

# EDITORIAL

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## Artificial Intelligence

The natural intelligence is limited as the capacity of human brain is limited to ten thousand million binary digits. According to the father of artificial intelligence, John McCarthy, it is "the science and engineering of making intelligent machines, especially intelligent computer programs". Artificial intelligence (AI) is the study and developments of intelligent machines and software that can reason, learn, gather knowledge, communicate, manipulate and perceive the objects. Artificial intelligence is different from psychology because of its emphasis on computation and is different from computer science because of its emphasis on perception, reasoning and action. It makes machines smarter and more useful.

Artificial intelligence has the advantages over the natural intelligence as it is more permanent, consistent, less expensive, has the ease of duplication and dissemination and can be documented. It can perform certain tasks like manipulation, integration and interpretation of large amounts of data much faster and better than the humans.

Using artificial intelligence to improve patient care in hospitals revolves around the clinical decision support system (CDSS) which is one of the first successful applications of AI. This is primarily being used in diagnosis of a patient condition given his symptom and demographic information. Mycin based expert system for identifying bacteria causing infections and recommending antibiotics was developed in 1970 under the work of CDSS for medical diagnosis. CDSS used Bayesian network to help pathologists more accurately diagnose lymph node disease. AI has also been useful for computer aided detection of tumors in medical imaging. Such approaches also help in diagnosis of different cancers and congenital heart defects. It also has a role in making diagnosis based on endoscopic images and doing analysis based on MRI images of brain tumour.

Another use of AI system in medical clinic can be to organize bed schedule, make staff rotations and provide medical information. AI has application in the field of cardiology (CRG), neurology (MRI), embryology (sonography), complex imaging of internal organs, etc. AI also has role in robotics. Robots are manufactured as hardware. The control of robot in AI in the form of software agent that reads data from the sensors decides what to do next and then directs the effectors to act in the physical world. Robotic surgery has already started globally.

Artificial intelligence techniques are used for diagnostic sciences in biomedical image classification. Model based intelligent analysis and decision support tools are important in medical imaging for computer assisted diagnosis (CAD) and evaluation. It helps radiologist who uses the output from a computerized analysis of medical images as a second opinion in detecting lesion, assessing extent of disease and improving the accuracy and consistency of radiological diagnosis to reduce the rate of false negative cases.

Different technique within the arena of artificial intelligence such as expert systems and neural networks may play a role during the problem solving processes within the clinical biochemistry laboratory. In the preanalytical phase, intelligent software program developed for the purpose may lead to avoidance of unnecessary tests that are otherwise felt necessary by treating doctor and hence leading to a reduction in the cost of treatment. Neural network analysis provides a non algorithmic approach to information processing, which results in the ability of the computer to form associations and to recognize patterns among data. These techniques may be used to extract knowledge from example patients to optimize decision limits and identify clinically important laboratory quantities. An expert system may be defined as a computer program that can give advice in a well defined area of expertise and is able to explain its reasoning.

In conclusion, we can say that AI gives the ability to the machines to think analytically using concept and will continue to play an increasingly important role in the medical field and its applications are likely to have far reaching effects on human life in the years to come.

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