CNS Newsletter

ARTICLES:

PAST AND UPCOMING EVENTS:

Combined Annual Meeting of the CNS and the Neuromodulation Society of the United Kingdom and Ireland

Dublin, Ireland | October 3-5, 2024

CNS Interventional Pain and Neuromodulation Workshop for Trainee Physicians

Halifax, NS | October 27-29, 2024

CNS Annual Meeting

Quebec City, QC | June 19-21, 2025

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Contact Info:
399 Bathurst Street
Toronto, ON
M5T 2S8
Tel: 416-603-5800
ext.3130
Fax: 416-603-5622

CNS Administrator:

Danielle.Alvares@uhn.ca

@CanNeuromod

Editor's Note

Dear CNS members,

I hope everyone enjoyed the warmer weather and is preparing for the cooler months ahead.

We've been busy at the CNS with several events this year, including our recent combined NSUKI/CNS meeting in Dublin, Ireland and trainee interventional workshop in Halifax. These events were well attended and we have already begun furiously planning for the 2025 meeting. Throughout the year, we have had journal clubs featuring experts in the field. We trust our members have found these events helpful and educational.

Importantly, we have endeavored to further several initiatives to advance the accessibility of neuromodulation in Canada. This includes creating a Directory of Neuromodulation services available across Canada (https://neuromodulation.ca/directory/). We hope this will allow members and other healthcare providers to more readily identify local services, as we know there are often challenges and delays in patients receiving these specialized therapies.

In this newsletter, you will find:

- A new section of the newsletter with highlights of recent Canadian research
- Successes at the combined CNS/NSUKI meeting
- Highlights of our recent interventional pain and neuromodulation workshop for trainees

Finally, if you haven't already, follow us X (previously Twitter) @CanNeuromod to stay updated on our work.

Himanshu Gupta, MD
Editor & Trainee Representative

Research Spotlight

In this new section of the CNS newsletter, the Editor highlights recent research in the neuromodulation sphere with Canadian contributions. To have your work considered for a future newsletter release, please email the Editor.

CLINICAL RESEARCH: STEREOTACTIC AND FUNCTIONAL

Deep Brain Stimulation Improves Symptoms of Spasmodic Dysphonia Through Targeting of Thalamic Sensorimotor Connectivity

Hart, Michael G. PhD*; Polyhronopoulos, Nancy RN‡; Sandhu, Mandeep K. RN‡; Honey, Christopher R. MD, DPhil, FRCSC‡

Brief Summary: Spasmodic dysphonia (SD), a condition of the vocal cords affecting speech, is hypothesized to occur secondary to dysfunctional thalamic sensorimotor integration. Six participants underwent DBS for adductor subtype SD, and it was found that stimulation of thalamic sensorimotor areas was associated with improvement in symptoms.

Article Link: https://doi.org/10.1227/neu.0000000000002836

Outcomes of sacral neuromodulation in male patients with overactive bladder, chronic pelvic pain, and fecal incontinence

Ferreira Roseanne, Alwashmi Emad, Otis-Chapados Samuel, Bhojani Naeem, Chughtai Bilal, Elterman S. Dean, Zorn C. Kevin;

Brief Summary: Retrospective study of 64 male patients who underwent sacral neuromodulation, with the most common indication being overactive bladder. Over 80% of patients reported satisfaction and over 90% reported symptom improvement within the first year, with benefits persisting beyond one year in more than approximately 75% of patients.

