



BURSTDTM
STIMULATION

PAIN IS
MULTIDIMENSIONAL

LOW-ENERGY,
LOW-MAINTENANCE
THERAPIES

SIMPLICITY OF
PROGRAMMING

KEY LEARNINGS
AND MESSAGES

BURSTDTM STIMULATION

Distributed by



BURSTDR™ STIMULATION

PAIN IS MULTIDIMENSIONAL

Help your patients regain **better quality of life** by uniquely **managing both pain intensity** and **suffering*** with BurstDR™ stimulation.¹

This may help reduce the fear, frustration, anxiety and depression associated with their pain.¹

LOW-ENERGY, LOW-MAINTENANCE THERAPIES

BurstDR™ stimulation is a unique and proprietary waveform with a carryover effect² allowing it to be **dosed without sacrificing efficacy** and **optimizing battery longevity****.

SIMPLICITY OF PROGRAMMING

Patients and healthcare professionals **may spend less time** programming BurstDR™ stimulation using the BoldXR™ Dosing Protocol.³

FlexBurst360™ therapy provides a tailored, flexible solution to help treat patients with multi-site and evolving pain.⁴ NeuroSphere™ Virtual Clinic provides access to remote consultations, programming and troubleshooting adjustments.^{5,6}



GLOBAL PAIN

Addressing **Global Pain** With **BurstDR™** Stimulation Therapy

**PAIN IS
MULTIDIMENSIONAL**

REGAINPATIENTS' QUALITY
OF LIFE BY UNIQUELY
CONTROLLING ALL ELEMENTS
OF THEIR PAIN

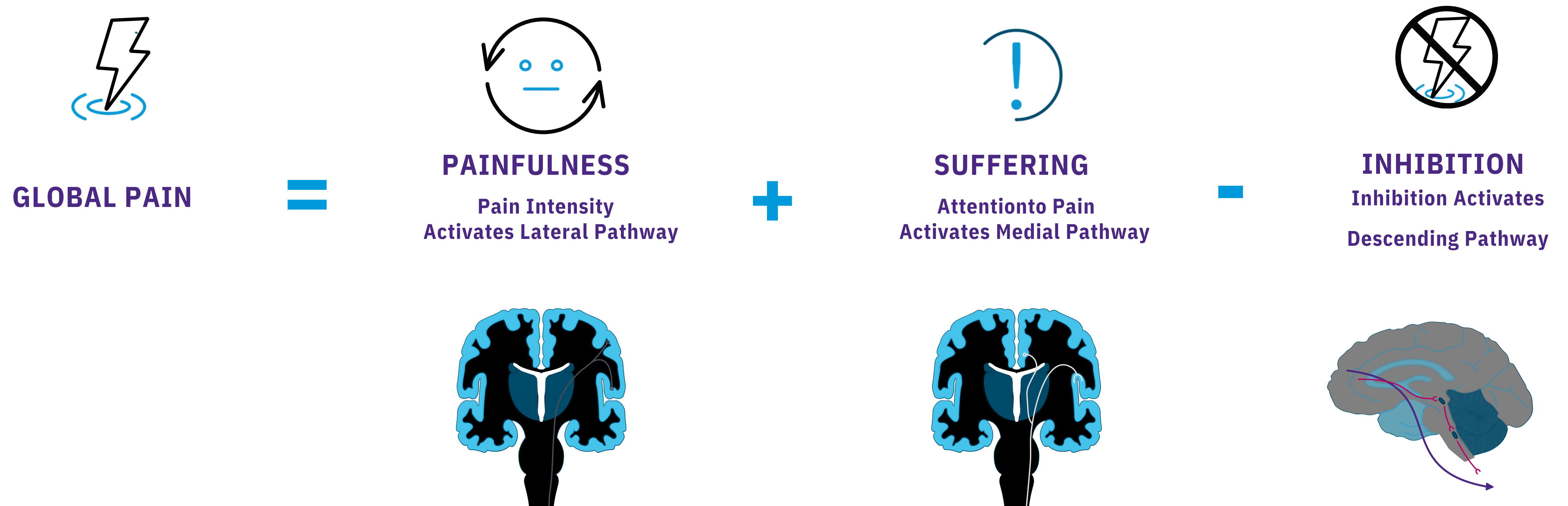
Help your patients regain **better quality of life** by uniquely **managing both pain intensity** and **suffering*** with BurstDR™ stimulation.¹

This may help reduce the fear, frustration, anxiety and depression associated with their pain.¹



GLOBAL PAIN

The Anatomy of Pain and Suffering in the Brain and Its Clinical Implications¹

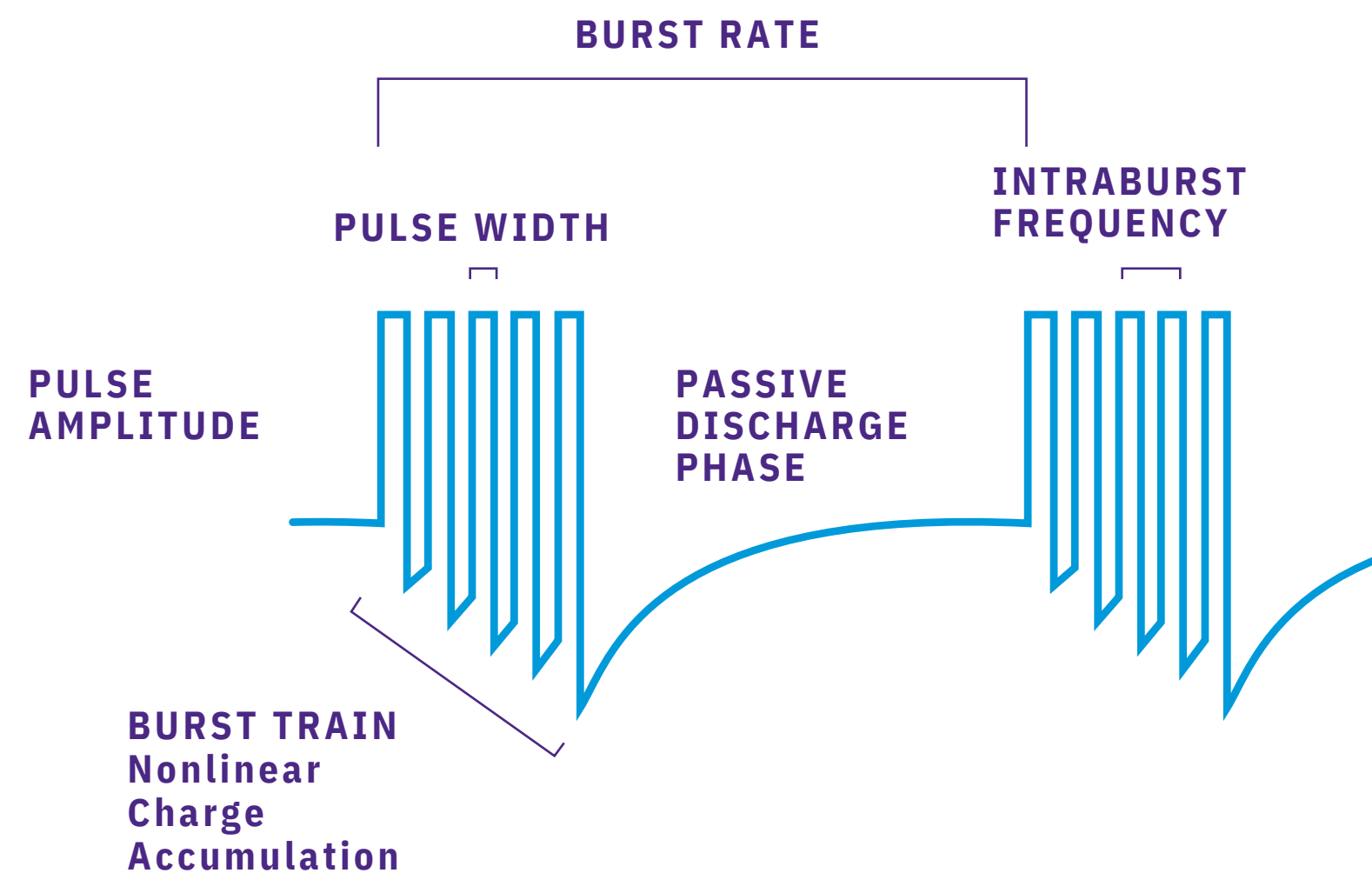


BURSTDR™ STIMULATION

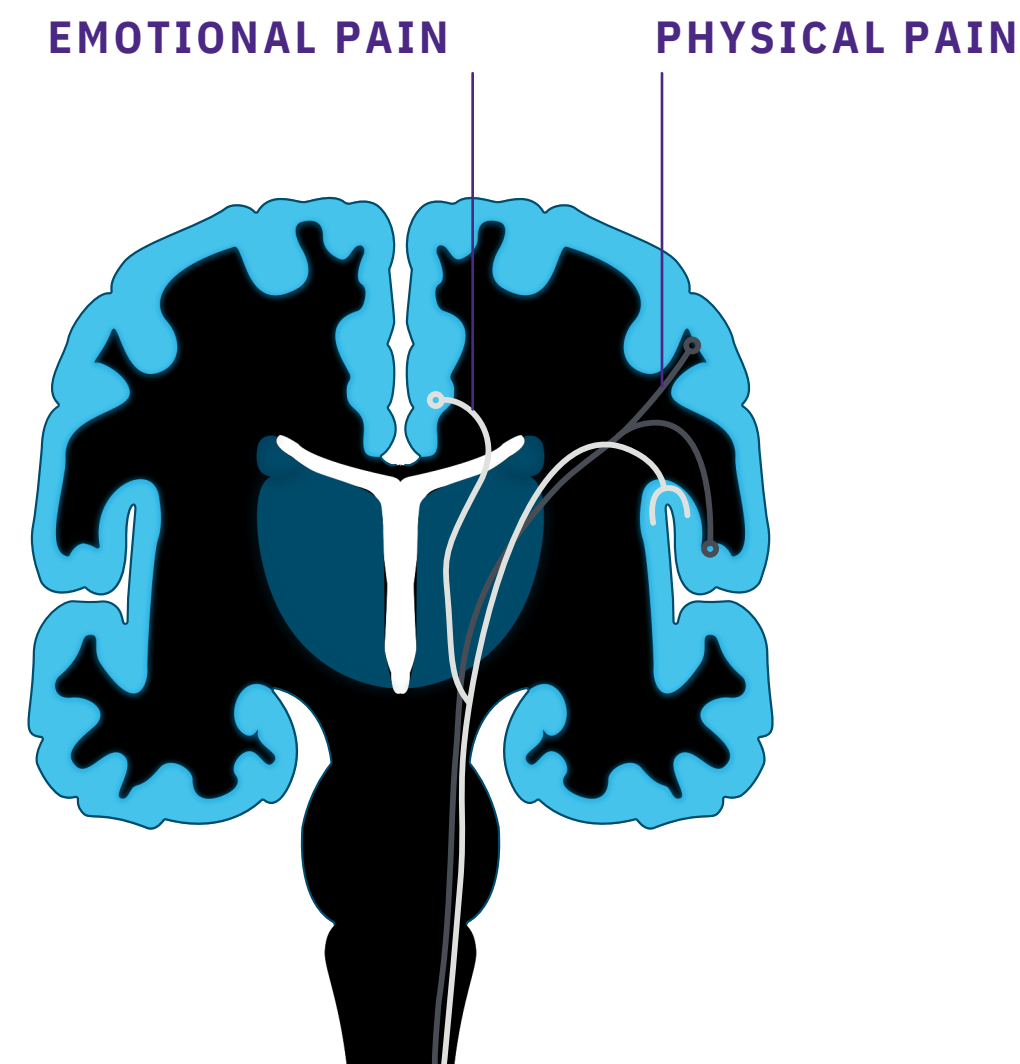
BurstDR™ Stimulation Is Proprietary From Abbott

BurstDR™ stimulation,^{***}exclusively from Abbott,isaproven technologyinspiredbynaturethatadvances neurostimulationtherapy by treating the whole patient. Not only does BurstDR™ stimulation offer your patients superior pain relief over tonic stimulation,⁸ it also relieves the suffering* associated with their chronic pain.

