Procedia of Engineering and Medical Sciences

Proceedings of the International Congress on "Medical Improvement and Natural Sciences" | 2022

Implantation in Medicine

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Annotation. Implantable devices are artificial implants that are partially or completely inserted into the human body and intended to remain after the procedure. Implantable devices are temporarily or permanently located in the human body for diagnostic, monitoring or therapeutic purposes.

Key words: implants, transplantation, stent, corrosion, in vivo, prostheses.

Implants are used to support the function of existing devices for the treatment of diseases, drug delivery, infection control, facilitating the placement or removal of devices with minimal damage to specific tissues, with unique sensitivity and rational design in terms of clinical needs. Medical An implant is a synthetic device, unlike a transplant, which is a transplanted biomedical tissue. Technically, an implant is a medical device manufactured to replace a missing biological structure, to improve a damaged biological structure. , or can be made from a biomedical material such as apatite. Some implants are bioactive, for example, injecting drugs under the skin in the form of implantable tablets or drug-eluting stents. Other medical implants contain artificial may be electronic devices such as cardiac pacemakers or cochlear implants.

Medical implants are products that must meet the functional requirements set by the human body. They can be used in almost all organs of the human body. Ideally, they have biomechanical properties comparable to autogenous tissues without any negative effects. The main requirements of all medical implants are corrosion resistance, biocompatibility, bio-adhesion, bio-functionality, recyclability and availability. Most of the tests to perform these tests are from materials to study extracts that offer screens for genotoxicity, carcinogenicity, reproductive toxicity. directed, cytotoxicity, irritation, sensitization and sterilization agent residues. The consequences of corrosion are the spontaneous disintegration of the implant material, which weakens the implant and the harmful effects of corrosion on the surrounding tissues and organs. Medical implants are regulated to ensure safety and efficiency for the patient and classified. One of the main goals of implant research and development is to predict the long-term, in vivo performance of implants. The lack of useful in vivo computer modeling data makes it difficult to assess the properties and synergistic contributions of therapeutic drug regimens. The current trends in modern implant surgery bring together various skilled and talented specialists such as traumatologists, orthopedists, mechanical engineers, pharmacists, etc. to achieve better results in research, development and implementation. Implantable medical devices help to improve the quality of human life and prolong the life of patients. A disadvantage of current implantable electronic devices is that medical devices depend on electrochemical batteries for their service life. Over time, the depletion of electrochemical battery power requires the replacement of new implantable electronic devices. Medical implants are made of a wide variety of materials, including metals, metal alloys, plastic polymers, ceramics, hydrogels, and composites. In addition, implants are often attached to the tissue with adhesives or cements that contain additional potentially toxic compounds.

Before they are clinically and commercially viable, all materials used in devices and their degradation by-products must be proven to be non-toxic to meet regulatory standards for biocompatibility.

Medical implants are biomedical tissue devices transplanted to restore the body. Artificial skin, artificial liver, artificial pancreas, endoscope tube, artificial tendon, artificial ligament, artificial cornea, artificial joints and bones, hernia type, artificial kidney artificial lung, vein, tracheal valves, etc. Intracorporeal or implantable devices inside the human body prevent the transmission of disease, otherwise they can cause surgical site infections with microbial contamination, as well as nosocominal infections possible. Implantable devices used in cardiac surgery are designed to save the patient's life, while prostheses used in joint replacement surgery are designed to improve the patient's quality of life. An implantable device or prosthesis is designed to remain permanently in the body. and includes pacemakers, joint prostheses, breast implants, ventricular shunts. Infection associated with prostheses and implantable devices is a major complication of morbidity and mortality. Even though infection rates are reported to be low, the impact of infections is significant, for example, in connection with prosthetic joint replacements. those involved, where adverse outcomes can range from dysfunction to amputation and sepsis. Implant biomaterials can be divided into two broad categories: structural and functional. Structural biomaterials serve the main purpose of integration with the surrounding tissues, creating a continuous transition from an artificial implant to natural tissues. Structural replacement implants include a variety of prostheses (eg, joint arthroplasties, dental implants, and tissue transplants). Functional replacement systems are used to improve the replacement of lost or reduced functionality. For example, a pacemaker and a cochlear implant.

In conclusion, it should be said that medical implants meet the functional requirements set by the working environment and the human body.

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