

## Artificial Intelligence in Medicine.

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### Introduction

Artificial intelligence (AI) is a new technical discipline that uses computer technology to research and develop the theory, method, technique and application system for simulating, and extending human intelligence. According to "pubmed.ncbi.nlm.nih.gov" data, only in the last 5 years, around 100,000 researches in the field of AI in medicine have been posted. This impressive number only demonstrates the importance and topicality of the topic, and denotes the speed with which AI enters medicine.

### Keywords

artificial intelligence ,depth of anesthesia monitoring, control of anesthesia, pain management, machine learning, deep learning, neural networks.

### Purpose

This research aims to better understand this technology and how it transforms medicine, what is the role of artificial intelligence-based systems in performing different medical activity in specializations and what are the results nowadays. One of the main goal was to investigate the role of artificial intelligence-based systems in performing medical work in specialties including radiology, oncology, cardiology, pediarty etc.

### Material and methods

The main resources for "searching articles" were pubmed.ncbi.nlm.nih.gov and cyberleninka.ru, so the sources that were analyzed in the research provide as objective a picture as possible of the role of AI that has undergone criticism and analysis by specialists from many corners of the world. The dynamic development of scientific progress in solving the topic of AI in medicine and new discoveries in this field play a dominant role in the work.

### Results

A tool, called the Molecular Prognostic Score (mPS), has recently been developed that is able to accurately predict the prognosis of breast cancer patients and comprehensively identified 184 genes related to breast cancer prognosis without any biological information. Unlike previous tools, it can be applied even to patients with estrogen receptor-negative breast cancer. In addition, the score provides useful information to avoid overtreatment.(Figure1). In anesthesiology, artificial intelligence and spectral analysis techniques are used to more directly analyze electroencephalographic signals in order to estimate the depth of anesthesia. A group of researchers reached such results as: the accuracy in using electroencephalography features was 88.4%, while the accuracy of the BIS index was 84.2%. Another study in this field is directly focused on the rapid diagnosis of myocardial infarction (MI) using electrocardiography (ECG). A total of 412,461 ECGs were used to develop a variational autoencoder (VAE). The performance of the neural network, measured as the area under the receiver operating characteristic (ROC) curve, was 0.887 (0.845–0.922).The way CNN works is showed in fig 2-3.

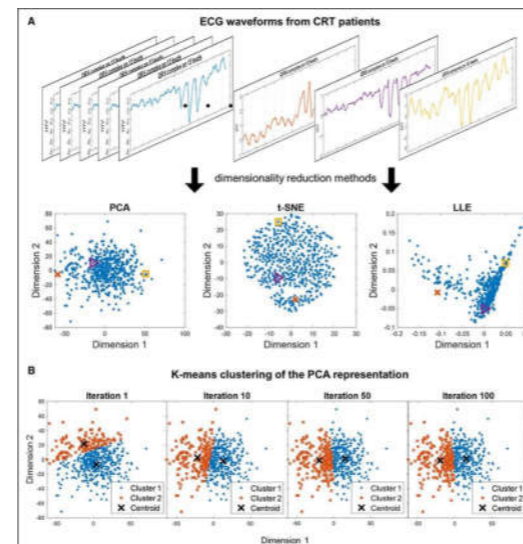


Fig2 [https://www.ncbi.nlm.nih.gov/core/lw/2.0/html/tileshop\\_op\\_pmc\\_inline.html?title=Click%20on%20image%20to%20zoom&p=PMC3&id=7808396\\_nihms-1631514-f0003.jpg](https://www.ncbi.nlm.nih.gov/core/lw/2.0/html/tileshop_op_pmc_inline.html?title=Click%20on%20image%20to%20zoom&p=PMC3&id=7808396_nihms-1631514-f0003.jpg)

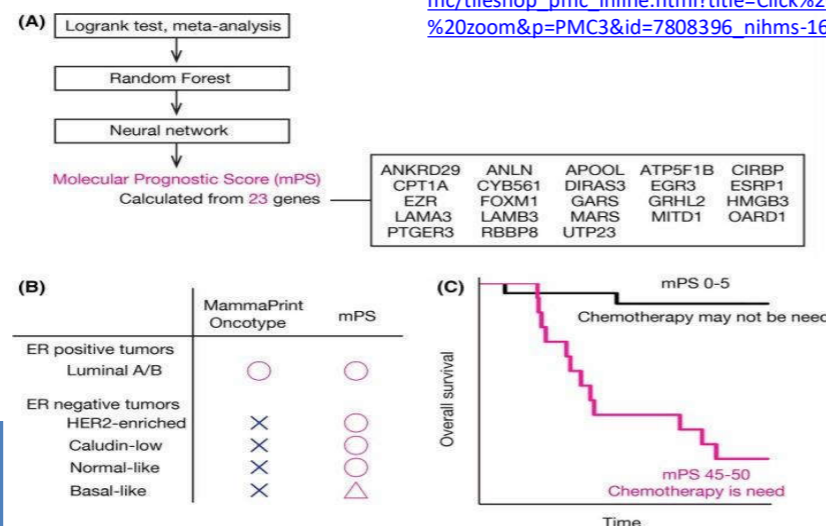


Fig1: <https://onlinelibrary.wiley.com/doi/10.1111/cas.14377>

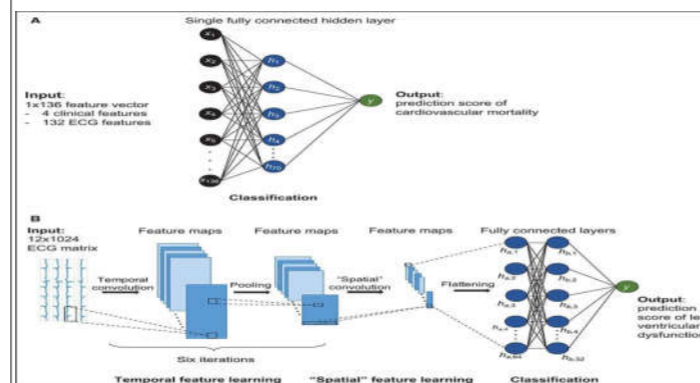


Fig3: [https://www.ncbi.nlm.nih.gov/core/lw/2.0/html/tileshop\\_op\\_pmc\\_inline.html?title=Click%20on%20image%20to%20zoom&p=PMC3&id=7808396\\_nihms-1631514-f0002.jpg](https://www.ncbi.nlm.nih.gov/core/lw/2.0/html/tileshop_op_pmc_inline.html?title=Click%20on%20image%20to%20zoom&p=PMC3&id=7808396_nihms-1631514-f0002.jpg)

### Conclusions

Their ability to learn from historical examples, analyze non-linear data, handle imprecise information and generalize by allowing the model to be applied to independent data has made them a very attractive analytical tool in the field of medicine. The author is of the opinion that the most important results still await us in the future.