

Bio-Implants Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Product Type (Cardiovascular Implants, Spinal Implants, Orthopedic Implants, Dental Implants, Ophthalmic Implants, and Other Implants), By Material (Biomaterial Metal & Alloys, Ceramics, Polymers, and Other Materials), By End User (Hospitals & Clinics, Ambulatory Surgical Centres, Others), By Region and Competition, 2019-2029F

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Abstracts

Global Bio-Implants Market was valued at USD 125.30 billion in 2023 and is anticipated to project robust growth in the forecast period with a CAGR of 10.70% through 2029. Bio-implants are biosynthetic materials utilized in medical applications for the purpose of bone repair, replacement, or aiding in bone healing. The primary role of implant fabric is to provide stability to bone fractures and facilitate organic bone recovery by minimizing movement at the bone-implant interface. The metals commonly used in bio-implants are titanium and its alloys, known for their exceptional corrosion resistance, high energy, and biocompatibility, making them widely used as surgical implants. Bio-implants are prostheses employed to replace, support, or enhance biological structures. They consist of various biosynthetic materials such as collagen and tissue-engineered products like artificial skin. Bio-implants are categorized into three major groups: biological implants encompassing bioartificial organs, cell therapy, and tissue engineering; biologized implants comprising in-vivo cell lining, technical implants, and biohybrid systems; and biofunctionalized implants including surface-functionalized implants and drug-eluting stents. In the field of ENT, bio-implants have yielded highly successful surgical outcomes, effectively regulated patients' physiological functions and enabling them to

lead productive lives.

Key Market Drivers

Rising Geriatric Population

The population of elderly individuals, aged 80 and above, is on the rise due to improved living standards and advancements in the medical field. Older adults tend to avoid lengthy medical treatments, which is expected to drive the demand for bio-implants in this age group in the coming years. Surgeons often avoid major operations in older patients due to concerns about medical complications, which contributes to market growth. The most common ailments among geriatric individuals are related to eyesight and joint issues. Addressing these conditions can be achieved through the use of retinal bioimplants and knee or hip joint replacements. Current market trends suggest that the elderly population is set to increase, with more noticeable effects in nations with a high HDI such as Korea and the United States. Considering the frequent use of bio-implants in orthopedic treatments, this development holds significant implications for the market. Hip fractures rank among the most prevalent catastrophic injuries among the elderly, often necessitating immediate surgery and anesthesia. Consequently, patients spend several weeks in the hospital, resulting in the utilization of 1.5 million hospital bed days each year. As per NICE recommendations, surgical intervention should be conducted on the same day as hospital admission or the following day. This approach is informed by the understanding that being bedridden with a hip fracture is an unpleasant, distressing, and debilitating experience for patients, who are unable to mobilize until the procedure is completed. Thus, the expanding geriatric population is driving the growth of the Bio-implant Market.

Rising Preference toward Minimally Invasive Surgeries

A significant trend observed in the bioimplants market is the increasing demand for minimally invasive surgeries. The ability to create precise incisions for accessing surgical points is a significant advantage of these procedures. Minimally invasive surgeries enable endoscopic and laparoscopic bio-implanting procedures, resulting in reduced pain and faster postoperative recovery.

Minimally invasive surgeries offer significant benefits in terms of reducing post-surgical complications, promoting quick recovery, and shortening hospital stays. Procedures such as laser surgery, endoscopy, and laparoscopy involve small incisions, effectively minimizing pain and morbidity while enhancing postoperative recovery. The

convenience of minimally invasive surgeries also drives the utilization of small bioimplants, smart tools, and devices. As a result, the preference for minimally invasive surgeries is poised to grow, making it a key trend in the bioimplants market in the coming years.

