Artificial intelligence and the future of physicians: replacement or partnership?

Farooq Azam Rathore (iD) ✉ [1], Fareeha Farooq [2]

1: Department of Rehabilitation Medicine, Quetta Institute of Medical Sciences, Quetta, Baluchistan, Pakistan

2: Department of Biochemistry, Quetta Institute of Medical Sciences, Quetta, Baluchistan, Pakistan

Email ✉ : farooqrathore@gmail.com
Contact #: +92-312-9549821

ABSTRACT

As artificial intelligence (AI) tools are becoming more integrated in healthcare, claims that AI will soon displace physicians are also growing. We believe that this assertion is premature and warrants deeper examination. This viewpoint first acknowledges the emerging and promising roles of AI in various specialties such as radiology, pathology, and cardiology, where AI tools and algorithmic models can assist in image analysis, predictive risk modelling, and optimize clinical workflow. It then challenges the narrative of "doctor replacement," by proposing four arguments: (1) a "physician" encompasses many roles and many cannot be automated; (2) passing standardized exams or diagnostic challenges cannot be equated with true clinical competence and clinical care provided in a variety of setting; (3) medical practice extends beyond accurate diagnosis to include clinical judgment, experience, ethical reasoning, and individualized management strategies; (4) patients seek human connection, empathy, trust, and presence; qualities that AI cannot authentically replicate. We propose a roadmap for physician–AI cooperation, promoting AI literacy for physicians at all levels, hybrid workflows, and improving human clinical skills in the time of rapid technological advancements. We argue that AI should augment, not replace, physicians.

Keywords: Artificial Intelligence (MeSH); Physicians (MeSH); Empathy (MeSH); Clinical Reasoning (MeSH); Education, Medical (MeSH); Human-Machine Collaboration (Non-MeSH); Patient-Centered Care (MeSH).

INTRODUCTION

The promise of artificial intelligence in diagnosis and clinical care: Rapid advances in artificial intelligence (AI) and large language models (LLMs) are transforming healthcare across multiple domains and specialties. As of 2021, there were more than 100 commercially available AI software applications for radiology,[1] and the integration of AI products in radiology has steadily increased since 2020, particularly in high-income countries.[2] Convolutional neural networks (CNNs) and integrated AI-computer-aided detection systems are being used for image segmentation, anomaly detection, and prioritization of critical findings.[3]

AI applications, especially those based on deep learning and radiomics, have achieved significant accuracy in identifying various abdominal conditions. These include, but are not limited to, diffuse liver parenchymal disease, focal liver lesions, pancreatic ductal adenocarcinoma, renal tumours, and bowel pathologies.[4] These models are highly effective in automating processes like segmentation, classification, and prognostication across imaging modalities such as ultrasound, computed tomography (CT) scan, and magnetic resonance imaging (MRI). In several contexts, they have shown performance comparable to, or exceeding, conventional diagnostic techniques. In pathology, digital pathology and AI are gaining traction. A recent systematic review and meta-analysis evaluated AI applied to whole slide images across various types of disease. It reported average sensitivity of approximately 96.3% and specificity of approximately 93.3%.[5] In psychiatry AI powered mobile phone applications can help address mental health challenges faced by children.[6] AI, particularly CNNs, have demonstrated significant promise in dermatology, especially for tasks like skin cancer detection and classification.[7] Recent studies indicate that AI-based systems can achieve high diagnostic accuracy, sometimes surpassing the performance of dermatologists in certain applications. The integration of AI into clinical dermatological practice holds the potential to enhance triage processes, support clinical decision-making, and ultimately improve patient outcomes.[7]

These and other examples show that AI is augmenting and enhancing many aspects of diagnosis and clinical care by improving speed, detecting abnormal findings and supporting workflow and decision making for the physicians. However, the narrative that rapid technological advancement will enable AI to entirely replace physicians oversimplifies the profound complexities inherent in clinical practice.

