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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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VECTORS OF DEVELOPMENT OF THE UNIFIED MEDICAL INFORMATION SPACE

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Abstract.

Aim: The aim of the article is to analyze the current state of functioning of the medical information space of Ukraine in order to formulate scientifically sound proposals aimed at improving the implementation of medical reform.

Materials and methods: The study is based on the analysis of literary sources of Ukrainian and international scientists, Ukrainian and foreign legislation and judicial practice. The article uses general theoretical and special methods of scientific cognition: theoretical analysis, systemic and structural, analysis and synthesis, sociological and statistical, logical and semantic, comparative and legal, method of ascent from the abstract to the concrete, forecasting and generalization.

Results: One of the key categories of the reform of the Ukrainian national medical sphere - the unified medical information space and its constituent elements - is studied. The electronic health care system, which stores medical data about patients in a single place and ensures their exchange between medical institutions, is analyzed. Emphasis is placed on the possibilities of using telemedicine and artificial intelligence, which play a key role in the development of the unified medical information space in accordance with global trends. The importance of legislative provision of efficiency and safety of the unified medical space is emphasized. It is about regulating the protection of personal data, establishing technical standards and requirements for medical information systems, ensuring confidentiality, integrity and data availability of the unified medical information space.

Conclusions: Conclusions are drawn about the importance of proper functioning of each of the elements of the unified medical information space, both individually and in conjunction with each other. The authors' vision of improving the existing system of the unified medical information space is presented.

Key words. Medical space, e-health, information system, healthcare, licensing, medical data security, electronic medical record.

Introduction.

In recent years, the development and implementation of healthcare information systems has undergone a major evolution in the world. The organization of the healthcare system in Ukraine has also changed significantly, as the disease-oriented approach has been replaced by a patient-centered approach, and the quantitative strategy based on volumes has been replaced by qualitative approaches to healthcare delivery.

The implementation of these changes is accompanied by a change in the tasks set by the modern healthcare system. Currently, the vector is focused on the use of electronic services, automation of medical services accounting and medical information management through the introduction of electronic document management in the field of healthcare. Thus, the introduction of electronic medical records in the healthcare system can provide many benefits to doctors, patients, and medical services.

At a time when the population of Ukraine faces significant difficulties in various spheres of life, the issue of ensuring an adequate level of health and preserving the life of the nation is becoming particularly relevant. In this context, medical care performs not only a direct function, but is also a kind of criterion for the level of performance of the health care system and public policy in general.

The above makes it necessary to analyze the current state of functioning of the medical information space of Ukraine and its elements in the context of medical reform, as well as to formulate proposals for possible improvement of this process, which may affect the practical implementation of the medical sector reform.

Literature review.

In recent years, many scholars have devoted their work to studying the problems of implementation and proper functioning of the unified healthcare information space, as well as certain aspects of its functioning both in Ukraine and in foreign countries.

Various aspects of the functioning of the unified healthcare information space were studied in doctoral and PhD theses and monographs. For example, L. Krynychko [1] in her dissertation identified the directions of development of the information and communication system of public administration of the health care system. N. Melnykova [2] studied the process of processing and analyzing personalized medical data, in particular, using artificial intelligence. A monograph authored by a group of scientists and practitioners entitled “Unified medical space of Ukraine: legal dimension” [3], which explores the current problems of creating and functioning of the unified medical information space in Ukraine, was extremely innovative. In the collective monograph "Information technologies in the field of health care" [4] the theoretical and methodological principles and practical aspects of the implementation of information technologies in the field of health care are highlighted.

Chaban O, Boyko O. [5] considered the current state of implementation of medical information systems in Ukraine and abroad, studied and analyzed the problems of creating the

unified medical information space. N. Schwalbe & B. Wahl [6] studied artificial intelligence and its impact on the global healthcare system in the future. Thus, after analyzing the scientific works of Ukrainian and some foreign scientists on the issues outlined in this article, it can be argued that their research is mainly devoted to the study of various types of information systems and their interaction, the use of artificial intelligence in the medical field, international information communication, etc. However, it remains important to define and study the structure and characteristics of the unified medical information space in the legal dimension and to identify vectors for its further development.

Methodology of the study.

