# Problems and prospects of digitization and the use of artificial intelligence in medicine

***Problemas y perspectivas de la digitalización y el uso de la inteligencia artificial en medicina***

***Problemas e perspectivas da digitalização e do uso da inteligência artificial na medicina***

**Evgen Kharytonov**[1]
**Olena Kharytonova**[2]
**Maxym Tkalych**[3]
**Yuliia Tolmachevska**[4]

**Received:** June 29th, 2025
**Accepted:** July 10th, 2025
**Available:** December 5th, 2025

**How to cite this article:**
Kharytonov, E., Kharytonova, O., Tkalych, M. and Tolmachevska, Y. (2026). *Problems and prospects of digitization and the use of artificial intelligence in medicine.* DIXI, vol. 28, n°. 1, january-june 2026, 1-16.
DOI: https://doi.org/10.16925/2357-5891.2026.01.10

Research article. https://doi.org/10.16925/2357-5891.2026.01.10

[1] Doctor of Legal Sciences. Professor of the Civil Law Department and Head of the same Department at National University Odesa Law Academy (Odesa, Ukraine). Corresponding Member of National Academy of Law Sciences of Ukraine. Honored Science and Technology Worker of Ukraine.
E-mail: zharuton@gmail.com
**ORCID:** https://orcid.org/0000-0001-5521-0839.

[2] Doctor of Legal Sciences. Professor of the Department of Intellectual Property and Patent Justice, and Head of the same Department at National University Odesa Law Academy (Odesa, Ukraine). Corresponding Member of National Academy of Law Sciences of Ukraine. Honored Science and Technology Worker of Ukraine.
E-mail: lh2512@gmail.com
**ORCID:** https://orcid.org/0000-0002-9681-9605.

[3] PhD. Associate Professor of the Civil Law Department of Zaporizhzhia National University (Zaporizhzhia, Ukraine).
E-mail: maxx.tkalich@gmail.com
**ORCID:** https://orcid.org/0000-0003-4224-7231.

[4] PhD candidate of the Civil Law Department of at National University Odesa Law Academy (Odesa, Ukraine).
E-mail: yuliiaTolmachevska7@gmail.com
**ORCID:** https://orcid.org/0000-0002-7964-8875.

## Abstract

This article examines the key trends, challenges, and prospects of digital transformation and the implementation of artificial intelligence (AI) in the field of medicine. With the advent of the fourth industrial revolution and the transition to a post-industrial economy, digital technologies and AI have significantly penetrated healthcare, changing the landscape of diagnostics, treatment, and administrative functions. The study explores the benefits of AI, including personalized treatment, accelerated diagnostics, and more efficient resource management. Simultaneously, it emphasizes the risks — ethical, legal, and data security concerns — which complicate the responsible integration of these technologies. Special attention is given to Ukraine's efforts in implementing eHealth reforms, expanding telemedicine, and incorporating AI in clinical practice during the ongoing war. International and domestic experiences are analyzed to assess the applicability and consequences of AI solutions in healthcare. The article concludes by underlining the urgent need for comprehensive legal frameworks, ethical standards, and data protection mechanisms to maximize AI's potential in medicine while minimizing threats to human rights and safety.

**Keywords:** Artificial intelligence; data protection; digital transformation; digitalization; eHealth; healthcare; personalized medicine; telemedicine.

## Resumen

Este artículo examina las principales tendencias, retos y perspectivas de la transformación digital y la implementación de la inteligencia artificial (IA) en el campo de la medicina. Con la llegada de la cuarta revolución industrial y la transición a una economía posindustrial, las tecnologías digitales y la IA han penetrado significativamente en la atención sanitaria, cambiando el panorama del diagnóstico, el tratamiento y las funciones administrativas. El estudio explora los beneficios de la IA, incluyendo el tratamiento personalizado, el diagnóstico acelerado y una gestión más eficiente de los recursos. Al mismo tiempo, hace hincapié en los riesgos —cuestiones éticas, legales y de seguridad de los datos— que complican la integración responsable de estas tecnologías. Se presta especial atención a los esfuerzos de Ucrania por implementar reformas en materia de salud electrónica, ampliar la telemedicina e incorporar la IA en la práctica clínica durante la guerra en curso. Se analizan experiencias internacionales y nacionales para evaluar la aplicabilidad y las consecuencias de las soluciones de IA en la atención sanitaria. El artículo concluye subrayando la urgente necesidad de marcos jurídicos integrales, normas éticas y mecanismos de protección de datos para maximizar el potencial de la IA en la medicina y minimizar al mismo tiempo las amenazas a los derechos humanos y la seguridad.

