

Artificial Intelligence in Medicine: Benefits and Drawbacks

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Abstract: Present article discusses the penetration of completely new term of IT “artificial intelligence” into medicine. In addition, an attempt to analyze benefits and drawbacks of artificial intelligence in medicine was made and term definitions were reviewed.

Keywords: artificial intelligence, capability, healthcare industry, radiology equipment, surgery robots, health practitioners.

Before discussing the role of artificial intelligence in medicine, its benefits and drawbacks, it would be relevant to compare the definitions of the term “artificial intelligence” given in different dictionaries and sources. There was an attempt to select the most appropriate ones from rich internet database. According to Collins dictionary, artificial intelligence is “the capability of computers or programs to operate in ways believed in mimic human thought processes, such as reasoning and learning; and, the branch of computer science dealing with this”.

According to Merriam-Webster dictionary, artificial intelligence is “a branch of computer science dealing with the simulation of intelligent behavior in computers” and another second meaning of it is “the capability of a machine to imitate intelligent human behavior”. At the same time artificial intelligence is “a constellation of many different technologies working together to enable machines to sense, comprehend, act, and learn with human-like levels of intelligence” (<https://www.accenture.com/>)

Oxford dictionary defines artificially intelligence as following: “the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages”.

Computer approaches are mostly used in medical artificial intelligence (AI) to make clinical diagnostics and suggest therapies. AI can find important associations in a data collection and has been used to diagnose, treat, and predict outcomes in a variety of clinical circumstances.

Great changings and improvements have been happening since the term “artificial intelligence” came into being. We can easily observe them in all the subbranches of medicine.

While medical technologies were mostly known as classic medical devices (e.g., prosthetics, stents, implants) before the mobile era, the emergence of smartphones, wearables, sensors, and communication systems has revolutionized medicine by allowing artificial intelligence (AI) powered tools (such as applications) to be contained in very small sizes. (Steinhubl SR, Muse ED, Topol EJ, 2015). AI has transformed medical technology and is usually understood as a branch of computer

science that can solve complicated issues with multiple applications in fields with a lot of data but little theory. (Peng Y, Zhang Y, Wang L., 2010).

Although AI is undoubtedly altering the healthcare business, it is still a relatively new technology. As AI usage spreads throughout the healthcare industry, issues regarding the technology's benefits and drawbacks become increasingly pressing.

It would be relevant to discuss the advantages of artificial intelligence first. According to information taken from <https://www.drexel.edu>, acquiring correct information in a timely manner is an important part of identifying and treating medical problems. Doctors and other medical professionals may use AI to use real-time, precise data to speed up and improve important therapeutic decisions. Improved preventative measures, cost savings, and patient wait times can all be achieved by producing more quick and realistic outcomes.

Improved physician-patient connections can be aided by real-time analytics. Patients can be more engaged in their treatments if important health data is made available via mobile devices. Doctors and nurses can be alerted to critical changes in patient status and crises via mobile notifications.

Artificial intelligence in medicine has already had a significant impact on healthcare practices throughout the world. Appointment scheduling, translation of clinical facts, and patient history keeping are among the innovations. Artificial intelligence is allowing healthcare institutions to automate more time-consuming and exacting operations. Intelligent radiology equipment, for example, can recognize important visual signals, saving hours of intensive study. Appointment scheduling, patient tracking, and treatment recommendations may all be automated with other automated systems.

Medical professionals have more time to examine patients and identify sickness and condition as more critical processes are automated. Artificial intelligence (AI) is speeding up processes at medical facilities, allowing them to save valuable production hours. Time is money in every industry; thus, AI has the potential to save a lot of money.

The healthcare sector is estimated to spend a lot of money every year. Administrative burdens, such as filing, evaluating, and settling accounts, account for a large amount of these needless expenditures. Another area where there is need for improvement is determining medical necessity. To correctly determine medical necessity, hours of analyzing patient history and information are typically required. New natural language processing (NLP) and deep learning (DL) algorithms can aid physicians in the assessment of hospital cases and the avoidance of rejections.

Medical practitioners are given more time to help and engage with patients by freeing up valuable productivity hours and resources.