Both general theoretical and special methods of scientific knowledge were used in the article. Using the method of theoretical analysis, the concept of a single medical information space was formulated. The system-structural method was used to determine the constituent elements of a single medical information space and their relationship. The methods of analysis and synthesis were used during the characterization of the national medical information system, the possibilities of telemedicine, the use of artificial intelligence for processing medical data, as well as the strengthening of digital security. Sociological and statistical methods were used to generalize empirical data regarding the connections of medical information systems to the electronic health care system, which are checked according to technical requirements and security. The use of the logical-semantic method provided an opportunity to systematically analyze probable risks in the medical information field and offer recommendations that would contribute to their reduction. Using the comparative legal method, an analysis of literary sources, legal acts of Ukraine, international legal acts and court practice was carried out, which allowed to identify gaps in legal regulation. Using the method of ascent from the abstract to the concrete, a real threat to the confidentiality of medical data was demonstrated. Forecasting and generalization methods were used to determine the development vectors of the unified medical information space.

Results and Discussion.

One of the key categories in the context of reforming the medical sphere is the term "unified medical space". Many works of scientists from various sciences (economic, medical, public administration, etc.) are devoted to the interpretation of this category. At the same time, the literature distinguishes the unified medical space in two meanings. In a narrow, as a system of a nationwide network of medical and preventive institutions [7, p.340] and broad, as a system of organizing medical care, which ensures the availability, quality and efficiency of qualified care for the entire population of the state and unites all medical resources through joint management and a defined financing mechanism [8, p. 64]. We note that according to V. Savytskyi, the unified medical space is a comprehensive balanced system of health care, which, based on the implementation of world best practices, is aimed at the optimal use of forces and means [9]. R. Maydanyk points out that the goal of the unified medical space is to protect health by all permissible social regulators (legal, economic, ethical, religious, etc.) on the basis of sustainable development and a fair guaranteed level of medical care, which reflects the realities and practical opportunities for improving the situation in sphere of health care [10].

National medical information system.

Today, an urgent issue for Ukraine is the improvement of the national information system, which is one of the components of the unified medical space. This system is designed to store medical data about patients' health in a single place - the electronic health care system. It consists of a central database and medical information systems. The central database of the electronic health care system contains the register of patients, register of medical records, registers of declarations on the choice of doctors, register of medical opinions and other registers. Medical professionals, pharmacists and laboratory workers can work with the central database only through medical information systems [11]. Instead, medical information systems are information and communication systems that allow hospitals, laboratories and pharmacies to automate their work and interact with the central database of the electronic health care system. Currently, more than 35 medical information systems are connected to the system, which are checked according to technical requirements and security. In addition, the organization of the work of medical institutions can be provided by other services, such as an appointment with a doctor (for example, HELSI), an accounting module, etc.

In this way, doctors can add, view and exchange information in the electronic health care system, pharmacists can view data on electronic prescriptions and pay them, and patients can use electronic prescriptions, e-referral and other digital services. It should be noted that the state owns the central database. Therefore, the responsibility for the protection of personal data rests with the owner of the system - the National Health Service of Ukraine, as well as directly with those medical workers who process personal data [12].

At the same time, initiatives are being updated at the national and European levels to store data on patient treatment in electronic medical records [13]. An electronic medical record is defined as an electronic version of a patient's medical history that is maintained by a healthcare provider for a period of time and includes all relevant information: demographics, course of illness, progress reports, prescribed treatment, diagnosis, immunization reports, laboratory data, etc. The issue currently being discussed within the EU in the context of cross-border health care is the existence of nationwide systems of electronic medical records and their accessibility across borders [14].

Usually, medical information optimization processes are accompanied by large sets of data that cannot be received, processed and sent without special transformation. Thus, digitized health information is more portable and can be transferred between healthcare facilities. Storing patient data digitally also makes it easier to search for specific information and allows for better preparation for patient care [15].

Medical information systems are critical components of the modern construction and functioning of the unified medical space system, as they allow storing, managing and exchanging medical records and other patient data, promote the use of

evidence-based medicine, simplify record keeping and ensure their mobility. This is confirmed by M. Spivak, who notes that it is a means of coordination and integration between levels of medical care in order to introduce a new system of quality management [16].

