



Healthcare Industry

Not a Distant Future: Practical Applications of AI in Healthcare Today



Healthcare innovation with Artificial Intelligence (AI) is often thought of as something that will happen in the future; but it is, in fact, happening now.



AI in Healthcare

01

Practical Applications of AI in Healthcare

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02

Challenges and Ethical Considerations in Healthcare AI

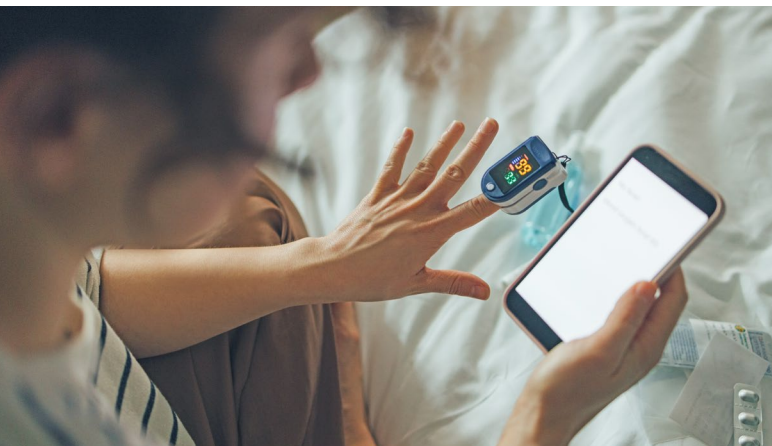
For-profit healthcare organizations must address many potential obstacles when integrating AI into their processes.

03

AI is Already Advancing Healthcare

Artificial Intelligence has swiftly transitioned from a futuristic concept to a central tenant in the strategy of companies within the healthcare domain.

In this article, we explore the practical, immediate applications of AI that are transforming the healthcare sector. We delve into areas where these technologies are enhancing operations and improving patient outcomes, such as clinical decision support, personalized medicine, medical imaging, and even employee/workforce management. We also discuss the ethical considerations and potential obstacles that healthcare organizations should be aware of when integrating AI into their current processes. AI is becoming a crucial component of the healthcare industry, facilitating more efficient processes, enhanced decision-making, and improved patient care.



Practical Applications of AI in Healthcare

If you are reading this article, you are likely aware of the impact AI has had and will continue to have on the healthcare industry. AI is playing a significant role in various healthcare domains, especially within areas such as clinical decision support, personalized medicine, and patient interactions.

Enhanced Clinical Decision Support

Through the use of electronic health record (EHR) data, AI can provide live and intuitive clinical decision support, stratify patient cohorts' risk for various diseases, and predict a patient's risk for inpatient readmissions and complex conditions such as sepsis.¹

Traditionally, clinical decision support engines have relied on manually encoded rule-based systems that use "if-this-then-that" logic. However, with the integration of targeted natural language processing (NLP), text and feature extractions can feed data into sophisticated machine learning (ML) models that interpret hundreds or thousands of features. Real-time predictions can be surfaced through the addition of modules within the EHR user interface.

The era of one-size-fits-all medicine is gradually fading as AI ushers in the age of personalized treatment plans. By identifying patterns using data mining techniques on data collected from clinical EHRs, AI integration can help clinicians customize treatment plans to the individual patient's needs. There is, however, a clear gap within research focused on the implementation of such tools, and even more so within the context of deploying the analytics solution within an established clinical workflow.¹¹

Customer Service Automation

After its resounding success within the consumer-facing customer-service domain, AI-powered chatbots, or virtual assistants, are slowly finding their niche and becoming more integrated into various facets of the clinical world. These chatbots have massive potential in helping patients in a variety of ways, including:



Navigating complex health systems:

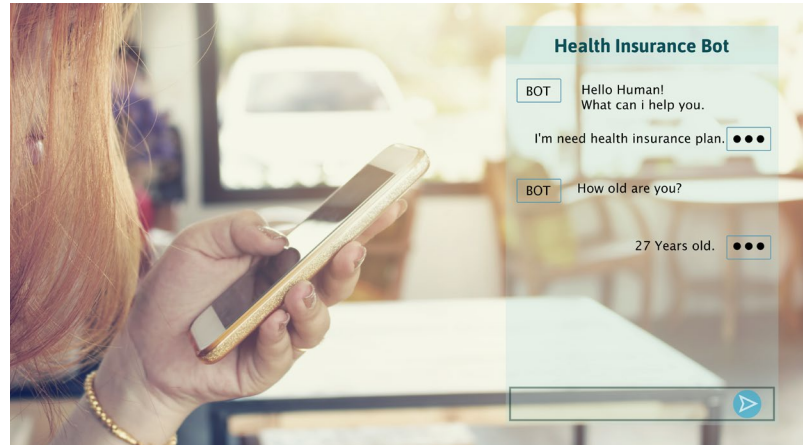
Healthcare systems can be overwhelming for many patients. Chatbots have the potential to assist with appointment scheduling, prescription renewals, or simply answering questions about services and facilities. The opportunities for engagement are endless.



