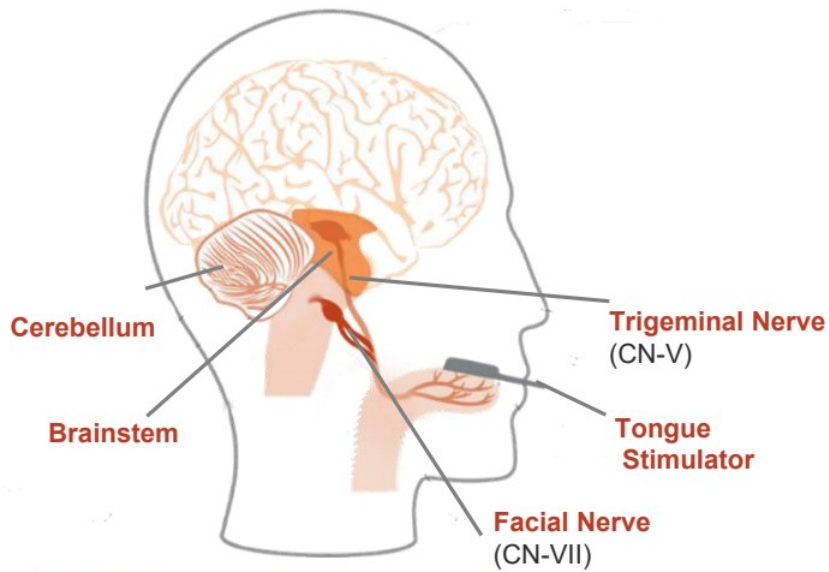
PoNS Device

Empowering the brain and improvement during PoNS Therapy™



- Mouthpiece electrodes stimulate the tongue surface, sending signals to the brain
- The stimulation produced by PoNS is believed to help strengthen the neural connections associated with balance and walking when combined with physical rehabilitation exercises

Inducing Neuromodulation to Create Long Term Neuroplastic Change

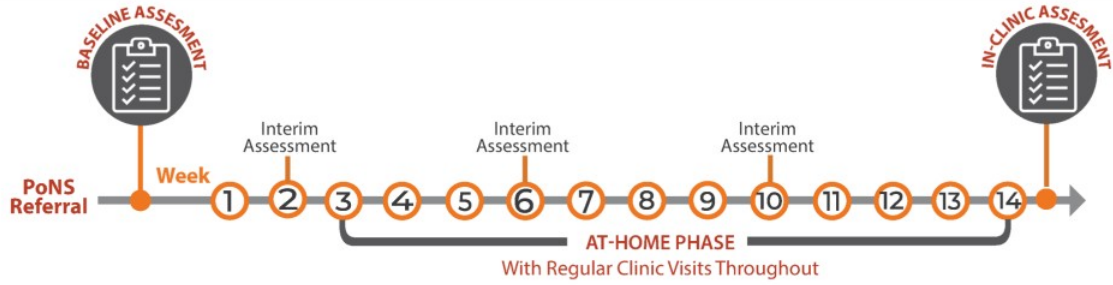


~25MM pulses per 20-minute session
Feels like champagne or carbonated water bubbles

- When PoNS is on, translingual neurostimulation ("TLNS") is initiated.
- TLNS delivers electrical impulses that stimulate the lingual branch of the trigeminal nerve and chorda tympani branch of the facial nerve.
- This stimulation triggers a flow of neural impulses to the brain structures: pons varolii and medulla (in the brainstem), and cerebellum.
- While using PoNS and engaging in movement and coordination tasks, PoNS Therapy promotes neuromodulation, activating the brain's pathways to help improve gait, balance, movement, and coordination.

PoNS Therapy

14-Week PoNS Therapy
Safe and Effective



91% of PoNS sessions are completed at home



69% of stroke patients had a **significant improvement** in gait and **28%** were no longer at risk of falling

74% of patients with traumatic brain injury showed **significant improvement** in balance²

Commercialization and Reimbursement

Large Potential Addressable Markets

U.S. Market



Affected by MS
70% report difficulty walking²



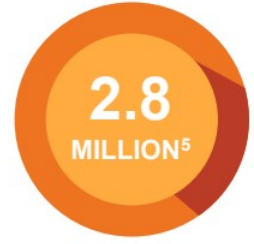
Authorized for gait deficit due to symptoms of MS



Affected by stroke
Impaired walking affects about 80% of survivors⁴



Pilot Study Conducted
Additional Study Ongoing (MUSC)



Sustain a TBI annually
80% report balance impairment⁶



Studies Completed
Additional Study Planned

Potential for Future Development

- Cerebral Palsy (764K)⁷
- Parkinson's Disease (1M, 90K new each year)⁸

Ongoing Evaluation

- Balance Maintenance in Baby Boomers (78M)
- Neurological Wellness (1B)
- Human Performance

Understanding the MS Market Opportunity in U.S.



