Combining the Power of Graphical User Interfaces and Command-based Input: A Medical Literature Search Tool with No Buttons

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Introduction

Medical associations, governmental organizations, and health-care institutions publish clinical practice guidelines with the goal of improving quality of care through standardizing clinical practice. Clinicians may review guidelines at the point of care, when reviewing a case, creating educational materials, or developing an institutional guideline. Thousands of guidelines exist, and they can be tens or hundreds of pages long.

With such a quantity of knowledge available, clinicians may have difficulty narrowing their search to find answers quickly. This problem might be remedied if clinicians had a tool that would help them find guidelines relevant to their questions and identify key paragraphs within those guidelines in a way that is user friendly, fast, and precise.

This poster introduces a prototype application aimed to address this need.

Addressing the Problem

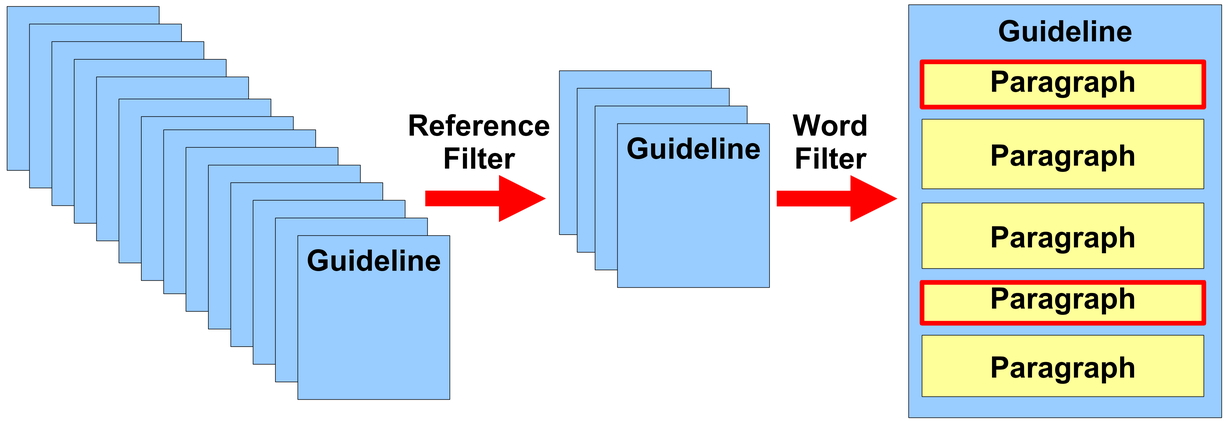
The Agency for Healthcare Research and Quality maintains a freely available, online repository called the National Guideline Clearinghouse (NGCH) that contains about 2,000 guidelines. Though this site has traditional search functionality, users may have difficulty wading through a large number of results.

NGCH guidelines are published in multiple formats, including XML. The site also has an XML (RSS) feed that acts as an index of all the guidelines. These features support programmatic access.

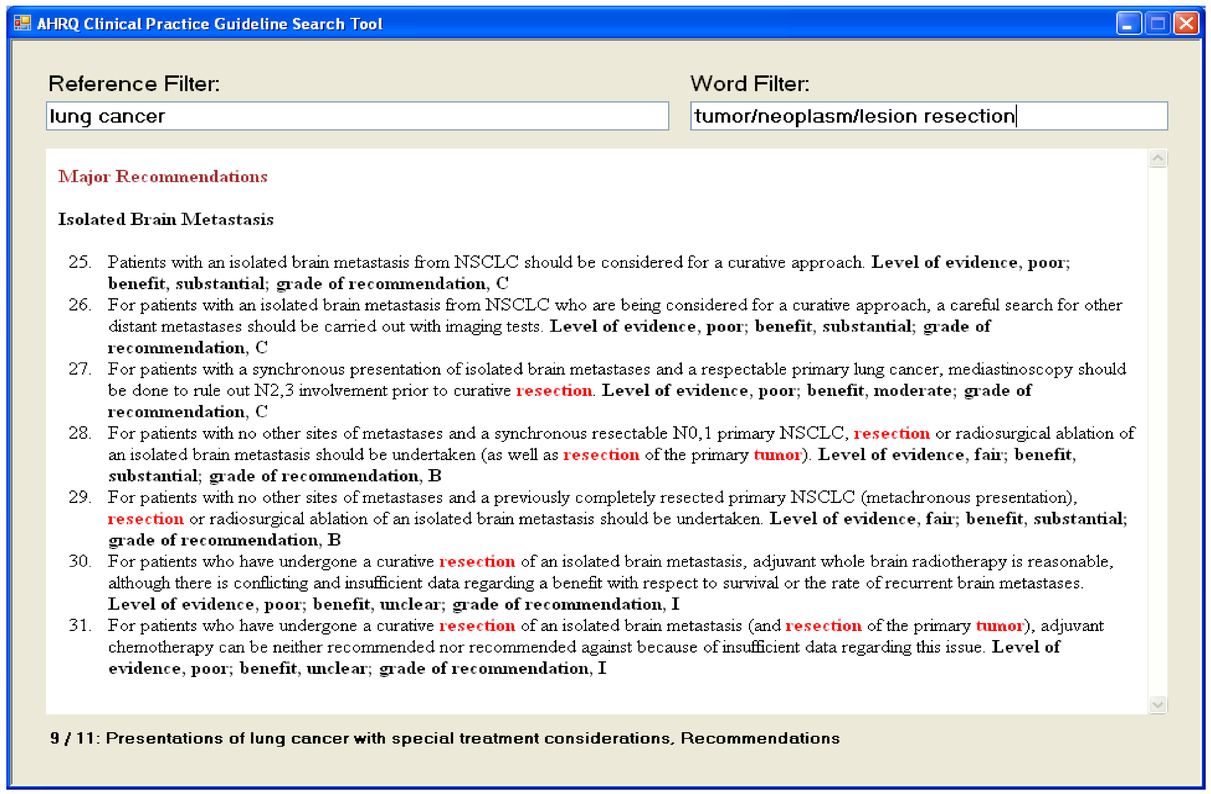
For this prototype, a software tool was developed to download NGCH guidelines into a local database. A user interface (see right) was also created to support text-based searches on the guidelines and fast navigation through results. The search syntax supports AND, OR, and negation logic as well as phrase and word-order matching.

Based on the concept of command-line interfaces, one goal was to allow users to search and navigate using keystrokes only—no mouse is required and no buttons must be clicked. The intent was to reduce the time it takes to find answers by not requiring users to switch between keyboard and mouse yet still support the look and feel of a graphical user interface.

Filtering guidelines in repository to identify relevant paragraphs



User Interface



Discussion

This prototype offers a new approach for searching clinical practice guidelines and other knowledge resources. Its simple user interface and advanced search capability may be a way to help clinicians stay abreast of best practices and translate them into everyday practice.

To extend this work and reach the ideal of implementing such a tool in a clinical environment, these steps may be important:

- Optimize precision / recall of search results
- Improve user interface via human-factors analysis
- Use “concept” XML feed to integrate UMLS terms and support searching by synonyms
- Format guidelines with better-structured document model (e.g. GEM, CPG-RA)
- Provide support for importing unstructured document types (e.g. PDF, HTML)
- Integrate with EHR systems

Conclusion

Text-based search tools such as this prototype may provide effective access to knowledge resources, such as clinical practice guidelines, by allowing users to perform advanced searches on large repositories and to navigate at the paragraph level. Doing so may be a means of better integrating clinical knowledge resources into everyday practice.

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