COMPREHENSIVE EDUCATORS GUIDE FOR AI IN HEALTH PROFESSIONS EDUCATION

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INTRODUCTION

The integration of Artificial Intelligence (AI) into the healthcare sector is not a distant prospect but a contemporary reality, fundamentally reshaping clinical practice and health management. This technological revolution presents both a profound opportunity and an urgent challenge to health professions education (HPE). The core mission for educators today is to cultivate a new generation of health professionals who can not only utilize these powerful tools but also guide their ethical and equitable implementation. This white paper serves as a comprehensive, evidence-based resource for health professions educators, providing a roadmap for navigating this complex new terrain. It builds upon the foundational work of Professor Rubin Pillay, updated with the latest literature and research to offer a current and forward-looking perspective.

The foundational philosophy of this guide is the principle of augmented intelligence, which posits that AI should serve to supplement, not supplant, the human clinician. The human mind is inherently limited in its capacity to process the vast and ever-growing sea of medical information. AI provides the means to manage this complexity, augmenting the clinician's cognitive capabilities and freeing them to focus on the uniquely human aspects of care: empathy, nuanced communication, and holistic patient understanding.

To this end, HPE is faced with a dual mandate, a concept echoed across the literature from leading medical organizations [1, 2]. This mandate requires a two-pronged approach:

1. **Training in AI:** This involves defining and instilling a set of foundational competencies that all health professionals must possess to use AI-based tools safely, effectively, and ethically in their practice.

2. **AI in Training:** This involves leveraging the capabilities of AI itself to enhance the educational process, creating more efficient, personalized, and impactful learning experiences – a concept often referred to as "Precision Education."

This white paper, drawing upon the work of leading organizations and researchers, is structured to address both facets of this mandate. It provides a framework of core competencies, offers concrete pedagogical strategies, and explores real-world case studies to prepare educators for the profound responsibility of training an AI-ready health workforce.

#PART 1

FOUNDATIONAL COMPETENCIES FOR THE AI-ENABLED HEALTH PROFESSIONAL

The effective and responsible use of AI in health care is not an innate skill; it is a professional competency that must be deliberately taught and assessed. A broad consensus has emerged from organizations like the American Medical Association (AMA), the Association of American Medical Colleges (AAMC), and researchers in publications such as Academic Medicine, on the essential domains of knowledge and skill required of a modern, AI-enabled health professional [2, 3]. This section synthesizes this expert consensus into a clear framework for curriculum development, updated with the latest research to reflect the evolving demands of the field.

CORE COMPETENCY DOMAINS

The following table outlines the core competency domains that are essential for all health professionals in the era of AI. This framework is a synthesis of the initial work by Pillay and the most recent recommendations from the AAMC and other leading bodies [4].

Competency Domain	Description and Key Subcompetencies
1. Foundational Knowledge of AI	Learners must understand the basic concepts of AI, machine learning, and data science. They should be able to describe how data quality and representativeness influence AI outputs and apply basic statistical properties (e.g., sensitivity, specificity) to interpret AI results. The goal is not to create computer scientists, but to foster general informatics competency.
2. Data Literacy & Management	Recognize the critical role of data in the AI lifecycle. Learners must understand the principles of data stewardship, including privacy and security. They need to identify how factors like data source, quality, and representativeness impact AI performance and can introduce bias. This includes a responsibility for their own documentation practices, as EHR data is used at scale to train future AI models.
3. AI-Enhanced Clinical Encounters	Carry out AI-enhanced clinical encounters that integrate diverse sources of information in creating patient-centered care plans. Students must exercise clinical judgment when applying AI-generated recommendations. They must explain concepts of risk and uncertainty related to AI outputs to patients. Enhanced communication skills are necessary to explain AI outputs and integrate diverse data (including patient-reported data from wearables/sensors) in shared decision-making.
4. Evidence-Based Evaluation of AI-Based Tools	Evaluate the quality, accuracy, safety, contextual appropriateness, and biases of AI-based tools and their underlying datasets. Students must access critical information before application, including sources and representativeness of training data, algorithm performance, and boundary conditions (e.g., exclusion criteria for populations). They must collaborate with patients, caregivers, and informaticians in the ongoing monitoring of AI applications.