1
MILLION¹

Americans affected by **MS**
70% report difficulty walking²



MS is a well-characterized chronic disease with a fast-growing diagnosed population³



MS patients are cared for by neurologists, a relatively discrete group
(approx. 16,000 in USA)



Gait dysfunction is a common and distressing symptom experienced by MS patients³



MS patients are vocal and connected on social media



MS patients actively seek out new and promising treatments

U.S. Commercialization Launch Initiatives

Driving Awareness

Education & Outreach

- Engage with general and MS neurologists about the benefits of PoNS and how to prescribe
- Identify and onboard neuro rehab clinics currently treating MS patients; emphasize that PoNS provides a significant value add for PT clinics giving them an impactful tool to leverage the power of neuroplasticity and drive meaningful functional outcomes
- Digital presence to engage with and enroll PTs in training

Targeted Marketing

- Advocacy engagement
- Social and digital presence
- Conference attendance (APTA, AAN, CMSC, ANPT)
- Educational resources on disease state, PoNS and PoNS Therapy for patients and HCPs
- Ambassador program, patient and PT testimonials, animated PoNS video, enhanced website for both patients and HCPs



U.S. Commercialization Launch Initiatives

Building Experience

Therapeutic Experience Program (“PoNSTEP”)

- Helius sponsored open-label, interventional, observational, outcome study evaluating PoNS on-label therapy in target population (MS) aiming to investigate adherence to PoNS Therapy regimen
- Enrolling ~ 40-50 subjects with gait deficit due to mild-moderate MS at Centers of Excellence
- Started enrollment in Q3' 22 and will continue through 2H 23
- 6 Centers of Excellence announced (NYU Langone Health, Shepherd Center, OHSU, MGH Institute, NCNE, Montefiore Medical Center)



U.S. Commercialization Launch Initiatives

Expanding Access / Increasing Ease of Use

Telehealth/E-Commerce/Online Pharmacy

- Partnered with UpScript Health on direct-to-consumer platform to streamline access to PoNS Therapy, aligning with current trends of self-care, home health care, get-it-now
- Network of fully licensed and compliant providers with e-prescribing capabilities
- Immediate distribution across all 50 states
- Reduced appointment times; direct delivery to patient's door
- Launched Dec 2022 – first units delivered Jan 2023



Online Training for Rehabilitation Specialists

- Standardized training with reduced training time
- Online platform allows for more efficient and broader training to expand commercial access to PoNS Therapy in all 50 states and Canada
- Online modules allow training to be completed in 3 hrs or less, at therapist's own pace
- Training content remains accessible and readily available for future reference



Reimbursement

Established US List Price	
Controller	\$17,800
Mouthpiece	\$7,900
Complete PoNS System	\$25,700
Cash	\$14,500

- All sales currently are cash pay
 - Discounted modestly below anticipated reimbursement rate
 - Direct to consumer financing option through a 3rd party
 - National MS Society - potential financial assistance

- Pursuing commercial and government reimbursement programs w initial cash pay option
- Dual path for reimbursement
- DME
 - Proposed Transitional Coverage of Emerging Technologies (“TCET”) for Medicare coverage
 - Applied for HCPCs codes
- NDC/UPC/HRI
 - Codes established for both PoNS System and PoNS Mouthpie
 - Medi-Span database price is equal to list price
- Registry program to generate evidence for coverage
 - Designed to gather important health economic information (ov 18-month period) to establish the value of PoNS on key therapeutic outcomes

Potential Addressable U.S. Opportunity in Stroke



Compelling Clinical Evidence³



*~Approximately 1-3% of stroke patients who routine physical therapy are no longer at risk falling⁴

US Path for Stroke Authorization

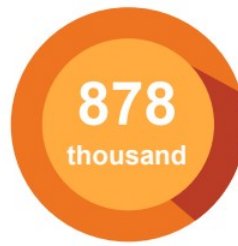
- Granted second FDA Breakthrough Designation with the proposed indication for dynamic gait and balance deficits due to symptoms from stroke
- Engaged with the FDA on Data Development Plan for stroke
- Plan includes expansion of Medical University of South Carolina (“MUSC”) study with the objective to leverage as a registrational study
- Targeting regulatory submission for stroke indication in early 2025
- If authorized, PoNS is expected be eligible for coverage under the proposed Transitional Coverage of Emerging Technologies (“TCET”) pathway



Potential Addressable Canadian Opportunity

Canadian Reimbursement Efforts

- PBC study to evaluate return-to-work data for long-term disability patients (TBI)
- Quebec Ministry of Health Letter of Intent for 30 patient reimbursement study (stroke)
- University of Montreal to conduct 10 patient study (stroke)
- Private insurance pilots for Long term-disability-cases (across Canada)
- Public provincial payer - real-world evidence pilot for motor vehicles accident (TBI)
- Educating and conducting trials with hospital stroke rehabilitation centers (across Canada)
- Expanding clinics for provincial and national insurance coverage



