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## Editorial

## Re-imagining clinical training in the artificial intelligence era

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Artificial intelligence (AI) is now no longer a future reality in medicine; it is transforming swiftly how clinicians diagnose, forecast outcomes, and communicate with patients. Radiology, pathology, cardiology, and oncology are already utilizing AI with accuracy that equals or exceeds human proficiency in specialized tasks. Medical training is still, however, with a system in place far longer than AI has been a standard part of clinical practice. If the clinicians of tomorrow are to use AI wisely, clinical education will need to be re-imagined.<sup>1-3</sup>

## 1. The Legacy of Traditional Training

For more than a century, bedside instructions and hands on training have been the mainstays of medical education. Clinical training enabled learners to observe, reason, and communicate directly with patients under supervision. The competency-based medical education (CBME) reforms, implemented worldwide and strengthened in India recently by the National Medical Commission (NMC), incorporated early clinical exposure, integration of simulation, and outcome-based frameworks.<sup>5</sup> However, even with these advances, there are still some challenges: reduced patient exposure, inconsistent quality instruction, faculty overload, and documentation demands diminish the richness of the bedside experience.<sup>2</sup>

### 1.1. Enter the AI era

AI is transforming healthcare on three connected fronts. First, decision and diagnostic tools are able to analyse

images, ECGs, and pathology slides at scale.<sup>5</sup> Second, predictive analytics and precision medicine platforms use multimodal data to guide individualized treatment regimens.<sup>2</sup> Third, AI is transforming education itself—virtual patients, adaptive tutors, and augmented/virtual reality environments provide individualized, scalable learning experiences.<sup>1,3</sup> These developments pose opportunity as well as risk: clinicians will be overwhelmed or bypassed over by technology unless training can keep pace.<sup>2</sup>

### 1.2. Rethinking clinical training

Clinical education must be reformed to prepare physicians not just to implement AI, but also to challenge it. Physicians need competencies for interpreting algorithmic suggestions, understanding dataset limitations, and integrating suggestions into patient-centred decision-making.<sup>1</sup> New skills—data literacy, algorithmic thinking, and digital professionalism within curricula in addition to classical clinical reasoning.<sup>3,5</sup>

At the same time, training must avoid undermining the humanistic core of medicine. Empathy, communication, and advocacy are as essential as ever. Educators must ensure that AI augments but does not replace bedside interaction.<sup>1,2</sup> Simulation, AI-driven feedback, and digital twin technology can augment practice opportunities but cannot substitute real patient contact.<sup>3</sup>

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## 2. Ethical and Professional Considerations

AI systems can reinforce biases if trained on prejudiced data, threatening fairness and justice.<sup>2</sup> Medical trainees are encouraged to question the transparency of models, quantify interpretability, and ensure patient autonomy. Human oversight, responsibility, and informed consent are essentials in using AI in health, as per the World Health Organization (WHO).<sup>4</sup> Profession identity formation in the age of AI must reaffirm the clinician as an active decision-maker and patient advocate, not a passive recipient of algorithms.<sup>1</sup>

### 2.1. Global and local challenges

Low and middle income countries (LMICs) are constrained by infrastructure, faculty readiness, and digital gaps.<sup>2</sup> But LMICs can skip a step with the use of affordable AI solutions tailored to local needs.<sup>3</sup> Developing nations might embrace AI sooner.<sup>5</sup> Faculty preparation is imperative; educators themselves need to become AI-literate to direct students responsibly.<sup>1</sup>

### 2.2. Towards the future

Future hybrid models blend bedside authenticity with the scalability of education empowered by AI.<sup>1-3</sup> Multidisciplinary collaboration among clinicians, educators, and data scientists is required. Research validation to ensure that AI-assisted training not only enhances learner performance but also patient outcomes is required.<sup>2</sup> Lastly, AI needs to be seen not as a replacement for the physician but as a partner—expanding horizon, improving precision, and freeing clinicians to focus on the human aspects of healing.<sup>4</sup>

## 3. Conclusion

We have a choice to make. If we continue down the current path with medical education, it threatens to produce clinicians unprepared for an AI-driven health system.<sup>2</sup> But if we embrace innovation responsibly, re-conceiving clinical training in the era of AI can enhance competence and compassion as well.<sup>1</sup> The challenge for educators, regulators, and institutions is to ensure that AI becomes an enabler of better doctors and healthier communities and not a diversion from the core of medicine.<sup>5</sup>

## 4. Conflict of Interest

None.

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