Article Link: https://pubmed.ncbi.nlm.nih.gov/39217518/

A Scoping Review of Epidural Spinal Cord Stimulation for Improving Motor and Voiding Function Following Spinal Cord Injury

Nina D'hondt, MD,[1] Karmi Margaret Marcial, MD, DPBA, DPBPM,[2] Nimish Mittal, MBBS, MD,[3] Matteo Costanzi, MD,[4] Yasmine Hoydonckx, MD, MSc, FIPP,[5] Pranab Kumar, MD, FRCA, FRCPC,[5] Marina F. Englesakis, BA, MLIS,[6] Anthony Burns, MD, MSc,[3] and Anuj Bhatia, MD, PhD, FRCPC[5]

Brief Summary: Scoping review that included 88 patients with spinal cord injury (both complete and incomplete) treated with epidural SCS. They found that the vast majority of patients had a variable degree of improvement in volitional motor function. Furthermore, studies evaluating spasticity and micturition also demonstrated benefit in these functions. The authors hypothesize various mechanisms of action of SCS, including the role of residual supraspinal transmission in neurological recovery.

Article Link: https://doi.org/10.46292/sci22-00061

Effect of Deep Brain Stimulation on Comorbid Self-injurious Behavior: A Systematic Review and Meta-analysis of Individual Patient Data

Karim Mithani, MD, MEng[1,2]; Kristina Zhang, BMSc[3]; Han Yan, MD[1,4]; Lior Elkaim, MD[5]; Peter J. Gariscsak, BSc[6]; Hrishikesh Suresh, MD[1,2]; Flavia Venetucci Gouveia, PhD[7]; Alfonso Fasano, MD, PhD[8,9]; Carolina Gorodetsky, MD[10,11]; George M. Ibrahim, MD, PhD[1,2,3,7]

Brief Summary: This review looked at the effect of DBS in 59 patients with self-injurious behaviors (SIB), primarily those with Tourette syndrome but also those with dystonia, epilepsy, and others. They noted DBS used to treat the primary neurologic condition was also effective in treating SIB.

Article Link: https://doi.org/10.1016/j.neurom.2024.07.009

Sacral neuromodulation in pediatric refractory bladder and bowel dysfunction

Insights from Canada's first pediatric cohort

Roseanne Ferreira[1], Dean Elterman[1], Mandy Rickard[2], Max Freeman[2], Natasha Brownrigg[2], Abby Varghese[2], Michael Chua[2], Armando Lorenzo[2], Joana Dos Santos[2]

Brief Summary: This inaugural report of six Canadian pediatric patients who underwent sacral neuromodulation for refractory bowel and bladder dysfunction. They report symptomatic improvement on validated questionnaires with a 70% improvement in lower urinary tract symptoms, reduction in pharmacological therapy and improvement in quality of life.

Article Link: https://cuaj.ca/index.php/journal/article/view/8881

Pulsed Radiofrequency Neuromodulation of the Greater Occipital Nerve for the Treatment of Headache Disorders in Adults: A Systematic Review

Kyle De Oliveira[a], Nina Dhondt[b], Marina Englesakis[c], Akash Goel[d], and Yasmine Hoydonckx[e]

[a]Department of Anesthesia and Pain Management, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada; [b]Department of Pain Medicine, Multidisciplinary Pain Center, VITAZ, Sint-Niklaas, Belgium; [c]The Institute of Education Research, Library & Information Services, University Health Network, Toronto, Ontario, Canada; [d]Department of Anesthesia and Pain Management, St Michael's Hospital, Unity Health, Toronto, Ontario, Canada; [e]Department of Anesthesia and Pain Medicine, Toronto Western Hospital, Toronto, Ontario, Canada

Brief Summary: This review looked at 608 patients who underwent pulsed radiofrequency neuromodulation of the greater occipital nerve. They note benefit in various headache conditions, principally benefits lasting 3–6 months in chronic migraine and 6–10 months in occipital neuralgia.

Article Link: https://doi.org/10.1080/24740527.2024.2355571

Combined Annual Meeting of the CNS and NSUKI

We jointly held our annual meeting with the Neuromodulation Society of the UK and Ireland (NSUKI), in Dublin, Ireland. It was a great meeting, with over 40 Canadian delegates, spanning from scientists, researchers, engineers, to healthcare providers. All came together to advance work in the field of neuromodulation therapy.

