

Cranial Navigation System - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Cranial Navigation System Market size is estimated at USD 2.80 billion in 2024, and is expected to reach USD 4 billion by 2029, growing at a CAGR of 5.90% during the forecast period (2024-2029).

Neurosurgery is considered the most challenging, with higher risks than general surgery. The cranial navigation system allows the professional to monitor the anatomical position continuously during the surgery by combining the patient's cranial surface anatomy with preoperative MRI studies. The approach improves the accuracy of the surgery and maximizes the success rate. These factors encourage various end users to incorporate the system and optimize the efficiency of neurosurgical procedures.

The increasing end-user confidence in image-guided surgery (IGS) is likely to boost market growth during the forecast period. For instance, in May 2023, professionals at AdventHealth announced the successful completion of the first surgical cases through Stryker's cranial navigation system. According to surgeons, the system can be a new benchmark for image-guided navigation in neurosurgical settings since it provides guidance capabilities and gives greater confidence in performing complex surgeries. Hence, the confidence level of professionals is positively correlated with the increasing demand for the cranial navigation system.

Market players are witnessing rising participation from emerging countries. For instance, in December 2022, a public university in India, All India Institute of Medical Sciences, Bathinda, purchased an advanced cranial and spine navigation system from Medtronic for its neurosurgery department. The economic development of emerging countries enables their government to allocate sufficient resources for research and development,

which is reflected in the increasing requirement for instruments.

The cranial navigation system market is growing due to the proactive efforts of market players to broaden system capabilities and improve product functionality. Zeta Surgical, in January 2024, announced that its Zeta Cranial Navigation System obtained Special 510(k) clearance from the US Food and Drug Administration (FDA). This clearance allows expanded functionality through upgraded software features and compatibility with supplementary accessories. The surging demand for contactless procedures compels market players to continue their research and development for advancing cranial navigation systems, which is expected to propel the market growth during the forecast period.

Therefore, owing to factors such as the rising cranial surgeries, growing requirement for detailed anatomical information prior to the incision, and product launches by market players, the market is anticipated to witness growth during the forecast period. However, the system's high maintenance and installation cost is estimated to restrain market growth.

Cranial Navigation System Market Trends

The Optical System Segment is Expected to Hold a Significant Market Share Over the Forecast Period

The cranial navigation system operates on the tracking model, which assists in correlating the patient's coordinates to the intraoperative or preoperative digital medical imagery. There are two types of systems commercially available in the market. Although both navigation systems have the same functionalities, the technology employed to offer the information to the professionals differs.

The adoption rate of the optical system by professionals is expected to be higher since it addresses the limitations of electromagnetic systems (EMS), including electromagnetic interferences of other medical devices that can impact the accuracy and registration through the EMS, which can also be time-consuming. The reproducibility and accuracy of the optical navigation system are considered better than those of other systems. Since the real-time navigation and registration are majorly dependent on the tracker and visibility of the probe to the infrared camera. Hence, such system advantages are likely to contribute to the significant segmental share in 2022.

The activities of market players for the product launch, approvals, and partnerships to

technologically advance the system are expected to boost the segment's growth over the forecast period. For instance, Claronav modified its optical tracker in the cranial navigation system to offer a live video for better positioning the tracker, permanent and steam sterilizable markers, and an augmented view for tooltip accuracy verification. Additionally, the increasing requirement for minimally invasive surgery, along with low levels of patient pain, reduced in-hospital stays, and rapid recovery, is expected to fuel the growing demand for optical cranial navigation systems.

Asia-Pacific is Expected to Witness Significant Growth Over the Forecast Period

Asia Pacific is anticipated to witness significant growth in the cranial navigation system market during the forecast period. This can be attributed to factors such as government initiatives to reduce the dependency on imported medical devices, the growing medical tourism industry, and the presence of significant market players engaged in product development.

The rising number of brain injuries in the region and the shortage of neurosurgeons are expected to increase the market growth. According to the article published in December 2022, there were approximately 3,700 neurosurgeons in India available for a population of 1.35 billion, significantly lower than developed countries such as the United States and Japan. The cranial navigation system assists surgeons in performing surgeries in a minimal time without compromising the accuracy of the surgery.

Various market players, such as HRS Navigation, have identified the need for affordable and simple navigation solutions in emerging countries like India. The company believes major countries in APAC regions are untapped markets for cranial navigation systems. Numerous government-backed hospitals and research institutions are collaborating with global companies to strengthen the product development process. For instance, in July 2023, Zeta Surgical announced the completion of its first patient treatment at the National Neuroscience Institute in Singapore through the Zeta cranial navigation system under the first-in-human trial. After the success of clinical trials, in September 2023, Zeta Surgical received the US Food and Drug Administration (FDA) approval for its cranial navigation system. Considering the international recognition of the US FDA, this certification will allow the company to commercialize its products in various countries, including Japan, China, and India. Additionally, increasing product launches enhances the competition level and increases the efficiency of the market.

Therefore, owing to factors such as the growing domestic production of cranial navigation systems, increasing accessibility of affordable navigation systems, and product approvals and launches by market players, the Asia-Pacific market is expected to witness growth.

Cranial Navigation System Industry Overview

The cranial navigation system market is concentrated and consists of a handful of major players. The key strategy the major players implement to strengthen their market position is regional expansion. Emerging countries are becoming hotspots for significant competition due to the rapidly expanding market, fueled by the rising number of neurosurgery cases and the increasing awareness of image-guided surgery. Players in the market include Stryker, HRS Navigation, Brainlab AG, 7D Surgical, Medtronic, ClaroNav, Heal Force Bio-Meditech Holdings Limited (Heal Force), Zeta Surgical Inc., Parsis Co., and Nexstim PLC.

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