Affected by **stroke**¹



Living with chronic
balance disorder
after **mTBI**²⁻⁵

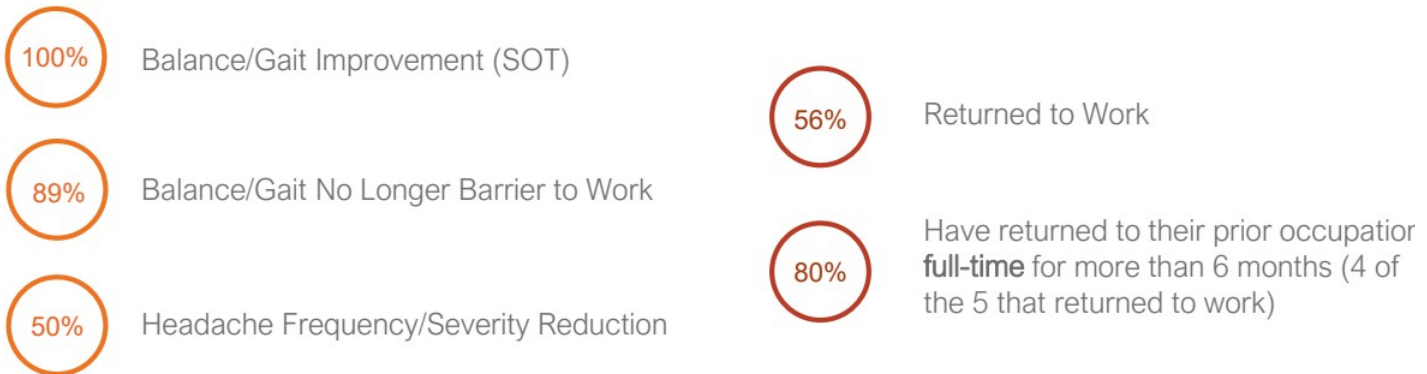


Affected by **MS**⁶

Pacific Blue Cross Study¹

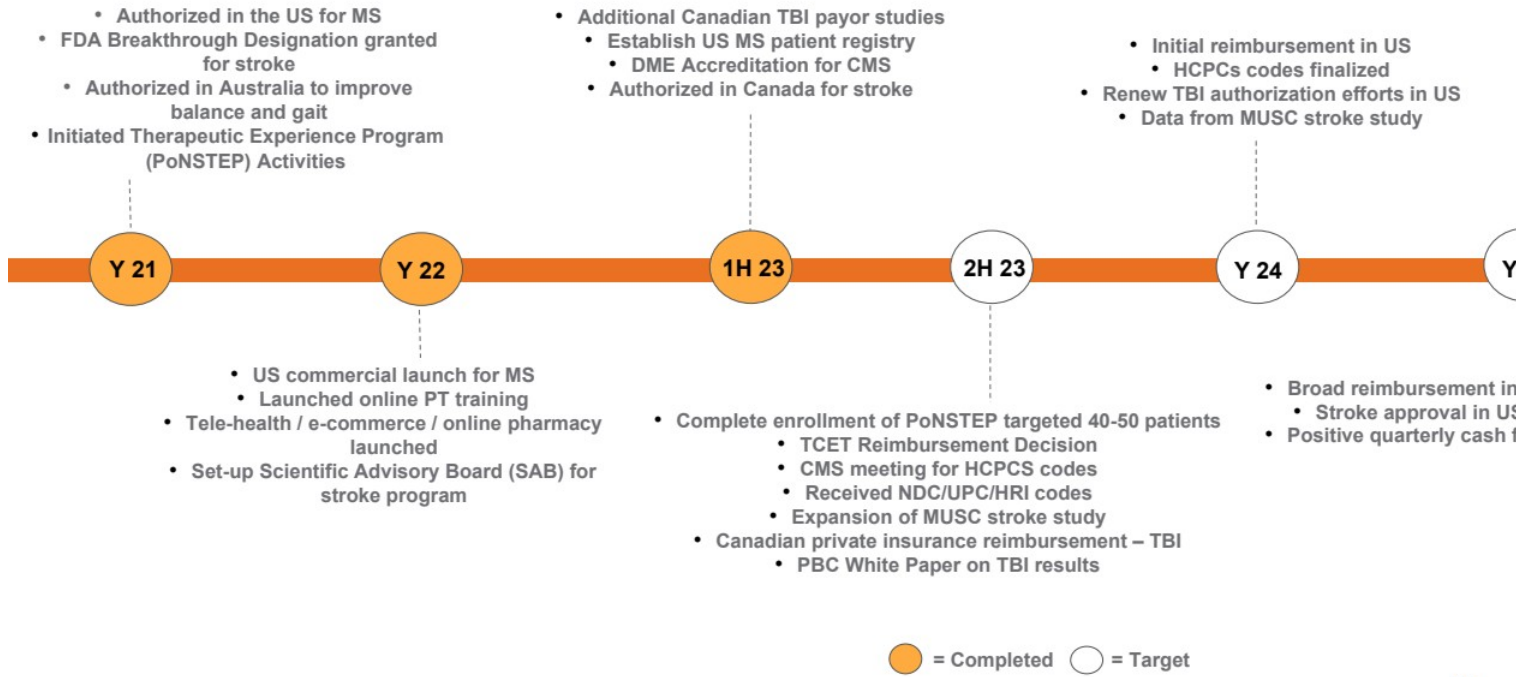
Return to Work Outcomes

Collaborative project between Pacific Blue Cross (“PBC”) and HealthTech Connex to evaluate the real-world impact of PoNS Therapy on return-to-work outcomes in 9 individuals on long-term disability due to Traumatic Brain Injury



PBC estimated that the five individuals who returned to work saved the provider approximately \$1.6 million in long-term disability claims

Recent Milestones and Anticipated Value Creation Events



Financial Update, Capitalization & Ownership

Financial Update

(\$ in thousands)