**Palabras clave:** inteligencia artificial; protección de datos; transformación digital; digitalización; salud electrónica; atención sanitaria; medicina personalizada; telemedicina.

## Resumo

Este artigo examina as principais tendências, desafios e perspectivas da transformação digital e a implementação da inteligência artificial (IA) no campo da medicina. Com o advento da quarta revolução industrial e a transição para uma economia pós-industrial, as tecnologias digitais e a IA penetraram significativamente na área da saúde, mudando o cenário dos diagnósticos, do tratamento e das funções administrativas. O estudo explora os benefícios da IA, incluindo tratamento personalizado, diagnósticos acelerados e gerenciamento de recursos mais eficiente. Ao mesmo tempo, ele enfatiza os riscos —preocupações éticas, legais e de segurança de dados— que complicam a integração responsável dessas tecnologias. É dada atenção especial aos esforços da Ucrânia para implementar reformas de saúde eletrônica, expandir a telemedicina e incorporar a IA na prática clínica durante a guerra em andamento. As experiências internacionais e nacionais são analisadas para avaliar a aplicabilidade e as consequências das soluções de IA na área da saúde. O artigo conclui desta-

cando a necessidade urgente de estruturas jurídicas abrangentes, padrões éticos e mecanismos de proteção de dados para maximizar o potencial da IA na medicina e, ao mesmo tempo, minimizar as ameaças aos direitos humanos e à segurança.

**Palavras-chave:** Inteligência artificial; proteção de dados; transformação digital; digitalização; eHealth; saúde; medicina personalizada; telemedicine.

# I. INTRODUCTION

Starting from the 80s of the 20th century, information and communication technologies have become increasingly integrated into various spheres of social life. The scale of this phenomenon led to the emergence of the concept of the Digital Age, or the Information Age, and later — the formation of Virtual Reality or the Metaverse. It is based on the idea of transitioning from the traditional industrial model of the economy to the post-industrial one and increasingly combining physical reality with virtual reality. Given the level of technological development, humanity has entered the stage of the fourth industrial revolution and is rapidly moving forward.

A characteristic feature of the industrial sphere is the automation of production processes based on the use of these technologies. However, not only industry, but also other sectors of the economy are following the path of scientific and technological progress and the use of high technologies. The latter penetrate almost all spheres of public life — economic, political, social, spiritual, requiring a person to quickly adapt to new circumstances and conditions, constant self-improvement and learning, the ability to process and assimilate large amounts of information.

The process of digitalization is becoming more and more comprehensive, legal regulation does not always adequately and quickly respond to the changes taking place. This process has become quite noticeable in the last decade in the field of healthcare, undoubtedly simplifying a number of legal relations. But this also has a downside, since the risk of various negative phenomena as a result of the use of artificial intelligence in this area is significantly increasing. An analysis of the relevant risks and prospects is currently appropriate and necessary in view of the rapid digitalization of relations in the field of medicine. Tasks of the study:

1. To analyze the current state and trends of digitalization and AI implementation in healthcare.
2. To identify the benefits and limitations of AI technologies in medical practice.

3. To examine Ukraine's regulatory and technological approaches to digital healthcare transformation.
4. To evaluate ethical and legal challenges associated with AI use in medicine.
5. To propose recommendations for the balanced and safe integration of AI technologies into the healthcare system.
6. The purpose of the article is research and analysis of digitalization and the modern development of artificial intelligence in the field of healthcare and the prospects and problems that arise in this regard.

## II. Analysis of Recent Research

The issue of legal regulation of the use of artificial intelligence in various spheres attracts close attention of scientists from various fields. Research in this field is traditionally interdisciplinary in nature. The presence of significant risks in the use of digital technologies and the lag in legal regulation have led to many studies devoted to individual aspects of legal regulation of the use of artificial intelligence.