BURSTDR™ STIMULATION UNIQUELY MIMICS BURST FIRING IN THE BRAIN⁹



GIVING PATIENTS RELIEF FROM BOTH THE PHYSICAL PAIN AND THE EMOTIONAL SUFFERING* ASSOCIATED WITH PAIN⁸



MULTIPLE BRAIN IMAGING STUDIES CONFIRM UNIQUE MODULATION OF THE MEDIAL PATHWAY¹⁰⁻¹²

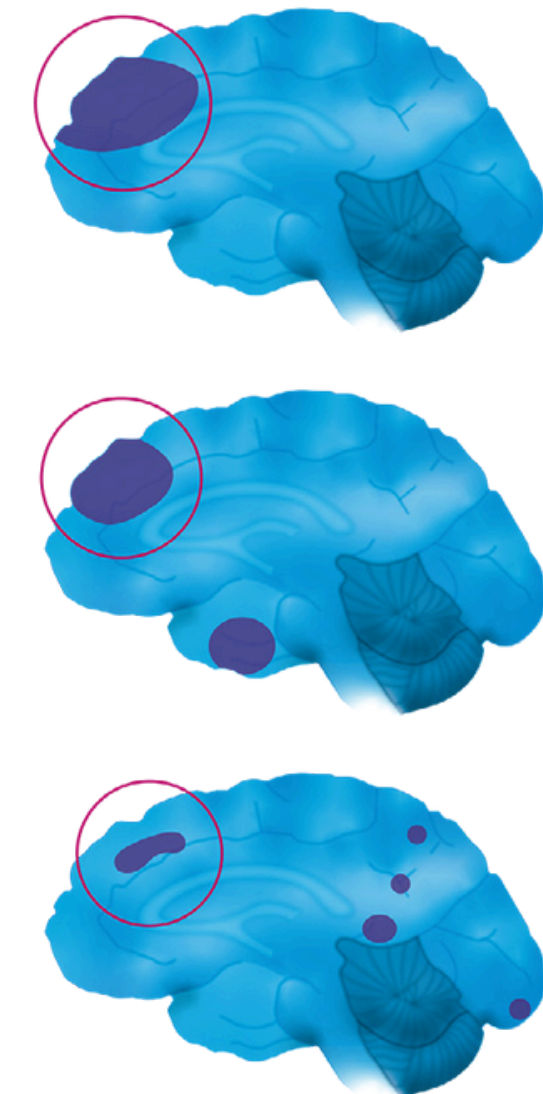
BURSTDR™ STIMULATION VS. TONIC STIMULATION

○ **ANTERIOR CINGULATE CORTEX**
Main Function: Salience Processing

EEG – DE RIDDER, 2013⁹

EEG – DE RIDDER, 2016¹¹

PET – YEARWOOD, 2016¹²



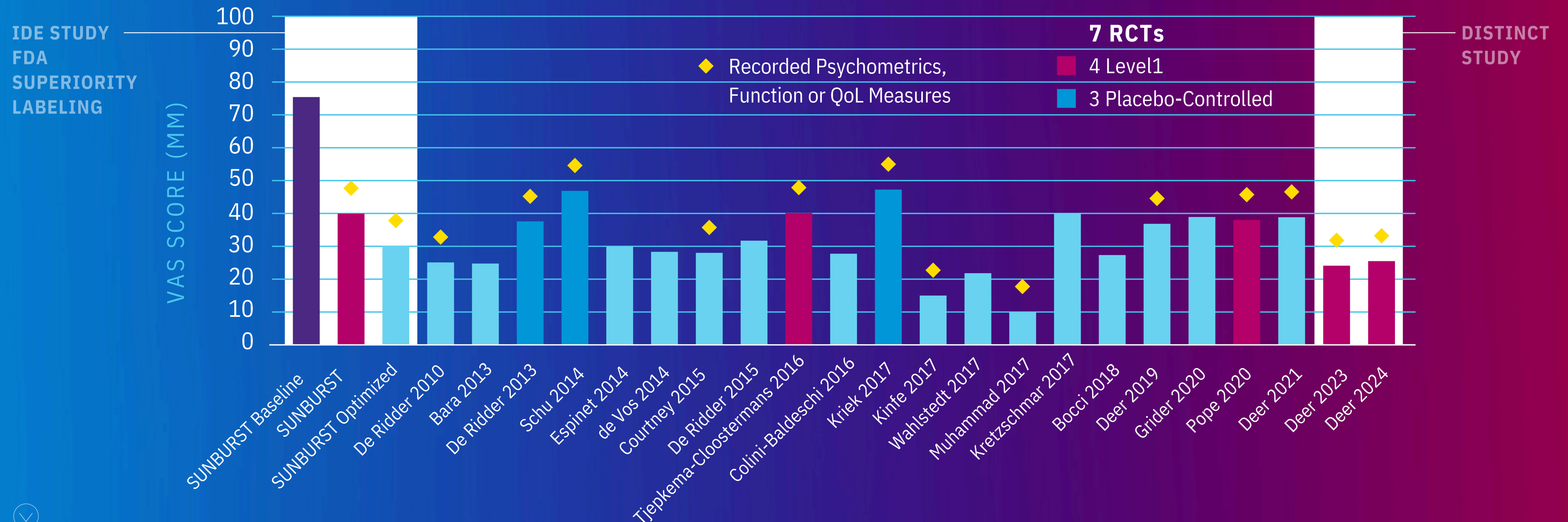
BURSTDR™ STIMULATION CLINICAL EVIDENCE OVERVIEW

BurstDR™ Stimulation Delivers Consistent, Positive Results^{3,8-10,13-35}

1,000+ PATIENTS STUDIED

10+ YEARS

3 CONTINENTS



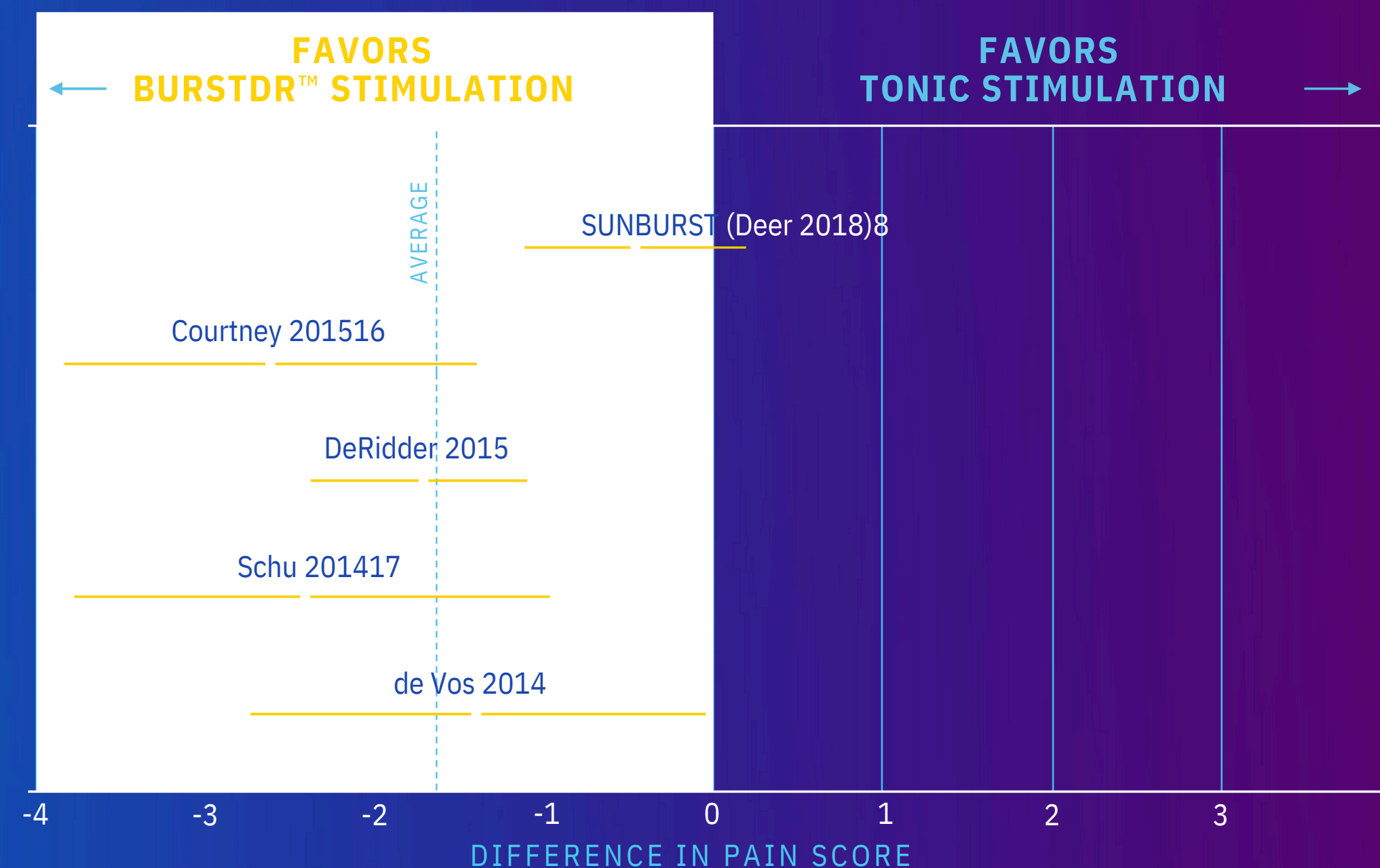
BURSTDR™ STIMULATION CLINICAL EVIDENCE OVERVIEW

BurstDR™ Stimulation Is Now the First Waveform to Have Level 1A Evidence Demonstrating Superiority Over Tonic for Chronic Pain³⁶

LEVEL OF EVIDENCE FOR THERAPEUTIC STUDIES³⁷

- 1A** Systematic review (with homogeneity) of RCTs
- 1B** Individual RCT (with narrow confidence intervals)
- 1C** All or none study
- 2A** Systematic review (with homogeneity) of cohort studies
- 2B** Individual cohort study (including low-quality RCT [e.g., <80% follow-up])
- 2C** “Outcomes” research; ecological studies
- 3A** Systematic review (with homogeneity) of case-control studies
- 3B** Individual case-control study
- 4** Case series (and poor-quality cohort and case-control study)
- 5** Expert opinion without explicit critical appraisal or based on physiology bench research or “first principles”

BURSTDR™ STIMULATION WAVEFORM Level 1A Evidence (N = 268)



KEY RESULTS

- 1** A **POOLED META-ANALYSIS** of five studies comparing BurstDR™ stimulation and tonic waveforms revealed a significant reduction in pain scores, **FAVORING BURSTDR™ STIMULATION OVER TONIC STIMULATION (N = 268, P < 0.001).**³⁶
- 2** Two out of three studies comparing high frequency to tonic were **UNABLE TO ESTABLISH HIGH-FREQUENCY WAVEFORM SUPERIORITY OVER TONIC STIMULATION.**³⁶

