

MeSH Speller + askMEDLINE: Auto-completes MeSH Terms then Searches MEDLINE/PubMed via Free-text, Natural Language Queries

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Abstract

Medical terminology is challenging even for healthcare personnel. Spelling errors can make searching MEDLINE/PubMed ineffective. We developed a utility that provides MeSH term and Specialist Lexicon Vocabulary suggestions as it is typed on a search page. The correctly spelled term can be incorporated into a free-text, natural language search or used as a clinical queries search.

Background

Handheld computers and wireless networks are now available for mobile access to online resources for clinicians. However, retrieval of electronic references can fail because of spelling or entry errors. They are common even among healthcare personnel. Diseases named after people are particularly difficult to spell. In a study on cancer information, Bader [1] found that spelling errors were frequent. Variations in the quality arose from mistakes or spelling variations. Our searches on askMEDLINE [2] showed that approximately 10% of failures were due to spelling errors. PubMed makes spelling suggestions in about 7% of searches daily; users click on over 35% of suggested terms. Failure in finding current evidence can be frustrating, especially for a clinician searching a question on therapy or diagnosis of an urgent case. If references are not available quickly, the clinician will likely not search later, even if the need is great [3]. With time constraints in today's practice environment, it may reduce further time for patient interaction. Searching can be made more efficient with automated spelling assistance. We developed a search utility that provides suggestions of terms as it is typed. Selected terms can be incorporated with askMEDLINE. Users could then search MEDLINE/PubMed using natural language queries or free-text.

Methods

Two tables, using MeSH and a Specialist Lexicon Vocabulary were developed with MySQL. When the first letter of a search term, a javascript makes an XMLHttpRequest object request to the askMEDLINE server. The first set of MeSH terms from the table is then returned to the browser in a dropdown menu. The object call is made each time a key is tapped. The process continues as each subsequent letter in the search term is entered. The request-and-response routine continues until the user selects the word or

term, or the table is unable to find a matching MeSH term. An estimate on the number of citations for a particular MeSH is shown in the dropdown window. If the search term is not found in the MeSH table, the Specialist Lexicon Vocabulary is searched. The selected MeSH term that is then sent as a query, or may be incorporated into a free-text, natural language search. The natural language query is parsed using the askMEDLINE strategy using PubMed's E-Utilities.

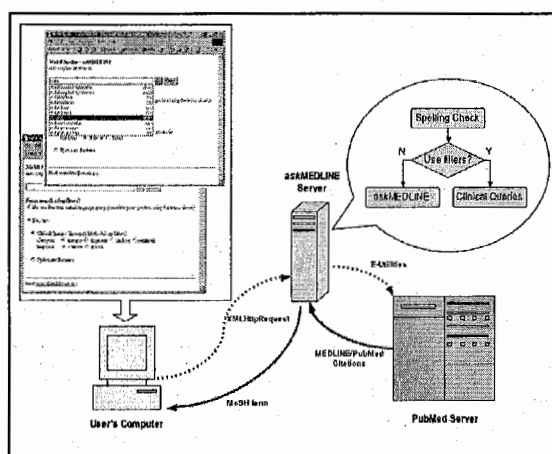


Figure 1. MeSH Speller search strategy

Conclusion

MeSH Speller provides the user a list of suggestions from MeSH terms or a Specialized Lexicon Vocabulary as soon as a part of the word is typed on the browser. The correctly spelled term can then be selected as a MEDLINE/PubMed query using clinical queries filters, or incorporated into a full-text, natural language query. Relevant citations with links to abstracts, full-text, and related citations are sent to the user. The utility is easy to use, fast and convenient. Early user feedback has been positive.

References:

- [1] Bader JL, Theofanos MF. Searching for Cancer Information on the Internet: Analyzing Natural Language Search Queries. *J Med Internet Res* 2003;5(4):e31.
- [2] <http://askmedline.nlm.nih.gov>
- [3] Sackett DL, Straus SE. Finding and applying evidence during clinical rounds: the "evidence cart". *JAMA*. 1998 Oct 21;280(15):1336.