Among domestic authors, it is worth noting O. A. Baranov and his publications on a wide range of issues related to the problems of legal support of the information sphere and the formation of the Internet of Things (Baranov 2017a, 2017b, 2018a, 2018b, 2019, 2021), V.G. Pylypchuk and O.S. Hylyaka (2022), M.O. Stefanchuk and O.A. Muzyku-Stefanchuk, M.M. Stefanchuk (2021), who reveals the problems of legal regulation of the digitalization of the economy, its advantages and significant risks in the use of digital technologies, O.E. Radutny (2015, 2016, 2017) on liability for errors in artificial intelligence, etc. S.B. Buletsa (2022), O.V. Krytskyi (2020), V.K. Tashchuk, and O.V. Malinovska-Biliychuk (2023), O.V. Palagin, T.V. Semikopna, I.A. Chaikovskyi, and O.V. Sivak (2020), Y.V. Voronenko and O.P. Mintser (2012), V.G. Kyrychenko (2019), N.O. Artamonova, O.M. Myrna and Y.V. Pavliche (2020), V.V. Hrytsenko (2016), and others devoted their scientific research directly to the issues of digitalization of the medical sphere and the application of artificial intelligence.

## III. Methodology

This research employs a qualitative interdisciplinary legal methodology to analyze the phenomenon of digitization and the application of artificial intelligence (AI) in the healthcare sector. The study is grounded in the understanding that the legal regulation of rapidly evolving technologies such as AI requires comprehensive approaches

that go beyond doctrinal legal analysis and incorporate socio-technical, ethical, and policy dimensions.

The first methodological component is doctrinal legal research, which involves a systematic examination of national and international legislation, regulatory documents, and judicial practice relevant to digital healthcare and the use of AI technologies in medicine. Ukrainian normative acts—including orders of the Ministry of Health and strategic initiatives of the Cabinet of Ministers—were analyzed alongside international soft law instruments, such as World Health Organization (WHO) guidelines on AI use in public health.

The second component is the comparative legal method, which is used to evaluate how other jurisdictions (e.g., EU countries, the United States) approach the regulation of AI in medicine, particularly in areas such as data protection, medical liability, and ethical oversight. This allows for the identification of best practices and gaps in Ukraine's legal framework in the context of healthcare digitalization and war-related emergencies.

A systemic approach is applied to assess the interaction between technological advancements and institutional structures, including the eHealth system, telemedicine networks, and AI-based diagnostic platforms. The study also explores how these technologies influence legal relationships between patients, healthcare providers, and the state.

The descriptive method is employed to highlight the current state of technological implementation in Ukrainian medicine, such as the expansion of digital services via the "Diia" platform, the development of electronic medical documentation, and the application of AI in diagnostics and data analytics. These empirical insights are supported by statistical data, policy documents, and expert assessments.

Furthermore, the critical-analytical method is used to identify ethical, legal, and practical risks posed by AI in medicine. This includes issues such as algorithmic bias, the lack of emotional intelligence in AI systems, threats to patient data confidentiality, and the absence of clear liability frameworks for harm caused by AI decisions.

Finally, the research draws from interdisciplinary sources in law, computer science, medicine, and ethics to ensure a holistic understanding of the challenges and opportunities in this area. This mixed-method, interdisciplinary approach enables a nuanced and comprehensive legal analysis of the integration of AI in medicine within the Ukrainian and global contexts.

# IV. Results and Discussion

First, it is necessary to decide on the terminology, as this will allow us to most clearly outline the areas of research.

Digitalization in healthcare refers to the implementation and active use of digital technologies, information systems and electronic solutions to improve the delivery of healthcare services and the management of healthcare processes. Digitalization in healthcare is defined as the conversion of analog information into digital format. This means that data that was previously presented in paper form is now transferred to electronic form, which allows it to be stored, processed and exchanged using electronic systems and devices (Kyrychenko, 2019).

Digital medicine is a process that ensures interaction between a doctor and a patient using digital technologies; it is a necessary tool that removes barriers to interaction and communication in the global information environment. The main requirement for the digitalization of medicine is to optimize people's lives.

The term "artificial intelligence" is usually used to refer to those types of computer systems that have certain abilities associated with human intelligence, such as perception, understanding, learning, reasoning, and problem solving. Artificial intelligence is usually divided into three categories: expert (or knowledge-based) systems, perceptual systems, and natural language systems. The last two categories are specialized computer programs. Expert systems are more complex; they can be considered computer programs, and even specialized combinations of computer programs and specialized databases.

Almost all experts agree that the use of artificial intelligence in the healthcare industry has broad prospects. According to forecasts by the consulting company Precedence Research, the global market for artificial intelligence in healthcare could reach $ 188 billion by 2030, growing at an average of 37% annually. In 2021, the market was already estimated at $1 billion (Dmytryk, n. d.).

The digital transformation of society has penetrated the medical field, which has given rise to the concepts of e-medicine or digital health. Digital health includes mobile health apps, electronic health records, wearables, telemedicine, and personalized medicine (Korchinsky, & Firman, 2022).