5. Workflow & Team Collaboration for AI-Based Tools	Analyze and adapt to changes in teams, roles, responsibilities, and workflows resulting from implementation of AI-based tools. Students must participate in team discussions analyzing how new AI tools fit into existing workflows. They must recognize data and informatics professionals as valuable team members and collaborate with them.
6. Practice-Based Learning and Improvement	Participate in continuing professional development and practice-based improvement activities related to use of AI tools in health care. Given the rapid pace of technological change, a commitment to lifelong learning is paramount. This includes a professional responsibility to stay informed about new AI tools, their evidence base, and their evolving ethical implications.
7. Ethical, Legal, & Social Implications (ELSI)	Explain how social, economic, and political systems influence AI tools and how these relationships impact justice, equity, and ethics. Learners must be prepared to identify and mitigate personal and structural biases that can be amplified by AI. They must understand that they hold the primary professional and legal responsibility for all patient care decisions, regardless of AI support, and be able to advocate for the development of fair and equitable systems.

NEW FUNCTIONAL ROLES FOR PROVIDERS

The integration of AI into clinical practice necessitates a shift in the functional roles that health professionals play. Training must prepare learners to adeptly navigate these new responsibilities:

- **The Clinician as an Evaluator:** Beyond diagnosis and treatment, the clinician must become a discerning evaluator of technology. This involves judging when an AI tool is appropriate for a given clinical context, understanding its limitations, and knowing what inputs are required to generate meaningful and reliable results.
- **The Clinician as an Interpreter:** The ability to interpret AI outputs with accuracy and clinical wisdom is crucial. This goes beyond simply reading a result; it requires an understanding of potential sources of error, bias, and clinical inappropriateness, and the ability to place the AI's output within the broader context of the patient's story.
- **The Clinician as a Communicator:** As AI becomes a more common part of the clinical encounter, clinicians must be able to communicate its role and results to patients and their families in a clear, understandable, and empathetic manner. This is a cornerstone of shared decision-making in the age of AI.
- **The Clinician as a Data Steward:** With the vast amounts of patient data being used to train and operate AI systems, clinicians have a heightened responsibility as stewards of that data. This involves ensuring patient privacy, maintaining data security, and practicing responsible documentation, recognizing that today's clinical notes are the training data for tomorrow's algorithms.

- **The Clinician as an Advocate:** Finally, health professionals must be equipped to advocate for the development and use of AI systems that are ethical, equitable, and centered on patient well-being. This includes speaking up about biased algorithms, data privacy concerns, and the potential for AI to either exacerbate or mitigate health disparities.

AI PROMPTING SKILLS: A NEW CORE COMPETENCY

The rise of generative AI tools, particularly large language models like ChatGPT, has introduced a new essential skill for health professionals: **AI prompting literacy.** Recent research has shown that the quality of AI outputs is heavily dependent on the quality of the prompts provided by users [9]. This has significant implications for health professions education, as students must learn not only how to use AI tools but how to use them effectively and safely.

KEY COMPONENTS OF AI PROMPTING SKILLS:

Effective AI prompting in healthcare contexts requires understanding several critical principles. **Specificity and Context** are fundamental, as healthcare professionals must provide detailed, contextually rich prompts that include relevant patient information, clinical scenarios, and specific questions or tasks. **Iterative Refinement** represents another crucial skill, involving the ability to refine and improve prompts based on initial AI responses, asking follow-up questions, and providing additional context when needed.

Safety and Verification protocols are essential, requiring users to understand that AI outputs must always be verified against established medical knowledge and guidelines, never accepting AI recommendations without critical evaluation. **Ethical Considerations** must be integrated into prompting practices, including awareness of patient privacy when crafting prompts and understanding the limitations and potential biases of AI systems.