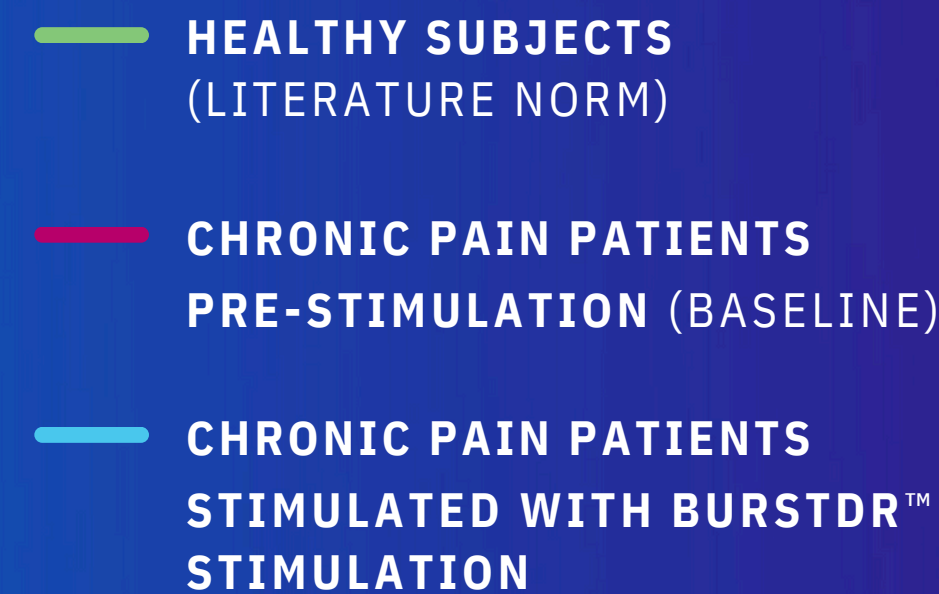


BURSTDR™ STIMULATION CLINICAL EVIDENCE OVERVIEW

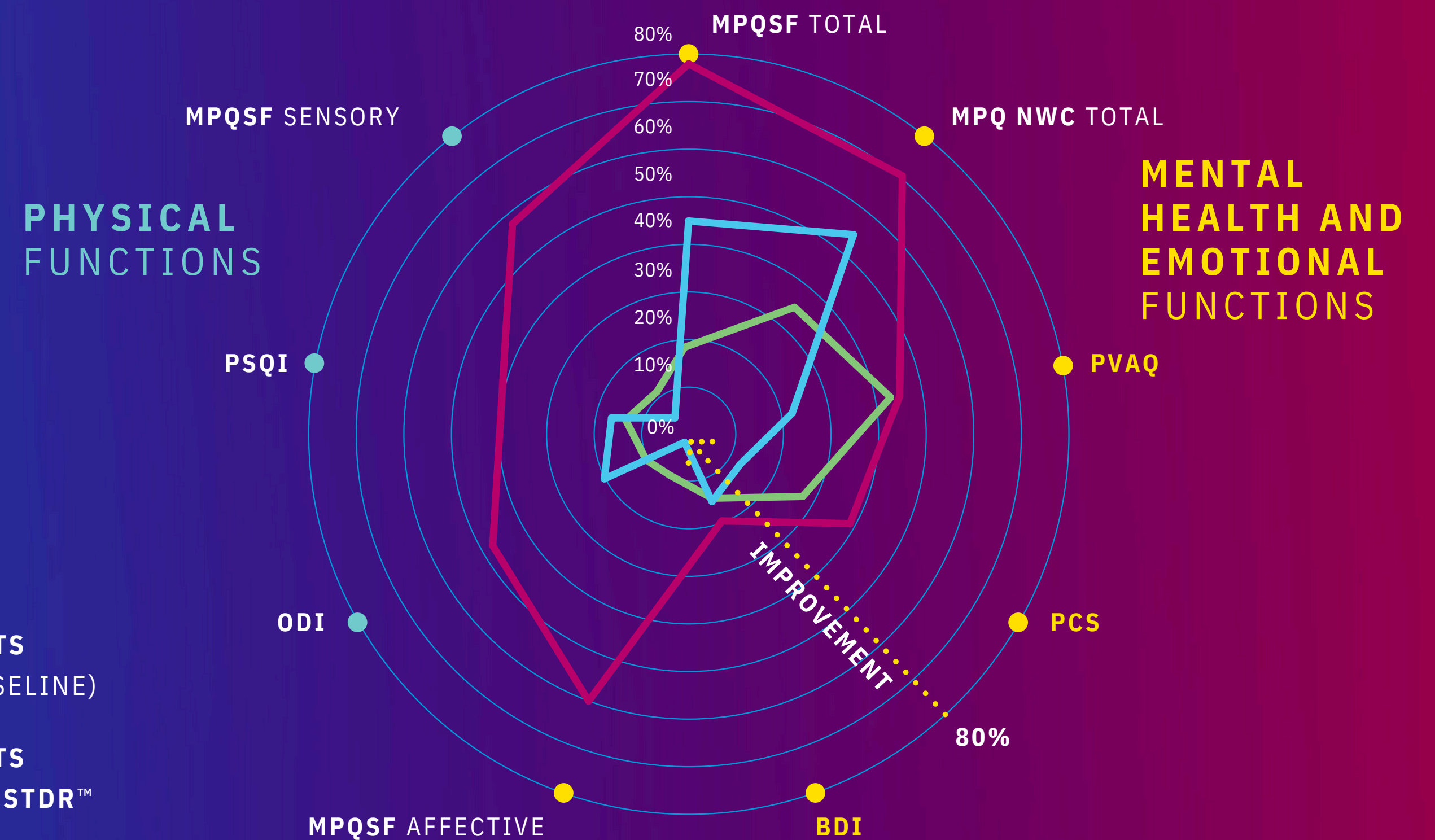
Patient Health and Well-Being Enhancement

BurstDR™ stimulation impacts more than pain intensity, providing the patient better control of the emotional suffering* associated with the pain.

- Demonstrated significant improvement in physical functions
- Improved mental health functions
- Improved quality of life and social well-being



TOTAL PRO SCORE (%) OF A POOLED ANALYSIS OF 9 STUDIES WITH 427 PATIENTS³⁸



PCS, PVAQ AND BDI SCORES ARE EXCELLENT INDICATORS OF **MEDIAL PAIN PATHWAY MODULATION**.



LOW-ENERGY, LOW-MAINTENANCE THERAPIES

BurstDR™ Stimulation



LOW-ENERGY, LOW-MAINTENANCE THERAPIES

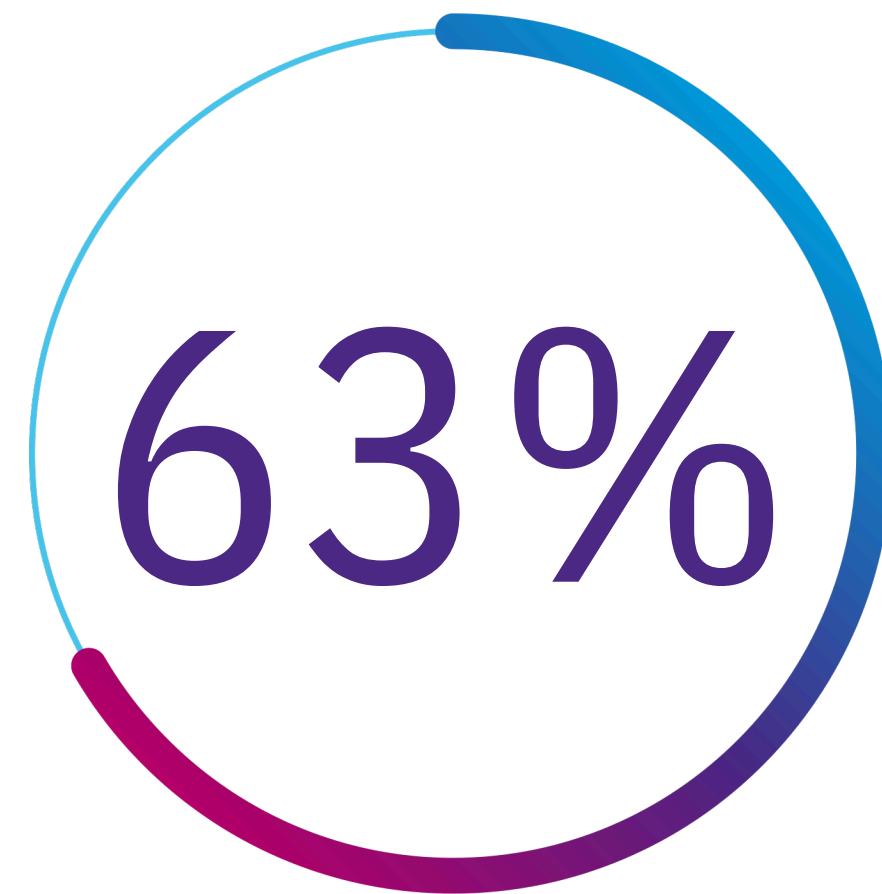
BurstDR™ stimulation is a unique and proprietary waveform with a carryover effect² allowing it to be **dosed without sacrificing efficacy** and **optimizing battery longevity**.^{**}



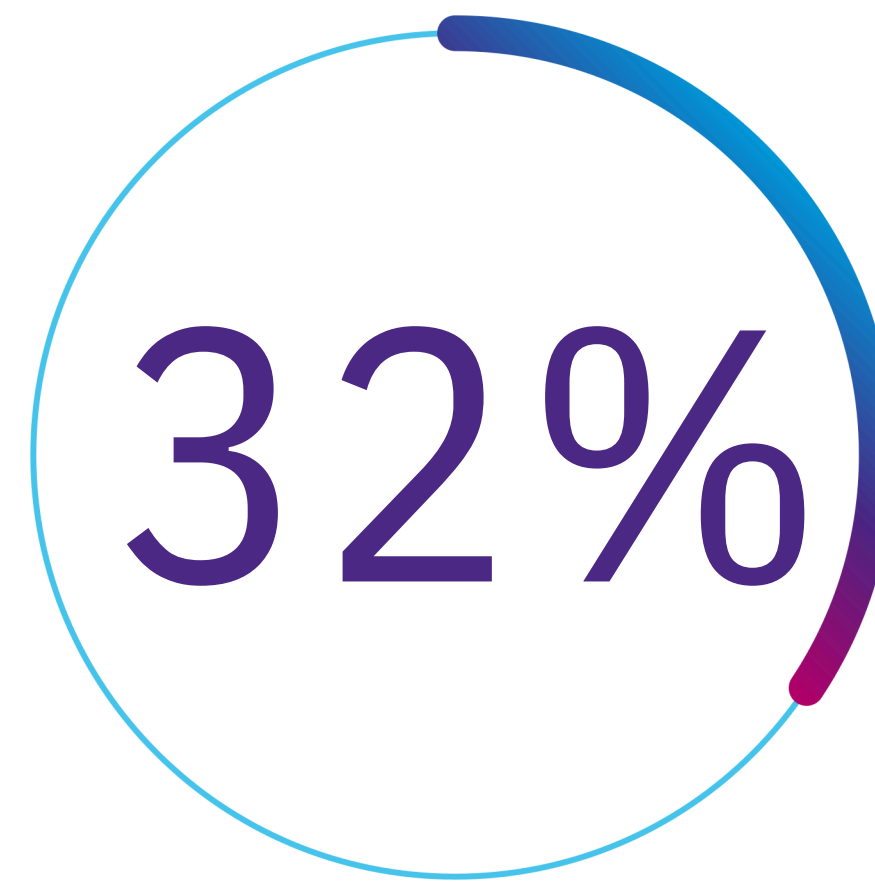
LOW-ENERGY, LOW-MAINTENANCE THERAPIES

There Is a Need for Lower-Maintenance Devices³⁹

PATIENTS PREFER A LOWER-MAINTENANCE OPTION ³⁹



REPORTED DIFFICULTY
PLACING THE CHARGER



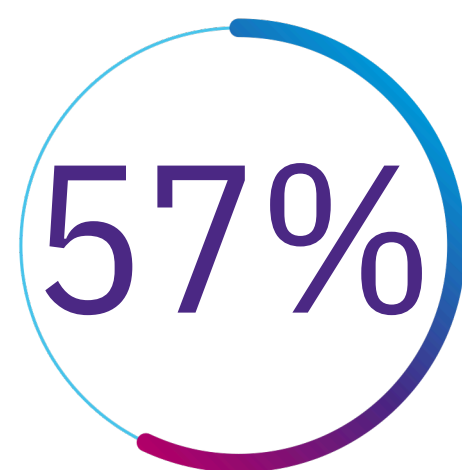
REPORTED RECHARGING
IS UNCOMFORTABLE



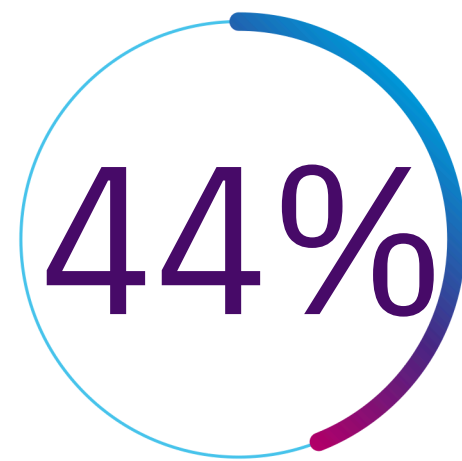
SAY THEY WOULD HAVE TRADED
A LARGER IPG FOR THE
CONVENIENCE OF NOT HAVING TO
RECHARGE AT ALL