Summary Operations and Cash Flows	Q3 2023	Q3 2022	YTD (9/30/23)	YTD (9/30/22)
Total Revenue	\$143	\$196	\$510	\$505
Operating Loss	\$(3,153)	\$(4,853)	\$(10,182)	\$(12,847)
Net Loss	\$(3,663)	\$(1,030)	\$(7,805)	\$(9,186)
Cash Used in Operations	\$(2,452)	\$(3,821)	\$(8,382)	\$(12,167)

(\$ in thousands)

Summary Balance Sheet	9/30/2023	12/31/2022
Cash, Cash Equivalents, and Proceeds Receivable from Warrant Exercises	\$7,031	\$14,549
Derivative Liability	\$4,239	\$6,917
Long-term Debt	\$ --	\$ --
Total Stockholders' Equity	\$3,021	\$8,151

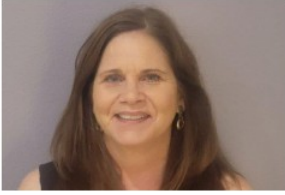
Capitalization & Cash Position

Nasdaq	
Symbol	HSDT
Market Cap*	\$4.5M
Price Per Share*	\$6.36
Shares Outstanding*	708K
50 Day Avg Volume	395K
Cash (including proceeds receivable from warrant exercises) at 9/30/23	\$7.0M
* Based upon shares outstanding at November 3, 2023 and closing price on November 27, 2023	

Capitalization (in thousands)	As Reported 9/30/23
Common Stock	68
Warrants**	63
Options	24
RSUs	
Total Fully Diluted	1,57
**Includes 627K warrants @ \$6.9135 strike price	

HSDT Analyst Coverage		
LADENBURG THALMANN & CO. INC.	MAXIM GROUP, LLC	ROTH CAPITAL PARTNERS, LLC
Jeffrey S. Cohen	Anthony Vendetti	Jonathan Aschoff, PhD

Testimonials



"I have been living with MS for 35 years and have just completed my 14 week of PoNS Therapy. I am impressed with the results. The difference is apparent on before- and after- videos of me on the treadmill, and I feel steadier and more self-assured in my overall ability to move. I feel my improved gait since PoNS has led me to attempt things such as parking further from an entrance to a store or across the street from my destination instead of circling the block to find a closer spot. As a result of my improved walking, I was able to participate in a more active excursion on my vacation, such as walking and scrambling through an underground cave in the Yucatan. My starting speed on the treadmill went from 1.3 to 2.6 during the protocol. PoNS Therapy was a serious commitment of time and energy but the improvements in my gait, at least for me, have changed my life."

**– Kerrie Walters,
PoNS Patient Ambassador**

"As a physical therapist, I have worked with many patients with neurological deficits. When I heard about PoNS, I had doubts that tongue-based electrical stimulation could effectively retrain the brain to improve walking ability. But as I worked with Anna, the improvement was undeniable. I'm excited about using PoNS with more patients".

**– Dr. Naseem Chatiwala, PT, DPT, MS, NCS
PoNS Trainer**



References

Slide 4

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Slide 21

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Thank you

NASDAQ:HSDT

Appendix

MS Scientific Advisory Board

- Dr. Deborah Backus, PT, PhD, FACRM, Director, MS Research, Shepherd Center, immediate past president and current Board Member, ACRM
- Dr. Francois Bethoux, MD, Director of Rehabilitation Services at the Cleveland Clinic Mellen Center
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- Dr. Stephen Kanter, PT, DPT, ATC, Director of Rehabilitation Services at the International Multiple Sclerosis Management Practice (IMSMP)
- Dr. Prudence Plummer, PT, PhD, Professor, Department of Physical Therapy in the School of Health and Rehabilitation Sciences at MGH Institute of Health Professions
- Dr. Mandy Rohrig, PT, DPT, MSCS, Can Do Multiple Sclerosis

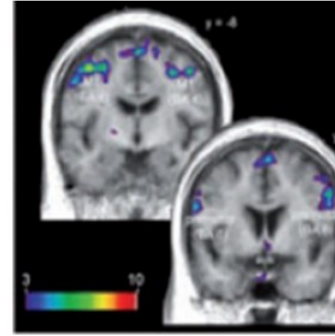
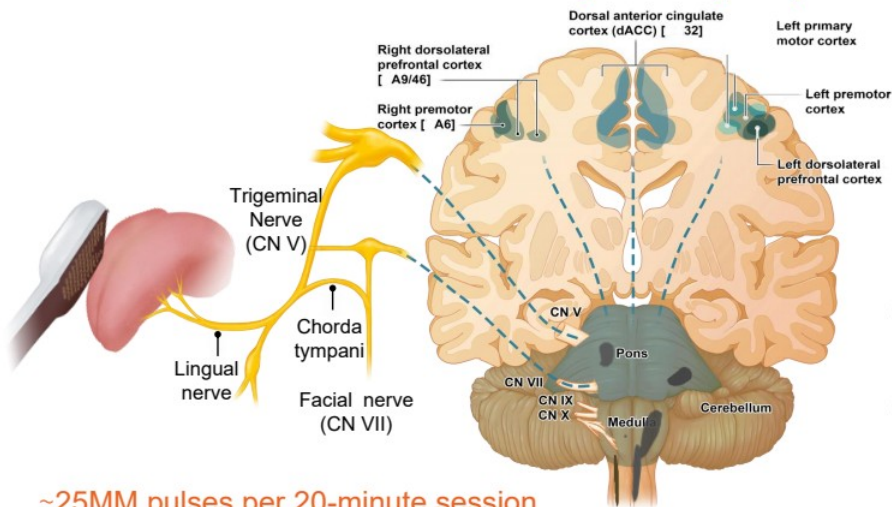
Stroke Scientific Advisory Board

