

EDITORIAL

BEYOND DIGITAL SKILLS: WHY AI LITERACY MUST BECOME A CORE ELEMENT OF MEDICAL PROFESSIONALISM

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Dear Editor,

Artificial intelligence (AI) is no longer a distant possibility in medicine. It is already being used to summarize clinical information, support diagnostic decisions, draft patient communications, assist research, and generate educational content. Medical students and doctors are also using freely available generative AI tools, often without formal training or institutional guidance. The question is therefore no longer whether doctors should use AI. The more important question is whether they are sufficiently prepared to use it safely, critically, and professionally.

Traditional digital skills focus on the ability to operate electronic health records, search databases, communicate through digital platforms, and protect one's online identity. AI literacy demands something more. It requires doctors to understand what AI can and cannot do, critically evaluate its outputs, recognize bias and uncertainty, protect confidential information, and remain accountable for decisions influenced by these systems. In this sense, AI literacy is not simply a technical skill. It is becoming an essential component of medical professionalism. From technological competence to professional responsibility. Professionalism has always required physicians to maintain competence, protect confidentiality, communicate honestly, recognize the limits of their knowledge, and place patients' inter-

ests above convenience. These responsibilities do not disappear when AI becomes involved. On the contrary, AI makes them more complex. Generative AI systems can produce fluent and authoritative answers even when the underlying information is incomplete, inaccurate, or fabricated. The World Health Organization has highlighted risks related to false or biased outputs, automation bias, cybersecurity, privacy, and the inappropriate use of patient data¹ A well-written response may appear clinically convincing, but fluency should not be mistaken for accuracy. The World Medical Association has therefore emphasized the concept of augmented intelligence: AI should strengthen rather than replace human judgement. Its 2025 statement affirms that physicians must retain final authority over AI-supported decisions and remain accountable for patient care² This is a crucial professional principle. A doctor cannot transfer responsibility to an algorithm, just as responsibility cannot be transferred to a laboratory report, clinical guideline, or decision-support system. Recent evidence illustrates why this matters. In a study evaluating large language models for drafting emergency department encounter summaries, only 33% of summaries produced by GPT-4 were entirely free of errors across all evaluated domains. Hallucinated information appeared in 42% of summaries, while 47% omitted clinically relevant information³ The study did not suggest that these tools have no value. Rather, it demonstrated that apparently useful outputs still require careful cl-

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inical review. The problem is not limited to inaccurate information. AI recommendations can also influence how clinicians think. An empirical study of AI-assisted diagnostic decision-making found that users sometimes agreed with incorrect AI recommendations particularly when they perceived the system as beneficial. Those without specialist expertise were more susceptible to this automation bias.⁴ Doctors therefore need the confidence and competence to challenge an AI-generated recommendation, even when it is presented with certainty. What should AI literacy include?

AI literacy does not mean that every doctor must learn programming, develop algorithms, or become a data scientist. It means acquiring the knowledge and judgement needed to use AI responsibly within one's professional role.

At a minimum, doctors should understand the broad differences between predictive AI, clinical decision-support systems, and generative AI. They should recognize that an AI model's performance depends on the data used to develop and validate it. A tool trained predominantly on data from one population may not perform equally well in another setting. This is especially important in low- and middle-income countries, where locally representative data may be limited and imported systems may not adequately reflect local disease patterns, languages, resources, or clinical pathways.

AI-literate doctors should be able to ask basic but important questions. What is the intended purpose of the tool? Has it been validated in a population similar to the patients being treated? What information was used to generate the recommendation? What are the known limitations? Could bias affect particular groups? Is patient information being entered into a secure and institutionally approved sys-

tem? Who remains responsible if the output contributes to harm?

AI literacy must also include communication. Patients should not be left with the impression that a computer has independently determined their diagnosis or treatment. Where AI materially contributes to care, doctors should be able to explain its role in understandable terms, acknowledge uncertainty, and clarify that professional judgement remains central. Transparency is essential for preserving trust.

The international Digital Health Competencies in Medical Education framework supports a systematic approach to preparing future doctors for digitally enabled practice. Developed through consensus involving 211 experts from 79 countries and territories, the framework includes competencies related to health data, information systems, governance, ethics, and AI.⁵ Its importance lies in treating digital competence as part of clinical practice rather than as an isolated technical subject.

Medical education cannot remain reactive

Despite rapidly expanding interest, AI education in medicine remains inconsistent. A major scoping review found substantial growth in the application of AI across medical education but also identified limitations in the evidence, curriculum integration, and evaluation of educational outcomes.⁶ Similarly, a 2025 survey of United States osteopathic medical schools found that formal policies and training related to generative AI were still uneven, with many institutions remaining at the stage of informal discussion or policy development.⁷

Ignoring AI will not prevent its use. It will only encourage hidden, inconsistent, and potentially unsafe use. Blanket prohibition is equally inadequate. Students who are simply told not to use AI are unlikely to develop the judgement required when they

encounter AI-supported systems in clinical practice. AI literacy should therefore be introduced progressively throughout undergraduate, postgraduate and continuing medical education. Early teaching can cover fundamental concepts, confidentiality, appropriate use, disclosure, and verification of generated content. Later learning should address clinical decision support, bias, validation, patient communication, research integrity, and accountability.

Importantly, teaching should extend beyond prompt-writing demonstrations. Knowing how to obtain a polished response from a chatbot is not the same as knowing whether that response is reliable or appropriate. Educational activities should require learners to compare AI-generated recommendations with clinical guidelines, detect fabricated references, identify missing clinical information, examine biased outputs, and justify when an AI recommendation should be accepted, modified, or rejected.

Curriculum reform must be accompanied by clear institutional policies. Triola and Rodman have argued for the coordinated integration of curriculum, policy, and governance rather than isolated experimentation with generative AI.⁸ Institutions should specify which tools are approved, what information must never be entered into public platforms, when AI use must be disclosed, and how errors or safety concerns should be reported.

Assessment also requires reconsideration. If AI is likely to become part of professional practice, learners should be assessed both with and without it. They must demonstrate independent clinical competence while also showing that they can supervise AI-supported work. An entrustment-based framework may be particularly useful: learners can gradually progress from observing AI use to using it under supervision and, ultimately, to applying it inde-

pendently within clearly defined professional limits.⁹

Faculty development is equally essential. Educators cannot teach critical AI use if they are themselves uncertain about the technology. Nor can individual teachers carry the responsibility alone. Medical colleges, regulatory bodies, professional associations, hospitals, and continuing professional development program must share responsibility for establishing minimum competencies and providing updated training.

Protecting the human core of medicine

Some fear that incorporating AI into medical education will encourage dependence and weaken clinical reasoning. That risk is real, but it is an argument for better education rather than avoidance. Doctors must learn when AI can improve efficiency and when it may introduce error, bias, distraction, or false reassurance.

The purpose of AI literacy is not to make medicine more technological. It is to ensure that technology remains subordinate to the values of medicine. Empathy, ethical judgement, contextual understanding, communication, and responsibility cannot be delegated to an algorithm. AI may suggest possibilities, organize information, or identify patterns, but it does not carry professional accountability and cannot understand a patient's experience in the way a trusted clinician should.

The defining question for the future will not be whether a doctor uses AI, but how the doctor uses it. Does the physician verify the information? Protect confidentiality? Recognize bias? Explain uncertainty? Challenge unsafe recommendations? Remain accountable for the final decision?

These are questions of professionalism. AI literacy must therefore move beyond optional workshops a-

nd continuously updated professional competency. The aim is not to produce doctors who follow AI more confidently. It is to prepare doctors who know when to use it, when to question it, and when to set it aside.

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