The fear: will AI replace physicians: Media coverage, and even scientific publications of AI and LLMs often highlight their success in medical exams,[1,8] and better performance than physicians,[9] leading to headlines suggesting that physicians may soon be replaced.[10] These narratives frequently originate outside the clinical domain, lacking a nuanced understanding of the realities of medical practice. Consequently, they may provoke anxiety, particularly among medical students and early-career physicians. However, such claims are usually based on limited assessments conducted in controlled environments rather than real-world clinical settings. They fail to account for the complex, dynamic, and multifaceted role of physicians in everyday practice. As a result, they may distort public and

professional perceptions, fueling unnecessary concern about the future of the medical profession.

To address these concerns, it is important to examine what current AI systems can and cannot do, and to recognize the value of human physicians within patient care. In this context, we present four key arguments supporting the position that AI cannot replace physicians.

The "Doctor" role is multifaceted and cannot be fully automated: The title "doctor" or "physician" is an umbrella term a doctor can perform multiple roles based on his training, specialty and requirement. They can act as a diagnostician, proceduralist, therapeutic planner, counsellor, palliative care physician, researcher, team leader and teacher. Each of these roles demand distinct skills like manual dexterity, bedside judgment, communication skills, team coordination, moral reasoning and procedural competence. An AI tool that excels in radiological diagnosis cannot do a simple clinical examination, perform a procedure, lead a resuscitation team, or counsel a grieving family.

Decision-making in medicine is often contextual and diverse. The patients present in unpredictable ways, with missing or conflicting data, comorbidities, and unique socio-economical challenges. In many settings, physicians must make decisions under uncertainty, limited resources, or evolving disease. Currently, no AI model can yet flexibly operate across those diverse real-world contexts. AI models are domain specific. Their performance can degrade when encountering unforeseen patterns or shifts in patient populations. This limits their applicability to the full spectrum of medical practice. In addition, physicians routinely make decisions involving ethics, risk-benefit assessment, and moral responsibility. These aspects cannot be fully automated and left to a soulless AI tool.

Passing exams does not equal clinical competence: LLMs like ChatGPT have been shown to score at or near passing thresholds on medical licensure examinations. Kung TH, et al., reported that ChatGPT performed at or near the passing threshold of 60% accuracy of the United States Medical Licensing Examination (USMLE). ChatGPT was able to achieve this result without specialized input from human trainers.[8] Recent work, assessing ChatGPT-4 also demonstrates iterative improvement in exam-style accuracy.[11] However, such performance by LLMS reflects pattern recognition gained by training on millions of well-structured questions and not the complexity of real patient care. Medical exams test usually test recall, pattern matching, and structured problem solving using idealized vignettes. Real world patients in hospital and clinics rarely present with full information. Physicians must choose investigations judiciously, interpret ambiguous or conflicting results, tailor therapies to individual circumstances, and continuously reassess evolving clinical conditions. The unpredictable, complex nature of clinical reality is not captured by standardized exams. Thus, exam success by an AI cannot be equated to safe, responsible, human care.

Diagnosis is only part of the physician's work: Diagnosis is often portrayed as the "highest leverage" task by technology companies selling AI hype. However, in reality, it represents only one component of comprehensive patient care. After diagnosis, physicians have to create management plan, counsel patients, monitor therapy, manage complications and coordinate multidisciplinary care. In emergencies, clinicians must act quickly, often with incomplete data and face unexpected complications. In long-term care, they must offer psychological support, answer questions, improve patient compliance and try to improve patient outcomes. Although highly sophisticated AI tools can generate differential diagnoses, support clinical decision-making, and identify red flags, they cannot deliver holistic patient care. They cannot lead resuscitations, comfort families, adapt to unpredicted complications, or build connections over time. Its main role is supporting, not supplanting, the continuum of care.

Patients seek human, not an algorithm: Why do patients prefer consulting a physician rather than relying solely on a medical database?

