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Generative AI in Healthcare:
Valuation Considerations

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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] The goal of AI in general is to mimic the intelligence of humans to perform tasks. "Generative" AI aims to learn from data without the assistance of humans.[2] While today's generative AI bots are not yet prepared for widespread utilization in patient care settings, AI is garnering significant interest in the healthcare industry as providers begin to test its capabilities in clinics and offices.[3] This article reviews the role that generative AI is beginning to play in the U.S. healthcare system, the potential of AI in healthcare, and concerns related to the technology.

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1 "What is Generative AI?," McKinsey & Company, January 19, 2023, https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-ai; George Lawton, "What is Generative AI? Everything You Need to Know," TechTarget, last updated October 2023, https://www.techtarget.com/searchenterpriseai/definition/generative-AI?Offer=abt_pubpro_AI-Insider.
2 "What is Generative AI?," McKinsey & Company.
3 Robert Pearl, "ChatGPT's Use in Medicine Raises Questions of Security, Privacy, Bias," *Forbes*, April 24, 2023, https://www.forbes.com/sites/robertpearl/2023/04/24/chatgpts-use-in-medicine-raises-questions-of-security-privacy-bias/?sh=267cb97d5373.

Advantages and 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.[5] Providers are often time-constrained by the need to enter electronic health records (EHR) manually, increasing the chances of burnout.[6] Leveraging AI can streamline workflow, close gaps in care, and allow for risk adjustment and the elimination of delays in reimbursement.[7] 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.[8] AI also has the potential to question the decisions of a physician that may unknowingly exacerbate the ongoing issue of bias in medicine and potentially push towards a more equitable healthcare system.[9]

AI is a tool that is likely to transform the healthcare industry and revolutionize the way patients are treated; however, there are concerns to keep in mind regarding potential bias, security risks, and even privacy.[10] Biases identified within information technology (IT) applications may exacerbate healthcare inequities related to ethnicity, income, gender, race, or other factors.[11] While generative AI can provide solutions to biases in healthcare, there are other challenges that will need to be accounted for.[12] The accuracy of generative AI's outputs relies on the data used to train it, which may include lab results, imaging studies, and medical records.[13] Potential errors could put the health of patients at risk, so it is imperative to address the implications of these challenges for patient care.[14]

> *While generative AI can make the healthcare system more efficient by reducing bias, detecting errors, and reducing the amount of paperwork, it is very unlikely that it will replace physicians.*

Generative AI poses a number of risks to providers and patients. There are significant privacy concerns, especially considering the types of information that healthcare providers handle, including sensitive and patient identifying information.[15] For example, patient information may be sold to companies for use in targeted ads. These types of potential risks are similar to the risks related to social media generally.[16] Security may also be a major risk: AI will not solve the susceptibility of medical data to being hacked or stolen unless EHR companies allow their application programming interfaces to be used.[17] Organizations that maintain 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 use similar tactics.[18]

While generative AI can make the healthcare system more efficient by reducing bias, detecting errors, and reducing the amount of paperwork, it is very unlikely that it will replace physicians.[19] Generative AI is infamous for not providing appropriate (or any) context, which is necessary in real-world

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4   Jay Ackerman, "Top Three Reasons Why AI is Critical for Value-Based Care," *Managed Healthcare Executive*, June 27, 2023, https://www.managedhealthcareexecutive.com/view/top-three-reasons-why-ai-is-critical-for-value-based-care.

5   Ibid.

6   Ibid.

7   Ibid.

8   Ibid.; Julia Haines, "The State of the Nation's Nursing Shortage," *U.S. News & World Report*, November 1, 2022, https://www.usnews.com/news/health-news/articles/2022-11-01/the-state-of-the-nations-nursing-shortage.

9   Pearl, "ChatGPT's Use In Medicine."

10 Ibid.

11 Ibid.

12 "How Will Generative AI Impact Healthcare?," World Economic Forum, May 12, 2023, https://www.weforum.org/agenda/2023/05/how-will-generative-ai-impact-healthcare/.

13 Ibid.

14 Ibid.

15 Pearl, "ChatGPT's Use In Medicine."

16 Ibid.

17 Ibid.

18 Ibid.

19 Jan Homolak, "Opportunities and Risks of ChatGPT in Medicine, Science, and Academic Publishing: A Modern Promethean Dilemma," *Croatian Medical Journal* 64, no. 1 (February 2023), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10028563/.

settings, particularly in healthcare.[20] Physicians can also provide compassion and integrated care better than any AI software or program.[21] Generative AI will certainly be able to complement and augment physician work by reducing inefficiencies in the healthcare system, but it will likely never be able to replace the physician workforce.[22] Recent reports show that 40 percent of working hours in healthcare settings could be supported by generative, language-based AI.[23] The application of AI in healthcare will depend on training in the human experience, along with perception and expertise.[24]

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 related to data privacy and copyright.[25] While regulatory agencies are in uncharted territory, few have stepped forward with any sort of strategy to address the negative impact of AI. The Food and Drug Administration (FDA) has developed an action plan to provide reassurance on effectiveness and safety while using AI in the healthcare industry.[26] The plan outlines five focus areas: (1) develop a 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.[27]

In addition to regulatory agencies, the rapid implementation of AI will require healthcare 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.[28] 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.[29] The AMA aims to work with agencies such as the Federal Trade Commission (FTC) and the FDA to mitigate any misinformation, and

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20 Ibid.

