ETHICAL ISSUES IN THE USE OF AI IN MEDICINE

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Abstract

In the 21st century of scientific and technological progress, one of the many manifestations of the development of modern technologies has become artificial intelligence or artificial cognitive system [1]. Today, AI algorithms are used to diagnose diseases, predict treatment outcomes, manage medical data and even develop drugs. But along with this, a number of ethical issues arise: responsibility for errors, ensuring transparency and controllability of AI work, privacy issues [2]. In addition, the use of artificial intelligence has great potential for the medicine of the future [3]. Artificial intelligence has great potential to transform and systematize the entire health care system as a whole. At the moment, there are a number of examples of the results of the implementation of various types of technologies in medicine, such as the IBM program Watson in oncology, Celsus system, Sky app Vision. Based on statistics from the journal Nature, it is clear that between 2015 and 2020, the number of published studies related to the application of technology in the field of medicine has increased rapidly. There are many more such examples, but only one conclusion can be drawn from them - AI in the field of healthcare is undoubtedly one of the main assistants of the current generation of doctors. On the one hand, the introduction of highly specialized neural networks and artificial intelligence in medicine allows not only to significantly improve the quality of services provided in the field of diagnostics, treatment and prevention, but also to optimize the processes of information processing in multitasking conditions. On the other hand, a number of problems arise that require detailed study, which creates a solid basis for studying previously poorly studied aspects. When considering any topic in medicine, all the threads lead us to the root of this topic - ethical problems. Consequently, the topic of introducing artificial intelligence has become no exception, due to its versatility and relevance, each time it gives rise to more and more questions, mainly ethical ones.

Keywords: artificial intelligence, ethics, medicine, responsibility, personal data.

Introduction

There are currently some concerns about the security of artificial intelligence systems [4]. Training AI algorithms requires a huge amount of information, including medical records, genetic data, and test results. However, data breaches are becoming more common, threatening

patient privacy. For example, a 2021 study found that about 70% of healthcare institutions have experienced cyberattacks [5].

This situation requires strengthening legal norms. For example, in Europe, the General Data Protection Regulation (GDPR) is in force, which provides strict control over the processing of personal information. However, its application in the medical field remains difficult due to the need to balance data protection and technological developments [6].

In 2015–16, NHS Royal Free (London) shared data from 1.6 million patients with DeepMind to develop the Streams (kidney failure alert) app. The patients did not give explicit consent, and the data was accessible to more than 150 DeepMind employees. In 2017, the ICO (UK Information Conduct Authority) ruled the transfer unlawful.

When using "algorithms" in medicine, there is a risk of diagnostic error, which can occur in the first two stages of detection and perception of symptoms: recognition of leading manifestations and detection of decisive signs of the disease. It is still quite difficult to create correct differential diagnostic algorithms for all diseases [7]. There are cases when patented algorithms for identifying various diseases turned out to be unreliable. This happened with the Epic Sepsis Model (ESM), which belongs to the largest electronic medical records company in America, Epic System (stores medical information for 180 million people). The Epic Sepsis algorithm is designed to predict sepsis, the leading cause of death in hospitals. The developers claimed that the accuracy of disease predictions is up to 83%, but there are still no reliable independent tests of the algorithm. Experts reviewed hospital records of more than 38,000 patients and found that 2,500 had sepsis that ESM failed to identify (67% of patients), and in 88% of cases the system generated a false diagnosis [8].

Another important aspect is the question of accountability. When AI makes decisions, who is responsible for any errors that may occur? This can be difficult to establish, especially when the algorithm uses complex models that are difficult to explain. It is important that healthcare professionals retain control over the decision-making process and can explain to patients how and why certain choices were made.

Who should be held responsible for AI errors—the physician, the developer, or the healthcare facility—is still unclear. Some experts propose a system of shared responsibility, in which the physician remains the primary decision-maker, but the algorithm developers are required to provide transparent data on their work. In cases where AI algorithms produce erroneous or harmful results, determining responsibility can be fraught with legal and ethical complexities.

One of the most pressing ethical concerns surrounding the integration of AI into healthcare is the lack of transparency and accountability in AI algorithms. As AI systems become increasingly complex and autonomous, understanding how these algorithms make decisions becomes critical to ensuring fairness, equity, and patient safety.

The "black box" problem is fundamental to the philosophy of artificial intelligence, but has its own specifics when applied to medicine [9]. This means that the decision-making processes of artificial intelligence algorithms are opaque and difficult to interpret or study thoroughly. For example, colorectal cancer biomarkers recognized by AI. At the same time, the doctor does not know how the algorithms determine the quantitative and qualitative criteria of the detected
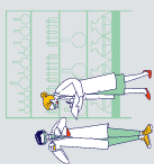
biomarkers to formulate the final diagnosis in each individual case, i.e. a "black box" arises in the pathology of the process.

