

HEALTH INFORMATICS

AI in health care: a tool for physician leaders

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Artificial intelligence (AI) in health care is rapidly expanding, with the daily emergence of new initiatives, topics, and critical issues, making it challenging for physician leaders to organize and distill this complex topic. We offer a simple approach that involves classifying topics by three levels of scale: the individual, the organization, and the system or sector. Despite the widespread adoption of AI applications across all aspects of our daily lives, its implementation in health care remains limited. There is a need to engage, in all stages of development, key stakeholders, specifically governments, technology companies, health care providers, patients, and civil society. Cultural, social, and/or regional disparities can impact the integration of AI in health care, reflecting varied beliefs, attitudes, and practices. Our simplified approach to structuring and organizing this complex subject can serve as a valuable tool for physician leaders in conducting more focused discussions with stakeholders and decision-makers.

KEYWORDS: artificial intelligence, engagement, diversity, implementation, health care, physician leadership

Perreira TA, Sodhi S, Karsan A, Hassan H, Dale A. AI in health care: a tool for physician leaders. *Can J Physician Leadersh* 2024;10(1):5-8
<https://doi.org/10.37964/cr24776>

While health systems globally strive to recover from the SARS-CoV-2 pandemic¹ and improve, the field of artificial intelligence (AI) is rapidly expanding, with the daily emergence of new initiatives, topics, and critical issues. It is understandably challenging for physician leaders to stay abreast of the latest evidence, advances, applications, and opportunities in AI. Leaders may feel an urgency to act and a fear of being left behind. The literature suggests

that AI-induced fear can have a negative effect on adoption rates.^{2,3}

We offer a simplified framework to help physician leaders organize and distill this intricate topic, hopefully enabling them to have more targeted discussions that can help expedite decision-making and project-implementation processes.

Basic levels of analysis

Getting started and identifying where to focus can be extremely challenging, especially for new physician leaders. Across scientific disciplines, phenomena can be examined in many ways. Although levels of analysis can be quite comprehensive,^{4,5} a simple approach can be taken that involves three basic levels of scale: the individual, the organization, and the system or sector.

The individual level is the smallest unit of analysis. In health care, this is usually the clinician and the patient. The organization level refers to multiple individuals working together in an institution. The system or sector level refers to entities external to an organization; it can include multiple organizations and/or networks and can span various domains.

Examining AI across different levels of scale

Recent systematic reviews of AI and health care are quite detailed, complex, and extensive.⁶⁻⁹ Examining the AI literature through an individual, organization and system/sector lens can help interlocutors clearly lay out and visualize the plethora of topics and issues (Figure 1).

A simple way to start is by considering the user and the purpose for which they are employing AI. For example, clinicians use AI to aid in clinical decisions, early diagnosis and disease prevention, precise and personalized medicine, remote monitoring of patients, and consultations. Similarly, patients use AI to improve medication compliance, as mental health support (chatbots) and virtual health assistants, and to access accurate/current medical information. Topics and critical issues can be categorized at the organization level by purpose or function. Categories

Figure 1. Examining AI uses at different levels of scale

may be broad, such as using AI for prediction of future events or more narrowly focused on assisting with administrative tasks.

Finally, topics and critical issues can be categorized at a system/sector level, with the possibility of further classification into local, regional (state or province), and national applications. The framework can be extended to include international classifications as well.

Practical applications

This model is simple to apply and easily adaptable to accommodate new emerging topics and critical issues as they arise. Examining and discussing AI in health care at the individual, organizational, and system level has proven helpful in the following instances.

Preliminary conversations about AI in health care – Regardless of audience and expertise level – system leaders, hospital board members, or frontline physicians – the framework helps provide a clear and comprehensive overview of AI in health care. It offers a systemic outlook, fostering an understanding of the broader context, while enabling individuals to identify their position and interests within the overarching landscape.

Crafting a risk management strategy for AI deployment – The framework helps one rationally think through the potential risks, concerns, and mitigation strategies required at each distinct level.

It enables one to identify risks at different levels and prioritize the highest, most pertinent, risks. For example, at the individual level, a clinician using AI as a clinical decision aid has a much higher risk than, say, an organization that is using AI to simply send appointment reminders.

Identifying barriers and enablers for AI adoption

– The individual, organization, and system levels each have unique barriers and enablers when it comes to the adoption of AI. The framework helps leadership to think through and identify the unique challenges at each level. For example, at the individual level, both physicians and their patients must have confidence and trust regarding the accuracy and reliability of AI prediction; otherwise, they will not use it. Hence, education and engagement are key components to successful adoption at the individual level. At the system level, depending on the AI initiative, interoperability and integration of electronic health records and other technology platforms across organizations pose substantial challenges for successful deployment.

Strategic planning and resource allocation – When strategic planning and identifying where to dedicate resources, it is helpful to have a systems perspective. Methodically discussing the topics at an individual, organization, and system level can help focus thinking and achieve consensus on what falls in and, just as important, outside one's purview. This approach also enables one to consider and identify key stakeholders at each level.

Policy development – A structured approach enables the identification of key stakeholders across various tiers. Government bodies, health professionals, provider organizations, patient advocacy groups, and research institutions, to name a few, each possess different strengths and can contribute to different aspects of policy development based on expertise, experience, and perspective. Thinking through and identifying key stakeholders at the individual, organization, and system levels can assist leaders in identifying where they are best suited to act, while simultaneously discerning areas where other stakeholders may be better positioned and equipped to develop and implement guidelines, ensuring a well-rounded and inclusive policymaking process.

Cultural, social, and regional disparities in AI adoption

Perceptions and trust in AI technologies play a crucial role in determining acceptance and adoption rates.¹⁰ Cultural, social, and/or regional disparities can impact the integration of AI in health care, reflecting varied beliefs, attitudes, and practices.¹¹ Central to the adoption of any new practice is engagement.¹² Building trust and relationships, especially in small rural and remote communities, is vital to the successful introduction and adoption of AI and technology. Identifying AI-educated community liaisons who understand local cultures and are able to communicate the benefits of AI and technology could assist in bridging the gap between technology advancement and community acceptance.¹¹

AI implementation in health care

The optimism for AI's role in advancing health care delivery is universally recognized.¹³ However, despite the widespread adoption of AI applications across all aspects of our daily lives, its implementation in health care remains limited.¹⁴ Recently, the World Health Organization issued guidance on ethics and governance for the use of AI in health, emphasizing the need to engage, in all stages of development, key stakeholders, specifically governments, technology companies, health care providers, patients, and

civil society.¹⁵ The literature also suggests that additional facilitators of AI in health care include active involvement and oversight in implementation processes, as well as identification of barriers related to generalizability and interoperability of new interventions with existing systems and the quality and accessibility of data.¹⁴

Conclusion

AI is a multifaceted field that continues to evolve. Having a simplified approach that is structured and organized can help physician leaders navigate this complex topic and engage in more effective dialogues with stakeholders and decision-makers. By demystifying these complexities and helping to focus discussions, we strive to facilitate faster integration and acceptance of AI in health care settings, recognizing that AI can have risks that must be identified and addressed (which can be a topic for a separate article).

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Conflict of interest: The authors declare no conflicting interests.

Funding: No financial support was received for this work.

Author attestation

All authors made substantial contributions to the conceptual design and drafting of the manuscript. All authors approved the final version to be published.

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This article has been peer reviewed.