In particular, we would like to acknowledge the excellent work of our very own CNS members:

- Dr. Chris Honey: DBS for Spasmodic Dysphonia: a New Field with a Surprising Target
- Dr. Vishal Varshney: Neuromodulation for Vascular Disease
- Dr. Anuj Bhatia: Placebo Effects and Composite Outcomes in Neuromodulation for Pain Syndromes
- Dr. Michel Prudhomme: Occipital Stimulation for Craniofacial Pain: 15 Years Experience of CHU de Quebec
- Dr. Mojgan Hodaie: Neuromodulation for Facial Pain

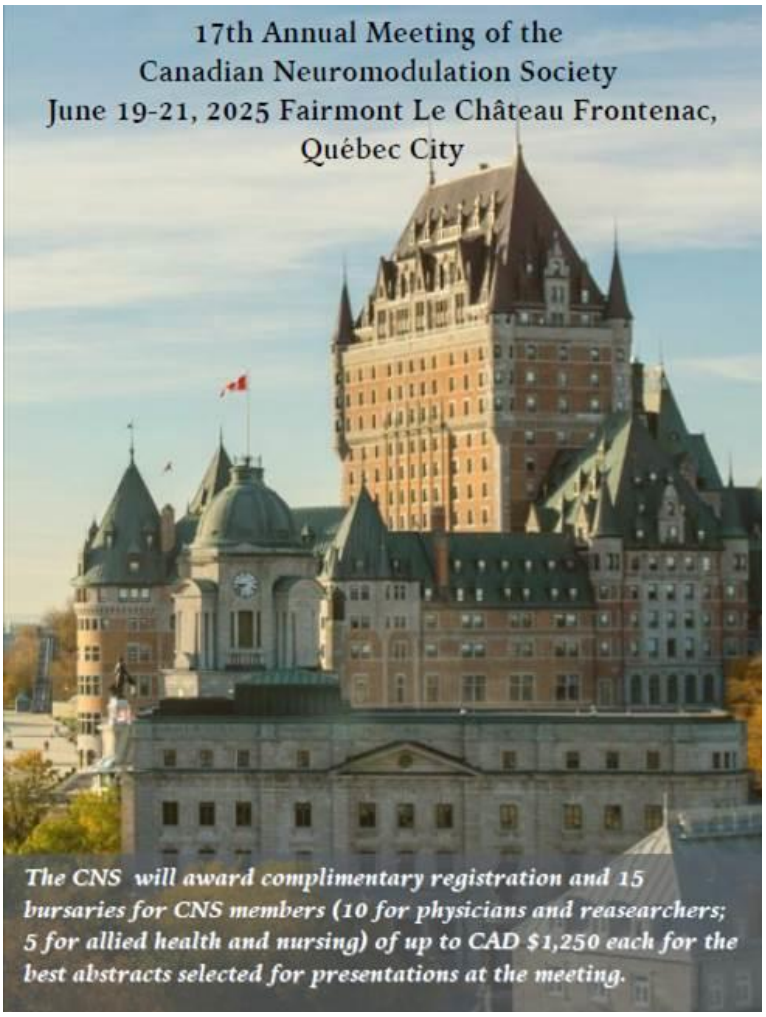
Interventional Pain and Neuromodulation Trainee Workshop:

We held our trainee workshop in Halifax, NS, which was a huge success. This was organized by our very own Course Director Dr. Lutz Weise and Course Coordinator Dr. Danielle Alvares. Trainees not only attended lectures and workshops related to routine interventional pain procedures, but also gained experience with SCS, intrathecal pumps, sacral nerve stimulation and others.