- Carl J. Hauser, MD, Beth Israel Deaconess Medical Center, Acute Care, Trauma & Critical Care, Lecturer, Surgery, Harvard Medical School
- Steven C. Cramer, MD, MMSc, FAAN, FAHA, Susan and David Wilstein Endowed Chair in Rehabilitation Medicine Professor, Department of Neurology, Medical Director of Research, California Rehabilitation Institute
- Teresa Kimberley, PT, PhD, FAPTA, Director, Brain Recovery Lab, Director of the PhD in Rehabilitation Science Program, MGH Institute
- Mark Bowden, PT, PhD, Professor and Division Director of Physical Therapy, MUSC
- Steve Kautz, PhD, Professor, Chair, Department of Health Sciences and Research, MUSC
- Charles Liu, MD, PhD, Professor of Clinical Neurological Surgery, Director, USC Neurorestoration Center

PoNS Therapy™ Mechanism of Action

Blood oxygen level-dependent (BOLD)

Neuromodulation:
modification of the nervous system by targeted stimuli

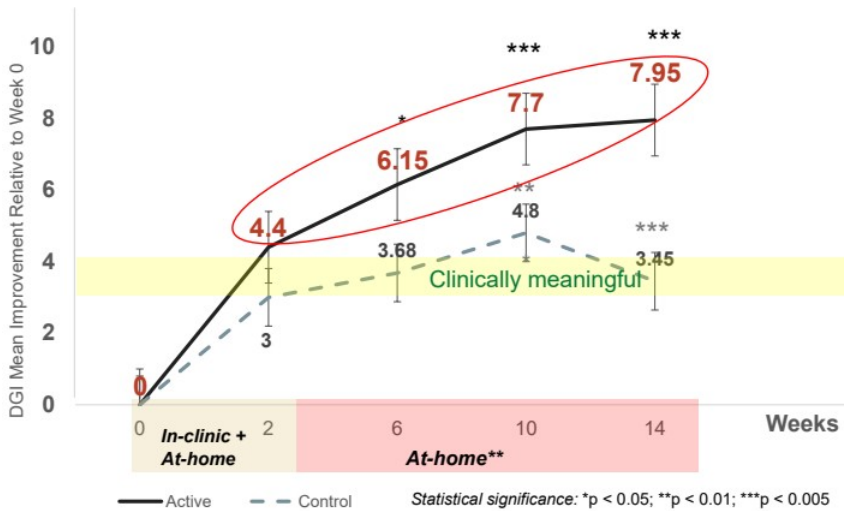


~25MM pulses per 20-minute session
Feels like champagne or carbonated water bubbles

PoNS device designed to induce *Translingual Neurostimulation*: trigeminal and facial nerve mediated neuromodulation via the tongue induces increased blood perfusion in specific brain areas resulting in neuroplasticity.

Clinical Evidence¹

Multiple Sclerosis Study – Gait Deficit in Mild and Moderate MS (EDSS score 3.0-6*)



Change In DGI Score Versus Time Within The Study Period

*Error on publication regarding EDSS Score
 **One visit per week was in-clinic

Two groups (10 each):

1. Active Group: PoNS + PT
2. Control Group: Placebo PoNS + PT

Mean avg of
7.95

All 10 subjects in the active treatment experienced at least a 4-point improvement from baseline to Week 14 in DGI.

Mean avg of
3.45

Only 3 of 10 (30%) subjects in the placebo control group experienced an improvement in DGI of at least 4 points from baseline to week 14.

100%

Improvement in Dynamic Gait Index scores for the Active Group

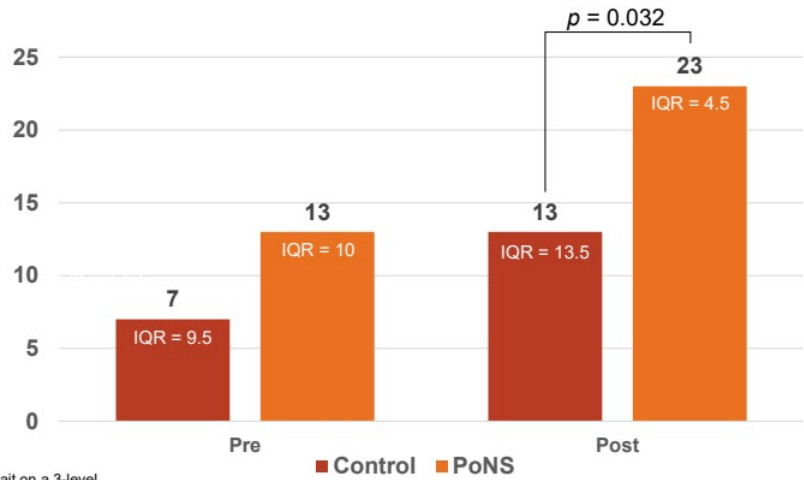
DGI = Dynamic Gait Index, a measure of the ability to

