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Global Deep Brain Stimulation Market: Analysis By Product (Dual Channel and Single Channel), By Application (Parkinson’s Disease, Essential Tremor, Dystonia, Epilepsy and Others), By End Use (Hospitals, Neurology Clinics, Ambulatory Surgical Clinics and Research Centers), By Region Size and Trends with Impact of COVID-19 and Forecast up to 2029

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Abstracts

Deep brain stimulation (DBS) is a neurosurgical procedure that involves implanting electrodes and a neurostimulator in the brain to deliver electrical impulses to specific areas responsible for movement and other neurological functions. The procedure is designed to treat various movement disorders and neuropsychiatric conditions, such as Parkinson's disease, essential tremor, dystonia, obsessive-compulsive disorder, and epilepsy. The global deep brain stimulation market value stood at US$1.31 billion in 2023 and is expected to reach US$2.56 billion by 2029.

The continuous growth of the global deep brain stimulation (DBS) market can be attributed to several key factors driving its adoption and expansion. An increasing prevalence of conditions like Parkinson’s disease, essential tremor, and epilepsy, coupled with rising awareness among patients and healthcare providers about the benefits of DBS, has expanded its patient pool. According to WHO, a major study released by The Lancet Neurology shows that, in 2021, more than 3 billion people worldwide were living with a neurological condition. Further, ongoing research and clinical trials exploring new applications of DBS in psychiatric disorders such as depression and obsessive-compulsive disorder are opening up new avenues for growth.

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Moreover, improvements in DBS device design, including smaller and more durable implants, contribute to better patient outcomes and reduced complications, further driving market expansion. Supportive regulatory frameworks and reimbursement policies in key markets facilitate greater accessibility to DBS treatments, fostering market growth globally. The market is expected to grow at a CAGR of 11.89% over the projected period of 2024-2029.

Market Segmentation Analysis:

By Product: The report provides bifurcation of the global deep brain stimulation market into two segments namely, dual channel and single channel. The dual channel segment of the global deep brain stimulation (DBS) market holds the highest share and is expected to be the fastest growing, due to its ability to offer enhanced therapeutic benefits through precise and customizable stimulation patterns across multiple brain regions. This capability is crucial for effectively managing complex neurological disorders like Parkinson’s disease and essential tremor. Technological advancements in dual channel DBS systems, including improved implants and programming software, further bolster their attractiveness to healthcare providers seeking optimal treatment outcomes for their patients.

By Application: The report provides bifurcation of the global deep brain stimulation market into five segments namely, Parkinson’s disease, essential tremor, epilepsy, dystonia and others. Parkinson’s disease segment dominates the market due to its established efficacy in alleviating motor symptoms such as tremors, rigidity, and bradykinesia. The treatment's success in improving patients' quality of life and reducing medication dependency has driven its widespread adoption. On the other hand, epilepsy is expected to be the fastest-growing segment in the forecasted period due to several factors, such as increasing prevalence of drug-resistant epilepsy cases globally, advancements in neuroimaging techniques facilitating better patient selection for DBS, and ongoing development of closed-loop DBS systems that can detect and respond to seizure activity in real-time.

By End Use: The report provides the bifurcation of the global deep brain stimulation market into four segments namely, hospitals, neurology clinics, ambulatory surgical clinics and research centers. Hospitals held the highest share in the market and is expected to be the fastest-growing segment in the forecasted period. Hospitals are equipped with specialized infrastructure and resources required for performing complex neurosurgical procedures like DBS, facilitated by advanced operating rooms and highly trained neurology and neurosurgery teams. They serve as central hubs for treating

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complex neurological conditions such as Parkinson’s disease and essential tremor, where DBS is a pivotal treatment option. Furthermore, hospitals provide comprehensive care through integrated multidisciplinary teams, ensuring patients receive thorough evaluation, precise surgical intervention, and ongoing management.

By Region: The report bifurcates the global deep brain stimulation market into four regions namely, North America, Europe, Asia Pacific, and Rest of the World. North America is the largest region of the deep brain stimulation market and presents a promising landscape due to its advanced healthcare infrastructure, significant investments in medical research, and a large patient population affected by neurological disorders. The region's strong focus on technological innovation has led to the development of DBS devices with enhanced efficacy and safety profiles, such as improved targeting capabilities and longer battery life. Additionally, favorable regulatory frameworks and robust reimbursement policies support widespread adoption of DBS therapies. These factors collectively create a conducive environment for the growth of the DBS market in North America, making it a leader in both innovation and treatment outcomes for neurological and movement disorders.

