

Artificial Intelligence in Healthcare

Dear Readers,

Since a created thing first takes form within the mind of its creator, it is in some sense a part or an extension of its creator and thus definitionally lesser. Our creations rarely surprise us, and when they do, it's either because of a bug in the design or because we are unable or unwilling to simulate its emergent behavior to a high enough degree of fidelity.

The ability to envision the future is strongly influenced by the memory of the past but it is harder to guess what memories from the past will be relevant for understanding life in the distant future, and so it is harder for the human intelligence to make specific predictions.

Artificial Intelligence (AI) is a field that attempts not just to understand but to build intelligent entities. The concept Artificial Intelligence can be traced in ancient times in which Greek myths of Hephaestus and Pygmalion incorporated the idea of intelligent robots (such as Talos) and artificial beings (such as Galatea and Pandora). In course of its existence, AI has witnessed many ups and downs and had undergone many changes.

As a scientific discipline, AI officially began in 1956, in the United States. Since then, the term “Artificial Intelligence”, probably first coined to create a striking impact, has become so popular that today everyone has heard of it. This application of computer science has continued to expand over the years, and the technologies it has spawned have contributed greatly to changing the world over the past sixty years.

AI is definitely getting increasingly sophisticated with every passing day, much more efficiently, faster and at a lower cost. Largely, the appeal of AI is its ability to collect, analyze and make sense of vast

amounts of data quickly and often more accurately than a human being. Knowledge is being automatically constructed from huge masses of data, using machine learning (ML) techniques. Today, AI applications affect almost all fields of activity – particularly in the industry, banking, insurance, healthcare and defense sectors. Several routine tasks are now automated, transforming many trades.

The potential for AI in healthcare is vast. Going ahead, it is more likely that AI systems will be used in more advanced diagnosis and treatments and will be able to attain the ability to carry out more tasks in the healthcare sector without human intervention. The increasing availability of healthcare data and rapid development of big data analytic methods has made possible the recent successful applications of AI in healthcare.

AI can assist physicians to make better clinical decisions or even replace human judgement in certain functional areas of healthcare (eg, radiology). AI techniques are being used in stroke management for early disease prediction, diagnosis, treatment, as well as outcome prediction and prognosis evaluation.

AI is also helping the healthcare sector in predicting ICU transfers and hospital readmissions, medical testing and sepsis prevention. AI has been helping in managing claims, improving clinical workflows and preventing different hospital-acquired infections. An AI system can assist physicians by providing up-to-date medical information from journals, textbooks and clinical practices to inform proper patient care.

In addition, an AI system can help to reduce diagnostic and therapeutic errors that are inevitable in the human clinical practice. There are three main areas where AI efforts

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Address for
correspondence:

Dr. Ramjan Shaik,
Editor, ijopp.

Email Id: ramjanshaik@gmail.com



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are being invested in the healthcare sector.

- Engagement – This involves improvising on how patients interact with healthcare providers and systems.
- Digitization – AI and other digital tools are expected to make operations more seamless and cost-effective.
- Diagnostics – By using products and services that use AI algorithms diagnosis and patient care can be improved.

In drug development process, pharma industry spends \$3.7 – 12 billion to bring new medicines to market which may or may not sustain in the market. Clinical trials are particularly costly and time consuming, making up the longest and most expensive stage of drug development. Sponsors cannot afford to waste resources on the futile completion of studies in which the side effects of an intervention negate the potential benefits, especially when the timely use of data would stop studies at an

earlier stage. The adoption of today's digital technologies (such as machine learning) offers a unique opportunity to revolutionize clinical trials with significant improvements in time, cost, and the quality of data collected through the introduction of real-time data capture.

Perhaps the largest cost savings will be through earlier and better decision-making, such as prompt trial termination or re-design decisions. Consequently, 30% productivity gains are achievable in clinical trials by embracing the technologies that will enable real-time data capture and analytics.

To conclude, there is a lot of potential yet to tap using AI in healthcare because it is already hyperspecialized for now which continues to learn and grow in subtlety. The use of AI techniques must be motivated by clinical problems and be applied to assist clinical practice in the end.