

## ARTIFICIAL INTELLIGENCE IN MEDICINE: HELPING DOCTORS AND PATIENT

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**Abstract:** the article analyzes the influence of artificial intelligence and its implementation in medicine. The history of the emergence of artificial intelligence from the beginning of experiments is studied.

**Keywords:** artificial intelligence, medicine, healthcare, neural network, ultrasound, MRI, ecosystems.

The use of artificial intelligence is one of the priority tasks in several areas, including medicine.

AI is currently widely used in medicine. It helps doctors find pathologies, for example, tumors in images, select individual treatment for each patient, monitor the patient's condition in real time, and much more. However, doctors prefer simpler algorithms in their work, because neural networks do not leave the specialist the opportunity to interpret the results in his own way.

Artificial intelligence implemented in highly specialized areas turns out to be more promising than more general projects. This time we will look at medical technologies. And for starters, one interesting graph that gives a clear idea of the level of development of machine learning technologies in medicine. Over 15 years (from 2005 to 2020), the number of cases of AI implementation in medical processes has increased almost 62 times (Fig1).



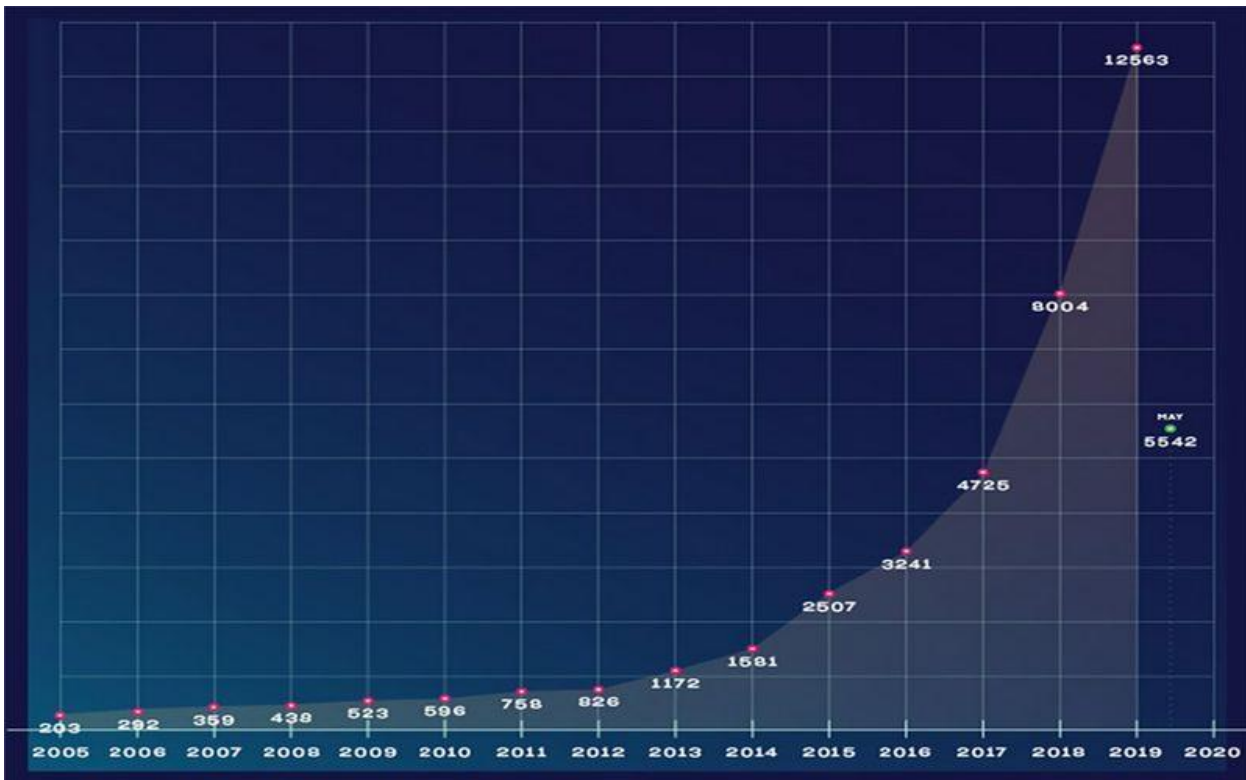


Fig.1 Number of cases of AI implementation in medical processes

The main goals of AI are to improve the efficiency of the healthcare system and reduce the burden and volume of routine work of doctors, allowing them to concentrate on making accurate diagnoses. Among the main areas of AI in medicine are:

- monitoring the patient's condition;
- automatic analysis of medical images;
- automation of routine tasks;
- processing and analysis of large volumes of data;
- assistance in making medical decisions.