EDUCATIONAL IMPLICATIONS:

Health professions curricula must now include specific training on AI prompting techniques. This includes hands-on practice with medical AI tools, case-based learning scenarios where students practice crafting effective prompts for different clinical situations, and assessment of students' ability to generate appropriate prompts and critically evaluate AI responses. Students should also learn to recognize when AI tools are appropriate to use and when human expertise is required.

#PART 2

THE AI REVOLUTION IN MEDICAL EDUCATION: CURRENT APPLICATIONS

The rapid integration of AI in medical education has led to a wide array of innovative applications aimed at enhancing teaching, learning, and education management processes. This section will explore key AI-driven innovations currently being implemented in medical schools and teaching hospitals worldwide, categorized into three main areas: solutions for medical students, educators, and administration.

AI FOR STUDENTS

- **AI-Powered Personalized Learning:** AI-driven adaptive learning platforms are revolutionizing how medical students acquire and retain knowledge. These systems use machine learning algorithms to analyze student performance, identify knowledge gaps, and create personalized learning paths. For example, AMBOSS is a comprehensive medical learning platform that uses AI to adapt its question bank and learning resources to each student's individual needs, tailoring content delivery to areas requiring more practice [5].
- **Virtual Patients and Simulations:** AI-powered simulations and virtual patients offer realistic training environments for medical students to practice clinical skills and decision-making in a safe and controlled setting. These immersive experiences allow students to interact with virtual patients, gather medical histories, conduct examinations, and develop diagnostic and treatment plans, all while receiving immediate feedback and guidance from AI algorithms. Oxford Medical Simulation (OMS), for instance, offers VR-based clinical simulations that use AI to create realistic patient interactions, with the AI adapting the patient's responses based on the student's actions [5].
- **AI-Assisted Diagnostic Training:** AI-powered diagnostic tools are being integrated into medical education to assist students in developing their clinical reasoning skills. These tools can analyze medical images, laboratory results, and patient data to generate differential diagnoses, suggest further investigations, and provide educational resources relevant to the case. By working alongside these tools, students can learn from real-world scenarios and enhance their diagnostic accuracy. Enlitic, an AI company specializing in medical imaging, has developed tools that can be used in radiology education to highlight areas of interest in medical images and explain the reasoning behind diagnoses [5].
- **Natural Language Processing for Medical Literature Review:** The vast amount of medical literature can be overwhelming for students. Natural language processing (NLP) techniques are being employed to develop AI-powered tools that can efficiently search, summarize, and extract relevant information from medical literature. These tools can help students stay up-to-date with the latest research findings, identify relevant clinical trials, and access evidence-based information to support their learning and clinical decision-making. IBM's Watson for Oncology is being used in some medical schools to teach students how to quickly synthesize relevant information from thousands of medical journals and clinical trials when researching treatment options for cancer patients [5].

AI FOR EDUCATORS

- **AI for Curriculum Design and Optimization:** AI analytics are being used to analyze student performance data and feedback to continuously improve and optimize medical curricula. The University of Michigan Medical School, for example, is using AI to analyze student performance data across various courses and clinical rotations to identify areas where the curriculum can be improved or better integrated [5].

- **Automated Assessment and Feedback Systems:** AI-powered systems are being used to provide more frequent, detailed, and objective assessments of student performance, particularly in areas like clinical reasoning and decision-making. Shadow Health's Digital Clinical Experiences use AI to assess students' interactions with virtual patients, providing detailed feedback on their communication skills, clinical reasoning, and empathy [5].
- **AI-Enhanced Lecture Preparation and Delivery:** AI tools are assisting medical educators in creating more engaging and effective lectures by suggesting relevant content, generating visual aids, and even providing real-time analytics on student engagement during lectures.
- **Virtual Teaching Assistants:** AI-powered chatbots and virtual assistants are being deployed to provide 24/7 support to students, answering common questions and providing guidance on course material. This allows educators to dedicate more time to complex tasks like curriculum development and personalized student mentoring.