21 Ibid.

22 Ibid.

23 Bill Siwicki, "Generative AI Could Augment 40% of Healthcare Working Hours" *Healthcare IT News*, May 11, 2023, https://www.healthcareitnews.com/news/generative-ai-could-augment-40-healthcare-working-hours; "AI for Everyone," Accenture, March 22, 2023, https://www.accenture.com/us-en/insights/technology/generative-ai?c=acn_glb_largelanguagemomediarelations_13427684&n=mrl_0323.

24 Siwicki, "Generative AI Could Augment 40% of Healthcare Working Hours."

25 Reuters, "US FTC Opens Investigation into OpenAI over Misleading Statements," July 13, 2023, https://www.reuters.com/technology/us-ftc-opens-investigation-into-openai-washington-post-2023-07-13/.

26 "Artificial Intelligence/Machine Learning (AI/ML)-Based Software As a Medical Device (SaMD) Action Plan," Center for Devices and Radiological Health, U.S. Food and Drug Administration, January 2021, https://www.fda.gov/media/145022/download.

27 Ibid.

28 Siwicki, "Generative AI Could Augment 40% of Healthcare Working Hours."

29 Kristine White, "AMA Adopts Proposal to Protect Patients from False and Misleading AI-Generated Medical Advice," *Healthcare Brew*, June 15, 2023, https://www.healthcare-brew.com/stories/2023/06/14/ama-adopts-proposal-to-protect-patients-from-false-and-misleading-ai-generated-medical-advice.

anticipates the establishment of federal and state regulations in the near future.[30]

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, the free-to-use generative AI bot.[31] In its investigation into 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.[32] The agency also requested descriptions of OpenAI's testing, algorithms, responses, and false information policies.[33]

As technology develops, new legal pathways need to be established, especially because increased liability would likely discourage practitioners, designers, and health systems from developing and implementing clinical AI models.[34]

Advancements and Entrants

ChatGPT 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.[35] These capabilities have made it ideal for application in healthcare.[36] The generative AI bot is pre-trained on vast amounts of data and can generate content based on that data.[37] Other big tech companies, including Microsoft and Google, have also created publicly accessible generative AI bots such as Bing AI, Copilot, and Bard.[38]

The rapid evolution of generative AI at large has spurred advancements in AI specifically designed to assist providers in healthcare settings.[39] Carbon Health, a primary care company, recently launched a proprietary AI-enabled EHR assistant for hands-free charting within its clinics.[40] The company aims to reduce provider workload, allowing each provider more time to see patients, and generally enhance the doctor-patient connection by focusing on patient care rather than typing.[41] Additionally, Tempus, a precision medicine and AI company, recently launched an AI-enabled clinical assistant that helps clinicians seamlessly access patient data.[42] Using 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.[43]

In April 2023, Epic, a healthcare 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.[44] The initial rollout will begin at UNC Health with five to 10 clinicians and eventually expand to other health systems.[45] The first iteration of this technology will draft suggested responses to the most common patient questions and messages for physicians to review and send.[46]

Impact of AI on Healthcare M&A

Healthcare merger and acquisition (M&A) activity reached record-breaking levels in 2021 and 2022, and volumes remained high during the first half of 2023, despite factors that typically would dampen the appetite for such transactions, such as increased regulatory scrutiny, higher interest rates, and concerns over a potential recession.

