Evidence Based Library and Information Practice

Evidence Summary

Applying the Narrow Forms of PubMed Methods-based and Topic-based Filters Increases Nephrologists' Search Efficiency

A Review of:

Shariff, S. Z., Sontrop, J. M., Haynes, R. B., Iansavichus, A. V., McKibbon, K. A., Wilczynski, N. L., Weir, M. A., Speechley, M. R., Thind, A. … Garg, A. X. (2012). Impact of PubMed search filters on the retrieval of evidence by physicians. *CMAJ: Canadian Medical Association Journal, 184*(3), E184-E190. doi: 10.1503/cmaj.101661

Reviewed by:
Kate Kelly
Chief Librarian
Royal College of Surgeons in Ireland
Dublin, Ireland
Email: katekelly@rcsi.ie

Received: 13 June 2012 **Accepted:** 15 Aug. 2012

Abstract

Objective – To determine whether the use of PubMed methods-based filters and topic-based filters, alone or in combination, improves physician searching.

Design – Mixed methods, survey questionnaire, comparative.

Setting – Canada.

Subjects – Random sample of Canadian nephrologists (n=153), responses (n=115), excluded (n=15), total (n=100).

Methods – The methods are described in detail in a previously published study protocol by a subset of the authors (Shariff et al., 2010).

One hundred systematic reviews on renal therapy were identified using the EvidenceUpdates service (http://plus.mcmaster.ca/EvidenceUpdates) and a clinical question was derived from each review. Randomly-selected Canadian nephrologists were randomly assigned a unique clinical question derived from the reviews and asked, by survey, to provide the search query they would use to search PubMed. The survey was administered until one valid search query for each of the one hundred questions was received.

The physician search was re-executed and compared to searches where either or both methods-based and topic-based filters were applied. Nine searches for each question were conducted: the original physician search, a broad and narrow form of the clinical queries therapy filter, a broad and narrow form of the nephrology topic filter and combinations of broad and narrow forms of both filters.

Significance tests of comprehensiveness (proportion of relevant articles found) and efficiency (ratio of relevant to non-relevant articles) of the filtered and unfiltered searches were conducted. The primary studies included in the systematic reviews were set as the reference standard for relevant articles.

As physicians indicated they did not scan beyond two pages of default PubMed results, primary analysis was also repeated on search results restricted to the first 40 records.

The ability of the filters to retrieve highly-relevant or highly-cited articles was also tested, with an article being considered highly-relevant if referenced by UpToDate and highly-cited if its citation count was greater than the median citation count of all relevant articles for that question – there was an average of eight highly-cited articles per question.

To reduce the risk of type I error, the conservative method of Bonferroni was applied so that tests with a $p<0.003$ were interpreted as statistically significant.

Main Results – Response rate 75%. Physician-provided search terms retrieved 46% of relevant articles and a ratio of relevant to non-relevant articles of 1:16 ($p<0.003$). Applying the narrow forms of both the nephrology and clinical queries filters together produced the greatest overall improvement, with efficiency improving by 16% and comprehensiveness remaining unchanged. Applying a narrow form of the clinical queries filter increased efficiency by 17% ($p<0.003$) but decreased comprehensiveness by 8% ($p<0.003$). No combination of search filters produced improvements in both comprehensiveness and efficiency.

When results were restricted to the first 40 citations, the use of the narrow form of the clinical queries filter alone improved overall search performance – comprehensiveness improved from 13% to 26 % and efficiency from 5.5% to 23%.

For highly-cited or highly-relevant articles the combined use of the narrow forms of both filters produced the greatest overall improvement in efficiency but no significant change in comprehensiveness.

Conclusion – The use of PubMed search filters improves the efficiency of physician searches and saves time and frustration. Applying clinical filters for quick clinical searches can significantly improve the efficiency of physician searching. Improved search performance has the potential to enhance the transfer of research into practice and improve patient care.

Commentary

The authors state that this study moves beyond the development of filters to testing their functionality in the real-world context of physician searching and that, to their knowledge, the latter has only been attempted twice before and never with methods- and topic-based filters in combination. This reviewer agrees with those statements although arguably the study by Lokker, Haynes, Wilczynski, McKibbon and Walter (2011), which includes 40 practising physicians and a study objective "to determine the yield of relevant citations and physician satisfaction while searching for diagnostic and treatment studies using the Clinical Queries page of PubMed compared with searching PubMed without these filters" could be added to the two studies referenced.

The only minor criticism of this study is that it cannot be read or replicated without reading the published study protocol. However the

study protocol describes the methodology in great detail and is worth reading by itself as an example of the level of thinking behind a study design. This reviewer found that any questions arising from reading the study were answered either further on in the paper or in the study protocol and the three online appendices which accompanied the study. The response rate of 75% is impressive and, as the study protocol indicates that the total population of nephrologists in Canada is 519, the sample size of 100 is large enough.

The authors clearly identify the strengths and limitations of the study, indicate areas of further research and reach valid conclusions. For health sciences librarians this is further evidence to support the use of the clinical queries filter and to include teaching the use of clinical filters in PubMed training – the results suggest using the methods-based filters are generalizable to other sub-specialties. In addition, as the authors suggest, the research methodology can be applied to other specialties to further evaluate the performance of filters in the real world. The dearth of literature on this topic indicates real research potential in this area.

References

Lokker, C., Haynes, R. B. Wilczynski, N. L. McKibbon, K. A., & Walter, S. D. (2011). Retrieval of diagnostic and treatment studies for clinical use through PubMed and PubMed's Clinical Queries filters. *Journal of the American Medical Informatics Association, 18*(5), 652-659. doi:10.1136/amiajnl-2011-000233

Shariff, S. Z., Cuerden, M. S., Haynes, R. B., McKibbon K. A., Wilczynski, N. L., Iansavichus, A. V., Speechley, M. R., Thind, A., & Garg, A. X. (2010). Evaluating the impact of MEDLINE filters on evidence retrieval: Study protocol. *Implementation Science,* 5, 58. doi:10.1186/1748-5908-5-58