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THE ROLE OF MODERN INFORMATION TECHNOLOGIES IN MEDICINE

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Abstract: This article broadly covers the role and importance of modern information technologies in the field of medicine. Based on current trends such as electronic health systems, telemedicine, artificial intelligence, mobile applications and health monitoring, as well as medical data security, it analyzes how information technologies have created convenience for patients and doctors. It also covers the prospects and future role of these technologies in the healthcare system.

Keywords : Information technology, healthcare, medicine, electronic medical record, telemedicine, artificial intelligence, mobile applications, data security, AI, e-health.

Login.

The rapid development of information technologies, as in all areas, is causing a major revolution in medicine. The healthcare system is now moving from a simple clinic to a digital environment, introducing modern approaches to the relationship between doctors and patients. Many technologies that were previously only imagined are now being used in practice: remote medical services, diagnostics using artificial intelligence, electronic management of medical information, mobile health monitoring systems, etc. All this not only improves the quality of treatment, but also saves time, money and human resources.

1. Electronic Health Systems (e-Health)

Electronic health care (e-Health) is a system for providing health services using information and communication technologies. With the help of these systems, all necessary information about patients is stored in a single electronic database. For example, the patient's medical history, drug allergies , previous laboratory tests and other important information are constantly updated.

For example, information about a patient's medical history, allergies, surgeries, laboratory results, diagnostics, and treatment processes is stored in a complete and systematic manner. This reduces medical errors, prevents duplicate tests , and prevents incorrect treatments.

One of the most popular systems is **Electronic Medical Records (EMR).** is , which simplifies the work of doctors, saves time and increases accuracy. At the same time, the **Electronic Health Record (EHR)** contains more extensive information about the patient's health - this facilitates the exchange of information between different health institutions.

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Currently, developed countries, such as the USA, Great Britain, Germany and Scandinavian countries, have moved to a fully digitalized form of healthcare systems. In them, all historical health information of the patient is collected in the EHR system and is constantly updated. Also, through these systems, the doctor writes prescriptions electronically and sends them directly to the pharmacy system - which simplifies the processes and reduces inconvenience.

The Republic of Uzbekistan is also paying special attention to the digitalization of healthcare. The **"E-Health"** platform is being implemented as part of state programs, which will improve the quality of medical services, reduce bureaucratic obstacles , and ease the workload of doctors.

Also, e-Health technologies have once again proven their relevance in the context of the pandemic . During the COVID-19 era, managing patient data through a centralized system played a key role in controlling the spread of the disease.

In conclusion, e- health systems are an important tool for improving the efficiency of the healthcare system, saving resources and ensuring patient safety. These technologies will remain one of the main directions for the digital transformation of medicine in the future .

Electronic Medical Records (EMRs) and Electronic Health Records (EHRs) provide detailed and complete information about a patient's health. This helps reduce errors and make decisions quickly in emergency situations. For example, in some countries, doctors send prescriptions directly to pharmacies electronically , which simplifies procedures.

2. Telemedicine and remote services

a set of technologies that allow for the provision of medical care remotely . This creates a great opportunity, especially for people living in remote and remote areas. Now, a patient can receive a doctor's consultation and discuss the results of diagnostic tests via video call, without having to go to a medical facility.

has become particularly relevant during the pandemic . Many health systems around the world have implemented this service and it has become a permanent feature. This has made it possible to reduce the risk of infectious diseases and expand access to medical services .

3. Artificial Intelligence (AI) and Machine Learning.

Artificial intelligence (AI) is currently one of the most promising areas in medicine. With the help of AI, accurate and reliable approaches are emerging in imaging diagnostics, genome analysis, disease prediction , and treatment selection. For example, AI analyzes MRI, CT, and X-ray images and provides doctors with accurate information about pathologies.

For example, AI algorithms developed by Google Health have sometimes been more accurate than doctors in assessing vision and detecting changes in the retina . IBM's Watson for Oncology system also provides doctors with suggestions for diagnosing and individualizing cancer treatments.

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Machine learning is an important branch of artificial intelligence , allowing computer systems to learn and improve themselves based on real medical data. These technologies can identify the risk of diseases based on historical data on millions of patients, select optimal treatment methods. In particular, during the COVID-19 pandemic, AI models have been actively used to predict infection trends, monitor patient status , and predict disease severity.

