



# Development and Preliminary Evaluation of an AI-Based Multi-Database Clinical Evidence Retrieval Application for Physicians

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## Introduction

- Physicians face increasing difficulty accessing relevant clinical evidence at the point of care due to time constraints and fragmented medical literature across multiple databases
- Existing platforms often require separate searches and prioritize a single database, limiting efficiency and breadth of evidence retrieval
- There is a need for tools that streamline access to diverse, high-quality clinical information

## Objective

To develop and evaluate an AI-based tool that aggregates and prioritizes clinical evidence from multiple open-access medical databases.

## Methods

- Developed a multi-source clinical evidence retrieval tool that enables a single-query search across multiple open-access databases
- Integrated open-access databases:
  - PubMed, Semantic Scholar, Directory of Open Access Journals (DOAJ), CORE, the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), PLOS, and the National Network of Libraries of Medicine (NNLM).
- Implemented AI-assisted summarization of individual articles
- Designed a source-weighting approach to prioritize databases based on query relevance
- Included filtering and sorting features to support efficient evidence retrieval
- Design decisions emphasized accessibility, ethical use of open-access data, and integration into clinical workflows
- Conducted preliminary testing using representative clinical queries
- Collected informal physician feedback to assess usability and perceived value

## System Interface and Example Output

### Search Interface

### Example Query

### AI-Generated Summary Example

### Filter Results

## Results

- Informal physician feedback based on review of the system concept indicated that integrated multi-database search could improve efficiency compared to traditional single-database workflows
- Physicians noted the potential value of retrieving diverse sources (e.g., clinical studies, public health data, and reviews) within a single query
- AI-generated summaries were perceived as useful for rapidly identifying key findings in individual articles
- The proposed system was viewed as aligned with clinical workflow needs and priorities
- The system concept was perceived as intuitive and easy to navigate, supporting rapid adoption in clinical settings
- Physician feedback directly informed system design, including the addition of the CDC as a data source to support access to evolving clinical guidelines

## Next Steps

This work represents an early-stage system requiring further evaluation and refinement. Subsequent work will include:

- Conducting structured usability testing with physicians to evaluate workflow integration and user experience
- Quantifying time efficiency compared to traditional single-database search methods
- Refining source-weighting algorithms to improve relevance of retrieved results
- Evaluating the accuracy and reliability of AI-generated summaries across different types of medical literature
- Exploring integration with electronic health record (EHR) systems to support real-time clinical decision-making
- Expanding database integration to include additional clinical guidelines and public health sources



Physicians often struggle to quickly find reliable medical information because research is spread across many different databases. This project developed a tool that allows users to search multiple medical sources at once and view summarized results in one place. By combining databases such as PubMed, WHO, and CDC, the system helps reduce the time needed to locate relevant evidence. Feedback from physicians suggests that this approach could make it easier to stay up to date and support clinical decision-making. This work represents an early step toward improving how healthcare providers access and use medical information.