Upcoming Meeting:

SAVE THE DATE:

Details for the 2025 meeting in Quebec City, QC: Agenda TBD



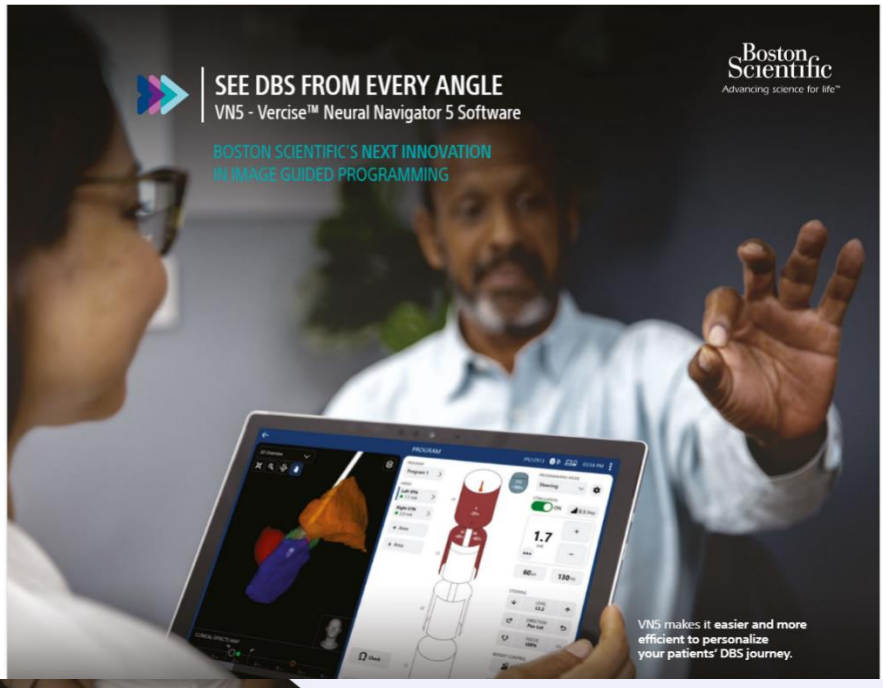
By the way ….

To make this newsletter happen, we would like to have your input!

You can send us your work/advancements/experience on the following topics:

- **What's out there**: Short reviews of recent advances on neuromodulation topics
- **This is how I do it**: Share with us your tips and tricks for performing neuromodulation procedures
- **My clinic/program**: Brief report on the unique features of your neuromodulation clinic/program
- **My lab**: Brief report on your neuromodulation research set-up
- **Never too late to learn**: Any educational event that you are organizing including information about upcoming national/international meetings
- **Curious cases**: Interesting case reports from your practice
- **Letter to the Editor**: Response to articles or topics addressed in the CNS newsletter

Please send your contribution to himanshu.gupta@medportal.ca. Thank you!!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VN5 - Vercise™ Neural Navigator 5 Software
BOSTON SCIENTIFIC'S NEXT INNOVATION IN IMAGE GUIDED PROGRAMMING
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Advancing science for life™
VN5 makes it easier and more efficient to personalize your patients' DBS journey.