Thus, the implementation of new services on the Diya portal is currently under development. In particular, by 2024, it was planned to transfer the following services to digital mode: registration of a declaration with a family doctor, obtaining an e-hospital, appointment of a pension or subsidy, etc. By the way, a transition period was established from June to September 2021 for the implementation of e-hospitals, during which medical institutions were to gradually switch to creating medical reports in

electronic form. And from September 1, their formation is possible only in electronic form. The availability and stability of eHealth in 24/7 mode was also ensured, an SDLC committee was formed to effectively manage the development of the system's functionality and developed RoadMap (roadmap for the development of eHealth components), the administrative burden on medical workers (over 25 thousand primary care physicians, over 113 thousand specialist physicians and over 157 thousand nursing staff) was reduced, and an electronic medical certificate of birth was launched.

Over the past 3 years, Ukraine has been implementing depaperization of public services at all levels, including the medical sector. Currently, the number of electronic projects in the healthcare sector has increased to over 100, which necessitated the creation of a separate structure — the Office for Coordination of the Development of Electronic Healthcare.

The office is a discussion platform on which the legislative, executive, international partners, specialized associations, trade unions, and public organizations resolve conceptual issues. Subsequently, priority electronic projects are coordinated with the Ministry of Health, included in the "roadmap" and implemented. Thus, according to the "roadmap", the implementation of 107 electronic projects in the medical sector was planned for 2023. They are aimed at automating processes for doctors, improving the quality, accessibility, and safety of medical services for patients. According to the Ministry of Health, the following initiatives have been implemented: 1) COVID-certificates for those vaccinated abroad; 2) functionality for accounting for rehabilitation interventions; 3) categorization functionality for different categories of patients according to their nosologies; 4) reimbursement functionality immunosuppressive drugs; 5) functionality for the reorganization of healthcare institutions; 7) medical reports 2.0 (making changes to the processes of forming medical reports on birth and temporary disability, creating an admin panel medical conclusions); 8) integration of the electronic health system with other state registries to improve data quality; 9) electronic prescriptions for all prescription drugs; 10) pilot of the electronic stock management system for medicines and medical devices e-stock; 11) register of those responsible for placing medical devices on the market (MVP). 7 projects are also being implemented to use telemedicine solutions (Matijas, n.d.).

The full-scale war, unfortunately, has made its own adjustments to this process, although since the beginning of the war, many IT initiatives have begun to create services to provide medical care to Ukrainians online, some of them on a volunteer basis. Mostly, these are telemedicine services — consultations with a doctor in a chat, by phone or via video call (Andreasyan, n.d.).

Regarding the provision of telemedical care, experts note that the provider of telemedical care is an institution or a sole proprietorship doctor, and not a doctor per se (individual licensing has not been implemented in Ukraine to date). A doctor, as an employee of a healthcare institution, may provide telemedical care under certain conditions. In this case, a telemedicine portal should function on the basis of the institution, which ensures the protection of medical and personal data, the integrity of information, proper recording of the information received, recommendations, etc.

In practice, these conditions are not always met. Those services provided remotely are often not exactly telemedicine, or are home teleconsultation, which does not meet the established requirements, in particular, the Order of the Ministry of Health No. 681 "On the introduction of regulatory documents on the use of telemedicine in the healthcare sector". It should be noted that for the period of martial law, it was replaced by the Order of the Ministry of Health of Ukraine dated September 17, 2022 No. 1695 "On Approval of the Procedure for Providing Medical Care Using Telemedicine, Rehabilitation Care Using Telerehabilitation for the Period of Martial Law in Ukraine or Its Certain Localities", according to which the provision of medical care using telemedicine, rehabilitation care using telerehabilitation is provided by a doctor's decision in accordance with the List of Injuries, Wounds and Other Conditions, the Provision of Medical Care for Which Requires the Use of Telemedicine in Conditions of Martial Law, approved by Order of the Ministry of Health dated June 20, 2022 No. 1062, registered with the Ministry of Justice of Ukraine dated July 2, 2022 No. 728/38064, and other regulatory legal acts in the field of healthcare.

