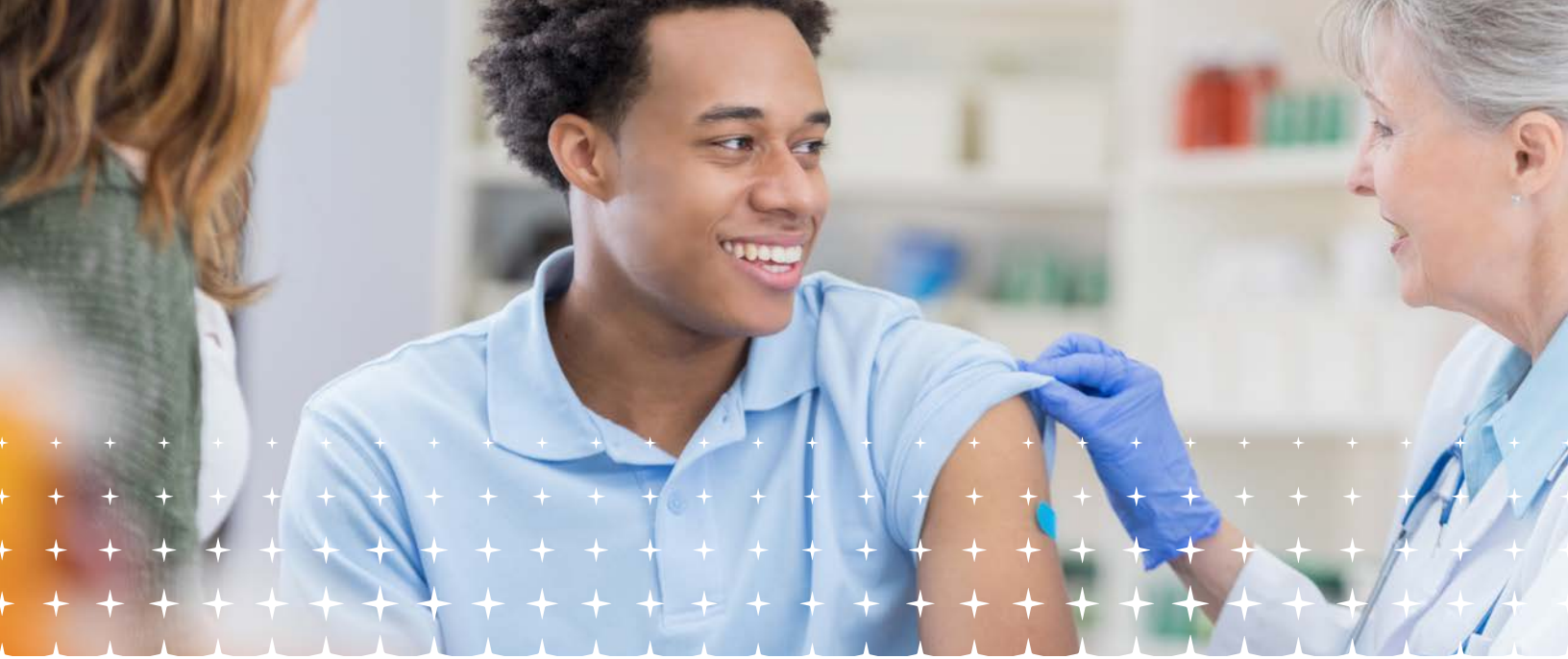


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# AI and the evolving role of the pharmacist



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Today's retail clinical pharmacists are adapting to an evolving role in team-based patient care that is designed to expand access to healthcare for a patient population with increasingly complex needs and conditions.

Retail pharmacists not only dispense medications and educate patients but also administer vaccines and manage chronic diseases.<sup>1</sup>

While their education and experience mean pharmacists are well-suited for their broader involvement on the patient care team, doing so effectively means they must reconfigure workflows to support additional patient care activities. At the same time, they must manage the rapid uptick in the number of prescriptions, complex drug regimens and administrative tasks driven by ongoing advances in healthcare and pharmaceuticals.

These changes have left pharmacists struggling to navigate an overwhelming influx of data from multiple channels — electronic health record (EHR) systems, laboratories, electronic prescribing, journals, clinical overviews, industry research, regulations, patient and provider communications, etc. — that they must translate into meaningful, actionable information.

### **Leveraging AI innovation to address modern challenges in the pharmacy industry**

Although retail pharmacies have technology in place to improve operations and assist with patient care responsibilities, it falls short in alleviating pharmacists' increasing workloads and reducing the time spent manually sorting through large volumes of data.

Furthermore, it does not focus on meeting pharmacists' requirements for clinical decision support as they endeavor to deliver timely, safe and effective care.