The answer lies in the need for human attention, empathy, and shared presence. A physician's ability to listen attentively, interpret nonverbal cues, tailor communication according to a patient's literacy level and cultural context, and provide emotional support is central to the therapeutic relationship. Although AI chatbots may generate language that appears empathetic, such responses are derived from learned linguistic patterns rather than genuine emotional understanding or lived human experience. Empathy in clinical care is not merely the production of comforting words; it involves relational engagement, moral commitment, and shared vulnerability. In moments of illness, uncertainty, or crisis, authentic human presence carries meaning that cannot be fully replicated or digitized.

Clinicians often bypass comprehensive history-taking and focused physical examination, moving prematurely to laboratory investigations or imaging studies. Rather than expressing concern about AI replacing physicians, we should reassert-and actively re-teach, the uniquely human dimensions of clinical care: attentive listening, appropriate clinical reasoning, narrative empathy, cultural humility, and moral accountability.

Regrettably, as technology continues to advance, bedside skills appear to be declining globally.[12] Many clinicians now rely early on imaging modalities or automated diagnostic tools, sometimes at the expense of detailed history-taking and careful physical examination. This trend risks narrowing the scope of clinical engagement and weakening the physician-patient relationship. Instead of fearing technological displacement, the medical profession should focus on strengthening and preserving the human foundations of care. These include active listening, thoughtful clinical judgment, compassionate presence, healing touch, and ethical responsibility, attributes that remain beyond the reach of algorithmic systems.

Roadmap for future: a collaborative and human-centered integration: In order to ensure that AI strengthens, rather than undermines, the role of

physicians, we propose the following roadmap:

Integrate AI literacy into medical education: Medical colleges should formally incorporate AI literacy into undergraduate and postgraduate curricula. Students, residents, and practicing clinicians must understand core concepts such as model development, bias, interpretability, limitations, failure modes, and the need of human oversight.

Design hybrid AI-physician workflows: AI should function as a decision-support tool rather than an autonomous authority, must retain ultimate responsibility for patient care decisions, with the capacity to review, question, override, or reject AI-generated outputs.

Allow time for human interaction: Healthcare systems should ensure that clinicians have adequate time to listen, examine, empathize, and engage in shared decision-making with patients. Institutional models should avoid prioritizing productivity metrics at the expense of presence, compassion, and relational continuity.

Teach, assess, and reward human skills: Medical curricula should formally teach and evaluate competencies such as communication, empathy, cultural sensitivity, shared decision-making, bedside reasoning, the skills that cannot be replicated by AI systems. Healthcare institutions must also recognize and reward these human attributes, rather than focusing solely on throughput or technical performance indicators.

Establish ethical, regulatory, and accountability frameworks: The deployment of AI in healthcare must include clearly defined responsibility structures, audit mechanisms, bias mitigation strategies, transparency requirements, and robust human oversight.

Demonstrate real-world validation: Most current many AI models are developed and deployed in high-income contexts with limited external generalizability to low- and middle-income countries. There is a pressing need for multicenter prospective trials and real-world implementation research in diverse and resource-constrained environments to ensure equity, safety, and contextual appropriateness.

Promote collaborative culture: The narrative must shift from "AI versus physician" to "physician and AI." Technology companies, clinicians, engineers, policymakers, and healthcare administrators should work collaboratively to position AI as a tool that amplifies human capability. Importantly, physicians should play a leading role in the design, evaluation, and governance of AI systems to ensure alignment with clinical realities and patient-centered values.

CONCLUSION

AI offers powerful tools to support medicine by improving diagnostics, aiding clinical decision-making, and enhancing workflow. However, the claim that AI will replace physicians misunderstands the depth, complexity, and human core of medical care. Being a physician requires not only the ability to diagnose, but also to function in high-pressure, complex environments while providing empathy and relational trust. Passing exams or rapidly diagnosing cases does not equate to mastery of patient care. Patients seek human care, not soulless algorithms. The future lies in co-evolution: clinicians who understand and harness AI, and AI systems designed to empower and not displace the human at the center of care.

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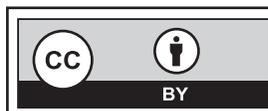
KMUJ web address: www.kmuj.kmu.edu.pk
Email address: kmuj@kmu.edu.pk