# Can AI Improve Medication Management in Elderly Patients?

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## Abstract

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## Introduction

The aging global population presents significant challenges for healthcare, particularly in managing the complex medication regimens of elderly patients. Polypharmacy, the use of multiple medications, is prevalent and increases the risk of adverse drug events and non-adherence [1]. Artificial Intelligence (AI) is emerging as a promising solution to revolutionize medication management in this demographic.

## The Role of AI in Medication Management

AI-powered solutions are being developed and implemented to address the multifaceted challenges of medication management in the elderly. These technologies offer a range of capabilities, from simple reminders to sophisticated decision support systems.

### Enhancing Medication Adherence

One of the most significant challenges in geriatric care is medication non-adherence. AI-powered applications can play a crucial role in improving adherence by providing personalized reminders for medication intake. These smart apps can track when medications are taken and alert caregivers or healthcare providers if a dose is missed [2]. By proactively addressing non-adherence, these tools can help prevent the negative health consequences associated with missed medications and reduce the overall cost of care.

### Tackling Polypharmacy and Deprescribing

Polypharmacy is a major concern in the elderly, and the process of deprescribing, or discontinuing unnecessary medications, can be complex. AI can assist healthcare providers in making more informed deprescribing decisions. For instance, a study by the Mass General Brigham MESH Incubator found that ChatGPT, a large language model, showed promise as a tool for managing polypharmacy [3]. While the study highlighted the need for further refinement, it demonstrated the potential of AI to analyze complex patient data and provide recommendations for optimizing medication regimens.

### Identifying High-Risk Patients

AI algorithms can analyze vast amounts of data from electronic health records (EHRs), including patient demographics, medical history, and medication lists, to identify individuals at high risk of adverse drug events. By risk-stratifying patients, AI can help healthcare providers focus their attention on those who need it most. A study involving an AI platform called FeelBetter demonstrated the ability of AI to accurately identify high-risk patients and help manage decisions about hospitalizations, resulting in significant cost savings for the hospital [2].

## Challenges and Limitations

Despite the immense potential of AI, several challenges and limitations must be addressed to ensure its successful and equitable implementation.

**Cost and Infrastructure:** *The high cost of implementing AI technologies and the need for a robust digital infrastructure can be significant barriers, particularly in low- and middle-income countries [1].* **Data Privacy and Security:** The use of AI in healthcare raises important concerns about data privacy and security. It is crucial to have strong regulatory frameworks in place to protect patient information. **Ethical Considerations:** *Algorithmic bias is a major ethical concern. AI models must be trained on diverse datasets to ensure that they are fair and equitable for all patient populations.* **AI Literacy:** There is a need to improve AI literacy among both healthcare professionals and patients to ensure that these technologies are used effectively and responsibly.

## The Future of AI in Geriatric Care

The future of AI in medication management for the elderly is promising. As AI technologies continue to evolve, we can expect to see even more sophisticated solutions that are seamlessly integrated into the healthcare workflow. Future research should focus on the long-term effectiveness of AI interventions in real-world settings and the development of scalable solutions that can be adapted to different healthcare contexts.

## Conclusion

AI holds transformative potential for medication management in the elderly. By improving adherence, addressing polypharmacy, and identifying high-risk patients, AI can enhance patient safety and reduce healthcare costs. However,

overcoming challenges like cost, data privacy, and algorithmic bias is crucial for its successful implementation. With continued ethical development, AI can pave the way for safer, more personalized geriatric care.

## References

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