Journal of Medical Implants & Surgery

Batista, J Med Imp Surg 2022, 7:4

Short Communication Open Access

Current and Future Directions in Organizational Models for Remote Monitoring of Cardiac Implantable Electronic Devices

Souza Batista*

Department of Dental Materials and Prosthodontics Aligarh Muslim University, India

Abstract

The development of science and technology has made it possible for IMD devices to provide cutting-edge medical treatments. Without any manual assistance from medical personnel, modern IMDs can automatically monitor and manage a variety of patients' medical conditions. While IMDs are increasingly becoming more linked to improve remote care delivery and give patients and doctors the ability to modify therapy while relaxing in their own homes, it also raises security-related concerns. Device vulnerabilities could be used by adversaries to remotely change device settings from anywhere in the world. The current dangers, security objectives, and suggested remedies are reviewed in this article along with their advantages and disadvantages.

It happens often to provide radiation to patients who have cardiac implanted electronic devices (CIEDs). An essential component of patient care is taking prospective problems into account. An overview of CIEDs is given, along with a list of probable issues and remedial actions that can be implemented.

Keywords: Arrhythmia; Electrophysiology; Cardiovascular implantable electronic device; Remote monitoring; Organizational models; Workflow

Abbreviations: CIED: Cardiac implanted electronic devices; PM: Pacemakers; ICD: Implantable cardioverter-defibrillators; CIED: Cardiac implanted electronic device; EP: Electrophysiology; IBN: Intra Body Network; INR: International Normalized Ratio

Introduction

In Australia and New Zealand, cardiac pacemakers (PM) have been implanted since 1961. In Australia and New Zealand, implantable cardioverter-defibrillators (ICDs) were initially utilised in 1984, and more recently, biventricular models for cardiac resynchronization treatment were introduced. An Australian and New Zealand cardiac implanted electronic device (CIED) survey has been conducted every three to four years since 1972, and the calendar year 2017 was chosen as the survey period to coordinate with earlier studies.

It is now obvious how remote monitoring (RM) for cardiac implanted electronic devices (CIEDs) may enhance both clinical and financial results. The complexity and sophistication of devices are rising, and there are more patients with CIEDs who need continuing maintenance. RM implementation across electrophysiology (EP) practices over the past 10 years has not been consistent, despite the evidence of benefit and necessity. The absence of instructions on how to handle RM data and patient follow-up is one of the main obstacles to adoption. RM clinics now have a variety of organizational structures [1-2].

Improved RM uptake and effectiveness call for an emphasis on clinic model optimization, which became more critical during the COVID-19 pandemic when the Heart Rhythm. Some of the most recent IMDs have begun to include several communication and networking features, sometimes referred to as "telemetry," as well as ever-more complex computational capability. Due to the ability of medical professionals to remotely access data and change the implant's configuration, this has given implants more intelligence and given patients more autonomy (i.e., without the patient being physically present in medical facilities). Telemetry and computing capabilities enable healthcare professionals to continuously monitor the patient's state and create novel diagnostic methods based on an Intra Body Network (IBN) of medical devices, in addition to a large cost savings [3].

In the past ten years, cardiac implanted electrical devices (CIEDs) have seen radical alterations. These modifications have made it possible for the combined use of implanted cardioverter defibrillators (ICDs) and pacemakers, or CIEDs, to increase. In 1957, the first generation of CIEDs that could be implanted in people was pacemakers. Tran's venous implantable defibrillators, which are the present version, have been accessible since 1997. The use of CIEDs is growing across the globe. The use of pacemakers in the US from 1993 to 2009. An attacker could harm the patient's health if they take advantage of a weakness in the IMD. Adverse events are the term used to describe such impacts. The negative effects that can result if the attacker succeeds are highly diverse because each type of implant is intended to address a specific medical issue. We list some of the harms an opponent could do to a patient for the most popular IMDs in attacks and the unfavorable outcomes they cause can be analyzed in terms of both their scope and persistence [4].

Materials and Method

Patients selection: This study included prospectively all consecutive patients who underwent a UGAVP and were eligible for the implantation of cardiac devices (such as pacemakers, defibrillators, CRT, or upgrades) at two centers: Princess Grace Hospital in Monaco between September 2014 and September 2015 and Mohammed VI university hospital in Marrakech, Morocco, between October 2016 and April 2018. Each patient signed a permission form authorizing the operation [5].

***Corresponding author:** Souza Batista , Department of Dental Materials and Prosthodontics Aligarh Muslim University, India Tel: 917582461352; E-mail: Batista.souza@gmail.com

Received: 01-Jul-2022, Manuscript No: JMIS-22-70487, **Editor assigned:** 04-Jul-2022, PreQC No: JMIS-22-70487 (PQ), **Reviewed:** 18-Jul-2022, QC No: JMIS-22-70487, **Revised:** 22-Jul-2022, Manuscript No: JMIS-22-70487 (R), **Published:** 29-Jul-2022, DOI: 10.4172/jmis.1000140

Citation: Batista S (2022) Current and Future Directions in Organizational Models for Remote Monitoring of Cardiac Implantable Electronic Devices. J Med Imp Surg 7: 140.

