METROLOGICAL SUPPORT OF MEDICAL TECHNOLOGIES IN THE REPUBLIC OF UZBEKISTAN: CURRENT STATUS, PROBLEMS AND PROSPECTS

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Annotation: *This article analyzes the state of metrological support of medical technologies in the Republic of Uzbekistan. It is argued that the accuracy and reliability of measuring instruments used for medical purposes is of great importance in the healthcare system. It also identifies current problems and develops scientific and practical proposals for their elimination in the future and further improvement of metrological support.*

Keywords: *metrology, medical technologies, measuring instruments, calibration, infrastructure modernization, metrological monitoring, personnel training, healthcare.*

Introduction

Medical technologies are an integral part of the modern healthcare system. Today, the development of modern medical technologies has sharply increased the demand for measurement accuracy and reliability in the healthcare system. Technical means used in diagnostics, laboratory analysis, determination of physiological indicators and treatment processes are directly dependent on metrological support. Insufficient metrological support or uncontrolled work in the field can lead to medical errors, incorrect diagnosis and ineffective treatment. Metrological control in the medical field is the main solution to protect the health of patients, reduce diagnostic errors and improve the quality of medical services. Therefore, studying the state of metrological support of medical technologies in the Republic of Uzbekistan, identifying existing problems and taking measures to eliminate them is an urgent scientific and practical issue. [1]

The concept and significance of metrological support in medical technologies. Metrological support is a set of organizational, technical and legal measures aimed at ensuring the unity, accuracy and reliability of measurements. Metrology in the medical field performs the following tasks:

- ensuring the accuracy of medical measuring instruments;
- increasing the reliability of diagnostic and laboratory results;
- ensuring patient safety;
- improving the quality of medical services.

Technologies such as electrocardiographs, blood pressure monitors, laboratory analyzers, X-ray and ultrasound devices require regular metrological verification. [2]

Current status of metrological provision in the Republic of Uzbekistan

Metrological provision in the Republic of Uzbekistan is regulated by the Law "On Metrology" and relevant regulatory legal acts, which include the principles of ensuring the unity of measurements, establishing the procedure for metrological verification, and coordination with international agreements. It is established that all medical technologies used in the healthcare system are subject to mandatory metrological control.

Also, in recent years, the number of metrological verifications in medical institutions has increased, the activities of state metrology services have expanded, and the mechanisms for registering and controlling medical equipment have been improved. However, in practice, we can see that these processes are not implemented to the same extent in all regions. [3]

Problems in the metrological provision of medical technologies

Despite a number of measures being taken in the sector, there are still enough problems in the system. In particular:

a) Non-compliance with metrological requirements

In some medical institutions/regions of Uzbekistan, cases of use of measuring instruments/medical devices without verification within the established time limits have been identified. For example, in some medical associations of the Khorezm region, 271 measuring instruments were used without passing metrological verification. Uza.uz These cases negatively affect the accuracy of diagnostics.

b) Obsolescence of equipment and lack of infrastructure

The equipment supply of laboratory networks is limited, and many medical laboratories lack modern measuring instruments. This situation reduces the reliability and accuracy of medical test results. one.uz

c) Issues of standards and compliance with international requirements

Uzbekistan is strengthening national standardization in the field of metrology, but full integration into the framework of international organizations and adaptation to global institutions such as the BIPM has not yet been completed. UzDaily.uz i.e. the process of full harmonization of the national metrological system with international standards has not yet been completed [4]

Measures to improve metrological provision

- strengthening legislation and international compliance - full integration of the national metrological legal framework with international standards (for example, OIML and BIPM) - will radically improve the quality of metrological services and strengthen export potential.

- infrastructure modernization - equipping medical institutions with high-precision, modern measuring instruments, modernization of diagnostic laboratories will increase the reliability of the system.

- metrological monitoring and digitization - online monitoring of medical equipment and the creation of a metrological database - will significantly increase the efficiency of metrological control.

- personnel training - training and advanced training of specialists in the field of metrology, as well as involvement in international qualification programs, will serve to strengthen the system.

- international cooperation and exchange of experience - expanding cooperation with international metrology institutes will strengthen the possibilities of introducing advanced practices and providing methodological support. [5]

Conclusion

The metrological provision of medical technologies in the healthcare system of the Republic of Uzbekistan is making significant progress. The current system is growing through legal frameworks, metrological inspections and global indices. Nevertheless, problems such as equipment obsolescence and non-compliance of some measuring instruments with metrological requirements remain. By addressing these issues, it is possible to ensure the quality of medical services and patient safety, develop infrastructure, digitize metrological monitoring, train personnel, and expand international cooperation. [6]

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