LOW-ENERGY, LOW-MAINTENANCE THERAPIES

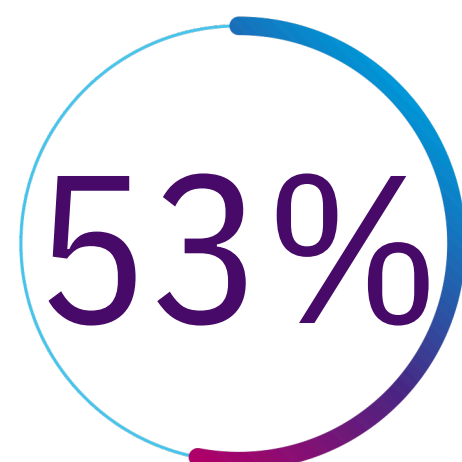
There Is a Need to Reduce the Side Effects of Charging



OF PATIENTS SOUGHT MEDICAL ASSISTANCE
FOLLOWING THE SIDE EFFECTS RELATED
TO CHARGING⁴⁰

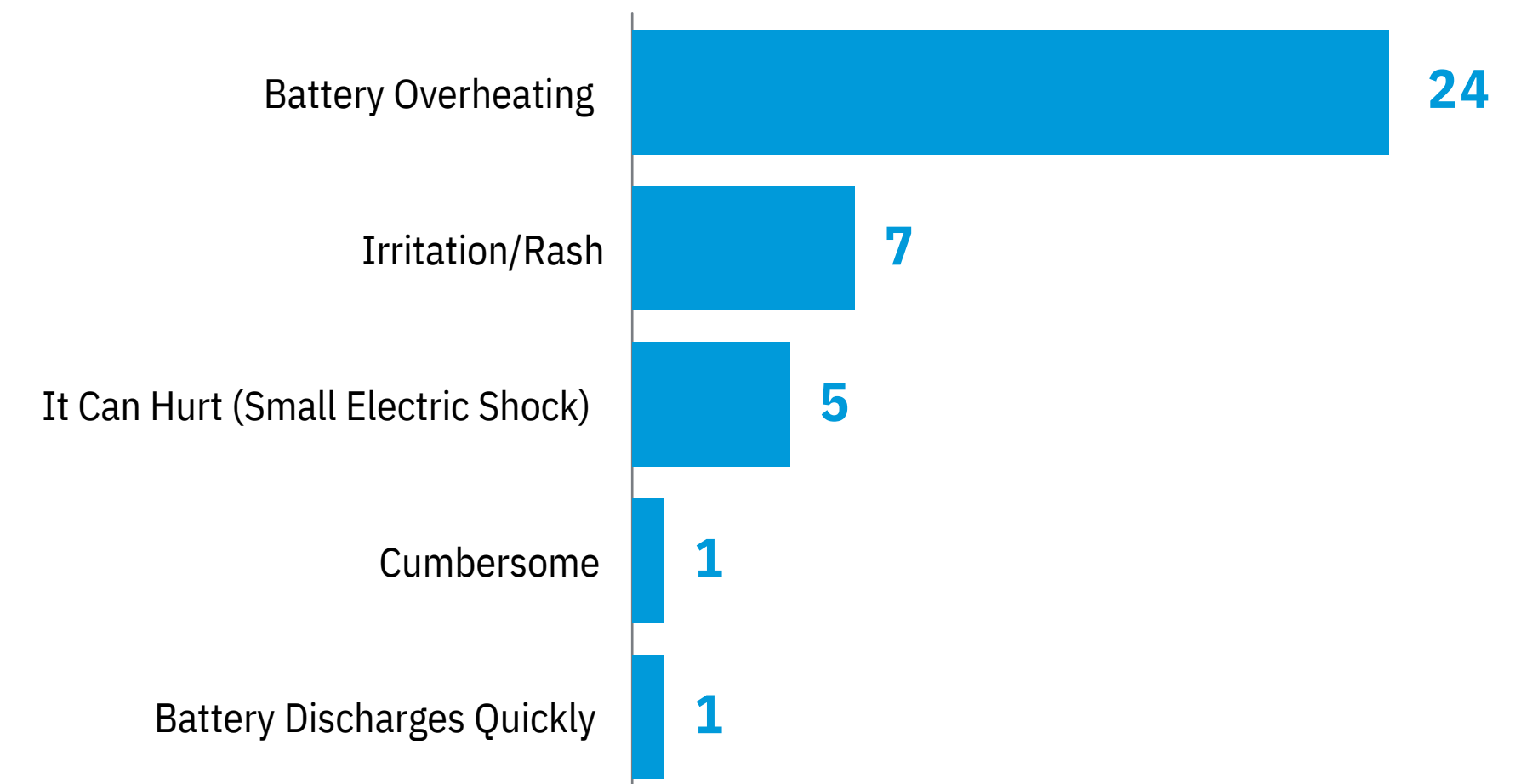


OF PATIENTS FIND RECHARGING
UNCOMFORTABLE, TIME-CONSUMING
AND RESTRICTIVE OF THEIR ACTIVITIES ⁴⁰



OF PATIENTS CLAIMED THAT, IF THEY COULD
GO BACK IN TIME, THEY WOULD HAVE
CHOSEN A NON-RECHARGEABLE DEVICE⁴⁰

SIDE EFFECTS

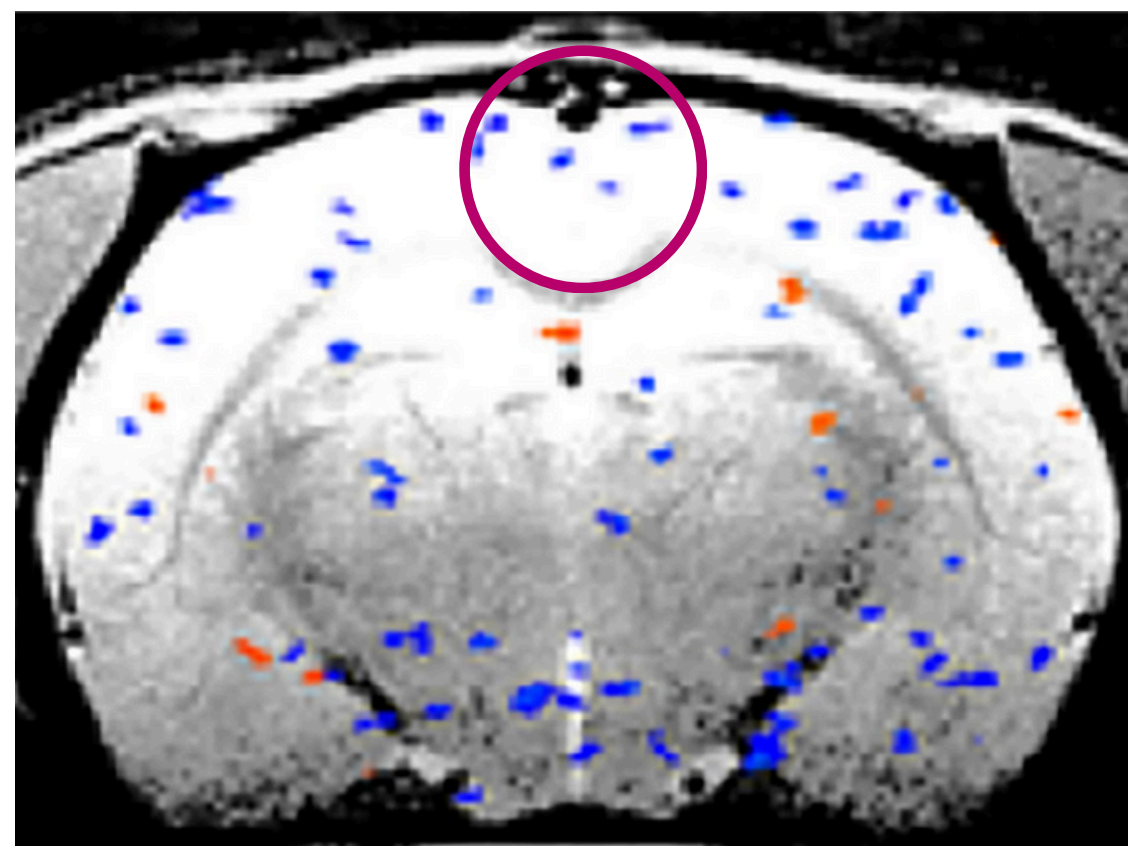


BURSTDR™ STIMULATION, A LOW-ENERGY SOLUTION

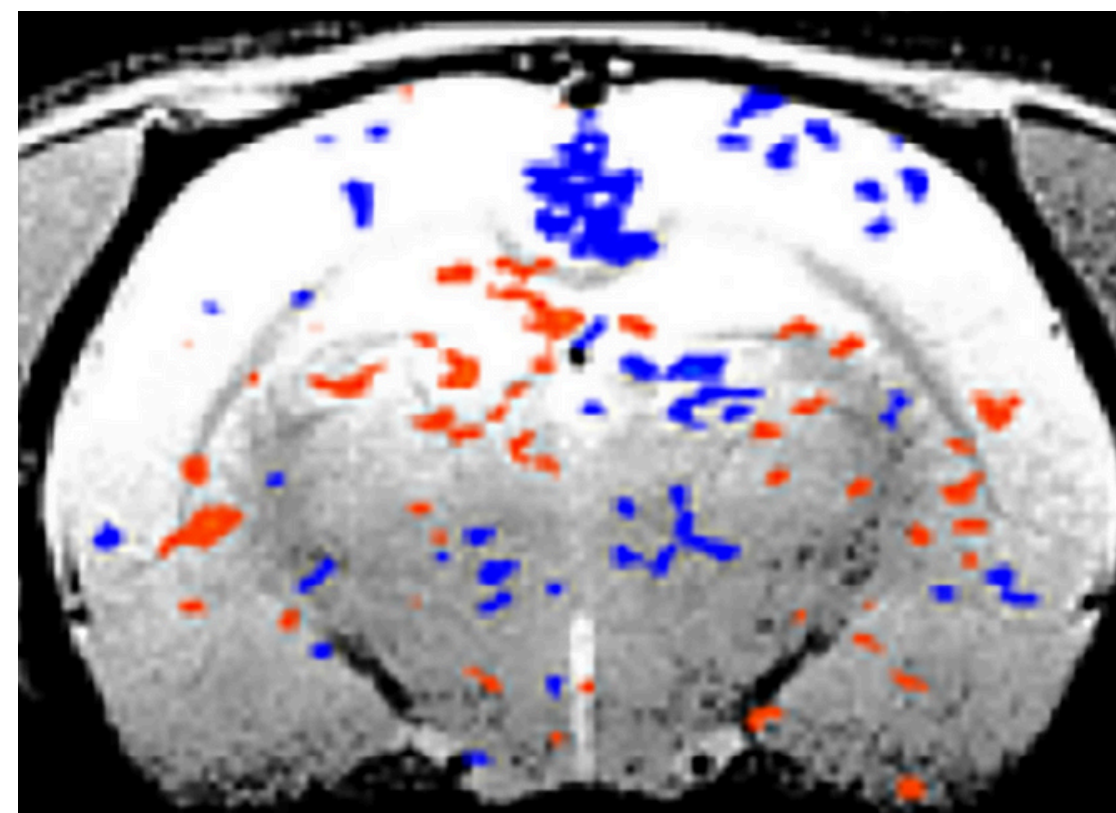
Further Research of BurstDR™ Stimulation Found There Is an Observed Carryover Effect²

BURSTDR™ STIMULATION IS EFFECTIVE EVEN WHEN STIMULATION IS TURNED OFF.

