Canadian Medical Education Journal

Commentary and Opinions

AI literacy starts at the bedside: a call for grassroots and reflective approaches in medical education

La littératie en IA commence au chevet du patient : plaidoyer pour des approches enracinées et réflexives en éducation médicale

Austin Solak,[1] Urmi Sheth,[2] Ragav Chona,[3] Allie Jones,[4] Nikoo Aghaei,[5] Ricky Hu[6]

[1]Schulich School of Medicine and Dentistry, Western University, Ontario, Canada; [2]Michael G. DeGroote School of Medicine, McMaster University, Ontario, Canada; [3]Temerty Faculty of Medicine, University of Toronto, Ontario, Canada, [4]NOSM University, Ontario, Canada; [5]Queen's School of Medicine, Queen's University, Ontario, Canada; [6]UBC Faculty of Medicine, University of British Columbia, British Columbia, Canada

Correspondence to: Austin Solak; email: asolak2026@meds.uwo.ca

Published ahead of issue: Aug 21, 2025; published: Dec 22, 2025. CMEJ 2025, 16(6) Available at https://doi.org/10.36834/cmej.81537

Introduction

A PGY-1 resident sits before an artificial intelligence (AI)-generated diagnosis, a tool now embedded into their hospital's workflow. The algorithm suggests a pulmonary embolism, prompting consideration of anticoagulation. However, without formal training on how to assess the model's reliability, interpret its outputs, or recognize potential biases, the resident hesitates. If they accept the diagnosis at face value, they risk acting on a faulty output, exposing the patient to unnecessary and harmful treatment. This moment reflects a growing dilemma; as AI and digital health applications become increasingly prevalent in clinical care, medical students are entering residency without the tools to critically evaluate or safely integrate these technologies into clinical care.[1,2]

Within AI applications and models, a fundamental concern is bias. In Canada, where healthcare outcomes differ significantly across Indigenous, racialized, and low-income populations, poorly designed AI tools risk reinforcing systemic inequities. For instance, dermatology algorithms trained predominantly on images of lighter skin tones have been shown to underperform when diagnosing skin conditions in patients with darker skin, including Black and Indigenous individuals.[3] This underrepresentation in training datasets can lead to misdiagnosis and delayed treatments, exacerbating existing health disparities.[3,4] In recent years, there has been a rapid expansion of diagnostic algorithms and generative AI tools such as ChatGPT and OpenEvidence, with these tools being used by both clinicians and patients alike.[5] However, Canadian medical education has not advanced at a similar pace to incorporate training on these technologies, with a recent study showing that over 85% of Canadian medical students receive no formal AI education as part of their medical degree curriculum.[2] This evolving landscape presents a timely opportunity for curricular innovation and pan-Canadian collaboration in medical education.

Currently, educational resources, best-practice guidelines, and institutional materials related to AI in medical education remain fragmented and siloed across individual medical schools and provinces. Past institutional initiatives, including a one-time AI course at the University of Toronto, workshops at the University of Alberta, and a national AI workshop series represent important early steps, but have lacked continuity and broad curricular integration.[6,7] Similarly, while national bodies such as the Canadian Federation of Medical Students (CFMS) have previously convened action committees and produced proposal documents related to AI in medical education, these efforts have not resulted in sustained national implementation.[8] In light of these gaps, the CFMS may consider formalizing a dedicated AI Task Force under its Education Committee to build on past proposals and develop tangible outcomes.

Within the clinical clerkship setting, medical students are exposed to AI-driven and interpretive tools almost daily. Common examples include automated ECG interpretations in the emergency department and the use of AI-scribes in outpatient clinics. While these tools enable efficiency, they also carry the risk of error if their outputs are interpreted at face value. To address this, clerkship curricula can consider incorporating educational strategies that encourage reflection and discussion around the use and limitations of AI in clinical practice.