AI FOR ADMINISTRATION

- **Predictive Analytics for Student Performance:** AI-powered predictive analytics are helping identify at-risk students and optimize resource allocation. By analyzing a wide range of data points, institutions can proactively offer support to students who may be struggling.
- **AI-Driven Admissions Processes:** AI is being used to enhance the efficiency of admissions processes and potentially reduce bias. The NYU Grossman School of Medicine, for instance, used a big data approach to enhance their admissions process and incorporate holistic measures at the initial screening stage, intentionally mitigating biases common in admissions [6].
- **Resource Allocation and Scheduling Optimization:** AI can optimize the allocation of resources, such as classroom space and clinical rotation schedules, to improve efficiency and reduce administrative overhead.

#PART 3

RESPONSIBLE AND ETHICAL AI IN HEALTH PROFESSIONS EDUCATION

The integration of AI into healthcare and health professions education is not merely a technical challenge; it is a profound ethical one. As AI systems become more autonomous and influential, it is imperative that they are developed and deployed within a robust ethical framework that prioritizes patient well-being, equity, and human values. This section outlines a framework for responsible and ethical AI implementation, drawing on recent guidance from the World Health Organization (WHO) and the Association of American Medical Colleges (AAMC) [4, 7].

A FRAMEWORK FOR ETHICAL IMPLEMENTATION

In 2024, the WHO released comprehensive guidance on the ethics and governance of large multi-modal models (LMMs), providing over 40 recommendations for governments, technology companies, and healthcare providers [7]. Similarly, the AAMC has published its "Principles for the Responsible Use of Artificial Intelligence in and for Medical Education," emphasizing a human-centered approach [4]. Synthesizing these and other recent works, a clear set of ethical principles emerges:

Ethical Principle	Description
1. Human-Centered Focus	Human judgment, critical thinking, and creativity must remain central to the use and implementation of AI. The goal is to augment, not replace, human decision-making, ensuring that technology serves human values and patient interests.
2. Transparency and Explainability	The workings of AI systems should be as transparent as possible. Healthcare professionals need to understand the basis of AI-generated recommendations to critically evaluate them, and patients have a right to know when AI is involved in their care.
3. Fairness and Equity	AI systems must be designed and implemented in a way that promotes health equity and avoids perpetuating or exacerbating existing disparities. This requires a concerted effort to identify and mitigate biases in algorithms and the data they are trained on.
4. Privacy and Data Protection	The use of AI in healthcare necessitates stringent data privacy and security measures. Patient data must be handled with the utmost care, with clear policies for consent, data stewardship, and protection against breaches.
5. Accountability and Responsibility	Clear lines of accountability must be established for AI-driven decisions and outcomes. This includes defining the legal and professional responsibilities of clinicians, institutions, and technology developers.
6. Safety and Efficacy	AI tools must be rigorously evaluated for their safety, accuracy, and effectiveness before being integrated into clinical or educational settings. This includes ongoing monitoring and post-release auditing to ensure they perform as intended.

ADDRESSING BIAS IN AI

A critical ethical challenge in the use of AI is the potential for algorithmic bias. AI systems learn from data, and if that data reflects existing societal biases, the AI will learn and potentially amplify those biases. This can lead to health disparities, as AI tools may perform less accurately for certain populations based on race, ethnicity, gender, or socioeconomic status.

Mitigating bias requires a multi-faceted approach:

- **Data Diversity:** Ensuring that training data is representative of the diverse populations that the AI will be used for.
- **Algorithmic Auditing:** Regularly testing AI systems for bias and performance disparities across different demographic groups.
- **Transparency:** Making information about the training data and potential limitations of AI tools readily available to users.
- **Education:** Training healthcare professionals to be aware of the potential for AI bias and to critically evaluate AI-generated recommendations in the context of individual patients.