TONIC STIMULATION

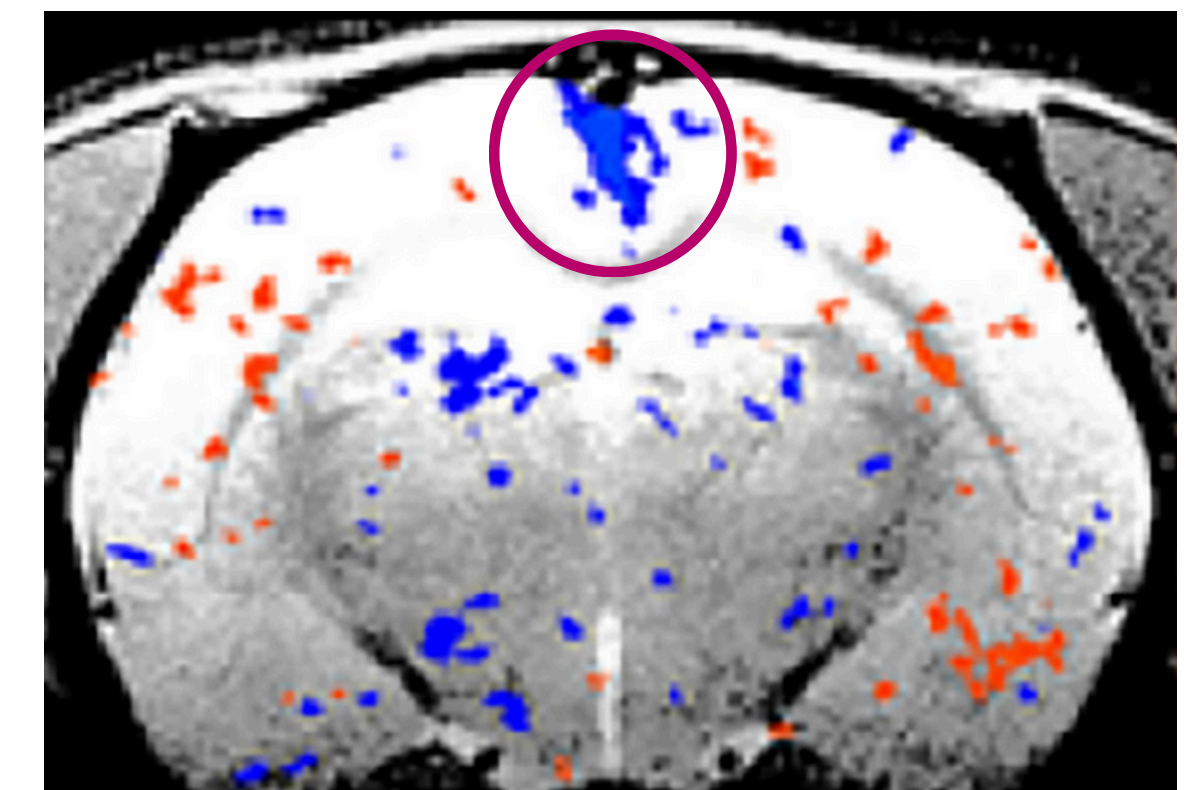


BURSTDR™ STIMULATION



Unlike tonic SCS, BurstDR™ stimulation has an inhibitory effect in the anterior cingulate cortex.

DOSED BURSTDR™ STIMULATION



This effect persists even while dosing the input.

 **ANTERIOR CINGULATE**
(Medial Pathway)

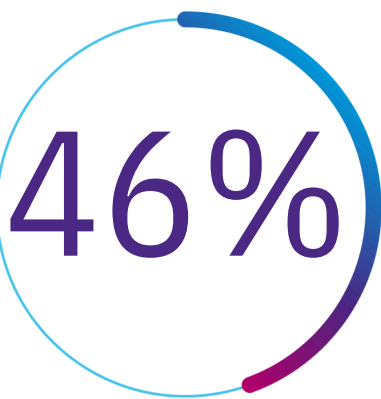
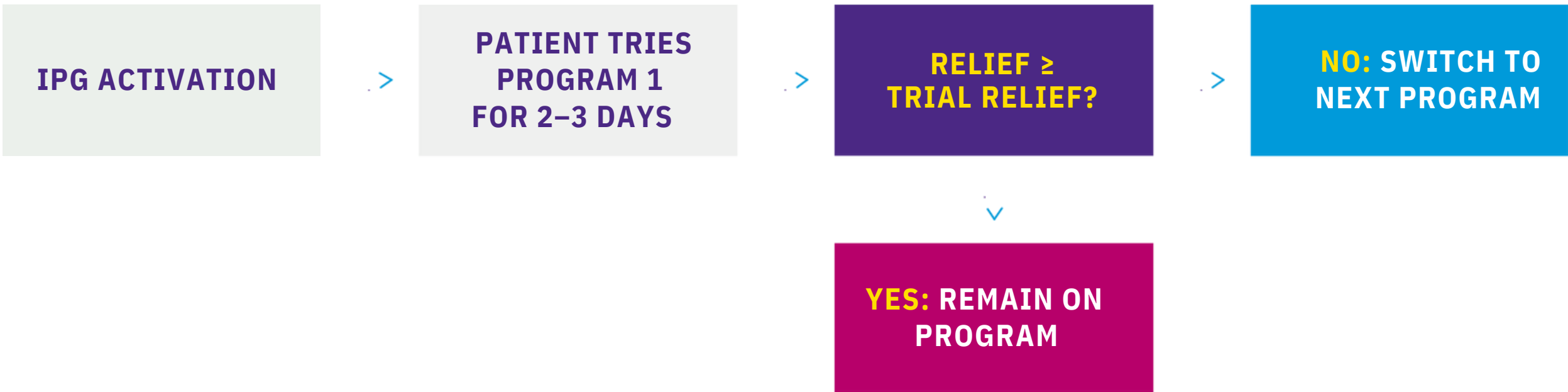


BURSTDTMR STIMULATION, A LOW-ENERGY SOLUTION

BOLD: Dosing BurstDRTM Stimulation3

Deer TR, et al. Novel intermittent dosing burst paradigm in spinal cord stimulation.
Neuromodulation. 2021;24(3):566-573.

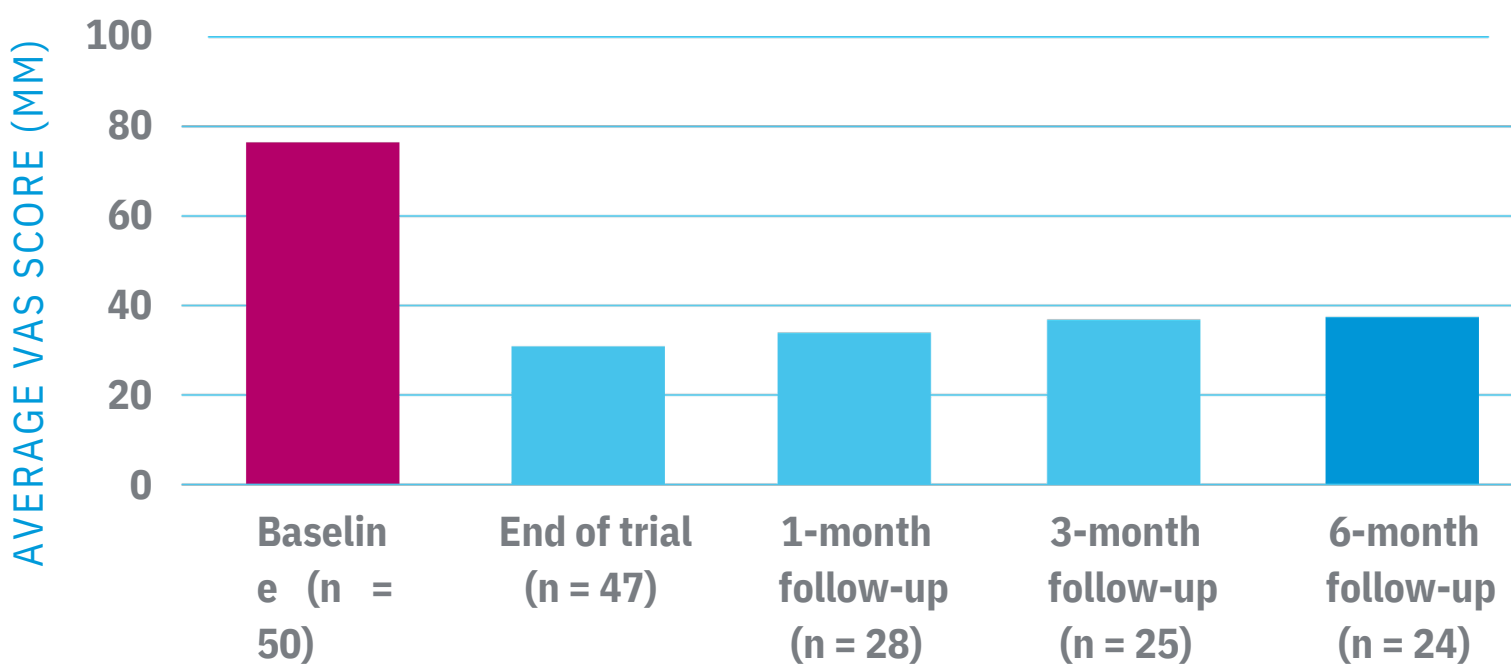
ALL PATIENTS ARE TRIALED WITH DOSED THERAPY (PROGRAM 5)



