

# **MRI Guided Neurosurgery Market - A Global and Regional Analysis: Focus on Type, Product, Application, End User, Country, and Region - Analysis and Forecast, 2025-2035**

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## **Abstracts**

MRI-guided neurosurgery is an advanced surgical technique that integrates Magnetic Resonance Imaging (MRI) with neurosurgical procedures to provide real-time, high-resolution imaging during surgery. MRI guided neurosurgery technology enables neurosurgeons to visualize brain structures, spinal regions, and other neurological tissues with unmatched clarity, allowing for precise surgical navigation. MRI-guided systems are particularly beneficial in minimally invasive surgeries, where accurate visualization is essential for avoiding damage to critical structures like blood vessels, nerves, and healthy brain tissue.

The use of functional MRI (fMRI) to map brain activity has further enhanced brain tumor resections, epilepsy treatments, and deep brain stimulation for movement disorders. By providing continuous imaging feedback during surgery, MRI-guided techniques reduce risks, shorten recovery times, and improve patient outcomes. Despite the high costs and the need for specialized training and equipment, the benefits of real-time imaging in neurosurgery are making it an increasingly essential tool in modern neurosurgical procedures. The future of MRI-guided neurosurgery looks promising, with robotic integration and AI-enhanced imaging poised to make these procedures even more precise and accessible.

One of the key drivers of the MRI-guided neurosurgery market is the increasing demand for minimally invasive surgeries. As healthcare providers and patients alike seek alternatives to traditional open surgeries, MRI-guided techniques provide the precision required for complex neurosurgical procedures while minimizing risks such as infection,

excessive bleeding, and prolonged recovery times.

Real-time MRI imaging allows surgeons to navigate delicate brain and spinal structures with high accuracy, enabling safer tumor resections, epilepsy treatments, and spinal surgeries. This shift towards less invasive procedures, coupled with the growing prevalence of neurological disorders such as brain tumors, epilepsy, and neurovascular diseases, continues to drive the adoption of MRI-guided technologies in neurosurgery.

Despite the growth of the MRI-guided neurosurgery market, several challenges persist. One of the primary challenges in MRI guided neurosurgery market is the high cost of MRI systems and related surgical equipment. MRI-guided neurosurgery requires specialized machines that are expensive to purchase and maintain, making it difficult for smaller healthcare facilities or those in low-resource regions to adopt MRI guided neurosurgery technology.

Additionally, the need for trained personnel to operate MRI-guided systems and interpret the real-time imaging further increases costs. These financial barriers can limit access to this advanced technology, preventing it from reaching broader patient populations and hindering its widespread adoption across diverse healthcare settings.

The global MRI-guided neurosurgery market is highly competitive, with several key players driving innovation and MRI-guided neurosurgery market growth. Leading companies such as Medtronic plc, GE Healthcare Inc., Brainlab AG, Koninklijke Philips N.V., Siemens Healthineers, Insightec Ltd., Synaptive Medical, Elekta AB, Canon Medical Systems Corporation, Donaldson Company Inc. (Medica S.p.A.), Samsung Electronics (NeuroLogica Corporation), Adaptive NeuroTechnologies, Inc., Hitachi, Ltd., Fujifilm Holdings Corporation, and Zimmer Biomet Holdings, Inc. are continuously developing advanced MRI technologies, robotic systems, and image-guided surgical solutions. These companies are leveraging cutting-edge research, strategic partnerships, and technological advancements to enhance neurosurgical precision, improve patient outcomes, and address growing demand for minimally invasive neurosurgeries. Additionally, ongoing investment in artificial intelligence (AI), machine learning, and functional MRI is expected to accelerate MRI-guided neurosurgery market growth and transform surgical practices globally.

### **MRI Guided Neurosurgery Market Segmentation:**

Segmentation 1: by Type

Conventional MR Imaging Devices

Robotic-Assisted MR Imaging Devices

## Segmentation 2: by Product

Systems

Instruments and Accessories

## Segmentation 3: by Application

Brain Tumour Resection

Spinal Surgery

Epilepsy Treatment

Vascular Neurosurgery

Functional Neurosurgery

## Segmentation 4: by End User

Hospitals

Ambulatory Surgery Centres

Others

## Segmentation 5: by Region

North America

Europe

Asia-Pacific

Rest of the World

One of the most significant emerging trends in the global MRI-guided neurosurgery market is the integration of advanced robotics and artificial intelligence (AI) into surgical procedures. This convergence is enhancing the precision, safety, and efficiency of neurosurgical interventions. Robotics-assisted MRI-guided neurosurgery allows for real-time imaging and manipulation, minimizing surgical errors and improving targeting accuracy for procedures like deep brain stimulation (DBS) and biopsies. In addition, AI and machine learning algorithms are being used to assist in surgical planning and navigation by analyzing complex imaging data, identifying optimal surgical paths, and predicting potential complications. These technologies improve decision-making, resulting in better surgical outcomes and faster recovery times. Moreover, innovations in non-invasive treatments, such as MRI-guided focused ultrasound (MRgFUS), are offering safer alternatives to traditional surgical methods, particularly for conditions like essential tremor. Enhanced MRI imaging capabilities and a more collaborative, multidisciplinary approach to neurosurgery are also contributing to the growth of MRI guided neurosurgery field, ensuring more precise and effective treatments for patients with neurological disorders.

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