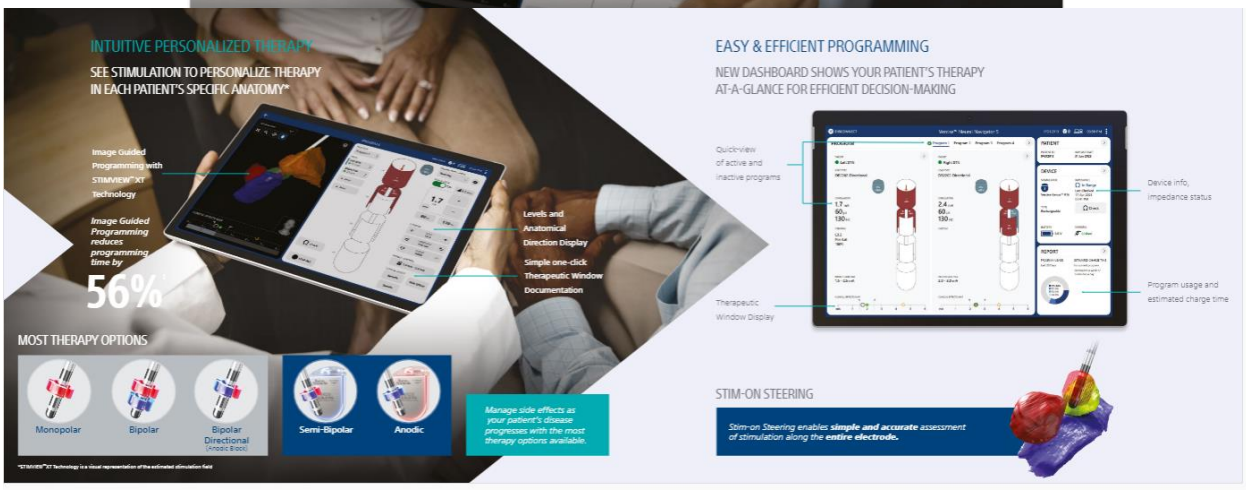
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Image Guided Programming with STIMVIEW™ XT Technology
Image Guided Programming reduces programming time by
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Levels and Anatomical Direction Display
Simple one-click Therapeutic Window Documentation
MOST THERAPY OPTIONS
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Bipolar Directional (Anodic Block)
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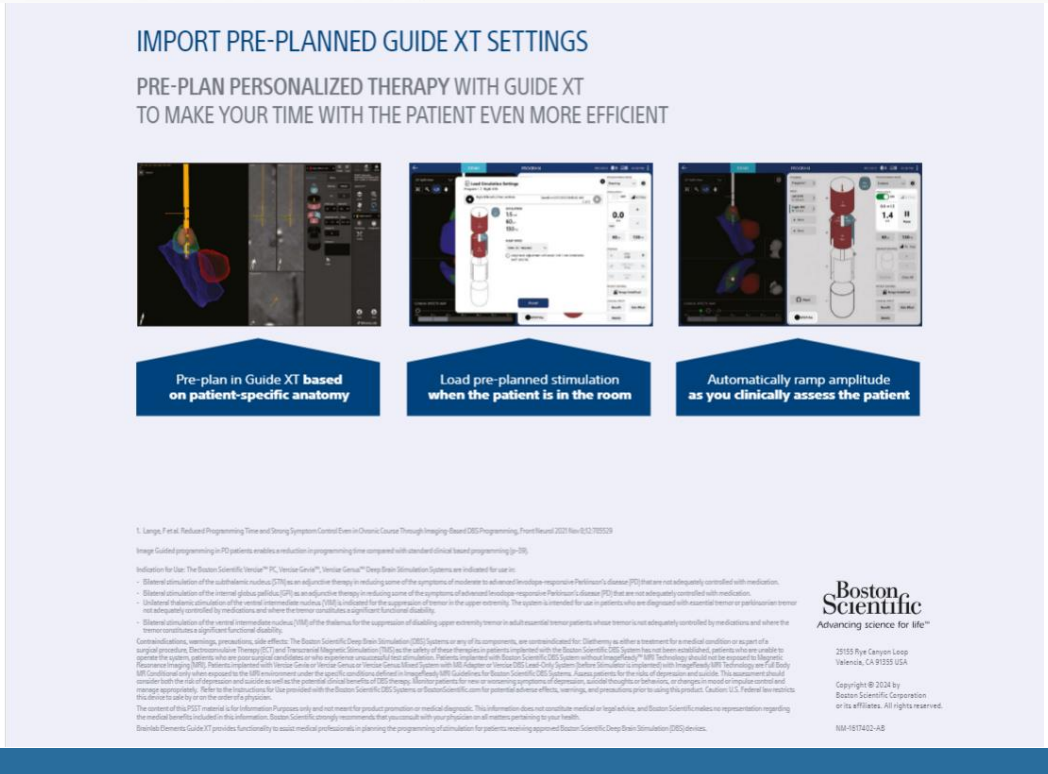
Manage side effects as your patient's disease progresses with the most therapy options available.
EASY & EFFICIENT PROGRAMMING
NEW DASHBOARD SHOWS YOUR PATIENT'S THERAPY AT-A-GLANCE FOR EFFICIENT DECISION-MAKING
Quick-view of active and inactive programs
Device info, impedance status
Therapeutic Window Display
Program usage and estimated charge time
STIM-ON STEERING
Stim-on Steering enables simple and accurate assessment of stimulation along the entire electrode.


