Generative AI's Disruption of the Health Care Industry

While artificial intelligence offers potential to revolutionize how health care is delivered, concerns about security risks, privacy issues and bias need to be addressed; regulatory efforts are starting

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Generative artificial intelligence (AI) is the utilization of algorithms to create content such as text, code, imagery, videos and even simulations in mere seconds.[1,2] The goal of AI generally is to mimic the intelligence of humans to perform tasks, with generative AI (a type of AI) aiming to learn from data without the assistance of humans.[1] While today's generative AI bots are not yet prepared for widespread utilization in patient care settings, AI is garnering significant interest in the health care industry as providers begin to test the capabilities of AI in clinics and offices.[3] This article will review the role that generative AI is beginning to play in the U.S. health care system, the potential of AI in health care and concerns related to the technology.

Advantages & Disadvantages

In the coming years, AI will likely be critical to the success of quality improvement, risk adjustment and population health management, all key tenets of value-based care.[4] With the rapid growth in the amount and accessibility of clinical data, AI will likely be utilized to analyze this data to reduce inefficiencies and costs while contributing to better patient outcomes.[4] Providers are often time-constrained due to manually entering electronic health records (EHR), increasing chances of burnout.[4] Leveraging AI can streamline workflow, close gaps in care, and allow for risk adjustment

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and the elimination of delays in reimbursement.[4] Additionally, with a projected shortage of nurses—the gap between nurse supply and demand is expected to surpass 100,000 by 2030—AI can serve as an additional "set of hands" by understanding patient medical records and codifying documents, improving clinician efficiency and patient outcomes, and driving higher reimbursement.[4,5]

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AI is a tool that is likely to transform the health care industry and revolutionize the way patients are treated; however, there are concerns to keep in mind regarding potential bias, security risks and even privacy.[3] Biases have been identified within information technology (IT) applications, which results in possibly exacerbating health care inequities that exist within the health care, such as ethnicity, income, gender or race.[3] While generative AI can provide solutions to biases in health care, there are other challenges that will need to be accounted for.[6] The accuracy of generative AI's outputs is reliant on the data that are utilized to train them, which could include lab results, imaging studies and medical records.[6] Potential errors could put the health of patients at risk, which is why addressing the implications of these challenges, and how they affect patient care, will be imperative.[6]

Generative AI poses a number of risks to providers and patients. There are significant privacy concerns related to generative AI, especially considering the types of information that health care providers handle, including sensitive and

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patient identifying information.[3] For example, patient information may be sold to companies for use in targeted ads. However, these types of potential risks are similar to the risks related to social media generally.[3] Other major risks with generative AI could be security—AI will not solve the susceptibility of medical data to being hacked or stolen unless EHR companies allow their application programming interface to be utilized.[3] Organizations that utilize EHRs are known to maintain a certain level of security, ensuring that data is at minimal to no risk, and it will be in the best interest of generative AI software to utilize similar tactics.[3]

While generative AI can make the health care system more efficient by reducing bias, detecting errors and reducing the amount of paperwork, it is very unlikely that they will replace physicians.[7] Generative AI is infamous for not providing appropriate (or any) context, which is necessary in real-world settings, particularly in health care.[7] Physicians can also provide compassion and integrated care more than any AI software or program.[7] Generative AI will certainly be able

to complement and augment physician work, by reducing inefficiencies within the health care system, but will likely never be able to replace the physician workforce.[7] Recent reports have shown that 40% of working hours in health care settings could be supported by generative, language-based AI.[8,9] The application of AI in health care will depend on training in the human experience, along with perception and expertise.[8]

Regulatory

The sprint toward AI in all industries has raised concern about risks and a lack of scrutiny, and regulators have been scrambling to modify existing rules to cover issues on data privacy and copyright.[10] While regulatory agencies are in uncharted territory, few have stepped forward with any sort of strategy to address the negative impacts of AI. The Food and Drug Administration (FDA) has developed an action plan to provide reassurance on effectiveness and safety while utilizing AI in the health care industry.[11] The plan outlines five areas

for focus: (1) develop the proposed framework, including guidance on software that learns over time; (2) develop good practices in machine learning to further improve algorithms; (3) ensure a patient-centered approach with complete transparency; (4) advance pilot performances in a real world setting; and (5) develop methods to evaluate algorithms in machine learning.[11]

In addition to regulatory agencies, the rapid implementation of AI will require health care organizations to monitor any risks (e.g., reputational, legal and ethical) emanating from AI use and determine how to address those risks, particularly given the current lack of regulatory framework and oversight.[8] In June 2023, the American Medical Association (AMA) voted to adopt a proposal to protect patients against misleading or false medical information from AI tools.[12] The AMA aims to work with agencies such as the Federal Trade Commission (FTC) and the FDA to mitigate any misinformation, and anticipates the establishment of federal and state regulations in the near future.[12]