One more advantage of AI is that it allows researchers to collect enormous amounts of data from a variety of sources. More efficient analysis of fatal illnesses is possible because to the capacity to rely on a large and expanding data set. In terms of real-time data, research may profit from the vast amount of data accessible, as long as it can be simply translated.

Medical research organizations such as the Childhood Cancer Data Lab are creating tools that will help medical practitioners better traverse large data sets. Artificial intelligence has also been used to analyze and diagnose symptoms early in the course of a disease.

In addition, AI may reduce physician stress. According to recent study, more than half of primary care doctors are pressured by deadlines and other job circumstances. AI aids in the streamlining of procedures, the automation of activities, the rapid sharing of data, and the organization of operations, all of which relieve medical personnel of the burden of juggling too many duties.

Yang states, “The most significant contributor to physician burn out is patient load and the nature of the profession. However, as AI can assist with more time-intensive operations, explaining diagnoses for example, medical professionals may experience some stress alleviation” (2018)

On the other hand, we can observe some limitations of artificial intelligence. In the medical field, AI has gone a long way, yet human supervision is still required. Surgery robots, for example, act rationally rather than empathically. Important behavioral insights that might assist identify or avoid medical problems may be seen by health practitioners.

Yang explains, “AI has been around for a few decades and continues to mature. As this area advances, there is more interaction between healthcare professionals and tech experts” (2018). To be used successfully, AI requires human input and assessment.

As AI advances, the disciplines of technology and medicine are increasingly collaborating to improve the technology. According to Yang, “Years of education are required for medical professionals to operate in their fields. Essential information gathered from Subject Matter Experts (SMEs) enriches the data available and improves explainable AI (XAI) to provide healthcare workers with trusted and valuable insights.”

The demands of patients frequently go beyond their acute physical ailments. Appropriate suggestions for specific patients might be influenced by social, economic, and historical circumstances. For example, an AI system could be able to

assign a patient to a certain treatment center based on a diagnosis. However, this approach may not take into consideration the patient's financial constraints or other personal preferences.

When an AI system is used, privacy becomes a concern. When it comes to gathering and using data, companies like Amazon have complete control. Hospitals, on the other hand, may encounter difficulties while attempting to transmit data via Apple mobile devices. These legal and societal constraints may limit AI's ability to aid medical procedures.

One of the most essential drawbacks of artificial intelligence is leading to unemployment. While AI may help save expenses and relieve clinician stress, it may also eliminate certain employment. This variable may result in the displacement of healthcare professionals who have invested time and money in their education, posing equitable issues.

According to a research published by the World Economic Forum in 2018, AI will generate a total of 58 million employment by 2022. However, according to the same research, AI would displace or eliminate 75 million employment by the same year. The main reason for the loss of job prospects is that as AI becomes increasingly integrated across industries, occupations that need repetitive activities will become obsolete.

Though AI has the potential to enhance many aspects of healthcare and medicine, it is critical to examine the social implications of its implementation.

Another limitation of AI is that inaccuracies are still possible. Medical AI is highly reliant on diagnostic data available from millions of instances. A mistake is totally feasible when there is inadequate data on specific illnesses, demographics, or environmental variables. This is especially essential when prescribing a certain medication.

Yang states, "No matter the system, there is always some portion of missing data. In the case with prescriptions, some information regarding certain populations and reactions to treatments may be absent. This occurrence can lead to issues with diagnosing and treating patients belonging to certain demographics" (2018).

To accommodate for data shortages, AI is continually developing and improving. It's worth noting, though, that certain groups may still be left out of domain knowledge.

Conclusion

To sum up, AI undoubtedly has the capacity to enhance healthcare systems. Automating time-consuming chores can free up clinicians' schedules so they can spend more time with patients. Improving data accessibility aids healthcare providers in taking the appropriate precautions to avoid disease. Real-time data can help

diagnoses be made more accurately and quickly. Artificial intelligence is being used to decrease administrative mistakes and save money. As SMEs get more involved in AI development, the technology becomes more relevant and well-informed. AI is rapidly being used in healthcare, and new limitations and problems are being faced and solved. AI still need some human monitoring, may omit social factors, has data gaps, and is vulnerable to more sophisticated cyberattacks. Despite some of the problems and limitations that AI confronts, this revolutionary technology has enormous potential in the medical field. It is relevant to state without any doubt, that AI is improving people's lives all across the world.

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