Clinical Evidence¹

Stroke – Results from a Pilot Randomized Controlled Trial

- Post-intervention assessment demonstrated significant and clinically meaningful improvement with PoNS Therapy vs. high-intensity physiotherapy alone
- A cutoff score of 17.5 on the Mini-BEST has been shown to discriminate between fallers and non-fallers with chronic stroke (>6 months) IQR = 10

Pre- and Post-intervention Assessment Using the Mini-Balance Evaluation Systems Test*

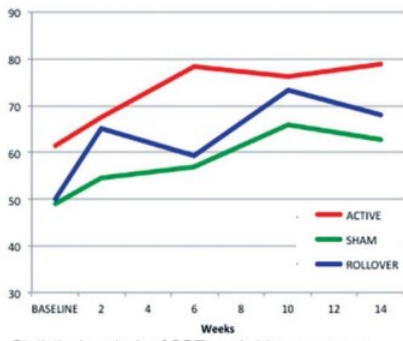


*Mini-BEST is a 14-item test that assesses measures dynamic balance, functional mobility, and gait on a 3-level ordinal scale (0–2). IQR, interquartile range.

Clinical Evidence¹

Multiple Sclerosis Study – Mild and Moderate MS (EDSS score 3.0-6*)

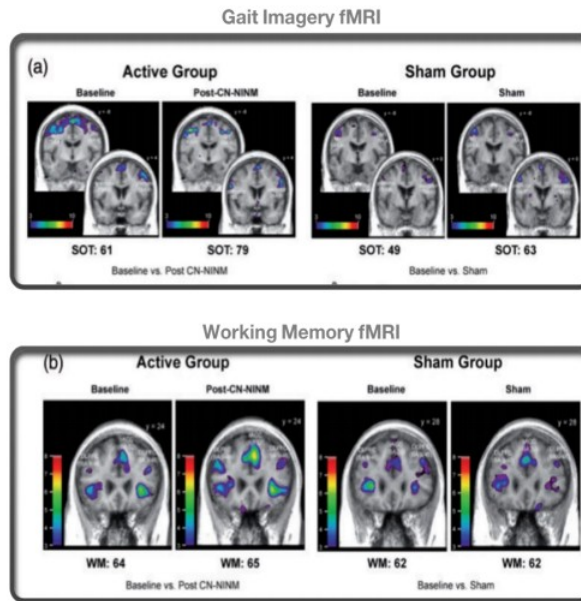
Change over time for Sensory Organization Test (SOT) composite



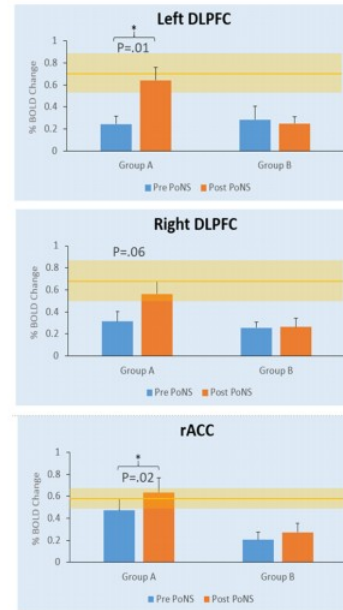
Statistical analysis of SOT week 14 scores vs pre-training reveals that improvement in the active group is significant ($p < 0.001$) whereas sham group difference did not reach statistical significance ($p < 0.06$)

Gait imagery revealed task-related activations in bilateral premotor and motor regions, and a higher BOLD signal in the left motor cortex

*Error on publication regarding EDSS Score



VOIs BOLD signal vs. Healthy Cor



PoNS™ Device¹

Authorized in Canada for gait deficit due to symptoms of MS since March 2020

Promising results from initial real-world evidence gathered through December 31, 2020
Presented at Consortium for Multiple Sclerosis Centers Annual Conference, June 2021



42

Patients with MS treated
with PoNS in Canada



58.3%

Patients had achieved at least a
4-point improvement in their
functional gait assessment (FGA)

Currently evaluating additional data gathered on MS patients for commercial and medical insights and publication

Real-World Evidence Poster Presentation

Translingual Neurostimulation by Portable Neuromodulation Stimulator System as a New Rehabilitation Therapy for Improving Gait in People With Multiple Sclerosis

Aznanah Fawzi-Yar-Pet, MD, PhD; Kim Skinner, PT, DPT; Greg Maslin, PhD; Nicole Strachan, BHK, MSc, PGR; and Lola Abulhaim, MBA — Helius Medical Technologies, Newtown, PA; Biomedical Statistical Consulting, Wynnewood, PA

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Introduction

Although gait impairment is a disabling symptom in MS leading to reduced mobility and impacting quality of life, current interventions (eg, rehabilitation therapy and pharmacological management) only marginally improve gait function.¹⁻³

Translingual neurostimulation (TLNS) delivered by a portable neuromodulation stimulator system promotes neuromodulation by stimulating the trigeminal (CN V) and facial (CN VII) nerves exiting a robust flow of neural impulses to the transcranial (spinal Vagus and medulla) and cerebellum.⁴

Recent studies have shown that noninvasive activation of cranial nerves by TLNS when combined with therapeutic exercise programs can modulate neural pathways involved in gait and balance to improve function.⁵⁻⁷

Objectives

To assess the effect of TLNS (Portable Neuromodulation Stimulator [PoNS®] Therapy), in combination with a supervised therapeutic exercise program, to improve gait deficit in persons with MS based on real-world evidence (RWE) data collected at clinical rehabilitation settings and pooled analysis of RWE data and data from 2 previous RCTs.^{8,9}

Methods

RWE Data

The RWE dataset was gathered from 4 Canadian rehabilitation clinics that integrated TLNS (PoNS Therapy) as an adjunct to a supervised therapeutic exercise program to treat gait deficit in patients with MS between March 4, 2018 and December 31, 2019.

