

Editorial

Artificial Intelligence in Health Care: The Future Ahead

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Artificial intelligence, popularly known as AI, has touched almost all aspects of human life and health care is a no exception. From its tremendous potential to expedite the diagnostic processes, enhance the speed of data analysis, and enable meticulous prediction of treatment outcome, AI has proven its enormous potential in improvising patient care.

AI, in health care, can be broadly categorized into three main groups: applications focused on patients, applications focused on clinicians, and applications focused on administrative and operational tasks. The applications that are patient focused comprise activities such as answering phone calls of patients, booking their appointments online, patient self-service, chat bots, etc. On the other hand, the AI applications focused on clinicians have several roles to play such as reviewing medical records, designing therapeutic drugs and devices, interpreting radiology images, formulating clinical diagnoses and treatment plans, etc. AI, working to improvise on administrative and operational tasks such as resource allocation, scheduling, and billing, has modernized the entire health care setting pattern, with added advantage of cost cutting, thereby allowing the system to adopt a better patent-centric approach. Also, robotic process automation (RPA) has improved the efficiency in medical records management and claims processing by leaps and bounds.

In terms of providing the benefits to patients, AI has had a major influence on the diagnosis aspect. AI systems based on machine learning and algorithms have improvised the accuracy in identifying anomalies like tumors or fractures by analyzing radiographs and computed tomography scans. Several researches have demonstrated that AI is capable of performing diagnostic tasks on par with or at times even better than human radiologists. This certainly depicts the enormous potential of AI in lowering the possibility of incorrect diagnosis and also allowing for an earlier intervention.

Utilizing the concept of "predictive analytics," AI possesses the potential of making predictions on future health outcomes of individuals, utilizing their previous medical records, lifestyle patterns, and demographic data. This enables the determination of which patients are at risk

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of conditions like diabetes and cardiac ailments. Such predictions enable the health care providers to take timely actions in educating and motivating the patients for utilizing preventive measures as well as providing early interventions, which prove to be beneficial to the patients on a broader



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perspective. Also, the unique ability of AI to analyze the genetic data of patients has paved a way to customize their treatment plan specially for cancer.

In addition to being of benefit to the said specialists of medical care, surgeons are also benefiting from AI. AI has enhanced the success of surgical procedures with the help of robots, which have been specially designed and customized to assist surgeons in stabilizing movements and providing real-time feedback. Also, the pathologists are gaining additional support from AI as the AI-powered tools have now expedited the histopathology slide analysis, enhancing the diagnostic accuracy significantly.

Oral health care too has benefitted enormously from the predictive capabilities of AI. Fields such as smile designing and orthodontics have had the highest advantage of this technology. The AI-driven solutions possess the special ability to create precise smile proportions based on uploaded photographs of the patient's smile and intraoral images, ensuring an accurate initial assessment. This, on the one hand, accelerates the diagnostic process, but on the other hand, empowers the dentist with some most valuable insights for formulating an effective treatment plan for improving the smile of the patient. AI-powered software can also assist orthodontists in analyzing facial and dental measurements and simulating treatment outcomes so as to provide a scaffold on the basis of which the entire treatment plan can be formulated and the patient can also foresee the most likely outcome of the treatment.

AI has shown a remarkable input in accelerating the drug discovery and development process. This has been due to its unique ability to analyze vast datasets to identify potential

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drug candidates. The simulations that are AI driven can predict the drug efficacy very quickly, and drug interactions can also be simulated using this technology. This certainly helps save time and resources manifold.

Al-powered wearable devices and sensors have enabled remote patient monitoring by collecting health data in real time. Telemedicine platforms are now using Al for remote consultations to patients located far off from health centers, ensuring that no one suffers from lack of health care.

Having said all this, it is imperative to know that the health care system is facing significant obstacles in integrating AI. Of all the concerns involved, privacy of patient data is perhaps the most important concern. Robust security measures are a must to ensure that patients' personal data are not accessible to unauthorized personnel. Also, one must understand that there is always a risk of unintentional error in the AI-based conclusions because it primarily relies on the data it has been trained on. So, for sure, there are ethical as well as regulatory concerns, especially when AI is being used for health care decision-making.

A distinctive regulatory system for AI-empowered applications in health care needs to be developed, keeping in mind its pros and cons. The World Health Organization, in 2023, released a publication listing key "regulatory considerations on artificial intelligence for health," which emphasized on the importance of establishing AI systems' safety and effectiveness, rapidly making appropriate systems available to those who need them, and fostering dialog among stakeholders. This can be considered the beginning of an era in terms of AI-related regulations.

All things considered, it is appropriate to say that to fully utilize AI's potential to enhance patient outcomes and build a more effective health care system, stakeholders such as health care providers, technologists, regulators, and patients must work together as a unit to bring the best out of this wonder. It is quite obvious that AI systems are there to support human clinicians rather than completely replace them. Human physicians, with AI on their side, in future, shall be able to focus more toward work layouts that involve specific human abilities such as empathy, persuasion, and final decision-making.

Conflict of Interest None declared.