From Algorithm to Exam Room:

How Artificial Intelligence Is Reshaping Clinical Practice & Medical Education

Taylor Schleinkofer, OMS-II

During a typical neurology clinic visit, Dr. Brosch pulls up a brain MRI—but not just to examine the images. Icometrix, which uses artificial intelligence (AI) to analyze brain imaging, has already quantified volumetric changes over time, highlighting patterns invisible to the human eye and informing treatment decisions.[1] In another building, Dr. McCollom wraps up a medical gastrointestinal (GI) oncology appointment while Ambient AI dictation software captures their conversation, generating clinical notes in real time. Meanwhile, at Marian University, Dr. Skinner incorporates AI technology into medical education, creating interactive activities such as escape rooms to teach pharmacology. These are not just glimpses of medicine's future with AI; this is medicine today.Artificial intelligence has moved from what was once considered experimental to what is now a clinical reality. It is accelerating diagnostic precision, streamlining administrative bur-

dens, and reshaping clinical workflows. The question facing today's medical students is not whether they will practice alongside AI, but whether they will be prepared to do so thoughtfully and effectively. Understanding AI's capabilities in diagnosis and disease management, recognizing its limitations, and how it fits into the physician's role are now foundational skills for medical practice.

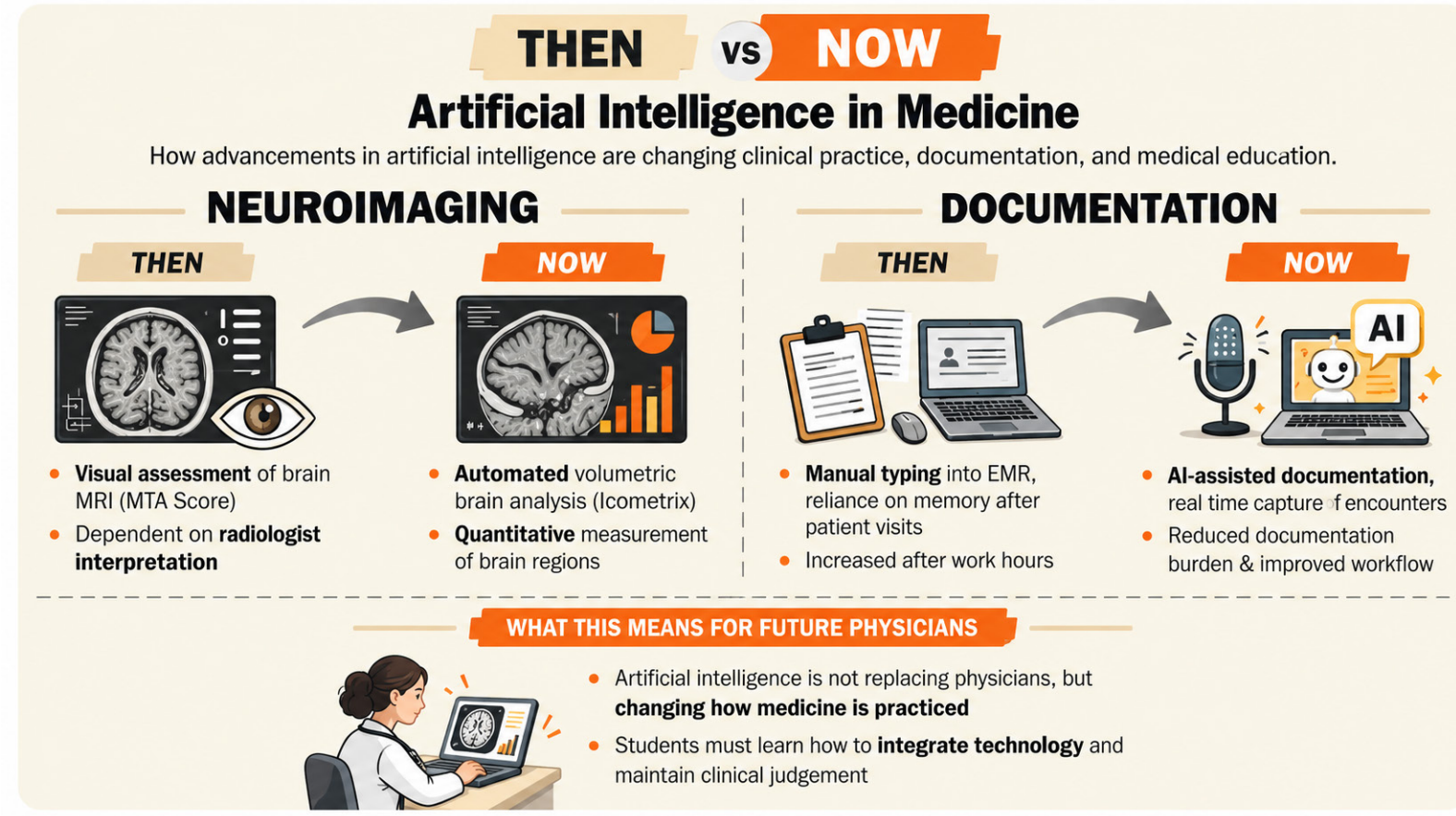
In neuroimaging, AI serves to enhance processes of diagnosis and treatment not to replace clinical decision making. Icometrix is an AI-powered neuroimaging software platform that performs quantitative analysis of brain MRIs by sectioning the brain into distinct regions, calculating volumetric measurements, and comparing these values against age-matched controls.[1] This software has demonstrated clinical utility in improving the standardization of neuroimaging interpretation compared with traditional assessment methods.[2] Previously, neuroradiologists relied on the Medial Temporal Atrophy (MTA) score, which is based on a visual analysis of MRIs.