The use of any technology is fraught with errors, including AI in medicine, which is why one of the largest problems of an ethical nature arises - the issue of data security. Medical information is one of the most sensitive groups of data, and its leakage can lead to serious consequences for patients. This problem requires careful analysis, since AI technologies often involve processing large amounts of data, which threatens their security. Firstly, this is due to the volume and complexity of the data: AI in medicine works with huge amounts of data, including medical records, genetic information, laboratory results and medical images. Processing and storing such data increases the risk of unauthorized access. Secondly, failures or cyberattacks can lead to leakage of confidential information. Systems using AI algorithms may be subject to attacks aimed at gaining access to personal data of patients. The following follows from this: the right to privacy of a person is at risk. Every patient has the right to protect their personal information. Respect for this right is one of the fundamental principles of medical ethics. Data leakage can lead to stigmatization, loss of trust in medical institutions and even legal consequences.

The use of any technology, including artificial intelligence in healthcare, is not without its errors and creates serious ethical dilemmas, the main one being ensuring the security of personal data. Medical information is considered highly confidential, and its disclosure can entail serious negative consequences for patients. This issue requires detailed study, since the introduction of AI in medicine, as a rule, involves working with colossal amounts of information, which creates potential risks for their protection. First of all, this is due to the scale and nature of the data processed: artificial intelligence systems in medicine operate with huge arrays, including anamneses, genetic data, test results and visualization studies. Processing and storing such volumes of information increases the likelihood of unauthorized access. Secondly, system failures or targeted cyberattacks can provoke a leak of confidential information. AI algorithms underlying medical systems can become a target for intruders seeking to gain access to patients' personal data. This puts everyone's right to privacy at risk. The protection of personal information is an inalienable right of every patient, and respect for this right is one of the key principles of medical ethics. Data leakage can lead to social isolation, loss of trust in medical organizations, and even litigation.[10]

Without transparency into the underlying decision-making processes, it is difficult to determine whether AI-generated recommendations are influenced by factors such as ethnicity, gender, socioeconomic status, or other sensitive characteristics [11].

To address this issue, it is critical to prioritize transparency and accountability in the development and deployment of AI algorithms in healthcare. This includes implementing standards for algorithmic explainability, creating conditions for re-auditing AI systems, and creating clear mechanisms for recourse and redress in the event of algorithmic errors or harm.

Conclusions

The use of AI in medicine opens up enormous opportunities to improve the quality and accessibility of medical care, but is accompanied by complex ethical challenges. The problems of data protection, distribution of responsibility, and transparency of algorithms require a comprehensive approach that includes legal, technological, and social solutions.

For the successful integration of AI into medicine, it is necessary to: strengthen the protection of patients' personal data, develop legal mechanisms for distributing responsibility for AI errors, and increase the transparency and explainability of algorithms. If we delve into each of these aspects, we can say the following. First, it is important that medical AI systems can provide clear explanations of their decisions, which will allow doctors and patients to understand how and why certain conclusions were made. In addition, it is necessary to create clear ethical standards for the development and use of AI in medicine. These standards should include aspects such as confidentiality, informed consent, and fairness in order to prevent abuse. It is important to note that to date, there are a number of successful examples of the creation and development of ethical standards for the use of neural networks in medicine. The World Health Organization has issued recommendations on the ethical use of AI in healthcare, emphasizing the need to ensure safety, privacy, and equal access. [12]. Furthermore, it is worth mentioning the Healthcare Artificial Intelligence Society (HIMSS), which has developed a set of ethical principles regarding the use of AI in medicine, including a focus on privacy and data protection.

As practice shows, the more resources there are for free use and comparison, the more accurate the analysis and subsequent conclusions will be. Using diverse data sets and training AI on statistical models that represent different demographic groups is critical to reducing bias. If a model is trained only on data from one group, it may not work effectively for others, which can lead to incorrect diagnoses and treatments.

It is important that AI does not replace the human factor, especially in complex medical situations, but is used in symbiosis with it. AI recommendations should be under constant, sensitive supervision of doctors. In this regard, training of medical workers seems to be one of the most optimal solutions to this ethical issue. This will help not only to effectively use AI tools, but also to understand their limitations and potential errors. In addition, it will provide a chance to constantly monitor and evaluate algorithms, which are necessary to identify possible problems and improve models.

In addition to working closely with healthcare professionals, it is important to maintain ongoing contact directly with patients. Patients should be as involved as possible in discussions and trials regarding the use of AI in their care. This will help to take into account their preferences and concerns, and will also increase the level of trust in the technology.

Only by taking these aspects into account can AI become a powerful tool in healthcare, capable of bringing benefits without violating human rights. Ultimately, despite the listed problems, the accuracy and effectiveness of solutions does not allow us to neglect the use of AI, but, on the contrary, makes this use necessary. The emerging problems should serve as a basis for

training and educating doctors in the ability to work with AI, expanding the scope of application and developing new diagnostic methods.

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