All patients treated within this date range are included in the analysis regardless of the completeness of the data in order to avoid selection bias.

Gait performance assessment was determined using the Functional Gait Assessment (FGA),¹⁰ a 10-item clinical gait test scored on a 4-level (0-3) ordinal scale; scores range from 0-30, with lower scores indicating greater impairment.

FGA measurements were made during patient care visits: Week 0 (Baseline), Week 2, Week 8, and Week 14.

Values over the first 8 weeks from baseline are summarized by mean (SD), median, minimum, and maximum values and 80% confidence intervals (CI) for the mean score and mean improvement; primary endpoint is mean change from baseline to Week 14.

Paired t-tests were employed to evaluate the mean improvements from baseline at each subsequent time point based on observed data.

TLNS (PoNS® Therapy): Rehabilitation Program



RWE Data

The primary analysis of the RWE was based on a mixed model for repeated measures (MMRM), both to account for missing data over time and to ensure that variability in baseline FGA scores did not result in substantial bias.

The model assumed an unstructured covariance matrix that allows variance and covariance to vary over time; parameters of the MMRM were estimated using full FIM-based.

MMRMs were used to evaluate values over time as well as changes from baseline including baseline as covariate.

For mean changes, t-tests derived from the MMRM were used to determine statistical significance; distributions of improvements were evaluated graphically using a cumulative distribution function.

Heterogeneity of improvements in gait deficit in the real-world clinical settings were evaluated across a number of clinical factors (gender, age category, race/ethnicity, years with MS category, type of MS, Expected Disability Status Scale (EDSS) category, prior physical therapy (PT), and medication use), with modeling approaches similar to those used in the overall analyses.

Pooled Analysis of RWE and RCT Data

In the 2 previous RCTs,^{8,9} gait improvement was assessed using the Dynamic Gait Index (DGI),¹¹ an 8-item test scored on a 4-level (0-3) ordinal scale; scores range from 0-24, with lower scores indicating greater impairment.

Seven of the 8 items on the DGI are also included within the 10-item FGA.

In order to pool the RWE data with data from the RCTs, an adjusted DGI score was derived by summing the 7 scores from the 7 items the two measures have in common and multiplying by 8/7; this 'adjusted' 7-item DGI, therefore, has the same overall scores range as the 8-item DGI.

A similar MMRM model was used to characterize expected improvements in gait from baseline to Week 14 in order to provide a summary of expected improvements in DGI over time using the largest possible sample size.

An additional responder analysis was performed to summarize the number and percentage of patients achieving improvement based on DGI categorical response.

Results

Demographic and Baseline Characteristics

The RWE analysis included 42 patients with a mean age of 55.4 years, mean duration of MS of 18.9 years, and mean EDSS score of 5.5 (Table 1).

Race/ethnicity was stratified by gender was 57.5 years (range, 38-72) for males (n = 14) and 51.0 years (range, 32-72) for females (n = 28).

Conclusions

In this evaluation of a real-world dataset of patients with MS with generally long duration of disease, translingual neurostimulation (PoNS therapy) combined with a therapeutic exercise program significantly improved gait deficit at Week 2, the earliest evaluated time point, and at every subsequent time point.

At Week 14, 58.3% of patients had an FGA improvement of 24 points, surpassing the MDC for older adults, stroke patients, and persons with other neurological disease.

Analysis of real-world data pooled with the 2 randomized clinical trials demonstrated, consistent with the RCT data, that translingual neurostimulation (PoNS therapy) combined with a therapeutic exercise program is safe and effective for improving gait deficit in individuals with mild and moderate symptoms from MS.

Table 1. Baseline and Disease Characteristics

Characteristic	n	(n, %)
Age	42	55.4 (SD 10.0)
Female	28	66.7
Male	14	33.3
Mean (SD) years since MS	19.9 (10.1)	
Age category		
< 50	10	23.8
50-59	10	23.8
60-69	10	23.8
≥ 70	12	28.6
EDSS category		
1-2	1	2.4
3	1	2.4
4	1	2.4
5	1	2.4
6	1	2.4
7	1	2.4
8	1	2.4
9	1	2.4
10	1	2.4
11	1	2.4
12	1	2.4
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15	1	2.4
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28	1	2.4
29	1	2.4
30	1	2.4
31	1	2.4
32	1	2.4
33	1	2.4
34	1	2.4
35	1	2.4
36	1	2.4
37	1	2.4
38	1	2.4
39	1	2.4
40	1	2.4
41	1	2.4
42	1	2.4