Increasing Range of Therapeutic Uses

Bio-implants have a wide range of therapeutic applications in various domains such as orthopedics, cardiology, dentistry, neurology, and more. They play a crucial role in enhancing both the duration and quality of human life. Moreover, bio-implants are utilized in the treatment of skin burns or wounds resulting from surgical procedures. Additionally, the increasing aging population, which is more susceptible to chronic conditions like cardiovascular disease, orthopedic disorders, endovascular diseases, and dental disorders, is one of the key drivers behind the growth of the Bio-Implants Market. Numerous chronic diseases, such as gout, congenital and neuropathic disorders, and cardiovascular diseases (CVD), have sedentary lifestyles as their primary contributing factor. Consequently, the global market for bio-implants has witnessed significant growth.

Technological advancement

Technological advancements in bio-implant manufacturing, such as 3D printing, laser technology, and nanotechnology, have significantly enhanced the biocompatibility of these products. A key contributing factor to these advancements is the increased allocation of healthcare funding by governments worldwide. Several governmental organizations are collaborating with healthcare research firms and medical equipment manufacturers to introduce novel and more efficacious devices to the market. Post-acute myocardial heart attack, the inclusion of extracellular vesicles from stem cells in bio implants has shown improved cardiac performance. The growing prevalence of cardiovascular diseases globally serves as the primary driver for the expansion of this market segment. Moreover, the increasing geriatric population worldwide presents a promising avenue for market growth throughout the forecast period. For instance, as per a 2021 essay published by the American Heart Association, approximately 40,000 children undergo congenital heart surgery annually in the United States.

Key Market Challenges

High Cost of Implanting Procedures

Implant procedures are significantly expensive due to the high costs associated with importing implant materials and the expertise required by skilled surgeons. For instance, dental implants for a single tooth typically fall within the higher price range. Similarly, the costs of treating chronic conditions with essential organ implants are exorbitant. These include retinal implants, cardiac stents, spinal implants, and cosmetic implants, all of which have the potential to restrict market growth.

Biomaterial Adaptation to Receptive Bodies

The efficacy of embedded implants in the human body is directly correlated with the body's adaptation to the material. The likelihood of immune reactions in the body plays a crucial role in assessing this efficacy. Infections resulting from implant materials have been reported due to bacterial adhesion to biomaterials used for implants, which impacts market growth. Allergic reactions of the body to foreign implanted materials cause discomfort to patients. Treatment in such cases often involves the removal of the implanted material and its replacement with other materials compatible with the body. Challenges arise at the implantation site due to material rejection by the human body, which manifests as inflammation and infections in and around the implant site.

Key Market Trends

Increasing Chronic Diseases due to Stressful Lifestyles

Chronic diseases affecting the heart, kidneys, and liver are on the rise due to stressful lifestyles and unhealthy habits. These conditions often require treatments such as organ and tissue transplantation, as well as the use of bio-implants. Additionally, degenerative bone and joint problems pose significant challenges. The increasing global geriatric population presents a substantial opportunity for the growth of the bio-implants market. Orthopedic biological implants are preferred for joint replacements and strengthening, addressing deformities caused by natural, accidental, or congenital factors. The utilization of implants, such as pacemakers and stents, for treating cardiovascular diseases is also increasing. This growth is driven by the need for effective control and treatment of heart ailments in the aging population worldwide.

Genetically Engineered Biomaterials

Naturally occurring biomaterials, such as proteins, undergo selective modifications for tissue engineering purposes. This primarily involves cell adhesion, protein fusions, and their applications in gene delivery, cell encapsulation, coating, and drug delivery. These

advancements are poised to enhance the growth prospects of the market. Genetically engineered biomaterials involve sequencing processes based on genetics, structure, molecular weights, and fusion chemistries. A surge in the production of biomaterials using physical and chemical combinations in genetic engineering is anticipated. This focused production of biomaterials through intrinsic research contributes to the improvement in the effectiveness of implants. One significant opportunity driving the expansion of the cosmetic biomaterial market is research aimed at developing artificial skin using specialized biomaterials. Various forms of sponges that combine fibrillar collagen and gelatin are under evaluation. The evaluation encompasses in vitro cellular responses and in vivo tissue reactions, including experimentation in a whole organism, such as in vivo cell lining.