The following advantages are emerging as a result of the use of artificial intelligence:

- Increased speed and accuracy of diagnosis;
- Personalization of treatment plans (personalized medicine);
- Reduction in the number of medical errors;
- Reducing the workload of doctors;
- The ability to use resources efficiently.

However, there are a number of challenges in implementing AI technologies in healthcare: data privacy, ethical standards, the possibility of errors and the risk of over-reliance on artificial systems. Therefore, it is advisable to see artificial intelligence as an assistant to the work of a doctor, rather than as a complete replacement.

In short, artificial intelligence and machine learning have ushered in a new era in medicine. They are highly optimizing the healthcare system, introducing safe and effective technologies for the lives of patients. In the future, these technologies will be further improved and will serve as effective solutions to many medical problems.

AI using worker robots operations from a person less error with done increase For example , operations performed using the Da Vinci robotic system are performed with high precision and minimally invasively.

Additionally, AI-powered chatbots can help patients with simple medical advice or identify symptoms, allowing the patient to receive immediate first aid.

4. Mobile health apps and monitoring systems

Mobile health apps are becoming increasingly popular, allowing users to keep track of their health. They can help monitor things like blood pressure, heart rate, blood sugar levels, and sleep quality . They can also help with medication reminders, exercise routines, and water intake.

mobile health apps include:

Health monitoring: Apps allow users to monitor various physiological parameters of the user in real time. For example, parameters such as blood pressure, heart rate, blood sugar levels, and sleep quality can be monitored. With these indicators , users can continuously monitor their health status and make necessary changes.

Reminders and reminders: You can set reminders and notifications to take your medication, drink fluids, exercise, or maintain a healthy lifestyle. This is especially useful for patients with chronic diseases.

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Sports and physical activity: Mobile apps allow users to track their physical activity (e.g., distance walked, calories burned, workout plan). This also encourages people to maintain a healthy lifestyle.

Health recommendations: Mobile apps sometimes provide recommendations based on the user's health metrics to maintain or improve a healthy lifestyle. For example, tips for improving sleep or various health practices.

Psychological support: Some mobile apps also offer psychological support to the user, allowing people to track their mental health, manage stress, and receive psychological support.

Examples :

1. **Apple Health and Google Fit** : These platforms not only provide general physical activity monitoring, but also offer the ability to analyze health data and provide recommendations to users. These platforms integrate with multiple apps and devices, bringing together users' various health metrics in one place.
2. **MyFitnessPal : This app** helps users track their diet, count calories , and reach fitness goals. MyFitnessPal is one of the most popular mobile health apps in the world, providing fitness tips as well as recommendations for healthy eating.
3. **Carrot Fit** : This app is designed to motivate and encourage users to exercise. Its features are focused on motivating the user in the form of great motivational notifications and fun games.

Mobile health systems continue to be used in medicine. Through such applications, the interaction between doctors and patients becomes more efficient and accurate. Mobile health applications allow doctors to remotely monitor the condition of patients and help detect diseases at an early stage. Also, through telemedicine and remote medical consultations, patients can constantly monitor their health.

Future prospects : In the future, the capabilities of mobile health systems are expected to expand further. With the help of artificial intelligence and machine learning technologies, mobile applications will have more advanced and accurate monitoring systems. Mobile applications can also be integrated into systems that allow for the creation of individual health passports, real-time health monitoring, and preventive recommendations.

fitness trackers, smart watches (Apple Watch, Samsung Galaxy Watch , etc.). These devices are also used by doctors to help remotely monitor the patient's condition. Such technologies are of vital importance for patients suffering from chronic diseases such as diabetes, heart disease, hypertension.

5. Medical data security

With the widespread introduction of information technology, ensuring the confidentiality and security of medical information is becoming an important task. Each patient's personal

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health information must be protected. Otherwise, this information may fall into the hands of malicious individuals and be misused .

Today, many healthcare institutions are using modern encryption (cryptography) methods. Also, systems for storing and exchanging medical data based on blockchain technology are emerging. All this allows for reliable protection of patient personal data.

Conclusion

Modern information technologies are taking the medical field to a completely new level. They are not only improving the quality of diagnostics and treatment, but also creating opportunities to meet the demand for medical services, facilitate communication between patients and doctors, and effectively use resources.

In the future, more advanced systems are expected to emerge in this area - smart clinics, fully automated diagnostic systems, personalized treatment methods based on genomics, and other advanced approaches. There is no doubt that the role of information technologies in healthcare is increasing year by year.

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