The war, as already noted, made its adjustments and the Ministry of Health, together with the National Health Service of Ukraine, implemented changes in the field of electronic health care (EHHC), creating new opportunities for telemedicine, teleconsultation services, teleradiology and telemetry at the state level. By the order of the Cabinet of Ministers of Ukraine dated July 14, 2023, No. 625-p, the Strategy for the Development of Telemedicine in Ukraine was approved. According to it, given the actual and potential advantages that telemedicine has compared to traditional methods of obtaining and processing medical information, telemedicine methods should be applied as widely as possible during the post-war restoration of the state through the further development of the architecture of the electronic health care system, the national telemedicine network according to international standards and integration into the global telemedicine community.

Telemedicine connects patients and healthcare providers when a personal visit is not necessary or possible, and provides the ability to remotely transmit medical diagnostic data from patients to doctors and/or between healthcare professionals

and provide remote access to such data. Using telemedicine, patients can consult, receive information about their health or treatment, medical or rehabilitation care (in cases where the presence of a healthcare professional is not mandatory). Experience in using telemedicine shows that, under conditions of proper organization, it is a safe and high-quality way of providing medical care, a convenient option for both patients and doctors, and an effective tool for collecting and transmitting medical information. The use of modern information and communication technologies in the global digital environment creates conditions for the expansion of telemedical technologies beyond medical care, namely for the formation of a culture and habits of using telemedicine among the population. However, the weak point of digitalization in the healthcare sector remains the protection of personal data, especially during war. If such information gets into the hands of fraudsters, it could lead to identity theft and its use for blackmail and other criminal activities.

The paradigm of the modern healthcare system is the treatment of the disease, but at the same time, it is well known that a paradigm based on prevention, prophylaxis, and disease prevention is much more effective. In turn, this means that the decision to identify trends in the onset of the disease should be made much earlier than is currently the case, and should be based on the analysis of a constantly updated large array of patient medical data (Baranov, 2018b). Artificial intelligence plays a very important role in this. According to statistics published a few years ago, 80% of people see a cardiologist for the first time in intensive care. And according to 2018 data, 68% of the causes of mortality in Ukraine are strokes and heart attacks — 90% of these deaths can be avoided with the help of wearable electronic medical devices and artificial intelligence, which can be used daily. That is, timely detection of problems with the functioning of the cardiovascular system, correct diagnosis, and appropriate lifestyle changes could actually prevent many deaths from cardiovascular pathology (Kyrychenko, 2019).

The use of artificial intelligence in medicine was first mentioned in 1976, when a computer algorithm was used to identify the causes of acute abdominal pain (Aung, Wong, & Ting, 2021). Artificial intelligence makes it possible to detect diseases such as skin cancer, diabetic retinopathy (Balyen, & Peto, 2019); in improving the classification of pathology, for example, in the description of scanned images in radiology or features of an electrocardiogram (ECG) (Benjamins, Hendriks, Knuuti, 2019); in predicting disease patterns, a vivid example of which are machine learning algorithms developed during the COVID-19 pandemic (Chen, & See, 2020).

The role of artificial intelligence in the diagnosis of orphan (rare) diseases is invaluable, as such diseases are often difficult to both diagnose and predict the best

course of treatment. Models based on artificial intelligence technologies that are able to study and analyze large databases of disease images have the potential to identify rare diseases. For example, researchers from Harvard Medical School, USA, have developed a deep learning algorithm that helps learn features that can then be used to search for similar cases in large pathological image repositories. Self-supervised image search for histology acts as a search engine for disease images and has many potential applications, including identifying rare diseases and helping clinicians identify patients who are likely to respond to similar treatments (Dmytryk, n.d.).

The application of the capabilities of artificial neural networks is currently a revolutionary approach in systems analysis and personalized precision medicine. Given a sufficient amount of data, the advantage of artificial neural networks in systems analysis is the ability to both reproduce relevant objects from the original data and detect complex nonlinear relationships. In a new work presented by scientists from the Department of Bioinformatics Linkoping University, Sweden, the possibilities of identifying gene modules that determine the development of diseases were studied, without prior study of the biological network, but based on the results of training an artificial autoencoder and processing a large array of transcriptional data. Based on the results of large-scale screening of primary data, gene expression patterns were identified and separate groups of genes associated with the development of diseases were discovered. This allowed the authors of the scientific project to express the hope that in the near future the new method will become one of the foundations of precision medicine and individualized treatment.

By the way, Ukraine already has positive experience in neonatal screening for the purpose of detection and early diagnosis of orphan diseases.