#PART 4

PEDAGOGICAL STRATEGIES AND CURRICULUM IMPLEMENTATION

The integration of AI into health professions education requires more than just adding new content; it necessitates a fundamental shift in pedagogical philosophy and a systematic approach to curriculum reform. This section outlines key pedagogical shifts and a practical framework for implementation, drawing on best practices from leading institutions and the latest educational research.

FOUNDATIONAL PEDAGOGICAL SHIFTS

The advent of AI challenges the traditional models of medical education, which have long emphasized the acquisition and retention of vast amounts of factual information. Two key paradigm shifts must guide curriculum reform:

1. The Knowledge Management Model:

As noted by the AMA's ChangeMedEd initiative, in an age of ubiquitous information access, the focus of education must shift from "information acquisition" (rote memorization) to "knowledge management" [2]. Educators must equip learners with the skills to access, critically appraise, and apply knowledge, a shift that can actually reduce curricular load by migrating some biomedical content to AI algorithms.

2. The "High Tech, High Touch" Paradigm:

As AI automates routine cognitive tasks, it paradoxically creates more opportunities for meaningful human interaction. When AI handles data analysis, pattern recognition, and routine documentation, clinicians are freed to focus on the uniquely human aspects of care: building therapeutic relationships, providing emotional support, and engaging in complex ethical reasoning. Educational programs must therefore balance technological competency with enhanced training in communication, empathy, and humanistic care [6].

A FOUR-STEP FRAMEWORK FOR CURRICULUM IMPLEMENTATION

Based on successful implementations documented in the literature, a systematic approach to curriculum reform should follow these four essential steps:

Step 1: Faculty Development:

The success of any AI-integrated curriculum depends fundamentally on faculty preparedness. Many current faculty members completed their training before the AI revolution and may lack the necessary knowledge and confidence to teach these concepts effectively. Institutions must invest in comprehensive faculty development programs that include basic AI literacy training, specialized training for faculty leading AI-focused courses, and ongoing professional development to keep pace with technological advances [4].

Step 2: Interdisciplinary Collaboration:

Effective AI education requires expertise that extends beyond traditional health professions faculty. Successful programs have established partnerships with computer science departments, health informatics programs, biostatistics units, and ethics centers. The University of California San Francisco's collaboration with their data science institute serves as an exemplary model, bringing together clinicians, data scientists, and ethicists to co-develop curriculum content [4].

Step 3: Curriculum Integration:

Rather than creating isolated AI courses, leading institutions are integrating AI com-

petencies longitudinally throughout the existing curriculum. This approach, advocated by the AAMC, ensures that AI concepts are reinforced across multiple contexts and clinical disciplines. Integration strategies include embedding AI case studies within existing clinical courses, incorporating AI tools into simulation exercises, and requiring AI-related projects in capstone experiences [2].

Step 4: Establishing Governance and Oversight:

The rapid pace of AI development requires robust governance structures to ensure educational quality and ethical implementation. Institutions should establish AI education committees with representatives from clinical departments, information technology, legal affairs, and student bodies. These committees should be responsible for reviewing and approving AI-related curriculum content, ensuring compliance with privacy and security regulations, monitoring the effectiveness of AI educational interventions, and addressing ethical concerns related to AI use in education [4].

#PART 5

OVERCOMING CHALLENGES AND ENSURING QUALITY

While the potential of AI in health professions education is immense, its successful and responsible integration is not without significant challenges. Addressing these challenges head-on is crucial for ensuring the quality, equity, and effectiveness of AI-enhanced education. This section explores some of the most pressing challenges and offers strategies for overcoming them.

THE EVIDENCE GAP

One of the most significant challenges facing the field is the current lack of rigorous, high-quality evidence for the effectiveness of AI in health professions education. A 2025 systematic review in BMC Medical Education found that the evidence regarding measurable educational outcomes of AI-powered interventions is poor, with most studies suffering from methodological weaknesses such as small sample sizes, lack of control groups, and failure to use established learning theories [8].