Using the MTA score, patients were assigned a score ranging from 0 to 4, corresponding to normal, mild, moderate, or severe atrophy, respectively. While this information was still helpful, Dr. Jared Brosch, a neurologist at Indiana University Health, notes, "it was still highly qualitative." In contrast, Icometrix generates more objective, quantitative data. This reflects a shift toward the use of quantitative MRI analysis to improve the consistency of neuroimaging interpretation. A retrospective study comparing narrative reports, visual rating scales such as MTA, and automated volumetric software found that automated tools provide more objective and reproducible measurements of brain atrophy.[3] Still, these tools do not eliminate the need for clinical decision making. Brain morphology varies considerably among individuals, and distinguishing pathological atrophy from normal age-related changes still requires careful physician judgment. As Dr. Brosch explains, "it is the clinician's job to interpret and be able to say, 'is this meaningful in this person?'" A neuroradiologist might observe concerning atrophy on imaging, but dementia is ultimately a clinical diagnosis dependent on loss of functional independence, information that imaging cannot convey. However, with the outputs of Icometrix, physicians gain the capacity for earlier disease detection and more informed long-term monitoring.[3] According to Dr. Brosch, Icometrix helps to "identify individuals who not only need a closer surveillance and future planning, but also can engage them into a study that could be disease modifying." While AI-assisted neuroimaging enhances disease detection and treatment planning, other applications of AI are transforming medicine by reducing the time physicians spend on documentation during patient encounters.

Artificial intelligence is enhancing clinical productivity by reducing the clerical burden that keeps physicians working after clinic hours.[4] Traditionally, physicians documented patient encounters by typing directly into the electronic medical record, later transitioning to templated formats for consistency. Yet neither approach solved a fundamental problem. "We're spending a lot of time typing, whether it's in the room while the patient's talking or afterwards trying to remember exactly what happened during the visit," explains Dr. Joseph McCollom, a medical GI and palliative oncologist at Parkview Packnett Family Cancer Institute. Ambient AI dictation addresses this problem by recording clinician-patient conversations and using speech recognition to automatically generate structured notes in real time, which physicians later review for accuracy. The impact on physician well-being can be substantial. "When I started using ambient AI dictation, I noticed that 'pajama time' really reduced and I could finally use that time instead of catching up on paperwork to do things that I really love to do," reports Dr. McCollom. This experience is supported by emerging research. In a 2025 quality-improvement study across six U.S. health systems, clinicians reported significant improvement in burnout-related measures after 30 days of using ambient AI scribes.[4] In addition to reclaiming personal time, the technology may improve accuracy. When rushing between back-to-back appointments, physicians may struggle to recall details from earlier encounters, but "AI remembers those details," Dr. McCollom notes. Still, this technology is not without

drawbacks. Each encounter is processed as a single event; "it's not necessarily learning each time how you are documenting," meaning physicians cannot train the AI to adapt to their individual style over time. This limits personalization, preferred ways of paraphrasing, and how a specific physician's clinical reasoning is expressed. For the next generation of physicians, thoughtful use of AI technologies may help prevent physician burnout.

The growing presence of AI tools in care-related settings stresses the need to train future physicians to integrate this new technology into patient care. While AI is readily available, educators are concerned about how medical students use this technology. Instead of discouraging the use of AI, the need to teach students how to properly prompt a language learning model (LLM) becomes increasingly significant. Effective use of LLMs depends on the quality of questions asked, providing clear context, and establishing boundaries. As Dr. Brian Skinner, a clinical pharmacist and Associate Professor of Internal Medicine at Marian University Wood College of Osteopathic Medicine, explains, "people are using these really incredible mega prompts to strongly limit what AI does and put very strict guardrails on it." This shift toward artificial intelligence being taught to students and its current use in the clinic highlights the essential nature of physical examinations and patient interactions. Dr. Skinner agrees stating, "your physical exam finding skills are going to be the most important thing." Osteopathic physicians need to focus on humanistic aspects of care. AI cannot provide empathy. "It can emulate empathy, but it will never be able to hold someone's hand and tell them the worst news of their lives," shares Dr. Skinner. In these aspects, human physicians will always be valuable and skills involving compassion, empathy, and sincerity will continue to be crucial for medical students especially as AI is interlaced in clinic and education.



Artificial intelligence is already changing how physicians practice medicine and how medical students are educated. From supporting clinical decisions, changing clinician's daily workflow, and altering medical education, the importance of humanistic skills and thoughtful oversight remains clear. At the same time, understanding how to engage with AI is becoming an essential component of modern medical practice. Dr. Joseph McCollom quotes Dr. Julie Gralow stating, "Oncologists will never be replaced by AI, but oncologists who know how to utilize AI correctly will replace oncologists that don't." For medical professionals and students, the challenge is not choosing between technology and humanism but learning how to practice medicine in a way that integrates both.

References

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