AI's Role In Healthcare: Complementing Or Competing With Doctors?

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Abstract
In the not-so-distant past, if you mentioned AI in the realm of healthcare, you might have conjured visions of robotic doctors, sterile machines conducting intricate surgeries, or even an ominous replacement of human physicians. However, as AI systems become increasingly capable, a question looms over the horizon: Is AI a complement or a competitor to the dedicated human healers, our doctors? To truly grasp the essence of this dynamic, we must venture into the extraordinary, emphasizing the augmentative role of AI in healthcare, underlining that AI is aimed to complement, rather than replace, doctors and healthcare providers. The fundamental solution emerges with the human–AI collaboration, which combines the cognitive strengths of healthcare providers with the analytical capabilities of AI.
Keywords: *Artificial intelligence, doctor, healthcare provider, medicine, implementation.*

I.   THE EMERGENCE OF AI IN HEALTHCARE

Artificial intelligence has evolved from a concept to a dynamic reality. It has played a robust and growing role in the world in the past few decades. What most do not realize is that AI presents itself in many forms that impact daily life. One central area AI is proliferating is in healthcare, specifically in diagnostics and treatment management. As much as there is a fear of AI surpassing human tasks and abilities, significant research shows how AI can aid in clinical decisions, support human judgment, and increase treatment efficiency.

Conversely, AI presents many fears of eventually replacing or reducing the need for human physicians, especially in clinical settings. However, recent research and data have shown that it is more likely that this tool will benefit and enhance clinical diagnostics and decision-making rather than reduce the need for clinicians.

II.   DIAGNOSTIC EXCELLENCE: A COLLABORATIVE APPROACH

One of the most prominent roles of AI in healthcare is in diagnostics. AI systems can analyze medical images (e.g., X-rays, MRIs, ultrasounds, CT scans, and DXAs) and assist healthcare providers in identifying and diagnosing diseases more accurately and quickly. It can also analyze large amounts of patient data, including medical 2D/3D imaging, bio-signals (e.g., ECG, EEG, EMG, and EHR), vital signs (e.g., body temperature, pulse rate, respiration rate, and blood pressure), demographic information, medical history, and laboratory test results. They can identify abnormalities, tumors, and early signs of the disease much faster than human radiologists. However, this doesn't mean that radiologists are being replaced. Instead, it can facilitate everyday tasks performed by radiologists. As a result, early adopters of AI will likely be at the forefront of the radiology field in the future.

III.   PERSONALIZED MEDICINE: THE MARRIAGE OF AI AND DOCTORS

Although a wide variety of statistical methods have been designed to accommodate the 'big data', from genetic information to medical histories, experiences with the use of artificial intelligence (AI) techniques suggest that they might be particularly appropriate. In addition, the application of data-intensive biomedical technologies in research studies has revealed that humans vary widely at the genetic, biochemical, physiological, exposure, and behavioral levels, especially with respect to disease processes and treatment responsiveness. This suggests that there is often a need to tailor, or 'personalize,' medicines to the nuanced and often unique features possessed by individual patients. Personalized treatment plans are another area where doctors and AI converge. This approach, known as precision medicine, holds the promise of optimizing therapy, reducing side effects, and improving patient outcomes. Active research in both AI and precision medicine is demonstrating a future where health-related tasks of both medical professionals and consumers are augmented with highly personalized medical diagnostic and therapeutic information. The synergy between these two forces and their impact on the healthcare system aligns with the ultimate goal of preventing and detecting diseases affecting the individual, which could ultimately decrease the disease burden for the public at large, and, therefore, the cost of preventable healthcare for all.

IV.   ADMINISTRATIVE EFFICIENCY

Healthcare workers spend a lot of time doing paperwork and other administrative tasks. AI and automation can perform many of those mundane tasks, freeing up employee time for other activities. This automation reduces medical professionals' administrative burden and enhances the patient experience by ensuring quicker and more accurate responses.

