

6th International Conference on Nanotechnologies and Biomedical Engineering Proceedings of ICNBME-2023, September 20–23, 2023, Chisinau, Moldova Volume 2: Biomedical Engineering and New Technologies for Diagnosis, Treatment, and Rehabilitation

## Evaluation of the Maintenance System of Medical Equipment – A Necessity for Implementing an Effective Quality System

Calin Corciova, Robert Fuior, Catalina Luca, Victor Sontea

## https://doi.org/10.1007/978-3-031-42782-4\_7

## Abstract

Evaluating the maintenance of medical equipment is essential to ensure the proper and safe operation of these systems, which are essential for the diagnosis, treatment, and monitoring of patients. Throughout the life cycle of medical equipment, regular maintenance and calibration are required to maintain its performance and accuracy. In addition, it is important that medical equipment undergoes regular reviews to verify that it still meets applicable standards and regulations. If a malfunction or problem is found in the operation of the medical equipment, it is essential to report it immediately to the supplier or distributor of the equipment so that timely corrective measures can be taken. Some key reasons for the importance of evaluating the maintenance of medical systems are patient safety, system reliability and availability, performance optimization, regulatory and standards compliance. This paper presents aspects related to maintenance, management, maintenance, and quality management of medical equipment by firstly analyzing the technological and medical information obtained through various questionnaires. Summarize the issues encountered in medical equipment maintenance and design a medical quality control system to manage the maintenance and quality control of medical equipment. In the medical equipment maintenance system, scientific management theories and methods are used to predict, adjust, inspect, and account for the quality of the entire medical process and to establish a complete quality monitoring and management



6th International Conference on Nanotechnologies and Biomedical Engineering Proceedings of ICNBME-2023, September 20–23, 2023, Chisinau, Moldova Volume 2: Biomedical Engineering and New Technologies for Diagnosis, Treatment, and Rehabilitation

system. Compliance with standards and regulations, as well as adequate training of medical personnel, can ensure the correct and efficient use of this equipment, thus contributing to the provision of high-quality medical care.

Keywords: medical equipment maintenance, medical equipment quality,

*maintenance management* 

## References

1. Senbekov, M., et al.: The recent progress and applications of digital technologies in healthcare: a review. Int. J. Telemedicine Appl. **2020**, 1–18 (2020). <u>https://doi.org/10.1155/2020/8830200</u>

2. American College of Clinical Engineering/ACCE.

https://accenet.org/about/Documents/What's\_a\_Clinical\_Engineer.pdf

3. World Health Organization. https://www.who.int/health-topics/medical-devices

4. International Organization for Standardization. <u>https://www.iso.org/home.html</u>

5. Badnjevi'c, A., et al.: Post-market surveillance of medical devices: a review. Technol. Health Care **30**(6), 1315–1329 (2022). <u>https://doi.org/10.3233/THC-220284</u>

6. Iadanza, E., Gonnelli, V., Satta, F., et al.: Evidence-based medical equipment management: a convenient implementation. Med. Biol. Eng. Comput. **57**, 2215–2230 (2019). https://doi.org/10.1007/s11517-019-02021-x

7. Wang, B., Fedele, J., Pridgen, B., et al.: Evidence-based approach to medical equipment maintenance monitoring. In: European Medical and Biological Engineering Conference Nordic-Baltic Conference on Biomedical Engineering and Medical Physics, IFMBE proceedings (2018). <u>https://doi.org/10.1007/978-981-10-5122-7\_65</u>

8. Wakefield, J., Hertzler, L., Poplin, B.: Evidence-based maintenance: part I: measuring maintenance effectiveness with failure codes. J. Clin. Eng. **35**, 132–144 (2010). https://doi.org/10.1097/JCE.0b013e3181e6231e

9. Medical Device with Measuring Function.

https://ec.europa.eu/docsroom/documents/10283/attachments/1/translations/en/renditions/native

10. Brown, R.J.: Measuring Measurement – What is metrology and why does it matter? Measurement (Lond.) **168**, 108408 (2021). https://doi.org/10.1016/j.measurement.2020.108408

11. Monteiro, E.C., Leon, L.F.: Metrological reliability of medical devices. J. Phys.: Conf. Ser. **588**, 20–32 (2015). <u>https://doi.org/10.1088/1742-6596/588/1/012032</u>

12. Badnjevi'c, A., Cifrek, M., Magjarevi'c, R., Džemi'c, Z. (eds.): Inspection of Medical Devices: For Regulatory Purposes. Springer Singapore, Singapore (2018)

13. International Vocabulary of Metrology. Basic and General Concepts and Associated Terms (VIM). https://www.oiml.org/en/files/pdf\_v/v002-200-e07.pdf

14. Organization Internationale de Métrologie Légale (OIML): National metrology systems – Developing the institutional and legislative framework 021. https://www.oiml.org/en/files/pdf\_d/d001-e20.pdf (2015)

15. Gurbeta, L., Badnjevi´c, A.: Inspection process of medical devices in healthcare institutions: software solution. Health Technol. **7**(1), 109–117 (2016). <u>https://doi.org/10.1007/s12553-016-0154-2</u>