

# Artificial Intelligence Age in Healthcare is Here and Here to Stay

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Artificial Intelligence (AI) enable people to learn, understand, solve problems, make decisions and be creative and independent. In 1956, John McCarthy defined "artificial intelligence (AI) (as "the science and engineering of making intelligent machines". AI can comprehend and react to human language. They can also provide general advice to consumers and professionals. Driverless cars are a prime example of how autonomous vehicles can operate without the need for human input or cooperation.<sup>1</sup>

Artificial intelligence in medicine is the application of artificial intelligence that replicates or surpasses human knowledge in the analysis, presentation and understanding of complex medical data. It can enhance and exceed human capabilities by providing better ways to diagnose, treat, or prevent diseases.<sup>2,3</sup>

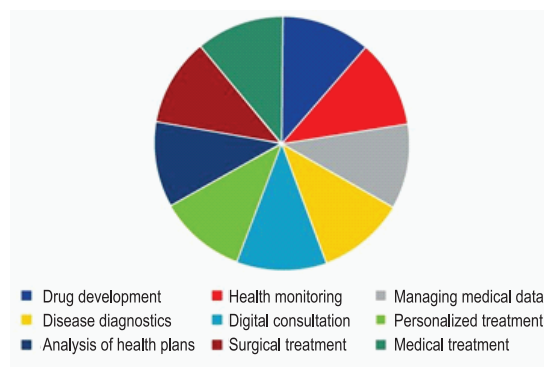
With the help of machine learning algorithms and deep learning AI can analyze large amounts of medical and electronic medical records and help diagnose diseases faster and more accurately.<sup>4</sup> Additionally, artificial intelligence has become an important part of the health culture in the healthcare sector. Artificial intelligence-based programs are used in applications such as diagnosis<sup>5</sup>, treatment guideline development<sup>6</sup>, Individualized drugs<sup>7</sup>, patient care and monitoring.<sup>8,9</sup>

In medicine, AI can be divided into two subtypes: the virtual subtype and the physical subtype.<sup>10</sup> Applications such as electronic medical records, online appointments, medication reminders and symptom checking as well as digital personalized health advice by phone, chatbots for consultation, telemedicine and other medical decision-making neural networks are examples of virtual devices. On the other hand, the physical part focuses on geriatric care, smart prosthetics for the disabled persons, CT, MRI, ultrasound, EKG or blood test analyzer machines, automated drug dispensing and robotics to assist in different surgeries.

However, the process of taking a patient's history, where a doctor asks a few questions and then combines symptoms to arrive at a possible diagnosis, is changing using a graphical feed. Given the many symptoms and disease processes seen in modern medicine, this requires sending

a lot of data to the cloud-based system. The benefits of this approach are limited because the robot cannot see and record instructions that a doctor can only see during a patient visit.

Many AI based applications are already being used in healthcare (Figure-1), from online appointments and identifying medical facilities to digitizing medical records, rescheduling and vaccination reminders for children and pregnant women, multiple drug combination drug dosing algorithms and adverse event reporting.



**Figure-1:** Practical use of AI in medical field<sup>11</sup>

Radiology and imaging are the sections of medicine that is technologically advanced and open to new technologies including AI.<sup>12</sup> Since the advent of image archiving and communication, computers have become essential in the workplace, evolving from managing tasks such as image acquisition and storage to image analysis. Computer-Aided Diagnosis (CAD) is widely used in screening mammograms. Recent studies on predictive value, sensitivity, and specificity suggest that CAD is not a useful diagnostic tool. Moreover, radiologists may be distracted by false-positive results, rendering unnecessary diagnostic tests.

Fitbit, Apple and other health trackers can track heart rates, physical exercise and sleep cycles. Some are even adding ECG tracking as a new feature. All of these innovations can help doctors better understand a patient's condition and notify users of changes. In an effort to prevent unnecessary hospitalizations, Netherlands has used intelligence to analyse its healthcare system and detect medical errors and health system malfunctions.

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In addition to current innovative approaches, many advances in different stages of development will make better doctors. Dental Hygiene Services is using depth measurement by improving computer vision to provide better hygiene for nurses and doctors.<sup>11</sup> Health Network learned how Siri, Google Now, S Voice and Cortana can answer mobile phone users' questions about mental health, self-harm and nutritional health, leading patients to seek care faster. A virtual nursing staff named 'Molly' was created to follow up with patients as they leave the hospital, allowing doctors to respond to emergencies.

AI is expanding into community medicine and public health and will have a major impact on all aspects of primary health care (PHC). AI-powered software will help primary care physicians identify patients who need more care and create personalized treatment plans for each patient. Clinicians can use AI to transcribe patient interactions, evaluate them, and upload relevant information directly to electronic medical records. These applications will provide primary care providers with information about patients' medical needs, as well as collect and evaluate patient data.

The new era of AI-powered practice has both its supporters and its detractors (Table-I). Many candidates and practitioners of medical field are concerned about job losses due to the increasing use of technology. Machines can interpret and measure human behaviour, but they cannot enhance human traits such as creativity, intelligence and interpersonal skills or analytical reasoning.

**Table-I:** Pros and cons of artificial intelligence in medicine

Advantages	Disadvantages
Accurate decision maker	Lacks in creativity
Decreased workload	Technical malfunction
Saves Money	Leads to unemployment
Better Monitoring	Cheating and plagiarism
Application in Medical Industry	Ethical issues

Eventually, artificial intelligence will play pivotal role in overall health care delivery system. To improve capacity and efficiency, it is important for future medical students and trainee doctors to get a good start in computer skills as well as the fundamentals and practical applications of AI.

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