What Is the Role of AI in Age-Related Disease Prevention?

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Abstract

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As the global population ages at an unprecedented rate, the prevalence of age-related diseases such as cardiovascular conditions, respiratory illnesses, and neurodegenerative disorders presents a growing challenge to healthcare systems worldwide. In this landscape, Artificial Intelligence (AI) is emerging as a transformative force, offering innovative solutions to enhance preventive medicine and improve the quality of life for older adults. This article explores the multifaceted role of AI in the prevention and management of age-related diseases, drawing on recent academic research to provide a comprehensive overview for health professionals.

The Multifaceted Role of AI in Geriatric Health

AI is poised to revolutionize geriatric care by addressing some of its most pressing challenges. A systematic review of AI applications in chronic disease management for aging populations highlights the potential of AI to optimize the distribution of medical resources, supplement professional management teams, and enhance health education [1]. By leveraging machine learning, deep learning, and natural language processing, AI can analyze vast datasets to identify patterns and predict health risks, enabling more proactive and personalized care for older adults.

Furthermore, AI is accelerating the discovery and development of novel therapies for age-related diseases. Companies like Rejuvenate Biomed are using proprietary AI-powered platforms to decode the biology of aging and identify combination therapies that target the root causes of these conditions [2]. This biology-first, disease-agnostic approach allows for the identification

of drugs that can simultaneously impact multiple hallmarks of aging, such as mitochondrial dysfunction and epigenetic alterations. For instance, their drug candidate for sarcopenia, RJx-01, is a combination drug that targets dysregulated pathways across 10 of the 12 recognized hallmarks of aging [2]. This innovative approach not only speeds up the drug discovery process but also increases the likelihood of clinical success.

AI in Action: From Drug Discovery to Patient Monitoring

The application of AI in geriatric health extends beyond drug discovery. AI-powered predictive analytics can help in the early detection and management of age-related diseases, allowing for timely interventions that can slow disease progression and improve outcomes. For example, AI algorithms can analyze electronic health records, medical images, and data from wearable devices to identify individuals at high risk for developing certain conditions, enabling clinicians to implement preventive strategies sooner.

However, the successful integration of AI into geriatric care also depends on the acceptance and trust of older adults. A qualitative study on the perspectives of older adults towards AI-driven health technologies found that while most participants had positive views, they also had concerns about privacy, data security, and the potential for fraud [3]. Many participants expressed a need for robust security measures and transparent communication about how their data would be used. This highlights the importance of a human-centered approach to the design and implementation of AI-based health technologies, one that prioritizes user trust and data security.

Challenges and the Path Forward

Despite its immense potential, the application of AI in geriatric care is not without its challenges. These include data scarcity, the need for model generalization, ensuring clinician adoption, and aligning AI decision-making with clinical guidelines [1]. Ethical and legal considerations, such as data privacy and accountability, also need to be addressed to ensure the responsible and equitable use of AI in healthcare.

Overcoming these challenges will require interdisciplinary collaboration between researchers, clinicians, data scientists, and policymakers. By working together, we can develop a framework for the ethical and effective use of AI in geriatric care, one that harnesses the power of technology to promote healthy aging while upholding the values of patient-centered care.

Conclusion

In conclusion, AI holds significant promise for revolutionizing the prevention and management of age-related diseases. From accelerating drug discovery to enabling personalized and proactive care, AI has the potential to improve the health and well-being of older adults around the world. However, realizing this potential will require a concerted effort to address the challenges of data privacy, user trust, and ethical implementation. By embracing a collaborative and human-centered approach, we can unlock the full potential of AI to create

a future where everyone has the opportunity to age with dignity and in good health.

References

[1] Feng, G., Weng, F., Lu, W., Xu, L., Zhu, W., Tan, M., & Weng, P. (2025). Artificial Intelligence in Chronic Disease Management for Aging Populations: A Systematic Review of Machine Learning and NLP Applications. *International Journal of General Medicine*, *18*, 3105–3115. https://pmc.ncbi.nlm.nih.gov/articles/PMC12170813/

[2] Drug Target Review. (2025, May 19). *AI at the forefront of age-related disease treatment*. https://www.drugtargetreview.com/article/159807/ai-at-the-forefront-of-age-related-disease-treatment/

[3] Wong, A. K. C., Lee, J. H. T., Zhao, Y., Lu, Q., Yang, S., & Hui, V. C. C. (2025). Exploring Older Adults' Perspectives and Acceptance of AI-Driven Health Technologies: Qualitative Study. *JMIR Aging*, *8*(1), e66778. https://aging.jmir.org/2025/1/e66778