Segmental Insights

Product Type Insights

Based on the product type, the market is categorized into different segments including cardiovascular implants, spinal implants, orthopaedic implants, dental implants, ophthalmic implants, and other implants. Among these, cardiovascular implants dominate the market due to the increasing prevalence of cardiovascular diseases. The geriatric population is also growing, creating further growth opportunities in this segment. Various factors such as smoking, sedentary lifestyle of the young population, and high blood pressure contribute to the development of cardiovascular diseases. Bioimplants are commonly used for treating such conditions, with surgery being the preferred method for most patients. As a result, the market is expected to experience significant expansion throughout the forecast period, as indicated by the analysis.

Material Insights

Based on the material, the biomaterial metal alloys category emerged as the dominant segment in the bio-implant market in 2023 and is projected to maintain its position throughout the forecast period. Key drivers for the category include notable advantages such as superior tensile strength and corrosion resistance compared to ceramics and other materials. Noteworthy applications of biomaterial metals include dental implants, joint replacement implants, and pacemaker cases. Conversely, ceramic implants are anticipated to experience rapid growth during the forecast period. Ceramics have garnered significant attention due to their ability to fulfil crucial mechanical functions for tissue repair. Furthermore, the potential of bio-ceramics to stimulate bone regeneration tissues is expected to drive their adoption in the coming years.

Regional Insights

North America has a dominant presence in the Bio-Implants Market. It is observed to hold a significant share and is projected to maintain this trend in the forecast period without any notable variations. The market growth is primarily driven by the growing incidence of chronic illnesses and the availability of advanced healthcare infrastructure. Europe is the second largest market for bio-implants, attributed to government funding and support, a rise in the prevalence of orthopedic illnesses, and increased RD efforts. For instance, many pacemaker manufacturers focus on developing MRI-conditional and leadless pacemakers. Moreover, the increasing prevalence of cardiovascular diseases (CVD) leads to a higher number of CVD procedures, contributing to market expansion. Asia Pacific is expected to witness the fastest growth throughout the forecast period, primarily due to the rising prevalence of spinal cord injuries. This can be attributed to a significant increase in the number of traffic accidents. According to a 2019 study by Tokyo's Keio University, more than 100,000 individuals in Japan suffer from paralysis caused by spinal cord injuries. However, the recent approval of iPS technology in the country is likely to offer potential for bio-implant market growth in the future, providing assistance to such patients. Therefore, these aforementioned factors are anticipated to propel market growth in the region during the forecast period.

Key Market Players

BIOTRONIK SE Co. KG

Invibio Limited

Wright Medical Group N.V.

Edwards Lifesciences Corporation

MiMeDX Group Inc.

Stryker Corporation

Endo International plc

Smith Nephew plc

Zimmer Biomet Holdings Inc

Ethicon Inc.

Report Scope:

In this report, the Global Bio-Implants Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Bio-Implants Market,By Product Type:

- oCardiovascular Implants

- oSpinal Implants

- oOrthopedic Implants

- oDental Implants

- oOphthalmic Implants

- oOther Implants

Bio-Implants Market,By Material:

- oBiomaterial Metal Alloys

- oCeramics

- oPolymers

- oOther Materials

Bio-Implants Market,By End User:

- oHospitals Clinics

- oAmbulatory Surgical Centres

oOthers

Bio-Implants Market, By Region:

oNorth America

United States

Canada

Mexico

oEurope

France

United Kingdom

Italy

Germany

Spain

oAsia-Pacific

China

India

Japan

Australia

South Korea

oSouth America

Brazil

Argentina

Colombia

oMiddle East Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Bio-Implants Market.

Available Customizations:

Global Bio-Implants marketreport with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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