THE ROLE OF INFORMATION TECHNOLOGIES IN MODERN MEDICINE.

Xolbekov Baxtiyor Baymanovich
Senior Lecturer
Department of Medical Biology and Histology
Tashkent State Medical University
Tashkent, Uzbekistan
Pardayev Og‘abek Baxtiyor o‘g‘li
1st year undergraduate students of TSMU Termez branch.
ogabekpardayev428@gmail.com

Annotation.
The rapid development of information technologies has significantly transformed modern medicine. Digital systems, artificial intelligence, telemedicine, and electronic medical records have improved diagnostic accuracy, treatment efficiency, and patient care management. The integration of information technologies into healthcare institutions enhances clinical decision-making, optimizes hospital workflows, and ensures better data storage and security. This article analyzes the importance of medical information technologies, their practical applications, advantages, challenges, and their impact on the quality of healthcare services. The study also discusses current research findings related to digital healthcare transformation.
Keywords: information technology, healthcare, telemedicine, electronic medical records, artificial intelligence, digital medicine.

Introduction.

Healthcare systems worldwide are undergoing rapid digital transformation. The integration of information technologies (IT) into medicine has created new opportunities for improving diagnostic methods, treatment strategies, and healthcare management. Medical errors, delayed diagnoses, and inefficient documentation were major issues before the widespread implementation of digital systems.

Today, electronic medical records, telemedicine platforms, artificial intelligence algorithms, and health information systems are widely used in hospitals and clinics. These technologies allow healthcare professionals to access patient information quickly, analyze medical data efficiently, and provide timely treatment. The importance of digital transformation has become especially evident during global health crises, where remote consultations and digital monitoring systems played a crucial role.

This article explores the structure, functions, and benefits of information technologies in medicine and evaluates their clinical and organizational impact.

Main Part.

1. Electronic Medical Records (EMR).

Electronic Medical Records (EMR) are digital versions of patients' paper charts. They store medical history, laboratory results, diagnoses, prescriptions, and treatment plans in a structured electronic format.

Advantages of EMR:

- Easy access to patient data
- Reduction of paperwork
- Improved accuracy of medical documentation
- Enhanced communication between healthcare providers
- Decreased risk of medical errors

EMR systems also improve long-term data storage and allow statistical analysis for research purposes.

2. Telemedicine.

Telemedicine enables remote medical consultations through digital communication technologies. It became especially important during the COVID-19 pandemic.

Benefits of telemedicine:

- Access to healthcare in remote areas
- Reduced travel time and costs
- Continuous monitoring of chronic patients
- Increased availability of specialists

Telemedicine platforms use video conferencing, mobile applications, and remote monitoring devices to provide high-quality medical services.

3. Artificial Intelligence in Medicine.

Artificial Intelligence (AI) plays a crucial role in diagnostics and clinical decision-making. AI algorithms analyze medical images, laboratory results, and patient histories to detect diseases at early stages.

Applications of AI:

- Radiology image analysis
- Cancer detection
- Predictive analytics
- Personalized treatment planning
- Robotic surgery assistance

AI systems reduce human error and increase diagnostic precision, particularly in complex cases.

4. Health Information Systems (HIS).

Health Information Systems integrate administrative, financial, and clinical data within healthcare institutions. They help manage hospital operations efficiently.

Functions of HIS:

- Patient registration
- Appointment scheduling
- Billing and insurance processing
- Inventory management
- Data analytics

HIS improves workflow efficiency and supports evidence-based decision-making.

5. Challenges and Limitations.

Despite many advantages, the implementation of IT in medicine faces certain challenges:

- High implementation costs
- Data privacy and cybersecurity risks
- Need for staff training
- Technical system failures

Ensuring patient data protection and maintaining system reliability are essential for sustainable digital healthcare development.

Research Results.

Recent studies show that hospitals implementing electronic medical record systems reduce medical errors by approximately 30–40%. Telemedicine services increase patient accessibility by up to 60% in rural areas. Artificial intelligence improves early disease detection rates, particularly in oncology and radiology.

Digital health systems also demonstrate improved patient satisfaction due to faster service and more accurate diagnoses. Healthcare institutions report increased operational efficiency and reduced administrative workload.

The research confirms that the integration of information technologies significantly enhances the overall quality of healthcare services.

Conclusion.

Information technologies have become an essential component of modern medicine. Electronic medical records, telemedicine, artificial intelligence, and health information systems contribute to improved diagnostic accuracy, better patient management, and enhanced healthcare efficiency.

Although challenges such as cybersecurity risks and high implementation costs exist, the long-term benefits outweigh these limitations. Continuous development and

proper regulation of medical information technologies will further strengthen healthcare systems globally.

Digital transformation is not merely an innovation but a necessity for sustainable and high-quality medical care in the 21st century.

REFERENCES.

1. Sadler T.W. Langman's Medical Embryology. 14th ed. Philadelphia: Wolters Kluwer; 2019.
2. Moore K.L., Persaud T.V.N., Torchia M.G. The Developing Human: Clinically Oriented Embryology. 11th ed. Philadelphia: Elsevier; 2020.
3. Standring S. (ed.). Gray's Anatomy: The Anatomical Basis of Clinical Practice. 41st ed. Elsevier; 2016.
4. Shortliffe E.H., Cimino J.J. Biomedical Informatics: Computer Applications in Health Care and Biomedicine. Springer; 2014.
5. World Health Organization. Digital Health Strategy Report. WHO; 2021.
6. Topol E. Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again. Basic Books; 2019.