

# **United States Artificial Organs Market By Organ Type (Artificial Heart {Prosthetic Heart Valves, Ventricular Assist Devices, Cardiac Pacemakers}, Artificial Kidney, Artificial Pancreas, Artificial Lungs, Cochlear Implants, Others), By Technology (Electronic Bionics, Mechanical), By Type of Fixation (Wearable, Implantable), By Material Type (Silicon, Plastic, Steel), By Region, Competition, Forecast and Opportunities, 2018-2028F**

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## **Abstracts**

United States Artificial Organs Market is anticipated to project steady growth in the forecast period. Artificial organs are truly remarkable man-made devices or tissues that are skillfully implanted or integrated into the human body. They establish a seamless interface with living tissue, seamlessly fulfilling the role of a natural organ, while also enhancing specific biological functions or effectively treating a malfunctioning or absent organ. These incredible advancements in biomedical engineering have not only significantly improved the quality of life for countless individuals but have also opened up new horizons and possibilities for medical treatments. Examples of artificial organs encompass a wide range, from artificial hearts, kidneys, and pancreases, to sophisticated cochlear implants that restore hearing capabilities.

The field of artificial organs continues to be an area of active research and development, with tireless efforts from scientists and engineers striving to further refine and expand the capabilities of these life-changing technologies. The pursuit of perfection in replicating the intricacies of natural organs and achieving seamless integration with the human body remains a driving force, as artificial organs become

even more sophisticated, durable, and accessible to the growing population.

## Key Market Drivers

### Increasing Prevalence of Chronic Diseases

The escalating prevalence of chronic diseases in the United States is anticipated to spur the demand for artificial organs, serving as a critical driver in the market. Chronic illnesses, such as kidney disease, heart disease, and liver disorders, often result in organ failure, necessitating organ transplantation. However, the conundrum of organ shortage and long waiting lists for transplants has sparked significant interest in the field of artificial organs. These bioengineered substitutes, including the artificial heart, kidney, and liver, can offer immediate and life-saving solutions, presenting a promising prospect to address the organ deficit. By replicating the functions of natural organs, artificial organs provide patients with a second chance at life, enhancing their quality of life and extending their lifespan. The rising incidence of chronic conditions, coupled with the aging population, is expected to further elevate the need for artificial organs.

Furthermore, advancements in biomaterials and 3D printing technologies are propelling the growth of this sector, fostering the development of more effective and compatible artificial organs. Researchers are constantly exploring innovative materials and techniques to enhance the functionality and longevity of artificial organs. From biocompatible materials to personalized 3D-printed organs, the possibilities for improving patient outcomes are expanding.

Striking a balance between accessibility, affordability, and safety is crucial to ensure that artificial organs can benefit a wide range of patients in need. Collaborative efforts between scientists, healthcare providers, and policymakers are necessary to overcome these hurdles and make artificial organs a viable and sustainable solution for those suffering from chronic illnesses. As the field of artificial organs continues to evolve, it holds the promise of revolutionizing healthcare by providing new treatment options, improving patient outcomes, and ultimately saving lives. With ongoing research and innovation, the future of artificial organs looks promising, offering hope to millions of individuals affected by chronic diseases.

### Growing Geriatric Population

The United States is currently experiencing a significant demographic shift, with the geriatric population projected to reach 98 million by 2060. This rise in the aged populace

is anticipated to fuel the demand for artificial organs, as this demographic is particularly vulnerable to chronic diseases and organ failure. The high prevalence of kidney, liver, and heart diseases among seniors necessitates viable treatment options, such as organ transplants. However, the scarcity of donor organs, coupled with the extended waiting times, often exacerbates the patients' conditions. Herein, the advent of artificial organs offers a promising solution. These bioengineered organs can mimic the function of natural organs, thereby enhancing the quality of life for the elderly while reducing healthcare system dependency. Furthermore, continuous advancements in biotechnology, such as 3D printing and tissue engineering, are propelling the development of more efficient and cost-effective artificial organs. Thus, these factors combined with the escalating geriatric population signify a potential upsurge in the demand for artificial organs in the United States.

### Advancements in Technology and Bio-Engineering

Advancements in technology and bio-engineering are set to drastically increase the demand for artificial organs in the United States. The continuous improvement of 3D printing technology, coupled with the pioneering application of bioengineering techniques in the creation of synthetic organs, marks a significant milestone in the field of regenerative medicine. These strides have the potential to address the severe organ shortages faced in the country, making transplants more accessible and reducing waiting times. Moreover, the development of biocompatible materials and personalized medicine, stemming from detailed genetic analysis, promises to improve compatibility rates and decrease organ rejection incidents. This equates to higher success rates in transplant procedures, therefore increasing the demand for artificial organs. The rise of AI and machine learning also contributes to more precise and efficient organ manufacturing, further driving demand. Additionally, societal acceptance of artificial organs is growing as public understanding of the science behind these innovations increases. As such, it is anticipated that these cumulative factors will significantly boost the demand for artificial organs in the near future.