Artificial intelligence technologies are of great importance in planning the activities of medical institutions, since a number of services related to organizing patient visits to a specialist, scheduling, redirecting people from one queue to another, etc. have already become commonplace. Medical visualization has also come into use both at the training stage and later — during automation of the routine processes in hospitals, which concerns, in particular, the visualization of various medical images — ultrasound, CT, MRI. Data processing and comparison can take a doctor a lot of time, but artificial intelligence does it much faster than a person.

Zebra system works, for example Medical Vision. It is based on a neural network that has been trained on several hundred thousand images of patients with lung problems. Thanks to this, Zebra Medical Vision aids diagnostics in pulmonology.

As experts note, the use of artificial intelligence is currently quite broad and covers various areas of medical activity: in the production of medical equipment

(development of programs that analyze images from computed tomography (CT), to improve CT images, etc.), in laboratory practice (for laboratory blood tests, data collection from blood pressure monitors, electrocardiographs and other devices), in ophthalmology (to confirm the diagnosis of diseases, read images, perform topographic mapping of the cornea and calculate intraocular lenses, etc.), in cardiology (for pre-processing of echocardiographic images (image segmentation), in dental radiology (to facilitate diagnosis, planning and predicting treatment outcomes, etc.). This list can be continued.

In particular, when diagnosing diseases applies a system from IBM called Watson Health. It is able to detect potential problems with the vascular system, recognize cancer, determine whether the patient is prone to blood clots. IBM Watson can react quickly when it is necessary to study new information and draw conclusions based on it. Thus, IBM's artificial intelligence analyzed 20 million scientific articles on oncology in 10 minutes and based on them gave the patient the correct diagnosis.

And at the Mayo Clinic, USA, artificial intelligence technologies are helping doctors diagnose new cases of certain cardiovascular diseases, including heart failure, irregular heartbeat, potentially years before they could be detected in any other way. For example, in 2022, doctors at the Mayo Clinic conducted a study by checking the electrocardiograms of more than 600,000 patients using artificial intelligence algorithms to determine the risk of "silent" atrial fibrillation. The program identified 1,000 people who were then asked to wear a heart monitor for a month. The researchers found that these patients had a five-fold higher risk of being diagnosed with atrial fibrillation after a month of monitoring compared to participants in the control group (Dmytryk, n.d.).

By the way, WHO has prepared recommendations for governments, technology companies and healthcare providers to ensure the appropriate use of large multimodal models to promote and protect public health. In particular, WHO sees the prospect of using artificial intelligence by doctors for diagnosis and clinical treatment, for example, responding to written requests from patients. The technology will also provide the opportunity to be used directly by patients, for example, to study symptoms and treat them (World Health Organization, 2023).

Already now, scientists, evaluating the experience of using artificial intelligence in the medical field, name the advantages and disadvantages or risks of such use. Among the advantages, everyone clearly agrees that the era of personalized service is coming, since artificial intelligence, having access to all data, diseases, inclinations of the body, will be able to analyze and personalize treatment, based solely on the

characteristics of the patient. Artificial intelligence takes into account everything: from genetic information to current analyzes of each individual patient.

Vaccine development will become faster and cheaper, as databases from around the world will give artificial intelligence the ability to quickly analyze a new virus and develop a vaccine against it, based on existing developments. Today, the process of developing new drugs is time-consuming, expensive and often inefficient. It is artificial intelligence technologies that can take this process to a new level, significantly accelerating the search and development of drugs. Machine learning algorithms can analyze huge databases of chemical compounds, predict their effectiveness and safety. This accelerated process can deliver life-saving treatments to patients faster than ever before (Dumikyan, n.d.).

Risk assessment will become more accurate, because artificial intelligence, thanks to the collected personalized data of each specific patient, will be able to accurately determine the need for medical intervention, the risks associated with it. Genetic analysis systems, which help to understand the primary cause of the disease, function similarly. One of the platforms for testing the human genome reveals a patient's predisposition to various diseases and draws the doctor's attention to this.

Accordingly, the cost of medical care will decrease, and the availability of innovative treatment, on the contrary, will increase.

In addition, artificial intelligence, due to its lack of physical (biological) vulnerability, can be used in disaster medicine, for especially dangerous highly contagious diseases, etc.

But there are also risks and negative aspects in the spread of artificial intelligence in medicine.

Among them, a small number of developments in this area are mentioned, since the cost of the relevant equipment at this stage of development is still quite high.

Quite large risks are also associated with maintaining the confidentiality of patient databases, as their possible leakage could cause great harm.

And finally, one of the disadvantages of using artificial intelligence is the lack of so-called "live interaction", since artificial intelligence is devoid of emotions and compassion, which are necessary for a sick person. Therefore, artificial intelligence cannot yet fully replace a doctor, who remains the central actor in the healthcare sector.