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## Artificial intelligence steps up

For retail pharmacies and clinical pharmacists, the modern solution comes in the form of artificial intelligence (AI). Advancements in AI capabilities and its deeper integration into healthcare systems and processes means pharmacists have access to a wider array of tools that support workflows and enable provision of more accurate evidence-based clinical decisions.<sup>2</sup>

This is supported by a growing body of research demonstrating AI's potential as a transformative technology in pharmacy practice.<sup>3</sup> AI algorithms assist pharmacists in efficiently accessing essential information from the vast amount of clinical and drug data they encounter in their daily pharmacy operations. By using responsible AI in conjunction with a drug reference tool, pharmacists can significantly improve medication therapy management (MTM) by aiding identification of potential drug-drug interactions, assessing medication safety and efficacy and supporting better informed recommendations tailored to individual patient needs.

AI also assists clinical decision support (CDS) systems with medication-related decisions and can play a role in medication management by helping pharmacists make informed decisions about prescribed medications and treatment regimens.<sup>4</sup> It can also assist with supporting the identification of potential drug interactions and adverse reactions and aid pharmacists in analyzing data around a patient's medication usage and refill history to support med adherence and help mitigate complications.

### AI also has the power to support pharmacists by:<sup>5</sup>

- Automating dispensing processes.<sup>6</sup>
- Optimizing medication dosages.<sup>7</sup>
- Supporting telemedicine initiatives.<sup>8</sup>
- Enhancing security measures.<sup>9</sup>

By incorporating responsible AI tools with trusted content into the pharmacy workflow, pharmacists can make care decisions based on the latest evidence, enhance clinical decision-making, boost confidence, alleviate burnout and enhance professional satisfaction.



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## AI is not without challenges

Despite its demonstrated benefits, AI presents several challenges for pharmacists. One is the cost and resources required for initial AI integration, which may be financially out of reach for some pharmacies. The training and education required to overcome reluctance to adopt AI tools can impede incorporation of AI into pharmacy operations.

While there may be initial reluctance to adopt AI tools, comprehensive training can empower pharmacists to fully leverage AI, enhancing their daily operations.

### Other notable challenges include:<sup>10</sup>

- Lack of empirical evidence supporting the efficacy of AI interventions. Because most AI research is retrospective and conducted in controlled environments, the results are hard to verify in real-world settings.
- Accountability concerns when AI is used for pharmaceutical purposes, which makes it difficult to determine who is responsible when problems arise.

Careful evaluation of potential AI tools and full consideration of their implications within a given pharmacy setting can bypass these issues and instill confidence in their use by pharmacists.



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## The principles of appropriate AI: ClinicalKey AI

The best AI solutions for pharmacists are those modeled upon the principles of responsible AI pulling from trusted content to support confident medication decisions. Adhering to these principles allows AI tools to support the expanded role of clinical pharmacists in today's retail setting while bypassing many of the challenges that can compromise accuracy and damage confidence.

One such solution is ClinicalKey AI from Elsevier, a company that upholds industry standards and privacy controls to ensure its solutions effectively align with and support user goals and objectives. ClinicalKey AI merges the power of AI with trusted content from more than 1,000 journals and books, as well as synoptic content to support point of care needs, and updates from the Food and Drug Administration (FDA), Centers for Disease



Control and Prevention (CDC) and National Library of Medicine (NLM), to bring pharmacists timely evidence-based information at the point of care.

**Currently the only AI-powered drug information solution available for pharmacists, ClinicalKey AI features a unique architectural design called “retrieval augmented generation” (RAG) that:**

- Allows users to type their questions in a conversational style.
- Grounds responses in accurate, current information by retrieving facts from trusted content.
- Generates responses with advanced result representation that includes summaries and follow-up questions.

To adhere to the principles of responsible AI, the data was tested by more than 30,000 clinicians for two years on a clinical large language model (LLM) platform. Internal testing was also undertaken by more than 100 Elsevier clinicians who regularly evaluate the accuracy of ClinicalKey AI's output, while clinicians with two health systems validated that the solution met pharmacists' workflow needs.

**ClinicalKey AI addresses three key challenges pharmacists face at the point of care: time constraints, complex medication regimens and unvetted AI.**

### Time constraints

The time constraints placed on pharmacists can put medication validation at risk when they are not equipped with additional trusted resources beyond traditional drug information. Not only can this hamper their ability to fulfill their expanding clinical roles, but many also struggle to provide comprehensive patient care beyond drug information and the medication profile. Pharmacists can also find it difficult to stay current on rapidly evolving evidence-based practices and new treatment recommendations.



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Time constraints can also create risks around patient counseling. Pharmacists dedicate significant amounts of time and effort to researching medications — from different disease states to new therapies and best practices — which can create inefficiencies and drain increasingly scarce resources. This can lead to pharmacist burnout and generate inefficiencies that translate into higher tangible and intangible costs, including missed opportunities to improve patient care.

ClinicalKey AI provides additional point-of-care and evidence-based resources that support focused patient care while helping to minimize disruptions and maximizing productivity. It further supports the clinical validation and drug review process with tailored responses that complement pharmacists' fast-paced medication dispensing and validation workflows. As a bonus, ClinicalKey AI also supports organizational growth in monetization of clinical and immunization services to support medication adherence and outcomes.

