

Bio-Implants Market Size and Forecast (2021 - 2031), Global and Regional Share, Trend, and Growth Opportunity Analysis Report Coverage: By Type (Cardiovascular Implants, Orthopedic Implants, Dental Implants, Ophthalmic Implants, and Others), Material (Metals, Ceramics, and Polymers), and End User (Hospitals & Clinics and Ambulatory Surgical Centers)

<https://marketpublishers.com/r/B88E3EB3CCF2EN.html>

Date: March 2024

Pages: 150

Price: US\$ 5,190.00 (Single User License)

ID: B88E3EB3CCF2EN

Abstracts

According to our new research study on “Bio-implants Market Forecast to 2031 – COVID-19 Impact and Global Analysis – by Type, Material, and End User,” the market is anticipated to grow from US\$ 117.82 billion in 2023 to US\$ 223.06 billion by 2031; it is estimated to register a CAGR of 8.3% during 2023–2031. Market growth is attributed to the increasing burden of lifestyle disorders and the growing demand for minimally invasive surgical procedures. Increasing technological developments and government initiatives will likely provide growth opportunities for the bio-implants market. However, product recalls and complexities associated with implant materials hinder the growth of the bio-implants market.

Bio-implants are prosthetic devices that replace, enhance, or support a biological structure. They consist of several biosynthetic components, such as tissue engineering products, along with collagen, including synthetic skin. Technological development in healthcare has contributed to the growth of the bio-implants market. Although the healthcare sector has made significant technological advancements over the years, the rising incidence of serious medical diseases has led to various challenges to the growth of the market for bio-implants.

North America accounted for the largest market share of the global bio-implants market

in 2023. The market in this region is segmented into the US, Canada, and Mexico. The growth of the bio-implants market in the region is due to the growing prevalence of chronic diseases and better healthcare infrastructure. In July 2022, updated Centers for Disease Control and Prevention (CDC) data shows that coronary artery disease is one of the most common types of heart diseases, with approximately 20.1 million adults aged 20 and older living with the disease in the US. Additionally, according to CDC data, every 40 seconds, an individual suffers from a heart attack in the US, i.e., nearly 805,000 people. The rising incidence of chronic diseases is expected to increase the overall demand for bio-implants, which is expected to boost the market growth during the forecast period. Asia Pacific is expected to register the highest CAGR in the bio-implants market during 2023–2031. The market growth in the region is ascribed to the growing geriatric population, increasing disposable income, rising healthcare investments and expansion by market players, and increasing cases of spinal cord injuries due to the rising number of traffic accidents.

Increasing Technological Developments and Government Initiatives to Provide Market Opportunities in the Future

Technological developments such as 3D printing, laser technology, and nanotechnology have significantly improved the production of bio-implants. 3D printing has transformed the designing and manufacturing methodologies of bio-implants. This technology enables the creation of patient-specific implants with intricate geometries, precise dimensions, and tailored features, resulting in better fit and functionality. Further, integrating sensors, microelectronics, and wireless communication into implants helps in the real-time monitoring of the patient's condition and health. Smart implants can transmit data to healthcare providers, enabling remote monitoring and timely interventions.

Many government organizations work with companies conducting health studies and producing medical devices to market new and more effective devices. For example, in December 2023, Nanyang Technological University Singapore and Singapore General Hospital (SGH) collaborated to invest in the advancement of 3D printing. The partnership leverages the facilities and combined expertise of the Singapore Center for 3D Printing at NTU and the 3D Printing Center at SGH to research and develop relevant technologies for clinical applications in point-of-care settings. In February 2024, a Pittsburgh engineer received US\$ 557,000 from the National Institutes of Health to conduct the world's first in vivo studies of orthopedic metamaterial implants to improve spinal injuries' treatment, repair, and recovery. Metamaterials are more advanced than traditional elements, alloys, or other materials because they can be designed to provide

a wide range of desired mechanical properties, including ultralight, ultra-stiff, ultrahigh strength-to-density ratios, compliance, and high resilience. In addition, metamaterial implants offer great scope for design as they can be made from various biocompatible materials. Thus, increasing technological developments and government initiatives are anticipated to provide growth opportunities for the market growth during the forecast period.

Type -Based Insights

Based on type, the bio-implants market is segmented into cardiovascular implants, orthopedic implants, dental implants, ophthalmic implants, and others. The cardiovascular implants segment held a larger market share in 2023. The growth of the segment is due to rapid rise in research and development activities to develop novel cardiac implant products. For example, in February 2022, Abbott, a medical technology company, announced the world's first patient implantation of a leadless dual-chamber pacemaker system as part of its AVEIR DR i2i pivotal clinical trial. The implantation of Abbott's experimental dual-chamber leadless pacemaker represents a significant technological milestone for leadless pacemaker technology; it is the first in the world to be in a pivotal trial.

Material-Based Insights

The bio-implants market, based on material, is segmented into metals, ceramics, and polymers. The metals segment held the largest bio-implants market share in 2023. It is further expected to register the highest CAGR from 2023 to 2031. The ceramics segment is expected to hold the second-largest market share during the forecast period due to increasing approvals of ceramic products by regulatory authorities. For example, in December 2021, DentalPoint, the pioneer of two-piece ceramic implants, announced that it had received US FDA approval for its newest product, ZERAMEX XT. The product is a metal-free alternative to titanium implants for cosmetic dentures, especially in the aesthetic area.

End User-Based Insights

Based on the end user, the market is bifurcated into hospitals & clinics and ambulatory surgical centers. The hospitals & clinics segment held a larger bio-implants market share in 2023 and the same is anticipated to register a higher CAGR during 2023–2031.

Leading players are implementing strategies such as expansion, partnership, launch of

new products, and acquisition of a new customer base for tapping prevailing business opportunities.

In April 2022, Orthopedic Implant Company received approval from the Food and Drug Administration and released the high valve dorsal scanning plate. The product helped expand the company's orthopedic trauma portfolio for the potential clinical implantation of OIC's DRPx Wrist Fracture Plating System, reinforcing it as one of the most comprehensive and value-driven alternatives to any other premium-priced plating systems.

In January 2022, Johnson & Johnson Medical Devices Companies (JJMDC) collaborated with Microsoft to enhance and further develop JJMDC's secure and compliant digital surgery ecosystem.

In October 2021, ScottCare Cardiovascular Solutions signed an agreement with Ninety One Holding, Inc. to become the primary distributor for Ninety One's cloud software platform for monitoring cardiac implanted devices, providing an effective expansion partnership between the two companies. This allows ScottCare Cardiovascular Solutions to offer Ninety One's cloud platform directly to clinics that work with their staff to monitor and manage patient data. Ninety One's software platform helps in combining advanced data science with the latest technologies to help analyze and manage complex medical data for patients with implanted cardiac devices.

The US Food and Drug Administration, Centers for Disease Control and Prevention (CDC), and Global Burden of Disease Study, are among the primary and secondary sources referred to while preparing the bio-implants market report.

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