V.   AI IN DRUG DEVELOPMENT

Artificial intelligence (AI) uses personified knowledge and learns from the solutions it produces to address not only specific but also complex problems. Artificial intelligence (AI) has been transforming the practice of drug discovery in the past decade. Various AI techniques have been used in many drug discovery applications, such as virtual screening and drug design. In the future, AI is expected to simplify and accelerate pharmaceutical development. AI can convert drug discovery from a labor-intensive to a capital- and data-intensive process by utilizing robotics and models of genetic targets, drugs, organs, diseases and their progression, pharmacokinetics, safety, and efficacy. Artificial intelligence (AI) can be used in the drug discovery and development process to speed up and make it more cost-effective and efficient.

VI.   PREDICTIVE ANALYTICS FOR DISEASE OUTBREAKS

AI-based models are not just limited to assistance in addressing the disease spread when it originates but could play a significant role in forecasting a disease outbreak even before it has started enabling the healthcare systems to respond more effectively.

VII.   THE DANCE OF EMPATHY AND HUMAN TOUCH

The essence of healthcare is not just in diagnosis and treatment; it's also about empathy, communication, and the human touch. There is an association between AI technologies and compassion in healthcare and interest in this association has grown internationally over the last decade. In a range of healthcare contexts, AI technologies are being used to enhance empathetic awareness; empathetic response and relational behavior; communication skills; health coaching; therapeutic interventions; moral development learning; clinical knowledge and clinical assessment; healthcare quality assessment; therapeutic bond and therapeutic alliance; and to provide health information and advice. The human-AI system of intelligent caring comprises six elements: (1) Awareness of suffering (e.g., pain, distress, risk, disadvantage); (2) Understanding the suffering (significance, context, rights, responsibilities, etc.); (3) Connecting with the suffering (e.g., verbal, physical, signs and symbols); (4) Making a judgment about the suffering (the need to act); (5) Responding with an intention to alleviate the suffering; (6) Attention to the effect and outcomes of the response. These elements can operate at an individual (human or machine) and collective systems level (healthcare organizations or systems) as a cyclical system to alleviate different types of suffering. New and novel approaches to human-AI intelligent caring could enrich education, learning, and clinical practice; extend healing spaces; and enhance healing relationships. Imagine a doctor who has more time to sit with a patient, listen attentively to their concerns, and offer reassurance. It's a dance of empathy, where AI's role is to ensure the stage is set for the human connection to flourish.

VIII.   ETHICAL CONSIDERATIONS AND CHALLENGES

As AI's influence in healthcare expands, ethical considerations and challenges also come to the forefront. It should be noted that ethical dilemmas, privacy and data protection, informed consent, social gaps, medical consultation, empathy, and sympathy are various challenges that we face in using AI. Doctors and healthcare professionals take a keen interest in ensuring that AI is used responsibly and in alignment with patient-centric principles.

AI AS A COMPETITOR

Even though the idea is intriguing, fundamentally, AI is not meant (designed and developed) to replace doctors but is able to repurpose roles and improve efficiency, as demonstrated by LLM-powered digital scribes and conversation summarization tools. If we step back and look at current applications in clinical practice, AI has already been an integral part of health services, without replacing doctors. For example, AI-aided decision support systems with ultrasound or MRI machines to assist diagnosis, or improving voice recognition in dictation devices to keep radiology notes. However, recent developments in AI are highly complex, rapidly evolving, and overwhelmingly positive—as seen in the increased accuracy of LLMs in completing tasks, high language comprehension, and human-like conversational responses—leading us to question their value and contribution to practice.

AI AS A COMPLIMENT

The advancements in AI are reassuring, showing promise in creating a paradigm shift in healthcare by complementing and enhancing the skills of doctors and healthcare providers rather than replacing them

IX.   CONCLUSION: A SYNERGISTIC FUTURE

In conclusion, the role of AI in healthcare is not one of competition or replacement but one of collaboration and enhancement. The advancements in AI are reassuring, showing promise in creating a paradigm shift in healthcare by complementing and enhancing the skills of doctors and healthcare providers rather than replacing them. To successfully harness the power of AI, healthcare organizations must be proactive, especially now, where generative AI and large language models (LLMs) are highly accessible but still in need of control and guidance. As AI becomes an essential component of modern healthcare, it is vital for organizations to invest in the necessary infrastructure, training, resources, and partnerships to support its successful adoption and ensure equitable access for all. The future of healthcare is not a zero-sum game. It is a synergistic relationship where AI and doctors elevate each other's capabilities. Together, they create a healthcare experience that transcends the boundaries of what was once possible.

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