

Considering a Building Perspective, Implantable Medical Device Development

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Citation: Norris M (2023). Considering a Building Perspective, Implantable Medical Device Development. *EJBI*. 19(2):154-155.
DOI: 10.24105/ejbi.2022.19.2.154-155

Received: 01-Feb-2023, Manuscript No. ejbi-23-93346;

Editor assigned: 03-Feb-2023, Pre QC No. ejbi-23-93346 (PQ);

Reviewed: 17-Feb-2023, QC No. ejbi-23-93346;

Revised: 20-Feb-2023, Manuscript No. ejbi-23-93346 (R);

Published: 24-Feb-2023

1. Introduction

Medical devices are an essential part of modern medicine. They play a vital role in the diagnosis, treatment, and prevention of various medical conditions. From simple thermometers to advanced surgical robots, medical devices have come a long way in improving the quality of healthcare. In this article, we will discuss medical devices in detail, including their types, uses, advantages, and challenges [1]. Medical devices are any instrument, apparatus, machine, software, implant, or other similar article intended for use in the diagnosis, treatment, or prevention of disease or other medical conditions. They can range from simple devices like a thermometer or a stethoscope to more complex equipment such as pacemakers, artificial organs, and surgical robots. Medical devices are regulated by government agencies like the Food and Drug Administration (FDA) in the United States. These agencies ensure that medical devices are safe and effective for their intended use. Medical devices are classified into three categories based on their level of risk [2].

Types of medical Devices

Medical devices can be classified based on their intended use. The following are the most common types of medical devices [3].

Diagnostic Devices: These devices are used to diagnose medical conditions. Examples include X-ray machines, ultrasound machines, and magnetic resonance imaging (MRI) machines.

Therapeutic Devices: These devices are used to treat medical conditions. Examples include pacemakers, insulin pumps, and artificial organs.

Surgical Devices: These devices are used in surgical procedures. Examples include surgical instruments, surgical robots, and endoscopes.

Monitoring Devices: These devices are used to monitor medical conditions. Examples include blood glucose monitors, heart monitors, and oxygen monitors [4].

Rehabilitation Devices: These devices are used to help patients recover from medical conditions or injuries. Examples include prosthetics, braces, and physical therapy equipment

Improved Diagnosis: Medical devices enable healthcare professionals to diagnose medical conditions accurately and quickly. This can lead to earlier detection and treatment, which can improve patient outcomes.

Better Treatment: Medical devices can provide targeted and precise treatment to patients, reducing the risk of side effects and improving outcomes.

Improved Patient Care: Medical devices can enhance patient comfort and safety during medical procedures, making the overall experience less stressful.

Increased Efficiency: Medical devices can help healthcare professionals work more efficiently, reducing the time and cost associated with medical procedures [5].

Challenges of medical Devices

While medical devices offer numerous advantages, they also pose several challenges, including:

Risk of Malfunction: Medical devices can malfunction, causing harm to patients. This risk is especially high for high-risk medical devices like pacemakers and artificial organs.

Limited Access: Medical devices can be expensive, limiting access to healthcare for people who cannot afford them. This can lead to disparities in healthcare outcomes.

Complexity: Medical devices can be complex, requiring specialized training for healthcare professionals to use them correctly.

Cybersecurity Risks: Medical devices are increasingly connected to the internet, posing cybersecurity risks. Hackers can potentially access patient data or even control medical devices, causing harm to patients

2. Conclusion

In conclusion, medical devices have revolutionized modern healthcare by providing healthcare professionals with accurate and effective tools to diagnose, treat, and prevent medical

conditions. These devices have improved patient outcomes, increased efficiency, reduced healthcare costs, and enhanced patient comfort and safety during medical procedures.

Medical devices are classified into three categories based on their level of risk, and they can be used for diagnostic, therapeutic, surgical, monitoring, and rehabilitation purposes. Each type of device offers unique benefits that can improve patient care and enhance healthcare professionals' ability to provide efficient and effective care.

Despite their advantages, medical devices also pose several challenges, such as the risk of malfunction, limited access to healthcare, complexity, and cybersecurity risks. To overcome these challenges, it is essential to ensure that medical devices are safe and effective, that healthcare professionals receive specialized training, and that patients have access to affordable healthcare.

Furthermore, the development of innovative medical devices is ongoing, with new technologies and advancements continuously emerging. These new technologies are expected to improve the accuracy and effectiveness of medical devices, reduce healthcare costs, and increase access to healthcare for people worldwide.

In conclusion, medical devices have transformed modern healthcare and will continue to play a critical role in improving patient outcomes and enhancing healthcare professionals' ability to provide efficient and effective care. However, it is essential to ensure that medical devices are safe, effective, and affordable

for everyone, regardless of their socioeconomic status or geographical location. By doing so, we can ensure that medical devices continue to benefit patients, healthcare professionals, and the healthcare industry as a whole

3. References

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