

## New Study Shows Significant Positive Impact of Vagus Nerve Stimulation Therapy for Patients with Treatment-Resistant Bipolar Depression

**London, May 20, 2020** – LivaNova PLC (NASDAQ:LIVN), a market-leading medical technology and innovation company, today announced the publication of a new study in the *International Journal of Bipolar Disorders*<sup>1</sup> that showed adding Vagus Nerve Stimulation Therapy (VNS Therapy<sup>®</sup>) to treatment as usual (TAU) significantly improves outcomes in patients with treatment-resistant bipolar depression (TRBD). The study examined patients from a five-year prospective registry and found 63% of TRBD patients treated with adjunctive VNS Therapy in addition to TAU had a significant reduction in depressive symptoms, as measured by a 50% or greater reduction in the Montgomery–Åsberg Depression Rating Scale (MADRS), compared with 39% of patients in the TAU alone group. The study also showed that TRBD patients treated with adjunctive VNS Therapy experienced both a more durable anti-depressant effect and a significantly greater mean reduction in suicidality score than for patients receiving TAU alone ( $p < 0.001$ ).

“Given the significant unmet need with regard to the management of bipolar depression patients, it is critical that alternative treatment options for patients with TRBD are explored,” said Dr. A. John Rush, Professor Emeritus, Duke-National University of Singapore, Singapore and Adjunct Professor at the Departments of Psychiatry, Duke University Medical School, Durham, North Carolina and Texas Tech University, Health Sciences Center, Permian Basin. “This study’s findings that adjunctive use of VNS Therapy can significantly improve depressive symptoms and reduce suicidal ideation while also increasing the durability of antidepressant effect, promises to transform the lives of patients with difficult-to-treat bipolar depression for the better.”

Bipolar patients are symptomatic nearly half of the time and the majority of their symptoms are depression related, yet safe, effective, long-term treatment options are scarce.<sup>2</sup> Similar to patients with difficult-to-treat depression (DTD), this TRBD subpopulation struggles to get well and stay well with 30% remaining depressed at 12 months despite initiation of antidepressant treatment.<sup>3</sup> A significant fraction of the disease burden in bipolar disorder is suicide-related and it is estimated that between 25% and 60% of individuals with bipolar disorder will attempt suicide at least once in their lives and between 4% and 19% will complete suicide.<sup>4</sup>

“LivaNova is dedicated to helping patients who suffer from treatment-resistant bipolar depression,” said Bryan Olin, Senior Vice President for Clinical, Quality and Regulatory Affairs at LivaNova. “We are heartened to see that the results of this five-year study show that patients receiving adjunctive VNS Therapy were more likely to respond and experienced a faster and more durable response than patients treated with TAU alone. Moreover, the study reconfirmed that adjunctive VNS Therapy significantly lowers suicidality, a very important and key factor when considering the overall positive impact on the lives of patients and their loved ones.”

The study was conducted with a patient population of 156 TRBD patients with 97 in the adjunctive VNS Therapy group and 59 in the TAU group. Before treatment, subjects in the adjunctive VNS Therapy group had, on average, suffered from 20.7 lifetime episodes of depression, had approximately three lifetime suicide events and had been treated with nine different therapies, including an antidepressant at some point. In comparison to the TAU group and prior to the study, patients in the adjunctive VNS Therapy group had experienced more episodes of depression, psychiatric hospitalizations, lifetime suicide attempts, along with a higher suicidality score and more severe symptoms based on MADRS and other scales at baseline.

The study concluded that VNS Therapy as an adjunctive treatment to TAU was more effective than TAU alone in reducing depressive symptoms and suicidal ideation. In addition, patients who received adjunctive VNS Therapy had a more rapid onset of response and more durable antidepressant effects. The study drew the conclusion that adjunctive VNS Therapy is an efficacious antidepressant treatment for patients with TRBD.

### About LivaNova

LivaNova PLC is a global medical technology and innovation company built on nearly five decades of experience and a relentless commitment to provide hope for patients and their families through innovative medical technologies, delivering life-changing improvements for both the Head and Heart. Headquartered in London, LivaNova employs approximately 4,000 employees and has a presence in more than 100 countries for the benefit of patients, healthcare professionals and healthcare systems worldwide. LivaNova operates as two businesses: Cardiovascular and Neuromodulation, with operating headquarters in Mirandola (Italy) and Houston (U.S.), respectively.

**For more information, please visit [www.livanova.com](http://www.livanova.com).**

## Safe Harbor Statement

This news release contains “forward-looking statements” concerning our goals, beliefs, expectations, strategies, objectives, plans and underlying assumptions and other statements that are not necessarily based on historical facts. These statements include, but are not limited to, statements regarding VNS Therapy and its use for difficult-to-treat depression. Actual results may differ materially from those indicated in our forward-looking statements as a result of various factors, including those factors set forth in Item 1A of our Annual Report on Form 10-K for the year ended December 31, 2019, as supplemented by any risk factors contained in our Quarterly Reports on Form 10-Q and our Current Reports on Form 8-K. We undertake no obligation to update the information contained in this press release to reflect subsequently occurring events or circumstances.

## References

- 1 *McAllister-Williams, R.H., Sousa, S., Kumar, A. et al. The effects of vagus nerve stimulation on the course and outcomes of patients with bipolar disorder in a treatment-resistant depressive episode: a 5-year prospective registry. Int J Bipolar Disord 8, 13 (2020). <https://doi.org/10.1186/s40345-020-0178-4>.*
- 2 *Judd et al. The long-term natural history of the weekly symptomatic status of bipolar I disorder. Arch Gen Psychiatry, 2002; 2003.*
- 3 *Kupfer et al. Stabilization in the treatment of mania, depression and mixed states. Acta Neuropsychiatr, 2000.*
- 4 *Goodwin FK, Jamison KR. Manic-Depressive Illness. New York: Oxford University Press; 1990.*

## LivaNova PLC Media Contact

**Deanna Wilke**, +1 (281) 727-2764  
VP, Corporate Communications  
[Corporate.Communications@livanova.com](mailto:Corporate.Communications@livanova.com)

###