Augmenting clinical documentation flow: Through the use of advanced NLP, live transcription of patient and provider interactions can occur while disparate data elements found in the EHR are integrated simultaneously. While live transcription already exists through software such as “Dragon,” the potential to integrate a semantic context NLP engine to pull relevant data from other clinical encounters can create a seamless clinical workflow.



Aiding with prior authorization tasks: There are numerous opportunities for chatbots to aid in automating the authorization process. They can be used to gather necessary information automatically from within EHRs and populate the relevant fields needed for forms. The efficiencies offered by minimizing the paperwork for healthcare providers include a faster approval process and more time dedicated to direct patient care.



Challenges and Ethical Considerations in Healthcare AI

The opportunities AI presents for innovation within healthcare need to be balanced with the risks and ethical considerations that are just as important. For-profit healthcare organizations must address many potential obstacles when integrating AI into their processes. Foremost among these are data privacy concerns, as AI systems will inevitably need to interact directly with sensitive data systems housing secure patient data. It is critical to establish robust safeguards to maintain trust and integrity within the organization.

Additionally, there are very real concerns related to model bias, as AI systems are only as good as the data on which they are trained. If this data is biased, it can lead to skewed results and unforeseen consequences with downstream impacts, hence the need for integrated comprehensive monitoring. Intelligent systems require transparency and interpretability in order for human consumers to trust the outputs provided.

As society continues to navigate the frontiers of technology and human interaction, it's important to note that implementations of these AI systems, should NOT be designed to replace human decision making in the clinical world. Instead, they should be designed to augment and enhance healthcare professionals with added predictive capabilities to assist, not dictate, their judgement.

HR & Employee Management

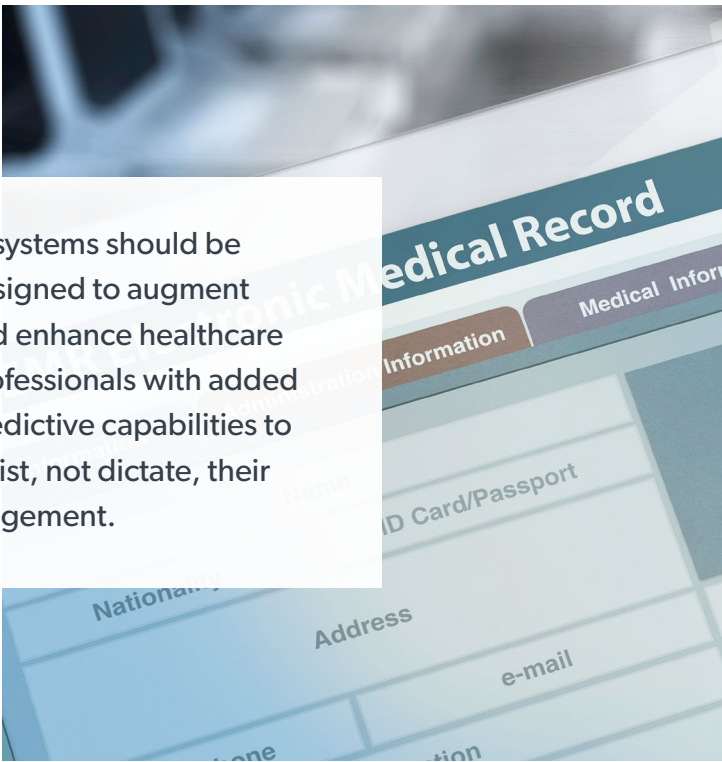
AI is also being deployed to manage healthcare staff more efficiently. This technology allows for employers to go beyond basic statistics and gain a deeper understanding of employee behavior and work patterns. For example, it can help identify clinician burn-out and attrition risk among employees and devise strategies to mitigate this risk. This is done using “traditional” ML methodologies to generate predictions on a per-employee basis based on characteristics found within an employer’s foundational HR system data. Data including role, salary, work performance, vacation days used, and even advanced tasking data, can be extracted from EHR systems.

Chatbots can be used to gather necessary information automatically from within EHRs and populate the relevant fields needed for forms.

The onus inevitably falls onto all users and stakeholders of the systems to ensure ethical considerations and limitations are being taken into account. These stakeholders include patients and physicians, who must have a basic knowledge of how AI tools make decisions in order to understand where the limitations of the systems exist. We are truly on the bleeding edge of technology and human interaction.

AI is Already Advancing Healthcare

Artificial Intelligence has swiftly transitioned from a futuristic concept to a central tenant in the strategy of companies within the healthcare domain. These technologies provide unprecedented opportunities to reshape healthcare through integrated solutions that optimize care delivery, enhance health outcomes, and improve the experiences of members, employers, and healthcare providers alike.



AI systems should be designed to augment and enhance healthcare professionals with added predictive capabilities to assist, not dictate, their judgement.

¹ Predictive analytics in the pediatric intensive care unit for early identification of sepsis: capturing the context of age, *Pediatr Res* ., 2019. <https://pubmed.ncbi.nlm.nih.gov/31365920/>

² Advancing continuous predictive analytics monitoring: moving from implementation to clinical action in a learning health system, *Critical Care Nursing Clinics of North America*, 2018. <https://pubmed.ncbi.nlm.nih.gov/29724445/>



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