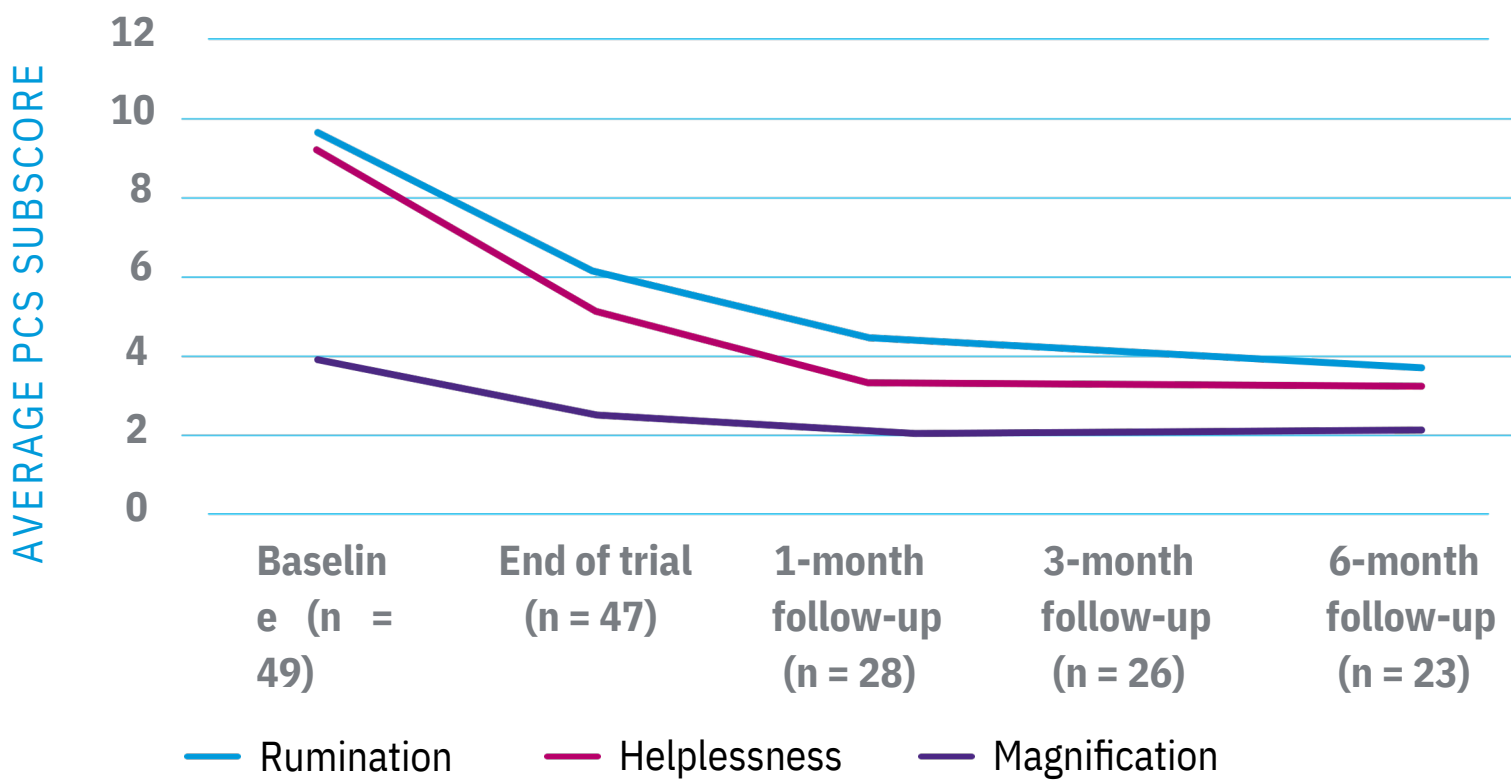
OF PATIENTS ARE UTILIZING THE PROGRAM WITH THE LOWEST DOSE SETTING. PATIENTS ARE USING THERAPY FOR 6 HOURS OR LESS PER DAY.

PROGRAM	PARAMETER
1	30 seconds on/360 seconds off
2	30 seconds on/240 seconds off
3	30 seconds on/150 seconds off
4	30 seconds on/120 seconds off
5	30 seconds on/90 seconds off

AVERAGE OVERALL PAIN VAS



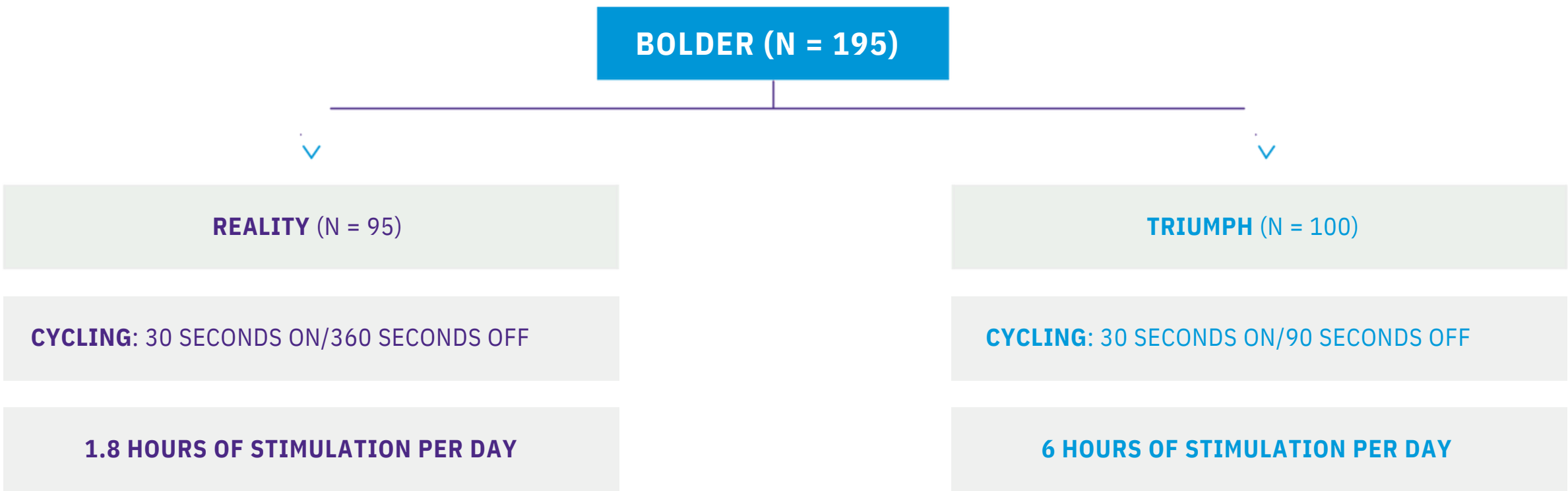
AVERAGE PCS SUBSCORES



BURSTDRTM STIMULATION, A LOW-ENERGY SOLUTION

BOLDER Study: Dosing BurstDR™ Stimulation 34

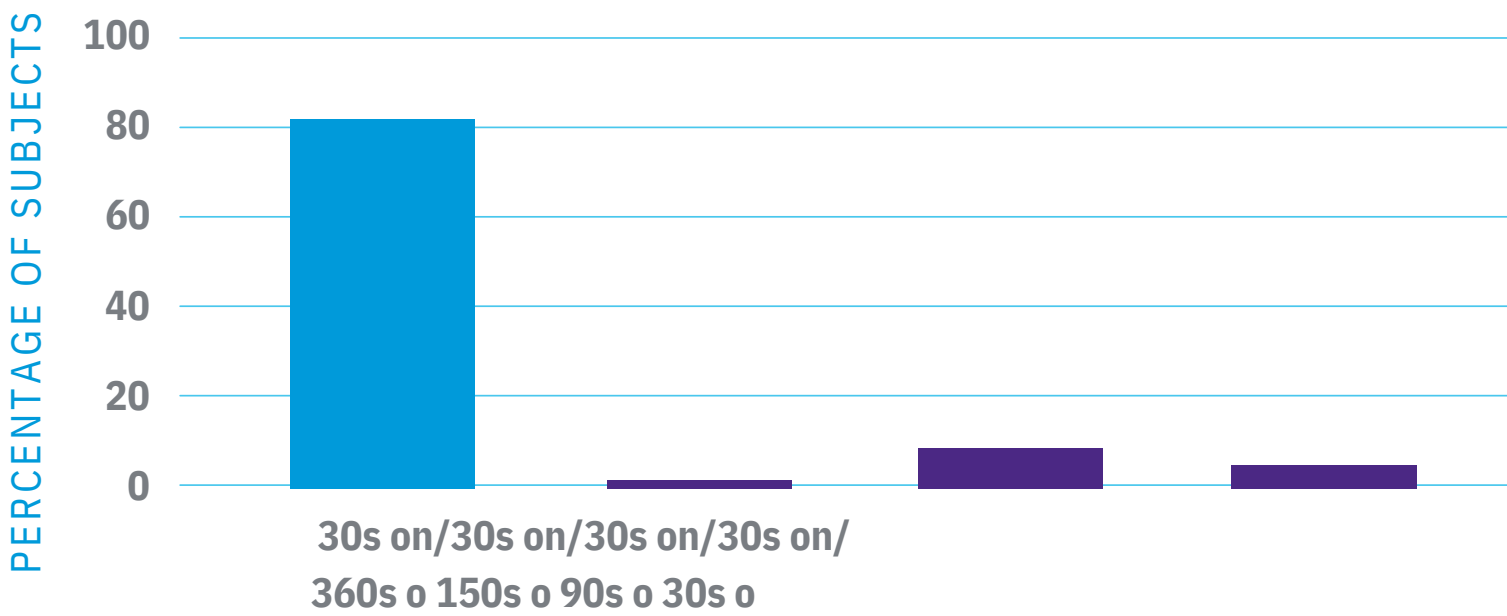
DeerT,etal. Ultra-low energycycledburstspinalcordstimulationyieldsrobustoutcomesin pain, function, and affective domains: a subanalysis from two prospective, multicenter, international clinical trials. *Neuromodulation*. 2022;25(1):137-144.



6-MONTH FOLLOW-UP

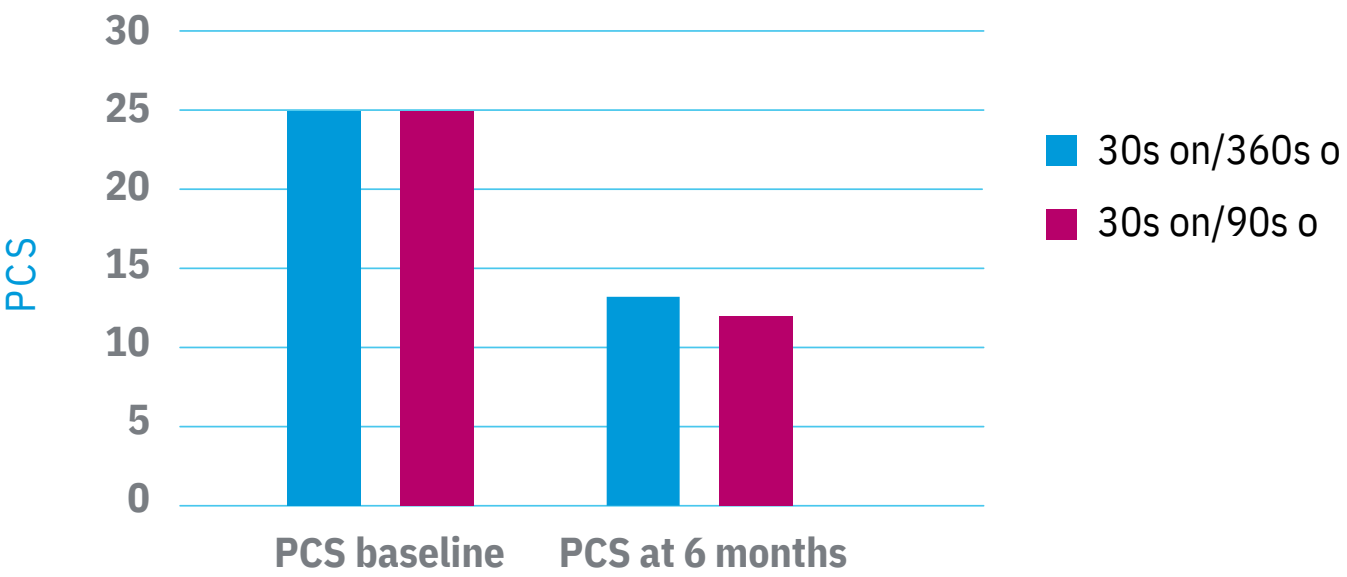
- Real-world evidence (n = 195) supports the effectiveness of BurstDR™ stimulation with long stimulation-off intervals.
- Over **81% of patients** who started at **ultra-low 30 seconds on/360 seconds off** settings stayed on the lowest BurstDR™ stimulation settings.
- **80% and 77%** of patients improved across a **multidimensional responder rate**, which considers both **PAIN RELIEF AND QUALITY OF LIFE** improvements for the 30 seconds on/90 seconds off and 30 seconds on/360 seconds off settings, respectively.
- By extending the usable battery life, utilization of low-energy stimulation may reduce health costs and surgical risk.