Artificial intelligence, in particular, is capable of analyzing X-ray, MRI and tomography images. Traditionally, each image is described by a doctor - depending on the complexity, this work takes from 15 minutes to four hours. There are often not enough such specialists, so there are huge queues for such examinations, and you have to sign up several weeks in advance. Artificial intelligence allows you to save time in such cases. It can analyze multiple images simultaneously and highlight areas where the doctor needs to pay special attention.

AI can make diagnoses and prescribe treatment based on symptoms, test results and examinations. Services have now been developed to check the compatibility of medications, to prevent complications after treatment and to shorten the rehabilitation period.

In the field of oncology, artificial intelligence is used to detect and predict the development of cancer. In the field of cardiology, AI is already being used to study ECG data and other medical measurements, as well as to predict cardiovascular diseases and optimize treatment.

#### **Patient card, ultrasound and MRI**

First of all, the article notes that artificial intelligence can make it easier for doctors to complete the routine work associated with filling out a patient's medical record. This will not

only free up staff time, but will also avoid technical errors, such as incorrectly indicating a person's body temperature or other data. The second obvious advantage is that artificial intelligence is capable of processing and analyzing a large amount of information about a patient or groups of people, which can help improve the quality of treatment and make the right decisions, for example, about medical examination of a team or even an entire plant.

Artificial intelligence can bring great benefits to doctors in practical work: provide a complete picture of the patient's health so that the doctor does not waste time analyzing the medical record, help select an effective combination of medications, and even adjust treatment tactics based on the latest data and analyzes of the patient. High technologies can also be useful because they are able to analyze a huge number of sources.

The second most important area of application of artificial intelligence is when interpreting ultrasound, CT, MRI, and radiographs. Such systems and solutions are currently being developed; they will help doctors pay attention to specific places in the images and find pathologies. At the same time, doctors can receive detailed and useful information in the form of 3D images directly on their screens.

Thanks to which specialists will know what is happening in the hospital. How the patient behaves, whether he follows the recommendations - the same applies to the actions of doctors. "Such a system will make it possible to understand what the nurse who is next to the patient is doing: feeding him, giving him an injection, changing his underwear, putting in an IV, etc."

#### **Will help you make a choice and make the right decision**

That the introduction of artificial intelligence into medicine will also help the patients themselves. Thus, high technologies will allow a person to figure out which medical institution is best for him to go to, as well as select a medication regimen based on his health condition. The ability to process large volumes of data can also benefit healthcare leaders - making the right decisions for the chief physicians of clinics or even the minister.

At the same time, the director of the Institute of Digital Medicine emphasizes that there are not yet many systems based on artificial intelligence for medicine in the world, since there are no uniform approaches and requirements for either patient databases or mathematical methods for their analysis. However, ways to solve these issues are being sought.

Of course, the primary task now is to create such a verified database so that decisions made on the basis of its analysis can be trusted. You cannot create a system and say that it offers the right clues if it only contains information about 20 patients. It is necessary to provide a large specialized sample and conduct clinical trials, although methodological tools for this have yet to be developed. In any case, creating such systems requires the joint work of not only mathematicians and programmers, but also doctors. The purpose of the article is to create an ecosystem for training medical specialists capable of working in the digital environment of modern healthcare.

The Institute of Digital Medicine adds that an ethical issue will also require resolution. The computer can offer its recommendations, but doctors will have to interpret them professionally and, of course, reasonably explain to the patient why this or that treatment tactic was chosen.

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