To address this evidence gap, the field must move towards more rigorous research methodologies, including:

- **Randomized Controlled Trials (RCTs):** Conducting more RCTs to compare the effectiveness of AI-based interventions with traditional educational methods.
- **Longitudinal Studies:** Tracking the long-term impact of AI education on clinical practice and patient outcomes.
- **Standardized Evaluation Metrics:** Developing and adopting standardized metrics for evaluating the effectiveness of AI educational tools.

ENSURING EQUITY AND ACCESS

The integration of AI into education raises significant concerns about equity and the digital divide. Access to the latest AI tools and technologies may be unevenly distributed, with well-resourced institutions having a significant advantage. This can exacerbate existing inequalities in health professions education and, ultimately, in healthcare itself.

To ensure equitable access, institutions and policymakers should:

- **Invest in Infrastructure:** Provide the necessary technological infrastructure and support to all institutions, regardless of their size or resources.
- **Promote Open-Source Tools:** Encourage the development and use of open-source AI tools and platforms to reduce costs and increase accessibility.
- **Address Algorithmic Bias:** Actively work to mitigate biases in AI algorithms that could disadvantage certain student populations.

FACULTY DEVELOPMENT AND AI LITERACY

As highlighted in the AAMC's principles, faculty development is a critical component of successful AI integration [4]. Many educators may not feel adequately prepared to teach about AI or to use AI-powered tools in their teaching. A lack of AI literacy among faculty can be a major barrier to the effective implementation of AI in the curriculum.

To address this, institutions must:

- **Provide Comprehensive Training:** Offer a range of faculty development opportunities, from basic AI literacy workshops to in-depth training on specific AI applications.

- **Foster a Culture of Learning:** Create a supportive environment where faculty feel comfortable experimenting with new technologies and learning alongside their students.
- **Recognize and Reward Innovation:** Acknowledge and reward faculty who are leaders in the integration of AI into their teaching and research.

ASSESSMENT STRATEGIES IN THE AGE OF AI: NEW CHALLENGES FOR FACULTY

The widespread availability of generative AI tools has fundamentally disrupted traditional assessment methods in health professions education. Faculty now face the challenge of designing assessments that are both AI-aware and educationally meaningful. This requires a comprehensive rethinking of how we evaluate student learning and competency in an AI-enhanced environment [10].

The Challenge of Academic Integrity:

Traditional assessment methods, particularly those relying on written assignments, take-home exams, and research projects, are now vulnerable to AI assistance. Students can use tools like ChatGPT to generate essays, solve problems, and even create clinical reasoning frameworks. This presents faculty with several critical challenges:

- **Detection vs. Integration:** Faculty must decide whether to focus on detecting AI use or integrating it meaningfully into the learning process. Recent research suggests that detection-based approaches are often ineffective and may miss the educational opportunity that AI presents [11].
- **Redefining Academic Integrity:** The concept of academic integrity must evolve to address AI use. Rather than prohibiting AI entirely, institutions need clear policies about appropriate and inappropriate AI use, with explicit guidelines for different types of assignments and assessments.

New Assessment Paradigms:

To address these challenges, faculty must adopt new assessment strategies that are both AI-resistant and educationally valuable:

- **Process-Focused Assessment:** Rather than evaluating only final products, faculty should assess the learning process itself. This includes requiring students to document their thinking process, show their work, and explain their reasoning. Portfolio-based assessments that track learning over time can provide insight into genuine understanding versus AI-generated content.
- **Authentic Assessment:** Assessments should mirror real-world clinical scenarios where AI tools would naturally be available. This includes simulation-based assessments, oral examinations, and practical skills demonstrations that cannot be easily completed by AI alone.
- **AI-Integrated Assessment:** Rather than avoiding AI, faculty can design assessments that explicitly incorporate AI tools, requiring students to demonstrate their ability to use AI effectively and critically evaluate AI outputs. This approach treats AI as a tool that students must learn to use responsibly.
- **Competency-Based Evaluation:** Assessment should focus on demonstrating core competencies rather than memorization of facts. This includes evaluating students' ability to apply knowledge in novel situations, think critically about complex problems, and demonstrate clinical reasoning skills.