Despite the fluidity of regulation, AI companies are starting to face government scrutiny. In July 2023, the FTC opened an investigation and sent a records request to OpenAI, the company behind ChatGPT.[10] In its investigation as to whether OpenAI engaged in practices that resulted in consumer harm, the FTC requested information regarding how OpenAI obtained data used to train their models and descriptions of ChatGPT's abilities.[13] The agency also requested descriptions of OpenAI's testing, algorithms, responses and the company's false information policies.[13]

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On October 30, 2023, President Joseph Biden signed an executive order to establish new standards for artificial intelligence (AI) in the U.S.[14] The executive order focuses on protecting the privacy of Americans and establishes new standards for security and safety in AI.[14] While the executive order impacts a variety of industries, there are many implications for the health care industry specifically. The order directs the Department of Health and Human Services (HHS) to develop a task force focused on AI within 90 days, which

will be responsible for developing frameworks and policies on the responsible use and deployment of AI and AI-enabled technology.[15] Within 365 days of the task force's creation, new guidance must be created related to the monitoring of quality and safety of technology enabled by AI and the incorporation of equity in new AI models.[15]

In addition to the federal government's push to monitor and regulate AI, the rapid implementation of the technology requires health care organizations to monitor any risks (e.g., reputational, legal and ethical) emanating from AI use and determine how to address those risks, particularly given the current lack of regulatory framework and oversight.[8]

While the executive order directs federal agencies to coordinate efforts around the regulation of AI, the agencies can only act within their budget and authority.[16] Another impediment to AI regulation may include any change in presidential administration, where different priorities may result in the executive order being revoked.[16] While many of the executive order's provisions have bipartisan support, the implementation of the policies may not be completed before the 2024 presidential election, leaving the ultimate outcome of these policies vulnerable to changing political forces.[16] The level of development and the pace of clinical AI implementation may be directly influenced by the liability faced by practitioners, designers and health systems, as more liability could discourage the use of AI in health care.[17] As technology develops, new legal pathways need to be established, especially as increased liability would likely repel practitioners, designers and health systems from implementing and developing clinical AI models.[17]

Advancements & Entrants

ChatGPT, the free-to-use generative AI bot developed by OpenAI, has become the preeminent bot in the field, and has piqued interest across multiple industries with its capability to replicate relevant, coherent and human-like responses when prompted by users.[18] These various capabilities have made it ideal for application in health care.[19] The generative AI bot is pre-trained on vast amounts of data and can generate content based on the data on which it has been trained.[18] Other big tech companies, including Microsoft and Google, have also created publicly accessible generative AI bots such as Bing AI, Copilot and Bard.[20]

The rapid evolution of generative AI at large has spurred advancements in AI specifically designed to assist providers in health care settings.[21] Carbon Health, a primary care company, recently launched a proprietary AI-enabled EHR assistant for hands-free charting within its clinics.[21] The company is aiming to reduce provider workload, allowing each provider

more time to see patients, and generally enhance the doctor-patient connection by focusing on the care of patients, rather than typing.[21] Additionally, Tempus, a precision medicine and AI company, recently launched an AI-enabled clinical assistant that helps clinicians seamlessly access patient data.[21] Utilizing Tempus, clinicians can access reports from clinical tests, filter patient incidence by diagnosis, access summarized patient information, and query clinical guidelines for updated standard of care insights.[21]

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In April 2023, Epic, a health care software company, announced a collaboration with Microsoft to combine Microsoft's Azure OpenAI and Epic's EHR software to respond to patient messages, alleviating provider workload.[22] The initial rollout will begin at UNC Health with five to ten clinicians and eventually expand to other health systems.[22] The first iteration of this technology will draft suggested responses to the most common patient questions and messages for physicians to review and send.[22]

Conclusion

While generative AI will continue to disrupt the health care industry, it aims to ultimately increase the efficacy of the health care system. By streamlining clerical work, performing literature searches, and even reducing error and bias within medicine, generative AI has the potential to revolutionize the way health care is delivered.[7] While generative AI has nearly unlimited potential, there are also risks associated with the technology, particularly in health care. Patient data could result in bias by the bot and even be susceptible to hacking or stealing. Generative AI has the potential to revolutionize the health care industry, but industry stakeholders will need to remain up-to-date on the risks and ongoing regulatory changes that affect the usage of generative AI. ◄

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