IMPORT PRE-PLANNED GUIDE XT SETTINGS
PRE-PLAN PERSONALIZED THERAPY WITH GUIDE XT TO MAKE YOUR TIME WITH THE PATIENT EVEN MORE EFFICIENT
Pre-plan in Guide XT based on patient-specific anatomy
Load pre-planned stimulation when the patient is in the room
Automatically ramp amplitude as you clinically assess the patient
1. Lange, F et al. Reduced Programming Time and Strong Symptom Control Even in Chronic Course Through Imaging-Based DBS Programming, Front Neurol 2021 Nov 8;12:785528
Image Guided programming in PD patients enables a reduction in programming time compared with standard clinical based programming (p<.05).
Indication for Use: The Boston Scientific Vercise™ PC, Vercise Genus™, Vercise Genus™ Deep Brain Stimulation Systems are indicated for use in:
- Bilateral stimulation of the subthalamic nucleus (STN) as an adjunctive therapy in reducing some of the symptoms of moderate to advanced levodopa-responsive Parkinson's disease (PD) that are not adequately controlled with medication.
- Bilateral stimulation of the internal globus pallidus (GPi) as an adjunctive therapy in reducing some of the symptoms of advanced levodopa-responsive Parkinson's disease (PD) that are not adequately controlled with medication.
- Unilateral thalamic stimulation of the ventral intermediate nucleus (VIM) is indicated for the suppression of tremor in the upper extremity. The system is intended for use in patients who are diagnosed with essential tremor or parkinsonian tremor not adequately controlled by medications and where the tremor constitutes a significant functional disability.
- Bilateral stimulation of the ventral intermediate nucleus (VIM) of the thalamus for the suppression of disabling upper extremity tremor in adult essential tremor patients whose tremor is not adequately controlled by medications and where the tremor constitutes a significant functional disability.
Contraindications, warnings, precautions, side effects: The Boston Scientific Deep Brain Stimulation (DBS) Systems or any of its components, are contraindicated for: Diathermy as either a treatment for a medical condition or as part of a surgical procedure, Electroconvulsive Therapy (ECT) and Transcranial Magnetic Stimulation (TMS) as the safety of these therapies in patients implanted with the Boston Scientific DBS System has not been established, patients who are unable to operate the system, patients who are poor surgical candidates or who experience unsuccessful test stimulation. Patients implanted with Boston Scientific DBS System without ImageReady™ MRI Technology should not be exposed to Magnetic Resonance Imaging (MRI). Patients implanted with Vercise Genus or Vercise Genus Mixed System with MR Adapter or Vercise DBS Lead-Only System (before Stimulator is implanted) with ImageReady MRI Technology are Full Body MR Conditional only when exposed to the MRI environment under the specific conditions defined in ImageReady MRI Guidelines for Boston Scientific DBS Systems. Assess patients for the risks of depression and suicide. This assessment should consider both the risk of depression and suicide as well as the potential clinical benefits of DBS therapy. Monitor patients for new or worsening symptoms of depression, suicidal thoughts or behaviors, or changes in mood or impulse control and manage appropriately. Refer to the Instructions for Use provided with the Boston Scientific DBS Systems or BostonScientific.com for potential adverse effects, warnings, and precautions prior to using this product. Caution: U.S. Federal law restricts this device to sale by or on the order of a physician.
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Brainlab Elements Guide XT provides functionality to assist medical professionals in planning the programming of stimulation for patients receiving approved Boston Scientific Deep Brain Stimulation (DBS) devices.
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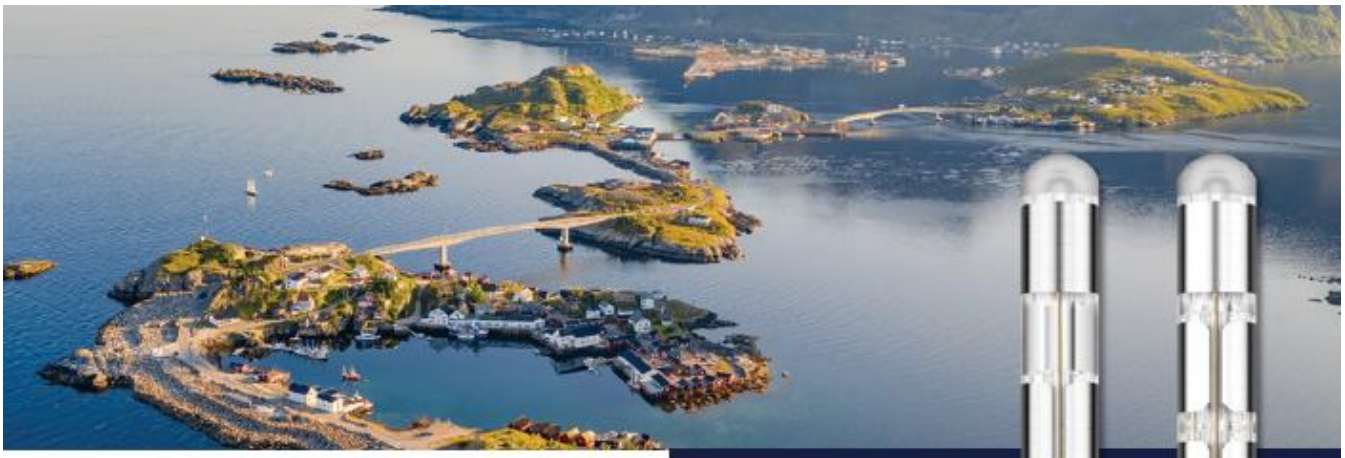

