

ARTIFICIAL INTELLIGENCE IN HEALTH CARE



Introduction - Artificial Intelligence (AI), in various forms and degrees, has begun to appear in a wide spectrum of technologies, it has changed our daily lives. It is changing the way we communicate, consume information and receive goods and services. What distinguishes AI technology from traditional technologies in healthcare is the ability to gather data, process it, and give a well-defined output to the end-user. There is great optimism that AI can provide substantial improvement in all areas of the health care system from diagnosis to treatment.

How AI transforming healthcare system

Artificial intelligence (AI) is the main driving force behind the transformation in healthcare, especially within the primary care. It has bridged the physical, cognitive and emotional space between patients and physicians, and shifted the focus from transactional to personal care. As artificial technology evolves and emerging it become more widely adopted, the digital patient journey is poised to advance further in the next few years. Integrated care delivery across the patient journey is expected to be the new focal point in healthcare. The use of machine learning and natural programming language are mainly responsible for the recent advancement in this field. Nowadays, its applications are widely used to solve the major problems faced by the doctors and patients at the time of diagnosing and treating the patients.

With the acceptance of AI in health care system, it becomes easy for the healthcare practitioner to diagnose the diseases and find out its possible treatment. From chronic diseases such as cancer, tuberculosis, hepatitis, to radiology and risk assessment, there are endless opportunities to take advantage of artificial intelligence. However, to drive this change, it is critical that the designed services are patient-centric and data privacy concerns are resolved. In the coming future, current voice-based virtual health assistants will evolve into holographic medical assistants. These medical holograms will be able to speak "face-to-face" with patients, answer their medical queries, perform preliminary diagnoses, and help close the gap between patient and physician. It should come as no surprise that our phones have evolved into symptom trackers and platforms that can be

used to check a doctor's reputation or schedule an appointment and even convenient to pay hospital bills.

Portable and efficient – With the advancement of this technology in the medical field the sensors and other health status monitoring equipment become more easy, efficient and portable. Patients will be able to undergo complex tests and procedures non-invasively in the comfort of their homes rather than visiting the hospital. For example, diabetes screening currently involves invasive procedures and requires patients to visit a lab. In the future, handheld devices and sensors will replace these lab-based procedures. Digital tools such as mobile health apps help patients monitor and manage their personal health. Such apps have increasingly been used for personal disease monitoring, chronic care management, support for health services, and complex population health analysis.

Clinical decision support – AI helps the healthcare practitioners by improving their ability to understand the pattern of diseases, its treatment and to provide better feedback, guidance and support to the patients. The use of artificial intelligence is enabling the healthcare practitioners to diagnose the diseases 30 times faster with 99% accuracy and reduce the need of unnecessary biopsies. The time saved and the conditions diagnosed are vital in an industry where the time taken and decisions made can be life altering for patients.

Drug discovery – Machine learning is one of the important applications of artificial intelligence which has the capacity to make drug discovery faster, cheaper and more effective. Drug designers frequently apply machine learning techniques to extract chemical information from large compound databases and to design drugs with important biological properties. At present time, there are dozens of health and pharma companies currently using artificial intelligence to help with drug discovery and improve the lengthy timelines and processes tied to discovering and taking drug all the way to market.

AI based wearable devices – Nowadays, different types of wearable devices have been invented. Some of the most common wearable devices are smart glasses, smart rings, smart belts and smart watches. The consumer market of the wearable devices is increasing steadily. These devices are used commonly to collect, transmit and analyze the data collected from body of the patient. This smart technology is used to early diagnosis and management of medical conditions as well as measure vital signs from patient body like blood pressure, heartbeat, function of nerves and internal organs. Mostly the devices are small, light in weight and easy to carry by the patients. They are capable to collect data and process it and warn the patient in case of critical health status.

Improving health care records – The innovation in artificial intelligence will continuously ease the way to collect and store data from hospitals for future use. The AI is already being used to analyze large amount of data to improve productivity, accelerate digital health and to support the clinical decision-making processes. In the United States of America digital information technology has revolutionized health care services since 2009. As a result, the government of United States now spent billions of dollars in the healthcare industry. According to the data collected by the Department of Health and Human Services 86 % physicians and 96% hospitals now have access to electronic health records in US. According to a survey conducted by the non profit healthcare organization in San Francisco California named Henry J. Kaiser more than 45% of people in the United States Of America think that electronic health care records improve the quality of health care system and only 6% of people report a decline.

Medical diagnosis – Diagnosis of disease is decisive for planning proper treatment and ensuring the well being of patients. Many physicians and researchers are turning their attention toward artificial intelligence capabilities to speed up the diagnosis processes and treatment. The primary focus of healthcare practitioners is to diagnose the diseases like

diabetes, cancer and diseases related to blood and internal organs through artificial intelligence. AI has the capacity to surpass the human doctors and help them to detect, predict and diagnose the diseases more accurately at faster rate. Likewise, AI algorithm have proved to be not only accurate and precise at specialty-level diagnostics, but also cost effective in terms of detecting diabetic retinopathy. Moreover, artificial intelligence is developing machine learning technology to help the pathologists in making more accurate diagnoses.

Influence on health resources and organizations – Artificial intelligence has ability to bring the change in healthcare system. AI play a vital role to improve the productivity and health care delivery to provide better care to the society. It also changing the working style of the doctors by providing opportunity to doctors for closely analyzing the patient's health and medical history. Moreover, healthcare system facing the rising demand of health care services and workforces to fill the gap between the patient and general practitioner. Healthcare system also need larger workforce to run the system in a smooth way. According to a report of world health organization the global economy will create 40 million new jobs in health care sector by 2030 but still the shortage of 9.9 million doctors, nurses and midwives is projected with in the same time period.

Future of Artificial Intelligence – The future of artificial intelligence in healthcare could include tasks that range from simple to complex, almost everything from answering the phone to medical record review, population health trending and analytics, therapeutic drug and device design, reading radiology images, making clinical diagnoses and treatment plans, and even talking with patients. This will result in faster adoption by healthcare providers by mitigating perceived risk and start to deliver measurable improvements in patient outcomes and operational efficiency at large scale.