全球瞭望

醫療保健革新：
人工智慧
在臨床實踐中的角色*

Revolutionizing Healthcare: The Role
of Artificial Intelligence in Clinical Practice

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摘 要

一、簡介：醫療保健系統對所有利害關係人來說都是複雜且充滿挑戰的，但人工智慧已經改變包含醫療在內的多個領域，並展現改善病患照護和生活品質的潛力。人工智慧的快速進展可望透過將其融入臨床實踐來革新醫療保健。報告人工智慧在臨床實踐中的角色可為醫療人員配備必要的知識和工具，這對於其成功

實施至關重要。

二、研究意義：本文對人工智慧在臨床實踐中的現況提供全面且最新的概述，包括其在疾病診斷、治療建議和患者參與中的潛在應用。亦討論了相關的挑戰，涵蓋倫理和法律考量以及對人類專業知識的需求。透過這樣的討論能夠更深入地理解人工智慧在醫療保健中的重要性，並支持醫療機構有效地採納人工智慧技術。

三、材料與方法：本調查分析了人工智慧在醫療保健系統中的使用情況，全面回顧了相關索引文獻，例如PubMed／Medline（國家醫學圖書館）、Scopus和EMBASE等，沒有時間限制，但僅限於以英文發表的文章。焦點問題在探討人工智慧於醫療保健環境中應用的影響以及該應用的潛在結果。

四、結果：將人工智慧融入醫療保健對於改善疾病診斷、治療選擇和臨床實驗室測試具有極大的潛力。人工智慧工具可以利用大型資料庫並識別模式，在醫療上有許多方面可超越人類的表現。人工智慧可提高準確性、降低成本和節省時間，同時最大限度地減少人為錯誤。它能革新個人化醫療、優化藥物劑量、加強群體健康管理、建立指南、提供虛擬健康助理、支持心理健康照護、改善患者教育，並對醫病信任關係帶來影響。

五、結論：人工智慧可以用於診斷疾病、制定個人化治療計劃，並協助臨床醫師制定決策。人工智慧並非僅簡單地實現任務自動化，而是開發能夠在醫療場域中加強患者照護的技術。然而，為了在醫療照護中負責任且有效地實施人工智慧，必須解決與資料隱私、偏差和人類專業知識需求相關的挑戰。

Introduction: Healthcare systems are complex and challenging for all stakeholders, but artificial intelligence (AI) has transformed various fields, including healthcare,

with the potential to improve patient care and quality of life. Rapid AI advancements can revolutionize healthcare by integrating it into clinical practice. Reporting AI's role in clinical practice is crucial for successful implementation by equipping healthcare providers with essential knowledge and tools.

Research Significance: This review article provides a comprehensive and up-to-date overview of the current state of AI in clinical practice, including its potential applications in disease diagnosis, treatment recommendations, and patient engagement. It also discusses the associated challenges, covering ethical and legal considerations and the need for human expertise. By doing so, it enhances understanding of AI's significance in healthcare and supports healthcare organizations in effectively adopting AI technologies.

Materials and Methods: The current investigation analyzed the use of AI in the healthcare system with a comprehensive review of relevant indexed literature, such as PubMed/Medline, Scopus, and EMBASE, with no time constraints but limited to articles published in English. The focused question explores the impact of applying AI in healthcare settings and the potential outcomes of this application.

Results: Integrating AI into healthcare holds excellent potential for improving disease diagnosis, treatment selection, and clinical laboratory testing. AI tools can leverage large datasets and identify patterns to surpass human performance in several healthcare aspects. AI offers increased accuracy, reduced costs, and time savings while minimizing human errors. It can revolutionize personalized medicine, optimize medication dosages, enhance population

health management, establish guidelines, provide virtual health assistants, support mental health care, improve patient education, and influence patient-physician trust.

Conclusion: AI can be used to diagnose diseases, develop personalized treatment plans, and assist clinicians with decision-making. Rather than simply automating tasks, AI is about developing technologies that can enhance patient care across healthcare settings. However, challenges related to data privacy, bias, and the need for human expertise must be addressed for the responsible and effective implementation of AI in healthcare.

壹、簡介

人工智慧（artificial intelligence, AI）是資訊科學中（Computer science）一個快速發展的領域，旨在創建能夠執行通常需要人類智能的任務的機器。人工智慧包括各種技術，如機器學習（machine learning, ML）、深度學習（deep learning, DL）和自然語言處理（natural language processing, NLP）。大型語言模型（large language model, LLMs）是一種使用深度學習技術和大規模數據集來理解、總結、生成和預測新的基於文本的內容的人工智慧演算法[1]。LLMs被設計用來生成基於文本的內容，並具有廣泛的適用性，可用於各種NLP任

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1 Suleimenov IE, Vitulyova YS, Bakirov AS, Gabrielyan OA. Artificial Intelligence: what is it? Proc 2020 6th Int Conf Comput Technol Appl. 2020; 22-5. https://doi.org/10.1145/3397125.3397141; Davenport T, Kalakota R. The potential for artificial intelligence in Healthcare. Future Healthc J. 2019; 6(2):94-8. https://doi.org/10.7861/futurehosp.6-2-94; Russell SJ. Artificial intelligence a modern approach. Pearson Education, Inc.; 2010.