30   White, "AMA Adopts Proposal."
31   Reuters, "US FTC Opens Investigation into OpenAI."
32   Brian Fung, "FTC is Investigating ChatGPT-maker OpenAI for Potential Harm to Consumers," CNN, July 13, 2023, https://www.cnn.com/2023/07/13/tech/ftc-openai-investigation/index.html.
33   Ibid.
34   Allison Smith Newsome and Jasmeet Singh, "Dr. Watson, A.I.: The Current Approach to Artificial Intelligence Training in the Medical Field and Legal Considerations for AI Diagnosis Dependence," American Health Law Association, July 6, 2023, https://www.americanhealthlaw.org/content-library/publications/briefings/d88632df-8f1e-48ce-b5f4-066d19b12aa6/Dr-Watson-A-I-The-Current-Approach-to-Artificial-I?Token=60909932-7f8c-4a43-97b9-8bcb7e610f4e.
35   "What Is Chat GPT?—Everything You Need to Know," *Enterprise DNA Blog*, April 22, 2023, https://blog.enterprisedna.co/what-is-chat-gpt-everything-you-need-to-know/#:~:text=The%20history%20of%20ChatGPT%20starts,promising%20but%20limited%20language%20model.
36   Bernard Marr, "Revolutionizing Healthcare: The Top 14 Uses of ChatGPT in Medicine and Wellness," *Forbes*, March 2, 2023, https://www.forbes.com/sites/bernardmarr/2023/03/02/revolutionizing-healthcare-the-top-14-uses-of-chatgpt-in-medicine-and-wellness/?sh=ba393de6e547.
37   "What Is Chat GPT?—Everything You Need to Know," *Enterprise DNA Blog*.
38   Umar Shakir, "Bing, Bard, and ChatGPT: How AI is Rewriting the Internet," *The Verge*, June 14, 2023, updated December 11, 2023, https://www.theverge.com/23610427/chatbots-chatgpt-new-bing-google-bard-conversational-ai.
39   Heather Landi, "The Latest Generative AI Efforts in Healthcare: Carbon Health, Tempus Launch Tools for Docs," *Fierce Healthcare*, June 6, 2023, https://www.fiercehealthcare.com/health-tech/latest-generative-ai-efforts-healthcare-carbon-health-tempus-launch-tools-docs.
40   Ibid.
41   Ibid.
42   Ibid.
43   Ibid.
44   Heather Landi, "Epic is Going All In on Generative AI in Healthcare. Here's Why a Handful of Health Systems is Eager to Test-Drive It," *Fierce Healthcare*, May 25, 2023, https://www.fiercehealthcare.com/health-tech/epic-moves-forward-bring-generative-ai-healthcare-heres-why-handful-health-systems-are.
45   Ibid.
46   Ibid.

Many of these transactions included companies that featured AI technologies, a trend likely to become more prevalent going forward. The global AI in healthcare market size was estimated at $15.1 billion (USD) in 2022 and is expected to surpass around $187.95 billion (USD) by 2030, growing at a compound annual growth rate of 37 percent during the forecast period.[47]

Not only are established companies attractive targets, start-up companies are also taking advantage of the industry's fascination with the potential of AI. In particular, AI technologies can drive a healthcare company's value by:

1. Adding new or complementary patient services, such as capacity management and referral management;[48]

2. Augmenting physician services by automating administrative services or providing easy access to clinical knowledge;[49] for example, by saving the physician valuable time that he or she can instead use to perform clinical services;

3. Increasing patient utilization by automating scheduling or discharge processes;[50]

4. Enabling healthcare companies to more easily analyze and extract new insights from patient data;[51]

5. Increasing quality and cost effectiveness through continuous internal provider benchmarking, utilization management, and patient risk scoring;[52] and

6. Allowing access to new data sources, such as the ability to extract, aggregate, and make searchable data from different types of medical records that are stored in different formats across various platforms.[53]

Conclusion

While generative AI will continue to disrupt the healthcare industry, ultimately it aims to increase the efficacy of the healthcare 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 healthcare is delivered.[54] While generative AI has nearly unlimited potential, there are also risks associated with the technology, particularly in healthcare. Patient data could result in bias by bots and even be susceptible to hacking or stealing. Industry stakeholders will need to remain up-to-date on the risks and ongoing regulatory changes that affect the usage of generative AI. **VE**

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47 "Artificial Intelligence (AI) in Healthcare Market," Precedence Research, February 2023, https://www.precedenceresearch.com/artificial-intelligence-in-healthcare-market.

48 Nikhil Sahni et al., "The Potential Impact of Artificial Intelligence on Healthcare Spending," (Working Paper 30857, National Bureau of Economic Research, January 2023), https://www.nber.org/papers/w30857.

49 Ibid.

50 Joe McKendrick, "Healthcare May Be the Ultimate Proving Ground for Artificial Intelligence," *Forbes*, February 22, 2023, https://www.forbes.com/sites/joemckendrick/2023/02/22/healthcare-may-be-the-ultimate-proving-ground-for-artificial-intelligence/?sh=75f8442e2b55; Sahni et al.,"The Potential Impact of Artificial Intelligence on Healthcare Spending."

51 McKendrick, "Healthcare May Be The Ultimate Proving Ground For Artificial Intelligence."

52 Sahni et al., "The Potential Impact of Artificial Intelligence on Healthcare Spending."

53 Laura Burlot and Nihkil Pradhan, "The Role of AI in Health Care M&A: Driving Value in a Difficult Market," Foley & Lardner LLP, May 10, 2023, available at https://www.jdsupra.com/legalnews/the-role-of-ai-in-health-care-m-a-8975425/; Ashley Capoot, "Google Announces New Generative AI Search Capabilities for Doctors," CNBC, October 9, 2023, https://www.cnbc.com/2023/10/09/google-announces-new-generative-ai-search-capabilities-for-doctors-.html.

54 Homolak, "Opportunities and risks of ChatGPT."