The first-of-its-kind[1] SenSight™ Directional Lead System

The benefits of directionality plus the power of sensing

With your collaboration and insights, we've designed every component of our DBS directional lead system – including the lead, the burr hole device, the extension, and everything in between. It's the only DBS directional lead system with 3T and 1.5T MR Conditional* eligibility.

Built with proprietary materials, components, and processes, the SenSight™ directional lead and Sensight™ Extension work seamlessly with the Percept™ PC Neurostimulator to enhance detection of local field potentials (LFPs), which are 1 million times smaller than DBS stimulation pulses.[2]

SenSight™ directional lead

1.5mm and 0.5mm spacing

Image enlarged to show detail.

Medtronic DBS systems are MR Conditional and safe in the MR environment as long as certain conditions are met. If the conditions are not met, a significant risk is tissue lesions from component heating, especially at the lead electrodes, resulting in serious and permanent injury including coma, paralysis, or death. Refer to the MRI Guidelines for Medtronic Deep Brain Stimulation Systems for a complete list of conditions: http://www.medtronic.com/manuals

* Products that appear on this web site may not all be licensed in accordance with Canadian Law.

1. Reference data on file
2. Neumann WJ, Staub F, Horn A, et al. Deep brain recordings using an implanted pulse generator in Parkinson's disease. *Neuromodulation*. 2016;19(1):20–24.

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CHRONIC PAIN PORTFOLIO

We're excited to announce our latest innovation in chronic pain therapy. The Eterna™ SCS System with Xtend™ Energy Technology reduces charging frequency to five times per year,[1,2] making it the lowest recharge burden platform on the market.[3]* The Eterna SCS System harnesses the low-energy power of BurstDR™ stimulation, which is clinically proven to reduce pain by 23% more than traditional waveform alternatives.[4]

PATIENT-FRIENDLY FEATURES

The Eterna SCS System is a powerful solution for chronic pain that patients integrate seamlessly into their lives.