With the help of unique patient identifiers, medical data from different healthcare systems must be linked and integrated. This way, information follows patients as they move between healthcare facilities and healthcare providers. However, there is a need to define standards to harmonize different types of medical data and develop the capacity to update and use them. For example, on April 24, 2024, the European Parliament approved the creation of the European Health Data Space (EHDS). The European Health Data Space will provide a real opportunity to access medical data and exchange medical information between the national systems of different Member States, which is especially important in the context of significant population migration. Member states will ensure that patient medical records, electronic prescriptions, laboratory tests, etc. comply with the common European format. In addition, to protect the rights of its citizens, each state must ensure that the responsible public authority participates in the cross-border digital infrastructure to support patients in exchanging data abroad. At the same time, it is envisaged to create a reliable legal framework for the use of health data for research and innovation, development of new treatments, vaccines or medical devices, etc. [17].

Telemedicine opportunities.

A significant breakthrough in the development of digital information transmission channels and global network communications, the ability to respond quickly to changes in the development of the electronic healthcare system, scaling it up, leads to the introduction of telemedicine. It is a health-related service provided through telecommunication and electronic information technologies and has a wide range of uses, including online patient consultations, remote diagnostics, remote counselling and treatment, remote physical and psychological rehabilitation. Telemedicine refers to the integrated use of information technologies for the transmission of medical information and communication at a certain distance and even over significant territorial distances.

It is worth noting that according to the Order of the Ministry of Health of Ukraine No. 681 dated 19.10.2015 "On approval of regulatory documents on the application of telemedicine in the sphere of health safety", the main objectives of telemedicine include: creation of the unified medical space, ensuring the provision of medical care to patients at a distance, preservation of medical secrecy and confidentiality, its integrity, promotion of quality improvement and optimization of healthcare organization and management processes [18].

The use of remote technologies using the information environment allows for fast medical care, improves the quality and productivity of emergency care, reduces the time to diagnose and saves costs for both doctors and patients by optimizing clinical procedures and reducing the cost of travel to hospitals. The ability to exchange information remotely also facilitates communication between medical professionals of different specializations. Doctors will be able to consult in real time with colleagues and other specialists regarding the correct diagnosis (especially in an emergency), prescription and correction of treatment, remote monitoring of patients' condition, etc. Examination reports, anamnesis, medical reports, X-rays, or other medical information are sent by the expert to the doctor for processing. Specialists can communicate electronically or arrange a virtual meeting. Such consultations eliminate the need for referrals to specialists, which significantly saves time for diagnosis and treatment.

However, it should be noted that the following main tasks need to be addressed in order to widely implement the use of telemedicine: 1) to develop an appropriate state policy on legislative regulation of telemedicine, licensing of healthcare operators, protection of patient confidentiality; 2) to develop and disseminate practical recommendations for the use of telemedicine in different contexts and for different recipients; 3) to integrate telemedicine into traditional healthcare services; 4) to popularize the use of telemedicine among healthcare professionals and patients; 5) to make the use of telemedicine accessible to different countries and population groups, to overcome inequalities in access to healthcare services. If the above requirements are met, remote patient care will be an indispensable alternative for healthcare systems around the world in the future, which will significantly improve patient care and the availability and quality of healthcare.

Application of artificial intelligence for processing medical data.

In fact, the use of information technology is becoming more and more accessible for use in medical activities, given how actively various IT developments are being implemented both in everyday life and at all stages of healthcare. Of course, the development of the unified medical information space is impossible to imagine without the use of artificial intelligence, which plays a key role in automation processes. Artificial intelligence can greatly assist doctors by automatically identifying potential problems and notifying medical staff about them. The use of electronic analytical data can reduce the likelihood of misdiagnoses and, consequently, medical malpractice claims.

We believe that there are two main and most effective areas of artificial intelligence application in the healthcare sector:

1) medical practice, as the use of artificial intelligence increases the speed and accuracy of diagnostics in such areas as cardiology, gastroenterology, neurology, endocrinology, and others. Artificial intelligence systems are capable of collecting and processing a significant amount of information, for example, on a patient's medical history, examination data, current health status, etc.