However, the introduction of AI technologies into medicine will help specialists focus on honing their skills in interacting with people, conducting complex operations with unforeseen choices, developing new principles of service, and improving artificial intelligence knowledge.

In addition, risks include the lack of clear regulatory and legal regulation of various aspects of the application of artificial intelligence technologies, the development of ethical norms, as well as solving the problems of accessibility of technologies for different segments of the population.

# V. Conclusions

Thus, the introduction of artificial intelligence technologies in the field of medicine provides enormous opportunities for improving the diagnosis, treatment of diseases and patient care. One of the main advantages of using artificial intelligence in medicine is that it can work faster and more efficiently than the human brain, making all processes faster and more accurate.

From accurate diagnosis to personalized treatment plans, from drug discovery to predictive analytics and surgical care. However, the processes of digitalization and the introduction of artificial intelligence in this area have certain disadvantages and problems associated with risks. Not least of all, this is due to the insufficient protection of a huge amount of personal data.

Developing ethical and legal standards, defining the principles of liability for harm caused by artificial intelligence, maintaining a balance between the use of artificial intelligence and the experience of doctors and other workers in this field, as well as ensuring equal access to new technologies for different socio-economic groups of the population are important aspects for the responsible and effective implementation of artificial intelligence in medical practice.

# VI. References

Andreasyan, G. (2023, 31 de marzo). *Medicine During the War: What Challenges Did the Medical System Face*. Mind. https://mind.ua/en/openmind/20255116-medicine-during-the-war-what-challenges-did-the-medical-system-face

Artamonova, N. O., Myrna, O. M. & Pavliche, Y. V. (2020). Modern Digital Medical Technologies. Ukrainian Radiological Journal, 28(1), 53-59.

Aung, Y. Y. M., Wong, D. C. S. & Ting, D. S. W. (2021). The Promise of Artificial Intelligence: A Review of the Opportunities and Challenges of Artificial Intelligence in Healthcare. *British Medical Bulletin, 139*(1), 4-15. https://doi.org/10.1093/bmb/ldab016

Balyen, L. & Peto, T. (2019). Promising Artificial Intelligence Deep Learning Algorithms in Ophthalmology. *Asia-Pacific Journal of Ophthalmology, 8*(3), 264-272. https://doi.org/10.22608/APO.2018479

Baranov, O. A. (2017). Internet of Things and Artificial Intelligence: Origins of the Problem of Legal Regulation. In: *IT Law: Problems and Prospects for Development in Ukraine* [paper]. II International Scientific and Practical Conference, November 17, 2017, Lviv Polytechnic National University.

Baranov, O. A. (2017). Internet of Things (IoT): Legal Models of Using Limited Radio Frequency Resources (Part I). *Information and Law, 2*(21), 41-50.

Baranov, O. A. (2018). Internet of Things (IoT): Robot with Artificial Intelligence as a Subject of Legal Relations. *Legal Ukraine*, (5-6), 75-95.

Baranov, O. A. (2019). Legal Aspects of National Strategies for the Development of Artificial Intelligence. *Legal Ukraine*, (7).

Baranov, O. A. (2020). *Problems of Legal Support of the Information Sphere and the Internet of Things*. Legal Thought.

Baranov, O. A. (2021). Social and Digital Transformation: A Source of Legal Problems. *Information and Law, 3*(28), 59-73.

Benjamins, J. W., Hendriks, T., Knuuti, J., Juárez-Orozco, L. E. & Van der Harst, P. (2019). A Primer in Artificial Intelligence in Cardiovascular Medicine. *Netherlands Heart Journal, 27*(9), 392-402. https://doi.org/10.1007/s12471-019-1286-6

Buletsa, S. B. (2022). Telemedicine: Advantages and Disadvantages in the Legal Field. *Law of Ukraine*, (3), 49-60.

Buletsa, S. B., Krytskyi, O. V. & Tashchuk, V. K. (2021). Legal Aspects of Digitalization in Healthcare. *Journal of Medical Law, 8*(2), 45-52.