## Supporting complex medication regimens

Increasingly complex medication regimens increase MTM and CDS risks related to the potential failure of pharmacists to address tailored treatment needs. Manual review processes may miss critical information, such as drug interactions, inaccurate dosing, therapeutic duplicates or contraindications. This can also impact drug efficacy, patient safety risks and medication outcomes.

More complex medication regimens also require pharmacists to stay current on the intricacies of complex disease states and treatment regimens. As such, fragmented clinical resources can lead to suboptimal medication management and, potentially, to adverse outcomes.

ClinicalKey AI enhances efficiency by curating trusted resources in one place, including clinical overviews, journal articles, FDA updates and drug monographs. Doing so empowers pharmacists to drive the clinical decision-making necessary for reconciling complex medication regimens.

By supporting pharmacists' CDS needs, ClinicalKey leads to more confident drug treatment decisions. It also delivers scientifically backed clinical information and synoptic point-of-care responses precisely when needed for a patient, with responses that include references with linked citations to supporting published evidence.

## Trusted content

There are several risks in an AI landscape that lacks appropriate guardrails. Because clinical pharmacists utilize a variety of resources, extreme care must be taken to ensure they align with current evidence-based best practices. Ensuring tools are thoroughly vetted is crucial. Unauthorized or incorrect use of AI algorithms can lead to unreliable results based on untrusted resources or potential hallucinations, which can put patient safety at risk.



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Finally, because clinical innovation involves adopting new technologies, a proper balance must exist between innovation and patient safety.

ClinicalKey AI helps pharmacists mitigate against the rogue use of AI by arming them with carefully vetted AI tools built on technology that has been tested by more than 30,000 clinicians and accuracy that is regularly tested by over 100 clinicians.

## AI challenges the status quo

Embracing innovative solutions can empower pharmacists to perform effectively and efficiently in their expanded roles while enhancing patient safety and driving positive changes in healthcare delivery. When appropriate care is taken to properly vet AI solutions to ensure they meet the principle of responsible AI, it is possible to bypass issues that impact accuracy and pharmacist confidence to deliver optimal patient care and organizational outcomes.

To learn more, visit [elsevier.com/clinicalkey-ai](https://elsevier.com/clinicalkey-ai).



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## Resources

- <sup>1</sup> Creidt, S. (2024, January 3). Team-based care: How pharmacists can expand patient access to health care. *Pharmacy Times*. Retrieved August 7, 2024, from <https://www.pharmacytimes.com/view/team-based-care-how-pharmacists-can-expand-patient-access-to-health-care>
- <sup>2</sup> Oswald, R. (2023, September 5). The role of artificial intelligence in pharmacy practice. *Pharmacy Times*. Retrieved from <https://www.pharmacytimes.com/view/the-role-of-artificial-intelligence-in-pharmacy-practice>
- <sup>3</sup> Chalasani, S. H., Syed, J., Ramesh, M., Patil, V., & Pramod Kumar, T. M. (2023). Artificial intelligence in the field of pharmacy practice: A literature review. *Exploratory Research in Clinical and Social Pharmacy*, 12, 100346. <https://doi.org/10.1016/j.rcsop.2023.100346>
- <sup>4</sup> Milenkovich, N. (2023, July 24). The rise of AI in pharmacy practice presents benefits and challenges. *Pharmacy Times*. Retrieved from <https://www.pharmacytimes.com/view/the-rise-of-ai-in-pharmacy-practice-presents-benefits-and-challenges>
- <sup>5</sup> Silvertown, A. (2023, November 25). Artificial intelligence in retail pharmacy: The impact and potential of AI. LinkedIn. Retrieved from <https://www.linkedin.com/pulse/artificial-intelligence-retail-pharmacy-impact-ai-adam-silvertown-6uqic/>
- <sup>6</sup> A. Harika Anupama, G.Srilekha, Uma Priya, (March-April 2020, article 07 page 32-35). Artificial Intelligence (AI) in Drug Dispensing & Drug Accountability. Retrieved from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://globalresearchonline.net/journalcontents/v6i-2/07.pdf
- <sup>7</sup> Geneva Tamunobarafiri Igwama, Ejike Innocent Nwankwo, Ebube Victor Emeihe and Mojeed Dayo Ajegbile, (July 2024). The role of AI in optimizing drug dosage and reducing medication errors. *International Journal of Biology and Pharmacy Research Updates*. Retrieved from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://orionjournals.com/ijbpru/sites/default/files/IJBPRU-2024-0027.pdf
- <sup>8</sup> Mary K. Pratt, (Mar 2023). AI's role in telemedicine. Retrieved from <https://www.techtarget.com/searchenterpriseai/feature/How-AI-has-cemented-its-role-in-telemedicine>
- <sup>9</sup> Keith Loria, (Aug 2023). Retrieved from <https://www.drugtopics.com/view/how-ai-can-improve-controlled-substance-security>
- <sup>10</sup> Uspensky, S. (2024, July 22). Artificial intelligence in pharmacy: Use cases, examples, challenges. Springs Apps. Retrieved from <https://springsapps.com/knowledge/artificial-intelligence-in-pharmacy-use-cases-examples-challenges>



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