РАННЕЕ ВЫЯВЛЕНИЕ ОНКОЛОГИЧЕСКИХ ЗАБОЛЕВАНИЙ С ИСПОЛЬЗОВАНИЕМ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В МЕДИЦИНЕ

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Аннотация: Высокий уровень рецидивов и смертности от рака сочетается с длительным и дорогим лечением. Исследователи и врачи ищут новые методы раннего обнаружения опухолей из-за снижения эффективности медицинской помощи на поздних стадиях. Искусственный интеллект (ИИ) улучшает диагностику и терапию злокачественных новообразований.
Ключевые слова: *искусственный интеллект, улучшение методов рака, прогнозирование рака, нейронные сети.*

TIBBIYOTDA SUN'IY INTELLEKT YORDAMIDA ONKOLOGIK KASALLIKLARNI ERTA ANIQLASH

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Annotatsiya: Saraton kasalligidan qaytalanish va o'limning yuqori ko'rsatkichlari uzoq va qimmat davolanish bilan birga keladi. Tadqiqotchilar va shifokorlar keyingi bosqichlarda tibbiy yordam samaradorligining pasayishi tufayli o'smalarni erta aniqlashning yangi usullarini qidirmoqdalar. Sun'iy intellekt (SI) neoplazmalarni tashxislash va davolashni takomillashtiradi.
Kalit so'zlar: *sun'iy intellekt, saraton usullarini takomillashtirish, saratonni oldindan aniqlash, neyron tarmoqlar.*

EARLY DETECTION OF ONCOLOGICAL DISEASES USING ARTIFICIAL INTELLIGENCE IN MEDICINE

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Annotation: High rates of recurrence and mortality from cancer are coupled with lengthy and expensive treatment. Researchers and doctors are looking for new methods for the early detection of tumors due to the decline in the effectiveness of medical care in later stages. Artificial intelligence (AI) improves the diagnosis and treatment of malignant neoplasms.
Keywords: *artificial intelligence, improving cancer methods, cancer prediction, neural networks.*

Relevance of research: Organization of the diagnostic process Using accelerated computational processing, artificial intelligence increases the throughput of instrumental research methods. Also, better diagnostic images can be obtained using artificial intelligence [1]. Tumor diagnosis and evaluation Algorithms can accurately assess tumor size and structure, as well as monitor multiple lesions. Using artificial intelligence, diagnosis becomes more non-invasive, since the patient is examined without damaging the integrity of his tissues [2]. Hazard insurance. The neural network estimates the risk of tumor development and the likelihood of its progression using clinical data such as medical history, diagnostic images, pathological reports, and biomarker information [3]. Planning and forecasting of therapy Assessment of patient survival

is carried out based on data from instrumental studies. Algorithms predict possible responses to immunotherapy using medical imaging. Artificial intelligence can assess residual tumors before surgery [5].

Artificial intelligence helps people with cancer in a more personalized way. Differential diagnosis of a tumor, assessment of the likelihood of outcomes, and prediction of response to therapy are part of the possibilities of an individual approach to each patient.

Materials and methods: Artificial intelligence (AI) can "see" a tumor in medical images and evaluate it 6,7, which improves cancer screening and diagnosis:
-Training is used using databases with diagnostic images.
-Machine learning allows tumors to be classified based on features that have been specified in advance. The researcher gives the following characteristics of the tumor: size, shape, and location.
-Another subsection of artificial intelligence is deep learning. It does not require a large number of input characteristics and can automatically adapt to new tasks.

During processing, the algorithm divides the image into separate parts. Data is collected from them by a classification chain. First, the malignancy of the tumor is assessed. After this, it is assigned a stage following generally accepted scales [6].

Artificial intelligence in digital pathology: how technologies detect cancer from biopsies Many men in the world have prostate cancer. Ultrasound is used for biopsy to confirm the diagnosis [9]. After the procedure, patients may experience pain, fever, or bleeding [10]. This may cause negative results and maintain the likelihood of developing malignancies [11].

Already after the first biopsy, patients need to increase awareness. This will help save time and prevent the painful surgery from happening again in the future. More than 6 thousand digitized biopsies were used to train the algorithms. Artificial intelligence (AI) decisions were compared with the assessments of specialists in urology and pathological anatomy. The neural network was able to distinguish between benign and malignant samples with a classification accuracy AUC > 0.9, comparable to the expert one. The AI also predicted the outcome of the disease by assessing the grade of malignancy according to the Gleason score 12. The BBC reports that the Ibex

Medical Analytics Galen platform has become the first software to diagnose prostate cancer from biopsy in the UK. Using artificial intelligence, he has already helped 105 men, correctly diagnosing thirteen of each.

The algorithm allows you to automate manual testing, reduce the duration of the study from an hour to several minutes, and accurately determine the presence of pathology, which is especially important due to the complexity of collecting material. The developers plan to conduct additional clinical studies to expand the use of artificial intelligence. In addition, this technology is used to diagnose breast cancer [12].

Results: Melanoma, a cancer of the skin, is successfully treated when it is diagnosed in its early stages. For this purpose, local surgery to remove the tumor is used. However, melanoma can penetrate deeper into the tissue if it is not detected early. This significantly increases the likelihood of metastasis and reduces the prognosis [13]. Self-examination of the skin may lead to an underestimation of a potential disease or, conversely, to an overreaction. Information about dermatoscopy, a specialized method, depends on the experience of the specialist, and examinations should be carried out regularly [14]. Advanced technologies help in diagnosing skin cancer. Improvement of existing methods for diagnosing skin tumors in oncology has made it possible to:
-Wider data set;
-Image pre-processing;
-Algorithms used for deep learning

Thanks to the developed neural network, the technical training process is significantly simplified. The algorithm requires fewer input parameters. Segmentation occurs during image processing. Thus, artificial intelligence identifies a potentially dangerous area and evaluates each pixel [15].

The results of the study allow the disease to "come out of the shadows." Even in complex situations where photos contain foreign objects (such as thick hair) or low contrast, automatic recognition using artificial intelligence works effectively [15].

Conclusions: Characteristics of artificial intelligence
-the presence of cancer in the early stages of development;
-deterioration of health or development of disease;
-improvement in health status or response to therapy;
-the presence of metastases in other places.

The process has been significantly accelerated thanks to the use of neural networks. If a doctor reviewed radiology reports from no more than three patients within an hour, artificial intelligence annotated all records in 10 minutes and 22 seconds. Clinics are receiving more and more answers from artificial intelligence. Algorithms identify diseases and predict their consequences. Artificial intelligence can predict warning signs that may appear in the future, and these signals can be used to change the actions of doctors in the present.

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