XTEND™ ENERGY TECHNOLOGY
Can be charged five times per year[1,2]* and provides peace of mind with zero-volt technology that enables the battery to recover when it is fully depleted.[5]

BURSTDR™ STIMULATION
Clinically proven therapy[6] to provide superior** relief.

EASY-TO-USE MOBILE APP
Patients use discrete and familiar Apple[a] mobile digital devices to adjust their therapy.

SMALLEST IMPLANT PROFILE
The Eterna SCS System is up to 58% smaller*** than other rechargeable spinal cord stimulation (SCS) systems.[7]

TOTALSCAN™ MRI TECHNOLOGY
Patients can safely undergo full-body magnetic resonance imaging (MRI) scans.[8]

UPGRADEABLE PLATFORM
Delivers the latest stimulation software without replacing the implant.

Connect Abbott to run some trials with Eterna

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*Upon implant of the Eterna™ SCS System, approximately 3 hours five times per year (69 to 74 days between charges) or 1 hour per month (25 to 27 days between charges) at standard (nominal) settings for BurstDR™ stimulation programming: 30/90 dosing when programmed with amplitude of 0.6mA and all other BurstDR™ stimulation settings are left at default. Recommended recharge frequency and duration for competitor product described in their respective IFU or clinical studies, which may involve different patient populations and other variables. Not a head-to-head comparison of stimulation settings or clinical outcomes.
**BurstDR™ stimulation superiority when compared to traditional tonic stimulation as studied in SUNBURST.
***Smallest size determined by volume in cubic centimeters. Based off comparison to volumetric measurement of the following IPGs: Boston Scientific‡1 WaveWriter Alpha‡1 16: 20.1 cc, Medtronic‡2 Intellis‡1: 13.9 cc, Nevro‡3 Omnia‡1: 26 cc, Saluda‡4 Evoke‡1: 33 cc.
†Recommended recharge frequency and duration for competitor product described in their respective IFU or clinical studies, which may involve different patient populations and other variables. Not a head-to-head comparison of stimulation settings or clinical outcomes.

1. Abbott. Eterna™ IPG Battery Recharge Characterization Report (90903492). 2023.
2. Abbott. Eterna™ IPG Elect Design Verification Report: Current Draw (90860050). 2022.
3. Abbott. OUS Eterna™ Lowest Recharge Burden Comparison Memo (MAT-2310293). 2022.
4. De Ridder D, Lenders MW, De Vos CC, et al. A 2-center comparative study on tonic versus burst spinal cord stimulation: amount of responders and amount of pain suppression. *Clin J Pain*. 2015;31(5):433-437. doi:10.1097/AJP.0000000000000129
5. Abbott. Gemini IPG Battery and Device Recovery from 0V (90956693). 2002.
6. Deer T, Slavin K, North R, et al. Randomized, controlled trial assessing burst stimulation for chronic pain: two-year outcomes from the SUNBURST Study. Presented at: The 2018 North American Neuromodulation Society (NANS) Annual Meeting; January 11-14, 2018; Las Vegas, NV.
7. Abbott. OUS Eterna™ SCS IPG Size Comparison Memo (MAT-2310297). 2023.
8. Abbott. MRI Procedure Information, Abbott Medical MR Conditional SCS and DRG Systems, Clinician's Manual. 2022.
9. Kapural L, Yu C, Doust MW, et al. Comparison of 10-kHz high-frequency and traditional low-frequency spinal cord stimulation for the treatment of chronic back and leg pain: 24-month results from a multicenter, randomized, controlled pivotal trial. *Neurosurgery*. 2016;79(5):667-677. doi:10.1227/NEU.0000000000001418

Abbott
8701 Bee Caves Rd., Bldg. 2, Austin, TX 78746 USA
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Brief Summary: Prior to using Abbott devices, please review the Clinician&8217;s Manual for a complete listing of indications, contraindications, warnings, precautions, potential adverse events, and directions for use. The system is intended to be used with leads and associated extensions that are compatible with the system.

View Important Safety Information

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