Ultrasound-guided venous puncture: The patient was prepped as normal in a sterile way and put in a supine posture without trendelenburg so that the vein could be accessed with sonography. The axillary vasculature was imaged using a surface vascular US probe that was put into a sterile plastic sleeve. The venous puncture was visually guided by real-time US imaging of the artery and vein's spatial connection and the path of the access needle. Under US visualization, a local an aesthetic was applied using lidocaine hydrochloride 2 percent along the puncture needle's path. The vein was located in the center of the screen using an out-of-plane approach, and the probe was held perpendicular to the skin with the left hand [6].

While keeping the plunger under negative pressure and keeping an eye out for tissue movement on the US screen, a 7-cm long, 18-gauge Cook bevel-tipped needle was inserted beneath the US probe. The syringe was withdrawn and a guide wire was inserted into the lumen after the needle was visible to have entered the vein and blood flashed into the syringe. From here, a sheath and dilator may be positioned as normal [7].

Management of antithrombotic therapy: Aspirin, Clopidogrel, Ticagrelor, Dabigatran, Rivaroxaban, Apixaban, low weight molecular heparin, and Vitamin K Antagonists [VKA] were used both before and after the surgery as part of the management of antithrombotic treatment. On the day of the treatment, the International Normalized Ratio (INR) objective for VKA patients was 2-3. If the INR was above 4, the implantation was delayed [8].

Discussion

Regarding the most pertinent application fields for the research's central question, three stands out as being particularly important. Emergency response, population monitoring, and active ageing monitoring are a few of them. Four additional application domains were noted, nevertheless. These include of encouraging a healthy lifestyle, organizing care services, providing assistance to those with disabilities, and socializing [9]. These findings suggest that smart cities have the potential to favorably impact public health, particularly in terms of illness prevention and promotion, which puts them in line with finding solutions to some of the current issues. Important components of the international health fairness strategy include oversight and supervision. The majority of the models discussed in the literature underwent actual implementation evaluations. The literature also revealed suggestions for further improvement, elicited needs, speculative models, defined structural frameworks, described and confirmed structures, and models to show the viability of the suggestions [10].

Conclusion

Implantable medical devices enhance patients' quality of life and, in some situations, are crucial to their survival. More computation and communication capabilities are being added to the latest generation of IMDs. In this essay, we made the case that in order to guarantee both safety and security for the user, progress on unique and smarter IMD designs must include security solutions by design. We have given a thorough analysis of the major security issues with the most recent IMDs and have talked about how a malicious adversary may occasionally pose a substantial threat to the patient's health. Therefore, it is obvious that these gadgets must include security procedures.

For the 2017 calendar year, a CIED survey was conducted in Australia and New Zealand. There were gains in PM implants compared to a comparable survey conducted in 2013; however the incidence of ICD implants has plateaued. In Australia and New Zealand, fewer PM replacements are needed, which is a result of longer power source service lives. Bipolar active fixation leads are now strongly preferred in the atria and ventricles.

Acknowledgement

None

Conflict of interest

None

References

1. Fedullo P, Kerr KM, Kim NH, Auger WR (2011) Chronic thromboembolic pulmonary hypertension. Am J Respir Crit Care Med 183:1605-1613.
2. Madani MM, Auger WR, Pretorius V (2012) pulmonary endarterectomy recent changes in a single institution's experience of more than 2,700 patients. Ann Thorac Surg 94: 97-103.
3. Silverman BG, Gross TP, Kaczmarek RG, Hamilton P, Hamburger S, et al. (1995) the epidemiology of pacemaker implantation in the United States. Public Health Rep 110: 42-46.
4. Pedersen SB, Hjortshøj SP, Bøtker HE (2017)Venous thromboembolism in patients with implantable cardioverter Defibrillators. Europace 19: 991-1001.
5. Magney JE, Parsons JA, Flynn DM, Hunter DW (1995) Pacemaker and defibrillator lead entrapment case studies Pacing. Clin Electrophysiol 18: 1509-1517.
6. Nash, Burrell CJ, Ring NJ, Marshall AJ (1998) Evaluation of an ultrasonically guided venepuncture technique for the placement of permanent pacing electrodes Pacing. Clin Electrophysiol 21: 452-455.
7. Deshmukh P (2017) Design of cloud security in the EHR for Indian healthcare services. Inf Sci 29: 281-287.
8. He D, Chan S, Tang S (2014) A novel and lightweight system to secure wireless medical sensor networks IEEE J. Health Infor 18: 316-326.
9. Lee S, Fu K, Kohno T, Ransford B, Maisel WH, et al. (2009) Clinically significant magnetic interference of implanted cardiac devices by portable headphones. Heart Rhythm 6: 1432-1436.
10. Marohn D (2006) Biometrics in healthcare Biometric Technol. Today 14: 9-11.