Table 2. MMRM for FGA Total Score Over Time and Change From Baseline

Characteristic	Mean (SD)	95% CI	P
Age	55.4 (10.0)	53.9-56.9	<.001
Female	55.4 (10.0)	53.9-56.9	<.001
Male	55.4 (10.0)	53.9-56.9	<.001
Mean (SD) years since MS	19.9 (10.1)	18.4-21.4	<.001
Age category			
< 50	55.4 (10.0)	53.9-56.9	<.001
50-59	55.4 (10.0)	53.9-56.9	<.001
60-69	55.4 (10.0)	53.9-56.9	<.001
≥ 70	55.4 (10.0)	53.9-56.9	<.001
EDSS category			
1-2	55.4 (10.0)	53.9-56.9	<.001
3	55.4 (10.0)	53.9-56.9	<.001
4	55.4 (10.0)	53.9-56.9	<.001
5	55.4 (10.0)	53.9-56.9	<.001
6	55.4 (10.0)	53.9-56.9	<.001
7	55.4 (10.0)	53.9-56.9	<.001
8	55.4 (10.0)	53.9-56.9	<.001
9	55.4 (10.0)	53.9-56.9	<.001
10	55.4 (10.0)	53.9-56.9	<.001
11	55.4 (10.0)	53.9-56.9	<.001
12	55.4 (10.0)	53.9-56.9	<.001
13	55.4 (10.0)	53.9-56.9	<.001
14	55.4 (10.0)	53.9-56.9	<.001
15	55.4 (10.0)	53.9-56.9	<.001
16	55.4 (10.0)	53.9-56.9	<.001
17	55.4 (10.0)	53.9-56.9	<.001
18	55.4 (10.0)	53.9-56.9	<.001
19	55.4 (10.0)	53.9-56.9	<.001
20	55.4 (10.0)	53.9-56.9	<.001
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36	55.4 (10.0)	53.9-56.9	<.001
37	55.4 (10.0)	53.9-56.9	<.001
38	55.4 (10.0)	53.9-56.9	<.001
39	55.4 (10.0)	53.9-56.9	<.001
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41	55.4 (10.0)	53.9-56.9	<.001
42	55.4 (10.0)	53.9-56.9	<.001

Figure 1. RWE Patients: Difference in Least Squares Means in FGA Score from Baseline

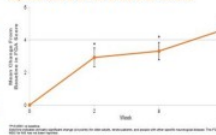


Figure 2. Percentage of RWE Patients with FGA Improvements ≥ 24 Points Over Time

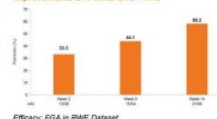


Figure 3. Cumulative Distribution of Observed Changes from Baseline to Week 14 in FGA

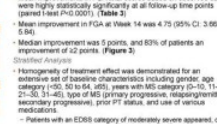


Figure 4. Pooled RWE/RCT Data: Summary of Categorical Responses—DGI Improvements (to Week 14)



Table 3. Observed FGA Total Scores Over Time and Change From Baseline

Characteristic	Mean (SD)	95% CI	P
Age	55.4 (10.0)	53.9-56.9	<.001
Female	55.4 (10.0)	53.9-56.9	<.001
Male	55.4 (10.0)	53.9-56.9	<.001
Mean (SD) years since MS	19.9 (10.1)	18.4-21.4	<.001
Age category			
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EDSS category			
1-2	55.4 (10.0)	53.9-56.9	<.001
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35	55.4 (10.0)	53.9-56.9	<.001
36	55.4 (10.0)	53.9-56.9	<.001
37	55.4 (10.0)	53.9-56.9	<.001
38	55.4 (10.0)	53.9-56.9	<.001
39	55.4 (10.0)	53.9-56.9	<.001
40	55.4 (10.0)	53.9-56.9	<.001
41	55.4 (10.0)	53.9-56.9	<.001
42	55.4 (10.0)	53.9-56.9	<.001

Table 4. Pooled Analysis of RWE Sample and RCT Active Cohorts

Visualized pooled mean improvement in DGI from baseline to Week 14 was 4.58 (95% CI, 3.62 to 5.54) for the pooled RWE and RCT analysis including all possible data at all weeks.

Among 53 patients with Week 14 data, 26 (49%) experienced 4-point improvement from baseline in DGI. Summary of categorical responses—DGI improvements (to Week 14).

Table 5. Safety

No serious adverse events related to the PoNS device were reported in the MS RCTs to date. During its use in clinical rehabilitation settings to treat balance and gait disorders (n=45, 128 patient-use sessions since March 4, 2018).

Presented at the 2022 Consortium of Multiple Sclerosis Centers (CMSC) Annual Meeting, June 1-4, 2022, National Harbor, MD

Visit ponstherapy.com to view the poster online

References

Slide 33

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1. Galea MP et al. *Brain Stimul.* 2017;10(6):1133-35.

Slide 35

1. Leonard, Gabriel et al. "Noninvasive tongue stimulation combined with intensive cognitive and physical rehabilitation induces neuroplastic changes in patients with multiple sclerosis: A multimodal neuroimaging study." *Multiple sclerosis journal - experimental, translational and clinical* vol. 3,1 2055217317690561. 1 Feb. 2017, doi:10.1177/2055217317690561

Slide 36

1. Helius Medical, Inc Portable Neuromodulation Stimulator (PoNS) Real World Evidence Study, August 2, 2020