



POSSIBILITIES OF APPLYING ARTIFICIAL INTELLIGENCE FOR DIAGNOSIS AND TREATMENT IN NEUROLOGICAL PRACTICE

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Introduction. Artificial intelligence (AI) has become one of the most promising areas of development in modern medicine in recent years. The use of machine learning algorithms, neural networks, and big data analysis significantly improves diagnostic accuracy, accelerates the processing of medical information, and selects the most effective treatment methods. AI plays a particularly important role in neurology, where the timely detection of nervous system diseases is crucial for preserving the patient's life and health.

Keywords: Artificial intelligence, neurology, diagnostics, treatment, machine learning, neural networks, stroke, Alzheimer's disease, Parkinson's disease, rehabilitation, medical technologies.

The use of artificial intelligence in the diagnosis of neurological diseases. One of the main areas of AI use in neurology is the diagnosis of diseases of the brain, spinal cord, and peripheral nervous system.

1. Neuroimaging analysis

AI is actively used to process magnetic resonance imaging (MRI), computed tomography (CT), and positron emission tomography (PET) data. Algorithms are capable of identifying:

- brain tumors;
- early stage strokes;
- multiple sclerosis;
- Alzheimer's disease;
- cerebrovascular disorders.

The use of AI allows for the detection of pathological changes faster and more accurately than with conventional visual assessment of images.

2. Diagnosis of epilepsy

Artificial intelligence systems analyze electroencephalograms (EEGs) and can detect hidden signs of epileptic activity, predict seizures, and help doctors choose treatment.

3. Early diagnosis of neurodegenerative diseases

AI can analyze cognitive tests, patient speech, movement patterns, and examination data for the early detection of Parkinson's disease, dementia, and Alzheimer's disease.

Application of AI in the treatment of neurological diseases

1. Personalized therapy

Based on patient data analysis, artificial intelligence helps select a personalized treatment plan, taking into account age, comorbidities, genetic characteristics, and drug response.

2. Rehabilitation after stroke and injuries

AI is used in robotic rehabilitation systems. Smart exercise machines and exoskeletons help restore motor function after stroke, traumatic brain injury, and spinal cord injury.

3. Neural interfaces

Modern brain-computer technologies allow patients with severe movement disorders to control computers, prosthetics, and communications devices using brain signals.

4. Monitoring the patient's condition



Wearable devices with AI elements track sleep, movement, tremors, seizure frequency, and other indicators in patients with neurological diseases.

Benefits of using artificial intelligence in neuroscience

- high diagnostic accuracy;
- early detection of diseases;
- reduction of examination time;
- reducing the likelihood of medical errors;
- personalized approach to treatment;
- improving the quality of life of patients.

Problems and limitations

Despite the great prospects, there are certain difficulties:

- the need to protect personal data;
- high cost of technology;
- the need for large volumes of high-quality data;
- the need for supervision by a physician;
- Ethical issues of AI application.

Conclusion

Artificial intelligence opens up new possibilities in the diagnosis and treatment of neurological diseases. Its implementation facilitates early detection, increases the effectiveness of therapy, and improves patient rehabilitation. In the future, AI will become an important part of a neurologist's work, but it will not completely replace a physician. The most effective approach is to combine the specialist's expertise with modern digital technologies.

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