### Rising Incidence of Organ Failure

The escalating incidence of organ failure in the United States is expected to significantly drive the demand for artificial organs. Chronic diseases such as diabetes, hypertension, and heart disease, which are prevalent in the American population, often lead to organ failure, necessitating transplantation. Unfortunately, the supply of donor organs is insufficient to meet the growing demand, leaving many patients on prolonged waiting lists. Artificial organs, engineered from biocompatible materials, offer a promising

solution to this crisis. By utilizing state-of-the-art biotechnology and advanced materials, researchers are developing artificial organs that closely mimic the structure and function of natural organs. These bioengineered organs not only provide a viable alternative to donor organs but also offer several advantages over traditional transplants.

One significant advantage of artificial organs is their availability. Unlike donor organs, which are limited in supply and subject to geographical constraints, artificial organs can be readily manufactured and distributed to hospitals and medical facilities across the country. This accessibility reduces wait times for patients in need, potentially saving countless lives. Moreover, the use of artificial organs eliminates the risk of donor organ rejection, a significant concern in traditional transplants. With artificial organs, there is no need for immunosuppressive drugs, which can have adverse side effects and increase the risk of infection. Patients can enjoy a better quality of life without the constant worry of their bodies rejecting the transplanted organ.

Furthermore, advancements in medical technology and biomedical engineering are continuously improving the efficiency and reliability of artificial organs. Scientists are exploring cutting-edge materials, such as biocompatible polymers and nanomaterials, to enhance the performance and longevity of these bioengineered organs. With each technological breakthrough, artificial organs become more sophisticated, durable, and compatible with the human body. Therefore, the convergence of rising organ failure rates and medical technology advancements is poised to boost the demand for artificial organs in the United States. As researchers and engineers continue to innovate in this field, the future holds great promise for individuals in need of life-saving organ replacements. The development and widespread adoption of artificial organs have the potential to revolutionize healthcare, offering hope to patients and their families grappling with the challenges of organ failure.

## Key Market Challenges

### High costs of Artificial organs

The high cost of artificial organs is a significant issue that is expected to decrease their demand in the United States. These innovative medical devices, meticulously engineered to replace the function of damaged or missing natural organs, are widely recognized as lifesavers. However, their prohibitively high price tags pose a formidable barrier, rendering them inaccessible to the average American, even those covered by comprehensive insurance plans. It is not merely the initial cost of the organ itself that burdens patients, but also the ongoing expenses associated with maintenance, potential

replacements, and the exorbitant costs of post-transplant care that can span a lifetime. The economic burden imposed on patients and their families is substantial, prompting many to explore alternative, less costly treatment options or join the extensive waiting list for donated organs.

While artificial organs hold immense promise in terms of revolutionary medical technology and potential health benefits, the financial obstacles they present hinder their widespread adoption. The demand for artificial organs in the United States is projected to dwindle until a viable solution to mitigate these exorbitant costs is found.

### Shortage of Skilled Professionals

Despite the significant advancements in the field of regenerative medicine and medical technology, the shortage of skilled professionals in the United States is poised to decrease the demand for artificial organs. The complex process of integrating artificial organs into the human body requires a level of expertise and sophistication that is currently in short supply. This dearth of qualified professionals is becoming a significant bottleneck. Artificial organs are a cutting-edge solution in healthcare, designed to address the limitations of organ donations and transplants. However, the lack of trained professionals equipped to handle the intricate procedures involved poses a significant challenge to their widespread adoption. It is not merely about the surgical implantation of these organs, but also about managing post-operative care and potential complications, which requires a well-rounded understanding of the technology and how it interfaces with human biology. The shortage of such experts could potentially deter patients from opting for these solutions, thus reducing demand. To address this, significant investment in education and training is needed to produce the cadre of professionals necessary to support this evolving field. Ultimately, the success of artificial organs in the healthcare landscape hinges on the availability of skilled professional's adept at navigating this complex field.

### Key Market Trends

#### Scarcity of Donor Organs

The scarcity of donor organs in the United States presents a significant challenge to the healthcare system, with thousands of patients on waiting lists for life-saving transplants. This challenge is anticipated to drive an increase in the demand for artificial organs. Unlike donor organs, artificial organs are not dependent on the fortuitous availability of a matching donor and can be designed and manufactured as needed. With

advancements in medical technology, the capabilities of these artificial organs are continually improving, making them a viable alternative for many patients. Despite some hurdles in terms of biocompatibility and longevity, the promise of a readily available solution to organ failure is enticing. As such, the scarcity of donor organs is likely to contribute to the heightened interest and investment in artificial organ research and development, propelling the artificial organ industry's growth in the United States. Indeed, in a future where the demand outweighs the supply, artificial organs could become the norm, revolutionizing the landscape of the organ transplantation field.