2) organizing the effective functioning of the healthcare industry in general, and medical institutions in particular. By analyzing large amounts of information, artificial intelligence is able to perform the organizational function of healthcare professionals, which includes organizing patient data, exchanging information between specialists and medical institutions, and making preventive, generalized, and most optimal decisions.

Scientists N. Schwalbe & B. Wahl have identified four main areas of artificial intelligence use in healthcare: diagnostics,

risk assessment of disease or mortality, disease outbreak control and surveillance, and healthcare policy and planning [6]. However, despite the growing enthusiasm for expanding the role of artificial intelligence in healthcare, there are many ethical challenges related to patient safety, informed consent, confidentiality, and protection of medical information. Thus, there have already been questionable cases of handling patient data. For example, the transfer of 1,6 million patient records by the London's Royal Free Hospital to the Google subsidiary Deep Mind for the creation of a health-care app addressing the detection of acute kidney injury has been questioned [19].

The use of artificial intelligence is more supported among patients and may meet with some resistance from healthcare professionals, particularly doctors. Such reservations arise for the following reasons: 1) unpreparedness for the potential of digital medicine is caused by a lack of knowledge and skills in its application due to the lack of basic and continuing education; 2) increased administrative burden associated with the digitization of medical records; 3) there is a growing fear of the risk that artificial intelligence will replace doctors, although a more correct and reasonable position is that artificial intelligence will complement the doctor's professionalism in the future; 4) there is no proper legal framework that would enshrine the concept of liability in case of acceptance or rejection of recommendations on the algorithm proposed by artificial intelligence, since the entire burden of legal consequences is placed on the doctor.

Thus, the introduction of artificial intelligence in medical practice and for processing and analyzing medical information is a promising area of development that is rapidly evolving along with other modern fields of medicine and teleconsulting. However, the use of artificial intelligence requires further study and verification. In addition, more research will be needed to demonstrate its effectiveness, value, and positive impact on patient care and outcomes. Particular attention should be paid to cost-effective AI models and products to enable widespread and affordable use in a variety of healthcare settings. Physicians should not view the use of AI as "man vs. machine," but rather as a partnership and a way to increase efficiency to further improve patient outcomes.

Digital security and privacy of medical data.

An important role in the organization of health care is played by the legal regulation of social relations, including relations in the field of medical assistance. Thus, the provision of medical services will be considered effective only if there is a scientifically based and effective mechanism of legal regulation that meets modern needs [20].

The following laws of Ukraine regulate the operation of the electronic healthcare system, the grounds and procedure for the use of personal medical data: "Fundamentals of legislation on health care" [21], 'On personal data protection' [22], "On state financial guarantees of medical care of the population" [23], "About information" [24], "About information protection in information and telecommunication systems" [25], "About electronic documents and electronic document management" [26], "About electronic identification and electronic trust services" [27] .

Among the subordinate legal acts, the Resolution of the Cabinet of Ministers of Ukraine "Some issues of the electronic health care system" [28] should be highlighted. Thus, paragraphs 52-62 of Resolution No. 411 define the conditions for connecting to the electronic health care system. It is about compliance with the technical requirements put forward by the National Health Service of Ukraine, namely: confidentiality, data integrity and access delimitation.

T. Dehling and A. Sunyaev also believe that the main requirements for information technology security are:

1) Confidentiality, which protects information from unauthorized deletion or unwanted modification by authorized users.

2) Data integrity, which allows for efficient queries for processing, analyzing information and transferring it between healthcare institutions.

3) Availability, which ensures that the system should be available and fully functional at any time whenever an authorized user needs it. Availability covers several aspects, such as scalability, resilience, and the ability to recover data in the event of data loss for any reason [29].

The electronic healthcare system is subject to verification testing prior to the start of operation, as well as periodic retesting during operation. To gain access to the system, the user must be registered, and this can only be done by the head of the institution or an employee dealing with personnel issues. The user can be a doctor, paramedic, or pharmacist. It is also worth noting that a healthcare professional should use the right to access a patient's personal data solely within the scope of his or her medical duties.

However, the amount of medical information stored by electronic information systems creates security risks and challenges associated with their use. Therefore, to remain effective, such a system must be fault tolerant, secure, confidential, and compliant with security policies.