DOSING PROGRAM USAGE



Dosing program usage at the 6-month follow-up visit for patients in the REALITY cohort

AVERAGE PCS OUTCOMES



E ffects of dosing BurstDR™ stimulation on subjects’ pain catastrophizing



BURSTDR™ STIMULATION, A LOW-ENERGY SOLUTION

BurstDR™ Stimulation From Abbott Delivered on Low-Maintenance IPGs

Dosing BurstDR™ stimulation allows you to provide your patients with low-energy, low-maintenance neuromodulation devices.



PROCLAIM™ XR SCS SYSTEM

RECHARGE-FREE, LOW-MAINTENANCE

- Up to 10-year battery life at low dose settings**
- Freedom from the hassles of recharging
- Superior† BurstDR™ stimulation therapy
- Familiar mobile devices
- Upgradeable platform
- Full-body MR Conditional labeling††



ETERNA™ SCS SYSTEM

RECHARGEABLE, LOW-MAINTENANCE

- Smallest rechargeable implant profile^{41†††} IPG (13.6 cc)⁴
- Charge 5 times per year^{42,43 §} with Xtend™ energy technology
- Implant depth⁴ between 0.5–2.5 cm
- TotalScan™ MRI Technology
- Superior† BurstDR™ stimulation therapy
- Patient-centric user interface
- Upgradeable platform

SIMPLICITY OF PROGRAMMING

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Patients and healthcare professionals **may spend less time** programming BurstDR™ stimulation using the BoldXR™ Dosing Protocol.³

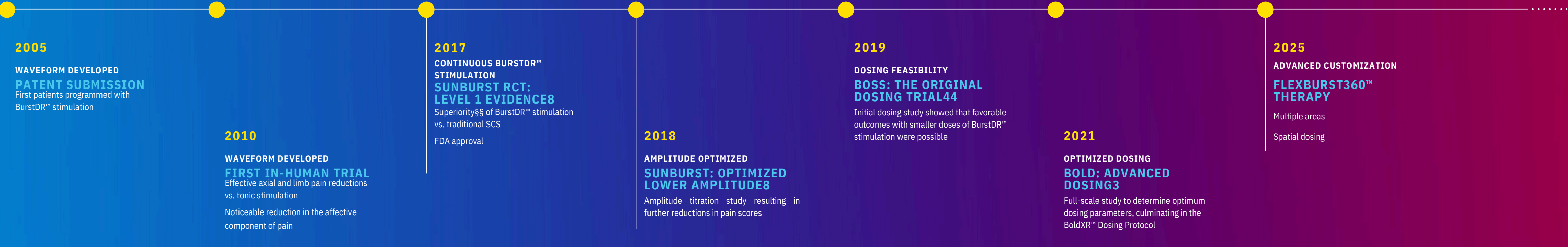
FlexBurst360™ therapy provides a tailored, flexible solution to help treat patients with multi-site and evolving pain.⁴

NeuroSphere™ Virtual Clinic provides access to remote consultations, programming and troubleshooting adjustments.^{5,6}



BURSTDR™ STIMULATION

BurstDR™ Stimulation Continues to Evolve



NEXT GENERATION OF BURSTDTM STIMULATION

Patients Experience Multi-Site and Evolving Pain

THERE REMAIN UNMET CLINICAL NEEDS WITH EXISTING WAVEFORMS.

88%

EXPERIENCE MULTI-SITE PAIN

88% of chronic pain patients have two or more noncontiguous painful areas.⁴⁵

30%

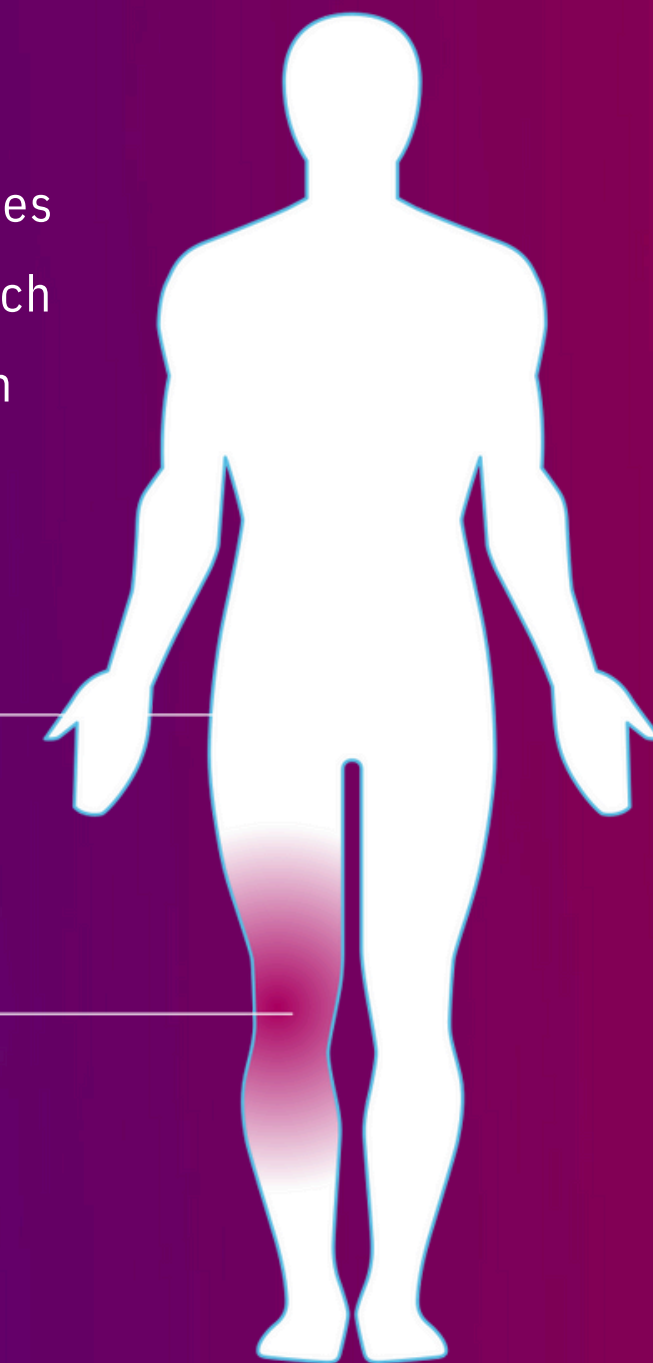
EXPERIENCE LESS EFFECTIVE THERAPY DUE TO EVOLVING PAIN

Roughly 30% of SCS patients experience less effective therapy due to pain becoming more complex over time.⁴⁶

Energy required for perception varies at different levels of the spine, which may lead to over-/understimulation of a pain area.

AREA 1

AREA 2

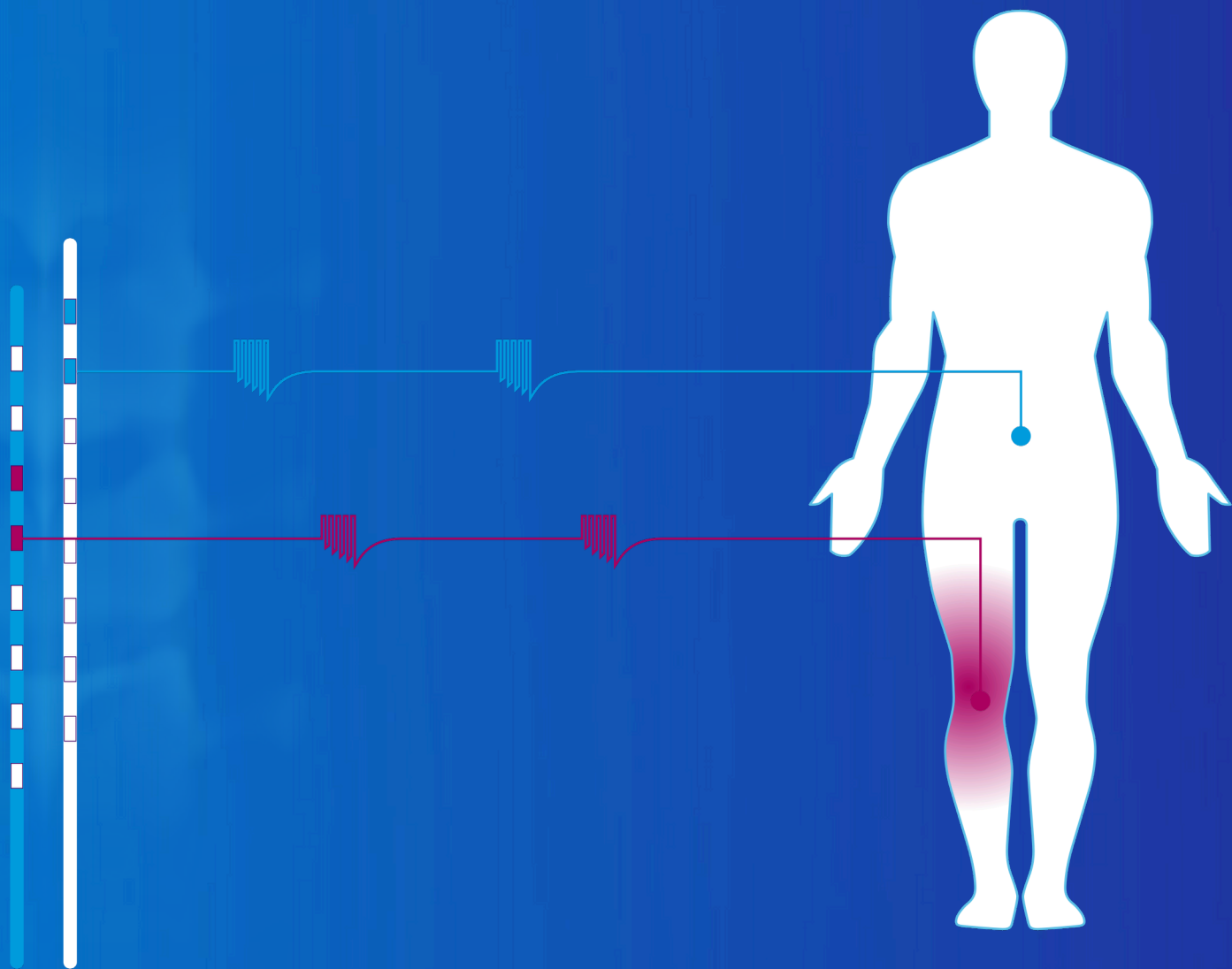


NEXT GENERATION OF BURSTDR™ STIMULATION

FlexBurst360™ Therapy Offers a Solution to Manage Therapy Over the Lifetime of the Device

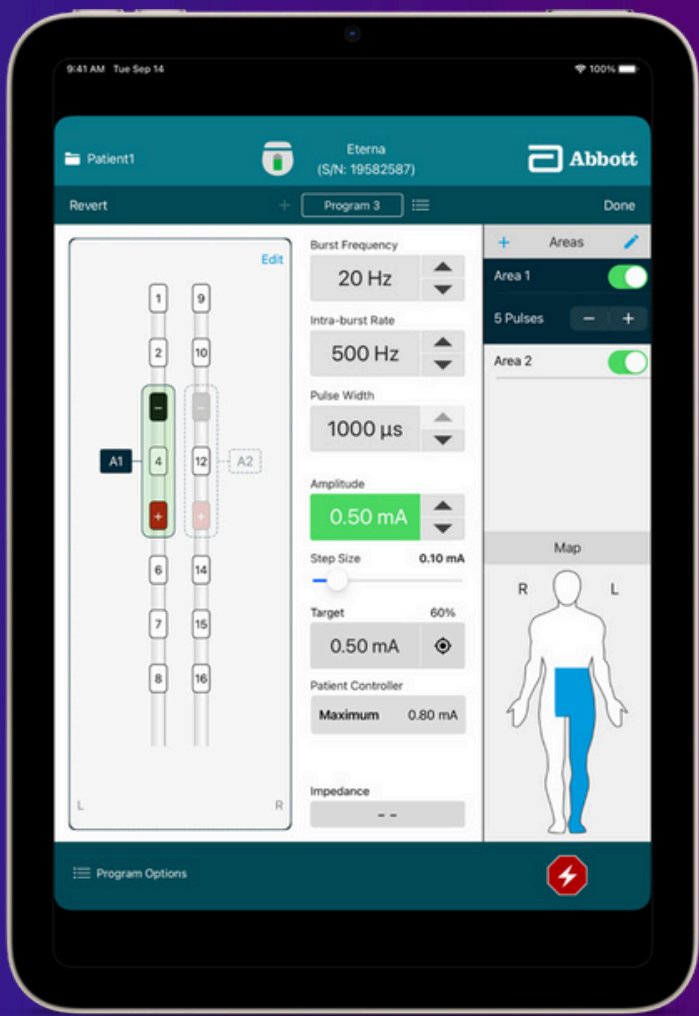
THERAPY SELECTION AT TIME OF IMPLANT

The Eterna™ SCS System with FlexBurst360™ therapy offers a solution for patients with single-area or multi-site pain (for example, pain in both the back and the legs).