Chen, J. & See, K. C. (2020). Artificial Intelligence for COVID-19: Rapid Review. *Journal of Medical Internet Research 22*(10), e21476. https://doi.org/10.2196/21476

Dmytryk, K. (n. d.). *How Artificial Intelligence Is Used in Medicine: Current Achievements and Prospects*. Weekly APTEKA. https://www.apteka.ua

Dumikyan, M. (n. d.). *Artificial Intelligence in Medicine: How Does AI Help Treat Diseases?* EON Plus. https://eon.plus

Hrytsenko, V. V. (2016). Digital Medicine and Intelligent Information Technologies — The Basis of Future Healthcare. *Bulletin of the NAS of Ukraine*, (5), 41-43.

Juarez-Orozco, L. E., Knol, R. J. J., Sanchez-Catasus, C. A., Martínez-Manzanera, O., Van der Zant, F. M. & Knuuti, J. (2020). Machine Learning in the Integration of Simple Variables for Identifying Patients with Myocardial Ischemia. *Journal of Nuclear Cardiology, 27*(1), 147-155. https://doi.org/10.1007/s12350-018-1304-x

Korchinsky, I. O. & Firman, N. A. (2022). Digital Medicine: Features and Problems of Development in Ukraine. *Digital Economy and Economic Security*, (1), 100-105.

Krytskyi, O. V. (2020). Digitalization of Medicine in the Conditions of Modern Society. *Political Science Bulletin*, (84), 83-92.

Kyrychenko, G. V. (2019). Information and Communication Mechanisms as Innovations in the System of Forming a Positive Image of State Authorities. Academic Notes of V. I. Vernadsky TNU. *State Administration, 69*(6), 46-54. https://doi.org/10.32838/2663-6468/2019.6/09

Kyrylenko, N. (n. d.). *Special Project Live to 100: We Are the First Generation That May Choose How Long to Live* [online]. https://www.vz.kiev.ua/spetsproyekt-dozhyty-do-100-my-pershe-pokolinnya-shho-mozhe-obyraty-skilky-zhyty/

Matijas, L. (n. d.). *Digitalization of Medicine: What Digital Projects Have Been Implemented This Year?* [online]. https://www.rapin.ua/didzhitalizacziya-mediczini-yaki-czifrovi-proekti-realizovani-czogo-roku/

Palagin, O. V., Semikopna, T. V., Chaikovskiy, I. A. & Syvak, O. V. (2020). Telerehabilitation: Information and Technological Support and Experience of Use. *Clinical Informatics and Telemedicine, 15*(16), 35-44.

Pylypchuk, V. G., Baranov, O. A. & Hylyaka, O. S. (2022). The Problem of Legal Regulation in the Sphere of Artificial Intelligence in the Context of the Development of European Union Legislation. *Bulletin of the National Academy of Legal Sciences of Ukraine, 29*(2), 35-62.

Radutny, O. E. (2015). Additional Methods in the Knowledge of Criminal Law in the Information Age. *Legal Informatics, 2*(46), 54-61.

Radutny, O. E. (2016). The State of Information and Legislative Activity on the Example of the Criminal Code of Ukraine. *Information and Law, 3*(18), 58-67.

Radutny, O. E. (2017). Artificial Intelligence as a Subject of Crime. *Information and Law, 4*(23), 106-115.

Saeed, U., Shah, S. Y., Ahmad, J., et al. (2022). Machine Learning Empowered COVID-19 Patient Monitoring Using Non-Contact Sensing: An Extensive Review. *Journal of Pharmaceutical Analysis, 12*(2), 193-204. https://doi.org/10.1016/j.jpha.2021.12.006

Stefanchuk, M. O. & Muzyka-Stefanchuk, O. A. (2019). Digital Economy: Legal Regulation and Risks. Law and Society 2, no. 1, 13-22.

Stefanchuk, M. O., Muzyka-Stefanchuk, O. A. & Stefanchuk, M. M. (2021). Prospects for Legal Regulation of Relations in the Sphere of Artificial Intelligence Use. *Bulletin of the National Academy of Legal Sciences of Ukraine, 28*(1), 157-168.

Tashchuk, V. K. & Malinovska-Biliychuk, O. V. (2023). ECG Digitization in Optimizing the Diagnosis of Acute and Chronic Coronary Syndromes. *Bukovyna Medical Bulletin, 27*(4), 93-99.

Voronenko, Yu. V. & Mintser, O. P. (2012). Concept of Informatization of Healthcare in Ukraine. *Medical Informatics and Engineering*, (3), 5-29.

World Health Organization (WHO). (2023). Artificial Intelligence for Health: Supporting Countries to Deploy Responsible AI Technologies to Accelerate Equitable Health for All [online]. https://www.who.int/publications/m/item/artificial-intelligence-for-health