As practice shows, one of the most important security issues in healthcare information systems is unauthorized access to patient information, for example, due to viruses or other forms of cyberattacks [30]. The catastrophic impact of security and privacy breaches was seen in the WannaCry ransomware episode [31]. These organisations might use outdated hardware and software, and staff too often use default passwords [32]. An illustrative example of the unfair use of medical data is the ECHR judgment in Biriuk v. Lithuania. The applicant demanded damages from a daily newspaper for publishing an article with information that she was HIV-positive. This information was allegedly confirmed by doctors at a local hospital. The Court stated that the protection of personal data, including medical data, is of fundamental importance for the satisfaction of the right of an individual to respect for his or her private and family life, as guaranteed by Article 8 of the ECHR. Therefore, the medical staff of the hospital provided information about the HIV-infected applicant, openly violating the duty to keep medical secrecy, and the state did not ensure the applicant's right to respect for her private life [33].

Fraudsters can use the data of medical institutions and create fake identification documents to steal medical information for

the purpose of abuse: providing false information to insurance companies for undue benefit, reselling medical equipment, manipulating the circulation of medicines, etc. [34].

A common problem is also the loss or theft of devices that store patient data (laptops, mobile devices) used by healthcare professionals for access [28]. Thus, the lack of proper training of medical staff in the safe handling of patient data (failure to comply with confidential information protection practices, use of outdated hardware and software, and standard passwords) leads to leakage of such information.

To ensure public trust in the safety of medical data, its use and exchange, healthcare facilities should have and adhere to clear data security and cybersecurity standards, such as regular software updates, prevention of data leakage, use of virtual local area networks and secure cloud environments, etc.

Conclusion.

Summarizing the above, it can be stated that the unified healthcare information space is a unified system for the exchange of medical data between governing bodies and individual healthcare institutions using technological means, which is designed to ensure the availability, quality and effectiveness of qualified medical care for the entire population of the state.

Thus, the components of the unified healthcare information space are:

1. Technical architecture (software architecture), which is ensured through the enormous scientific and human resources potential in the field of technology in Ukraine. At the same time, there is a need to define standards to harmonize different types of medical data and develop the capacity to use and protect them. For example, in Europe, the European Commission has committed itself to removing barriers to "fully mature and interoperable electronic health systems in Europe" and has approved a recommendation for a European format for the exchange of electronic health records (EHR) [35].
2. Legal and regulatory framework, as the legal framework regulates all aspects of the system, ensuring its efficiency, safety and compliance with patients' rights.
3. Information, which occupies a special place in the structure of the unified medical information space. A prerequisite for the use of information is the ability to process it in accordance with a specific legal purpose and taking into account the requirements of the legislation in the field of personal data protection and technical data protection in information and telecommunication systems.
4. Medical services, the intellectualization of which improves the quality and accessibility of medical care.
5. Governance, because for the sustainable and coordinated development of the unified medical information space environment, the relevant authorities and organizations should be involved with a clear distribution of tasks.

The current state of affairs shows that the main obstacle is the guarantee of medical data security, which undermines public confidence in the processes of medical technologization. After all, ensuring guarantees of non-disclosure of confidential information about an individual in the healthcare sector is one of the key tasks of the mechanism for protecting the legitimate interests of citizens [37]. In fact, today there is no ideal solution that could guarantee complete confidentiality and security of medical information.

However, there are several important recommendations that can help reduce risks: providing access to confidential medical information only to authorized users; using strong passwords and two-factor authentication; using secure protocols for medical data transmission; organizing secure data storage (secure databases and backup systems); training healthcare professionals in how to work with protected information (since most privacy violations occur through the actions of users).

Despite the fact that Ukraine is currently under martial law and the most acute problems are related to the military confrontation with armed aggression, the issues of improving the functioning of the healthcare system are not only still relevant, but also extremely important. They are currently an integral part of the country's future reconstruction. Accordingly, the proper operation of healthcare institutions is one of the prerequisites for the quality functioning of the healthcare system and the provision of preventive, therapeutic, rehabilitation and other services to citizens.

However, only after all these aspects of the unified healthcare information space are met and the organizational changes are completed, can the system be fully integrated and effective.

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