OPTIONS FOR EVOLVING PAIN

The Eterna™ SCS System with FlexBurst360™ therapy offers a solution to manage patients with evolving pain patterns over the lifetime of the device.



- YEAR 1 1 AREA
- YEAR 2 3 AREAS
- YEAR 3 4 AREAS



NEXT GENERATION OF BURSTDR™ STIMULATION

BurstDR™ Stimulation: Simplicity of Programming With BoldXR™ Dosing Protocol

BOLDXR™ DOSING PROTOCOL
A REVOLUTIONARY
LOW-ENERGY
PROTOCOL3

The world’s first standardized electronic dosing protocol for BurstDR™ stimulation is designed to improve patient experience.

USE SIMPLE PROGRAMMING CONFIGURATIONS

The programming parameters shown below, as supported through clinical data, are considered the “best” parameters to maintain outcomes and provide optimal paresthesia coverage.47

Ensure the following programming options are used:

	1	2	3	4	5	6	7	8
Open Bipole			-		+			

Keep the amplitude at a maximum of 0.6 mA.

ENABLE BURSTDR™ STIMULATION MODE AND USE BOLDXR™ DOSING PROTOCOL

FOR TRIAL

Use one area of BurstDR™ stimulation.

Program 1: 30 seconds on, 1 minute 30 seconds off (6 hours of therapy/day)

FOR IMPLANT

Use one area of BurstDR™ stimulation. Use FlexBurst360™ therapy for patients with ongoing programming needs.§§§

Create three copies of the program with different dosing levels.

Program 1: 30 seconds on, 6 minutes off (2 hours of therapy/day)

Program 2: 30 seconds on, 3 minutes off (4 hours of therapy/day)

Program 3: 30 seconds on, 1 minute 30 seconds off (6 hours of therapy/day)

	NUMBER OF AREAS	FREQUENCY
FlexBurst360™ Therapy48	2	20 Hz
	3 or more	10 Hz



ACCESS TO REMOTE CONSULTATIONS, PROGRAMMING AND TROUBLESHOOTING ADJUSTMENTS

Extend Care Beyond Clinic Walls With NeuroSphere™ Virtual Clinic



ENHANCED THERAPY MANAGEMENT ^{5,6}

More follow-up options, faster troubleshooting, improved patient trust, better therapy access for geographically distant patients, and more efficient consultations



FLEXIBILITY AND EFFICIENCY IN THE CLINIC ^{5,6}

Fewer cancellations, delays and overrun; reduced waiting lists; flexible clinic planning; better use of clinic space; and greater patient reach



LOWER PATIENT BURDEN RELATED TO TRAVELING TO THE CLINIC ^{5,6}

Lower costs and time for patients and accompanying persons, and reduced stress and fatigue



REDUCTION OF CO2 EMISSIONS ^{5,6}

Contributions to sustainability with lower costs and less traffic in and around the clinic

NEUROSPHERE™ VIRTUAL CLINIC



KEY LEARNINGS AND MESSAGES

BurstDR™ Stimulation Is a Proprietary Waveform That Is Uniquely Dosable

**PAIN IS
MULTIDIMENSIONAL**

REGAIN PATIENTS' QUALITY
OF LIFE BY UNIQUELY
CONTROLLING ALL ELEMENTS
OF THEIR PAIN

1

BURSTDR™ STIMULATION IS A PROPRIETARY WAVEFORM

That mimics natural firing patterns in the brain

2

BURSTDR™ STIMULATION PRODUCES CONSISTENT, SUPERIOR§§ AND REPLICABLE RESULTS^{3,8,9,13-34}

In diverse clinical settings around the world

- 1,000+ patients over 10 years on 3 continents
- 7 level 1 RCTs
- 3 placebo-controlled level I RCTs
- The only waveform with level 1A studies showing superiority compared to tonic stimulation

3

BURSTDR™ STIMULATION IMPROVES PHYSICAL, MENTAL AND SOCIAL HEALTH FUNCTIONS^{38,49}

10 studies showed improvements in physical, mental and social health functions with BurstDR™ stimulation compared to tonic stimulation



KEY LEARNINGS AND MESSAGES

BurstDR™ Stimulation Is a Proprietary Waveform That Is Uniquely Dosable

LOW-ENERGY,
LOW-MAINTENANCE
THERAPIES

SIMPLICITY OF
PROGRAMMING

4

BURSTDR™ STIMULATION LEADS TO AN OBSERVED CARRYOVER EFFECT²

Meaning the therapy is effective even after stimulation is turned off. Use the lowest therapeutic dose without sacrificing therapy effectiveness. BurstDR™ stimulation is delivered on low-maintenance recharge-free and rechargeable IPGs

5

SIMPLE AND EFFECTIVE SUBTHRESHOLD PROGRAMMING³

Patients and healthcare professionals may spend less time programming BurstDR™ stimulation using the BoldXR™ Dosing Protocol³

6

ACCESS TO REMOTE CONSULTATIONS, PROGRAMMING AND TROUBLESHOOTING ADJUSTMENTS WITH NEUROSPHERE™ VIRTUAL CLINIC

Help manage patients more flexibly and efficiently while improving access to therapy management^{5,6}





BURSTDR™
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PAIN IS
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LOW-ENERGY,
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KEY LEARNINGS
AND MESSAGES

BDI	Beck Depression Inventory	IFU	Instructions for Use
EEG	electroencephalogram	IPG	implantable pulse generator
IDE	investigational device exemption	MPQ	McGill Pain Questionnaire

*Pain and suffering as measured by VAS. **Up to 10 years of battery longevity at the lowest dose setting: 0.6mA, 500 Ohms, duty cycle 30s on/360s off.
NOTE: In neurostimulation therapy, ‘dose’ refers to the delivery of a quantity of energy to tissue. Safety comparisons and specific dose-response curves for each dosage have not been clinically established. Refer to the IFU for additional information. Hassle-free means recharge-free.

***BurstDR™ stimulation, patented technology exclusively from Abbott, is also referred to as burst stimulation in clinical literature.
†When compared to traditional tonic stimulation.

‡Within approved parameters. Refer to the IFU for full details on the MR Conditional scan parameters.
††† Smallest size determined by volume in cubic centimeters. Based off comparison to volumetric measurement of the following IPGs: Boston Scientific† WaveWriter Alpha† 16, 20.1 cc; Medtronic† Intellis†, 13.9 cc; Nevro† Omnia†, 26 cc; Saluda† Evoke†, 33 cc.

§Approximately three hours five times per year (69 to 74 days between charges) at standard (nominal) settings for BurstDR™ stimulation programs: 30/90 dosing when programmed with amplitude of 0.6mA and all other BurstDR™ stimulation settings are left at default.

§§Superiority when compared to traditional tonic stimulation in the SUNBURST study.

§§§FlexBurst360™ therapy is available on the Eterna™ SCS System.

- De Ridder D, Adhia D, Vanneste S. The anatomy of pain and suffering in the brain and its clinical implications. *Neurosci Biobehav Rev.* 2021;130:125-146. doi:10.1016/j.neubiorev.2021.08.013
- Saber M, Schwabe D, Tessmer JP, et al. Rat fMRI brain responses to noxious stimulation during tonic, burst, and burst microdosing spinal cord stimulation. Presented at: NANS Summer Series; 2018; New York, NY. doi:10.13140/RG.2.2.17553.28005
- Deer TR, Patterson DG, Baksh J, et al. Novel intermittent dosing burst paradigm in spinal cord stimulation. *Neuromodulation.* 2021;24(3):566-573. doi:10.1111/ner.13143
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- Ouerchefani N, Leguilloux J, Chaar A, Ouerchefani R. The expected and unexpected value of integrating remote programming into a neuromodulation treatment pathway — a modelling of patient, hospital and environmental costs. Poster presented at: International Neuromodulation Society World Congress; May 11-16, 2024; Vancouver, CA.
- De Ridder D, Vanneste S, Plazier M, Vancamp T. Mimicking the brain: evaluation of St Jude Medical’s Prodigy chronic pain system with burst technology. *Expert Rev Med Devices.* 2015;12(2):143-50. doi:10.1586/17434440.2015.985652
- Deer T, Slavin KV, Amirdelfan K, et al. Success using neuromodulation with BURST (SUNBURST) study: results from a prospective, randomized controlled trial using a novel burst waveform. *Neuromodulation.* 2018;21(1):56-66. doi:10.1111/ner.12698
- De Ridder D, Plazier M, Kamerling N, Menovsky T, Vanneste S. Burst spinal cord stimulation for limb and back pain. *World Neurosurg.* 2013;80(5):642-649.e1. doi:10.1016/j.wneu.2013.01.040
- Swadlow HA, Gusev AG. The impact of ‘bursting’ thalamic impulses at a neocortical synapse. *Nat Neurosci.* 2001;4(4):402-8. doi:10.1038/86054
- De Ridder D, Vanneste S. Burst and tonic spinal cord stimulation: different and common brain mechanisms. *Neuromodulation.* 2016;19(1):47-59. doi:10.1111/ner.12368
- Yearwood TL, Falowski S, Venkatesan L, Vanneste S. Comparison of neural activity in chronic pain patients during tonic and burst spinal cord stimulation: a SUNBURST sub-study. Paper presented at: North American Neuromodulation Society and the Neural Interfaces Conference; June 25-29, 2016; Baltimore, MD.

MPQSF	McGill Pain Questionnaire Short Form	PCS	Pain Catastrophizing Scale
NWC	number of words chosen	PET	positron emission tomography
ODI	Oswestry Disability Index	PRO	patient-reported outcome

- De Ridder D, Vanneste S, Plazier M, van der Loo E, Menovsky T. Burst spinal cord stimulation: toward paresthesia-free pain suppression. *Neurosurgery.* 2010;66(5):986-90. doi:10.1227/01.NEU.0000368153.44883.B3
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PSQI	Pittsburgh Sleep Quality Index	RCT	randomized controlled trial
PVAQ	pain awareness and vigilance questionnaire	SCS	spinal cord stimulation
QoL	quality of life	VAS	Visual Analog Scale

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