Canada is a world leader in digital health and AI, with institutions such as the Vector Institute and MaRS leading groundbreaking work in this space.[9,10] These organizations facilitate novel initiatives including interdisciplinary hackathons and think tanks, which foster collaboration despite variable productivity. However, more structured formats, such as faculty-led workshops and AI-focused research projects, may provide more consistent educational value and skill development. Participation in these initiatives also supports the development of key CanMEDS roles, including the Scholar (through applied learning and research), Collaborator (via interdisciplinary teamwork), and Health Advocate (by identifying and addressing inequities in AI applications) roles.[11]

In summary, as AI continues to evolve, medical students and future physicians must be equipped with the tools to use it safely, effectively, and critically within clinical care. The absence of formal AI education in Canadian medical curricula leaves students vulnerable to over-reliance on black box algorithms and the inability to appropriately recognize potential biases or limitations. To adapt to this changing landscape, both students and institutions can take proactive, foundational steps to support AI literacy in medical education. Proposed strategies include: (1) building a national, open-access repository of AI and digital health resources; (2) formally integrating AI education into medical curricula through a variety of modalities; and (3) fostering collaboration through structured initiatives. With these changes in place, the next generation of physicians will not only be literate in AI, but also prepared to appraise, contextualize, and advocate for its ethical and equitable use in patient care.

Conflicts of Interest: The authors have no conflicts of interest to declare that could potentially bias their work due to financial or personal relationships.
Funding: There were no sources of funding for this commentary.
Edited by: Marcel D'Eon (editor-in-chief)

References

1. Rajpurkar P, Chen E, Banerjee O, Topol EJ. AI in health and medicine. *Nat Med*. 2022 Jan; 28(1), 31–38. https://doi.org/10.1038/s41591-021-01614-0
2. Gordon M, Daniel M, Ajiboye A, et al. A scoping review of artificial intelligence in medical education: BEME Guide No. 84. *Med Teach*. 2024;*46*(4):446–470. https://doi.org/10.1080/0142159X.2024.2314198
3. Montoya LN, Roberts JS, Sánchez Hidalgo B. Towards fairness in AI for melanoma detection: systemic review and recommendations. In: Arai K, Kapoor S, Bhatia R, editors. *ICT.* Lecture notes in networks and systems. Vol. 1285. Cham: Springer; 2025. p. 320–341. https://doi.org10.1007/978-3-031-84460-7_21
4. Rezk E, Eltorki M, El-Dakhakhni W. Leveraging Artificial Intelligence to improve the diversity of dermatological skin color pathology: protocol for an algorithm development and validation study. *JMIR Res Protoc.* 2022;Mar 8;11(3):e34896. https://doi.org/10.2196/34896
5. Zaretsky J, Kim JM, Baskharoun S, et al. Generative Artificial Intelligence to transform inpatient discharge summaries to patient-friendly language and format. *JAMA Netw Open.* 2024;*7*(3),e240357. https://doi.org/10.1001/jamanetworkopen.2024.0357
6. Hu R, Fan KY, Pandey P, et al. Insights from teaching artificial intelligence to medical students in Canada. *Commun Med*. 2022;2:63. https://doi.org/10.1038/s43856-022-00125-4
7. Hu R, Rizwan A, Hu Z, Li T, Chung AD, Kwan BYM. An artificial intelligence training workshop for diagnostic radiology residents. *Radiol Artif Intell*. 2023;5(2):e220170. https://doi.org/10.1148/ryai.220170
8. Canadian Federation of Medical Students. *Education.* Ottawa (ON): CFMS; Available from: https://www.cfms.org/what-we-do/education/ [Accessed on Jun 3, 2025].
9. Vector Institute. *About us.* Toronto (ON): Vector Institute. Available from: https://vectorinstitute.ai/about/ [Accessed on May 22, 2025].
10. MaRS Discovery District. *Home page*. Toronto (ON): MaRS;. Available from: https://www.marsdd.com/ [Accessed on May 15, 2025].
11. Frank JR, Snell L, Sherbino J. *CanMEDS 2015 Physician Competency Framework*. Ottawa (ON): Royal College of Physicians and Surgeons of Canada; 2015. Available from: https://canmeds.royalcollege.ca/uploads/en/framework/CanMEDS%202015%20Framework_EN_Reduced.pdf [Accessed on May 21, 2025].