Assessment Design Principles for the AI Era:

Faculty should consider several key principles when designing assessments in an AI-enhanced environment:

- **Transparency and Clear Expectations:** Students should understand exactly when and how AI use is permitted or prohibited. Assessment instructions should be explicit about AI policies and the rationale behind them.
- **Multiple Assessment Methods:** No single assessment method should determine a student's grade or competency. A combination of AI-resistant assessments (such as in-person practical exams) and AI-integrated assessments provides a more comprehensive evaluation.
- **Emphasis on Higher-Order Thinking:** Assessments should focus on analysis, synthesis, evaluation, and creation rather than recall and comprehension, which are more easily automated by AI.
- **Real-Time and Synchronous Assessment:** In-person, timed assessments remain valuable for evaluating individual student knowledge and skills without AI assistance.

Faculty Training for AI-Era Assessment:

Institutions must provide faculty with specific training on designing and implementing assessments in the AI era. This includes:

- **Understanding AI Capabilities and Limitations:** Faculty need to understand what current AI tools can and cannot do to design appropriate assessments.
- **Assessment Design Workshops:** Hands-on training in creating AI-aware assessments, including practice with different assessment formats and evaluation criteria.
- **Technology Training:** Faculty need familiarity with AI detection tools, plagiarism detection software, and AI-integrated assessment platforms.
- **Ethical Considerations:** Training on the ethical implications of AI use in assessment, including issues of equity, accessibility, and academic integrity.

#PART 6

THE FUTURE OF AI IN HEALTH PROFESSIONS EDUCATION

The field of AI is evolving at an exponential rate, and its impact on health professions education will only continue to grow. Looking ahead, several emerging trends and innovations are poised to further transform the landscape of medical training. This section explores the future of AI in health professions education, highlighting key areas of development and the importance of strategic partnerships.

EMERGING TRENDS AND INNOVATIONS

- **AI in Clinical Skills Assessment:** AI will play an increasingly important role in the assessment of clinical skills. AI-powered systems will be able to analyze video recordings of student-patient interactions to provide objective and detailed feedback on communication skills, empathy, and clinical reasoning. This will allow for more standardized and scalable assessment of these critical competencies.
- **Augmented and Virtual Reality in Medical Training:** The combination of AI with augmented reality (AR) and virtual reality (VR) will create highly immersive and realistic training environments. Students will be able to practice complex surgical procedures, manage medical emergencies, and interact with virtual patients in a safe and controlled setting, with AI providing real-time feedback and adapting the scenarios based on the learner's performance.
- **AI-Powered Adaptive Testing for Licensing Exams:** AI will enable the development of more sophisticated adaptive testing for medical licensing and certification exams. These exams will be able to more accurately assess a candidate's knowledge and skills by tailoring the difficulty and content of questions based on their responses.
- **Continuous Learning and Competency Assessment for Practicing Physicians:** AI will facilitate a shift towards a model of continuous learning and competency assessment for practicing physicians. AI-powered tools will be able to monitor a physician's practice patterns, identify knowledge gaps, and recommend personalized learning activities to ensure that they remain up-to-date with the latest medical knowledge and best practices.

THE ROLE OF PUBLIC-PRIVATE PARTNERSHIPS

The advancement of AI in health professions education cannot be achieved in isolation. It will require strong collaboration between academic institutions, technology companies, healthcare providers, and government agencies. Public-private partnerships will be essential for:

- **Driving Innovation:** Combining the research and educational expertise of academia with the technological and financial resources of industry to develop and implement innovative AI solutions.
- **Ensuring Relevance:** Ensuring that AI education and training are aligned with the real-world needs of the healthcare industry.
- **Promoting Ethical Development:** Working together to establish and enforce ethical guidelines for the development and use of AI in healthcare.