### Technological Breakthroughs in The Field Of 3D Bioprinting

Technological advancements in the realm of 3D bioprinting are expected to dramatically drive up the demand for artificial organs in the United States. 3D bioprinting, a process that creates three-dimensional structures of biomaterials that mimic natural tissues and organs, is undergoing rapid innovation. These breakthroughs, which are pushing the boundaries of what is considered possible in medical science, are paving the way for a future where organ transplant waiting lists could become a thing of the past. As the technology becomes more sophisticated and accessible, it's expected that the demand for artificial organs will surge due to the increased ability to create customized, patient-specific organ replacements. This has the potential to save countless lives by addressing the chronic shortage of donor organs. Furthermore, the use of patient's own cells in the bioprinting process may eliminate the issue of organ rejection, a significant challenge in traditional transplantation. Thus, the technological progress in 3D bioprinting is not just expected to increase the demand for artificial organs, but also substantially improve the quality of life for patients in the United States.

### Segmental Insights

#### Organ Type Insights

Based on the Organ Type, the United States artificial organs market is a highly competitive and diversified industry, characterized by the presence of numerous regional and international players. Among the various organ types, the Artificial Heart segment is expected to dominate the market. This dominance can be attributed to the increased incidence of heart diseases and the growing elderly population, which necessitates the availability of advanced cardiac care solutions. The advancements in technology, such as the development of innovative materials and implantation techniques, are further propelling the growth of this segment.



While the Artificial Heart segment takes the lead, it is important to note that other segments like Artificial Kidney, Artificial Pancreas, Artificial Lungs, Cochlear Implants, and others also hold significant potential. These segments play a crucial role in addressing specific healthcare needs and contributing to the overall growth of the artificial organs market in the United States. With continuous research and development efforts, coupled with the increasing demand for improved quality of life, the market is poised for substantial growth in the coming years.

### Technology Insights

Based on the Technology, Electronic Bionics is poised to dominate the Artificial Organs market in the United States. This projection is driven by several key factors. Firstly, the continuous advancements in technology have paved the way for innovative solutions that enhance the functionality of artificial organs. Additionally, the increase in research and development activities has fostered the creation of cutting-edge bionic devices that mimic the natural functions of human organs.

Furthermore, the growing prevalence of conditions requiring organ transplants has created a strong demand for advanced artificial organ solutions. As the number of individuals in need of organ transplants rises, the need for reliable and efficient alternatives becomes increasingly crucial. Electronic Bionics, with its artificially intelligent and efficient solutions, is well-positioned to meet this demand. With these factors at play, the Electronic Bionics segment is expected to experience substantial growth in the coming years. The combination of technological advancements, research and development efforts, and the rising demand for efficient organ transplant solutions all contribute to the projected dominance of Electronic Bionics in the Artificial Organs market.

### Regional Insights

The Western region of the United States is anticipated to dominate the United States Artificial Organs Market. This region, known for its remarkable medical advancements, is home to several leading biotechnology and healthcare companies, positioning it at the forefront of innovation. With its robust infrastructure and state-of-the-art research facilities, the Western region has created an environment conducive to cutting-edge research and technology development. Moreover, the region's high incidence rate of organ failure, driven by factors such as lifestyle choices and environmental factors, has propelled it to the leading position in the market. The Western region's healthcare providers have recognized the urgent need for artificial organs to address the growing

demand and improve patient outcomes. As a result, they relentlessly work towards developing innovative solutions to address the complex healthcare needs of its population.

By combining expertise and resources, this region is poised to shape the future of the artificial organs industry, driving advancements, and improving patient outcomes. With ongoing collaborations between research institutions, healthcare providers, and biotechnology companies, the Western region continues to pave the way for groundbreaking discoveries and technological advancements in the field of artificial organs. The commitment to addressing the challenges of organ failure and improving the quality of life for patients remains a top priority, further solidifying the region's position as a leader in the market.

#### Key Market Players

B. Braun Medical, Inc.

Abiomed, Inc.

Baxter International, Inc.

Jarvik Heart, Inc.

Medtronic, Inc.

HeartWare International, Inc.

SynCardia Systems, LLC

Boston Scientific Corporation

Terumo Medical Corporation

Edwards Lifesciences Corporation

#### Report Scope:

In this report, the United States Artificial Organs Market has been segmented into the following categories, in addition to the industry trends which have also been detailed



below:

United States Artificial Organs Market, By Organ Type:

Artificial Heart

Artificial Kidney

Artificial Pancreas

Artificial Lungs

Cochlear Implants

Others

United States Artificial Organs Market, By Technology:

Electronic Bionics

Mechanical

United States Artificial Organs Market, By Type of Fixation:

Wearable

Implantable

United States Artificial Organs Market, By Material Type:

Silicon

Plastic

Steel

United States Artificial Organs Market, By Region:

Northeast Region

Midwest Region

West Region

South Region

## Competitive Landscape

**Company Profiles:** Detailed analysis of the major companies present in the United States Artificial Organs Market.

## Available Customizations:

United States Artificial Organs Market report 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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