Asia Pacific stands out as the fastest-growing region in the deep brain stimulation sector due to aging population, urbanization, and increasing disposable income. An aging population contribute to a rising prevalence of neurological disorders such as Parkinson's disease and essential tremor, driving demand for advanced treatment options like DBS. Secondly, improving healthcare infrastructure and increasing healthcare expenditure are expanding access to specialized neurological care, including DBS therapies. Thirdly, growing awareness among healthcare providers and patients about the efficacy of DBS in managing neurological conditions is accelerating adoption rates. Additionally, ongoing technological advancements and investments in research and development are fostering innovation in DBS technologies, further propelling market growth in the Asia Pacific region.

Global Deep Brain Stimulation Market Dynamics:

Growth Drivers: The global deep brain stimulation market growth is predicted to be supported by numerous growth drivers such rise in the geriatric population, increasing prevalence of neurological disorders, expanding indications for DBS, growing healthcare infrastructure, increasing demand for minimally invasive surgery, growing awareness and acceptance and regulatory approvals and funding, etc. Initially, DBS was primarily used for managing Parkinson's disease and essential tremor. However, ongoing research and clinical trials have demonstrated its efficacy in treating a wider

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range of neurological and psychiatric conditions like Tourette syndrome, chronic pain, depression, and even Alzheimer's disease. This broadening of indications means that more patients with diverse medical conditions can benefit from DBS, increasing its overall market demand. Additionally, as the list of approved indications for DBS grows, insurance companies and national healthcare systems are more likely to cover these procedures. Expanded insurance coverage reduces the financial burden on patients, making DBS more accessible and further boosting its market growth.

Challenges: However, the market growth would be negatively impacted by various challenges such as potential side effects associated with DBS surgery, presence of alternative procedures, high cost, etc. The high cost of deep brain stimulation (DBS) procedures and devices poses a significant barrier to access, particularly for patients in less affluent regions or those lacking adequate insurance coverage. The expense encompasses several components: initial surgical implantation of electrodes and the neurostimulator; post-operative care, including monitoring and adjustment of stimulation settings; and potential replacement surgeries for device components over time, as batteries and leads may need to be replaced periodically. These costs can accumulate substantially, making DBS a financially prohibitive option for many patients.

Trends: The market is projected to grow at a fast pace during the forecasted period, due to market trends like telemedicine, automated deep brain stimulation, closed-loop brain stimulation, rechargeable devices with longer battery life, tapping into emerging markets, miniaturized DBS devices etc. The development of rechargeable DBS devices with longer battery life represents a significant advancement in neurosurgery, offering improved patient outcomes, enhanced therapy management, reduced healthcare costs, convenience, and technological reliability. Traditional DBS devices often require surgical procedures to replace depleted batteries, typically every three to five years. Rechargeable DBS systems, however, extend the battery life significantly, sometimes lasting up to 15 years or more. This advancement reduces the frequency of replacement surgeries, lowering the risk of complications and associated healthcare costs. These devices are poised to expand the applications of DBS and further improve the quality of care for patients with neurological disorders.

Impact Analysis of COVID-19 and Way Forward:

The COVID-19 pandemic had a significant impact on the global deep brain stimulation (DBS) market, primarily due to disruptions in healthcare services and prioritization of COVID-19 patients. Elective procedures, including DBS surgeries for conditions like Parkinson’s disease, were often postponed to conserve resources and minimize virus

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transmission risks. This led to a reduction in the number of DBS procedures performed globally, delaying treatments for patients in need.

Post-COVID, the deep brain stimulation market is expected to stabilize after experiencing fluctuations during the pandemic. As elective surgeries resume and deferred patients seek treatment, there is expected to be a surge in demand for DBS procedures. Technological advancements, including smaller and more efficient devices, improved targeting techniques, and the introduction of advanced features like rechargeable implantable pulse generators and personalized programming, will enhance treatment outcomes and patient satisfaction. The shift towards telemedicine and remote DBS programming has become integral in maintaining therapy continuity.

Competitive Landscape and Recent Developments:

The global market is dominated by few of the key companies owing to their strong product portfolio, and key strategic decisions. These include a group of 3 key companies with wider geographic presence and persistent R&D, resulting in a strong product portfolio. The market is highly consolidated in nature, with three major players operating in the market i.e. Boston Scientific Corp., Medtronic and Abbott.

The key players in the global deep brain stimulation market are:

Abbott
Medtronic Plc
Boston Scientific Corporation
Renishaw plc
Zimmer Biomet
Aleva Neurotherapeutics
Newronika
SceneRay Co., Ltd.

Some of the strategies among key players in the market are new launch, mergers, acquisitions, and collaborations. In July 2023, Boston Scientific Corp. made an announcement regarding the FDA approval of its Vercise Neural Navigator 5 Software. This software, when integrated with the Vercise Genus DBS systems, is poised to provide clinicians with essential data for optimizing treatment for individuals living with Parkinson's disease or essential tremor. Also, in September 2022, Aleva Neurotherapeutics received CE-mark approval for its magnetic resonance imaging (MRI) labelling for the directSTIM DBS system, allowing the technology to be used in a

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full-body MRI environment across Europe.

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