CONCLUSION

The AI revolution is not a future event; it is a present and accelerating reality that is fundamentally reshaping the practice of medicine and, by extension, the education of health professionals. The imperative for educators is clear: to embrace this transformation not with uncritical enthusiasm, but with a thoughtful and strategic approach that is grounded in evidence, guided by ethics, and centered on human values. The dual mandate of training health professionals in AI and leveraging AI in their training provides a clear path forward, but it is a path that is fraught with challenges, from the need for more rigorous research to the critical importance of faculty development and the persistent threat of algorithmic bias.

This white paper has synthesized the foundational work in this field with the latest research and guidance from leading organizations to provide a comprehensive roadmap for educators. It has outlined the core competencies that will be required of the next generation of health professionals, explored the current and future applications of AI in medical education, and provided a framework for the ethical and responsible implementation of these powerful new technologies.

The journey ahead will require a collective effort. It will require a commitment from institutions to invest in the necessary infrastructure and support for both learners and educators. It will require a commitment from researchers to build a robust evidence base to guide our efforts. And it will require a commitment from all of us to work collaboratively – across disciplines, across institutions, and across the public and private sectors – to ensure that the AI revolution in health professions education is a revolution that serves all of humanity.

The future of healthcare will be defined by the partnership between human and artificial intelligence. It is our collective responsibility to ensure that this partnership is one that is not only innovative and efficient, but also equitable, ethical, and, above all, human.

REFERENCES

1. Lomis, K., et al. (2021). The new learning ecosystem: A paradigm shift for medical education. Academic Medicine.

2. Association of American Medical Colleges. (2025). Medical schools move from worrying about AI to teaching it. https://www.aamc.org/news/medical-schools-move-worrying-about-ai-teaching-it

3. Masters, K. (2025). Artificial Intelligence in Health Professions Education: assessment AMEE Guide No. 178. https://geiselmed.dartmouth.edu/thesen/wp-content/uploads/sites/111/2025/01/Masters-MacNeil.-Thesen-2025-Artificial-Intelligence-in-Health-Professions-Education-assessment-AMEE-Guide-No.-178.pdf

4. Association of American Medical Colleges. (2025). Principles for the Responsible Use of Artificial Intelligence in and for Medical Education. https://www.aamc.org/about-us/mission-areas/medical-education/principles-ai-use

5. Pillay, R. (n.d.). The AI Revolution in Medical Education. (Provided document)

6. Pillay, R. (n.d.). Comprehensive Educators Guide For AI in Health Professions Education. (Provided document)

7. World Health Organization. (2024). WHO releases AI ethics and governance guidance for large multi-modal models. https://www.who.int/news/item/18-01-2024-who-releases-ai-ethics-and-governance-guidance-for-large-multi-modal-models

8. Feigerlova, E., Hani, H., & Hothersall-Davies, E. (2025). A systematic review of the impact of artificial intelligence on educational outcomes in health professions education. BMC Medical Education, 25(1), 129. https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-025-06719-5

9. Naamati-Schneider, L., et al. (2025). Developing AI Literacy in Medical and Health Professions Education: Impact of AI-driven learning activities on students' prompting skills. Medical Teacher. https://www.sciencedirect.com/science/article/abs/pii/S1471595325003294

10. Gordon, M., et al. (2024). A scoping review of artificial intelligence in medical education. Medical Teacher, 46(4), 1-12. https://www.tandfonline.com/doi/full/10.1080/0142159X.2024.2314198

11. Si, J., et al. (2025). Exploring AI literacy, attitudes toward AI, and intentions to use AI among healthcare students. BMC Medical Education. https://pmc.ncbi.nlm.nih.gov/articles/PMC12398176/