PubMed And EBM Training for Medical Students: Finding a Better Way

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Background

PubMed searching and EBM principles have traditionally been taught to 2nd year medical students in a large auditorium setting during the Orientation to the Clinical Year. With lagging student attendance and little feedback on whether students were retaining lecture content, we designed a mandatory PubMed tutorial with support from School of Medicine faculty, to replace the in-person session. The interactive tutorial walks students through basic searching techniques, EBM principles, and conducting the search. A final quiz requires students to apply EBM principles to a new search scenario and find five relevant articles. Each student received individualized feedback from a librarian.

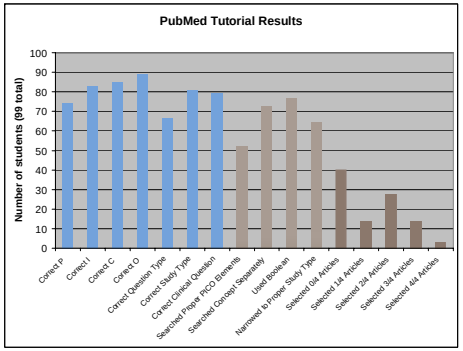
Searching techniques
- Search concepts separately
- Check *Details*
- Use appropriate MeSH
- Use Boolean operators
- Apply *Limits*

EBM principles
- Use the PICO framework
- Form the clinical question
- Identify the question type & appropriate study design

Development

The design process stretched over eight months. The structure was modeled on a frame-based tutorial developed at Mount Sinai School of Medicine.* This allowed us to provide instruction in one frame while students conducted a live PubMed search in another. We mapped out the didactic content through storyboards and created an example illustrating the major steps of a search. User testing was performed by several librarians, support staff, and a library student. Responses to the quiz and evaluation were sent to an email address.

Results



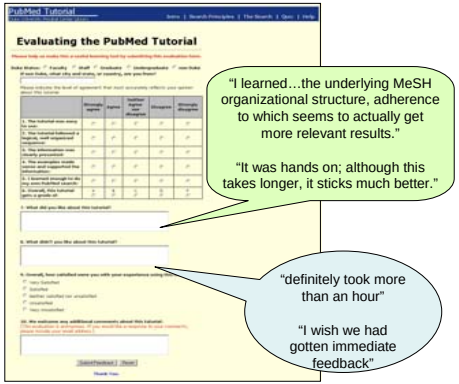
The tutorial received a grade of A or B from 86% of students, and 83% indicated they thought they "learned enough to do [their] own PubMed search." However, the results of the quiz demonstrated that student search skills were still lacking.

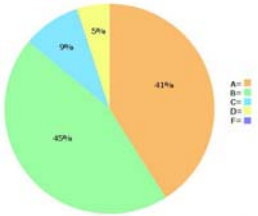
While many students could place the search elements in PICO format and construct the clinical question, they were less successful at searching or selecting relevant articles.

Analysis of quiz results was done using Pearson correlations in SPSS. The strongest correlation between searching variables and selecting the "gold standard" articles was the cumulative score, which included all the graded elements. The data suggest that no variable is more predictive of successful searching than another.

In other words, *there is no magic bullet*; students must learn all aspects of a good search, from PICO to narrowing to employing Boolean operators to limiting to the appropriate study type.

Student Feedback





What's that acronym we learned? PICA?…No, that's eating dirt….Hmmm.

Advantages

Biggest advantage: *All students completed the training and performed a search!*

For students…
- Able to complete tutorial at their convenience
- Generally happy with the tutorial, especially the interactive format and specific searching tips
- Quiz provided opportunity for one-on-one feedback by librarians
- Tutorial remains available for reviewing concepts

For librarians…
- Able to review quizzes at our convenience
- Data collection on searching skills
- Facilitates planning of additional training

Disadvantages

Biggest disadvantage: *Amount of time required to develop tutorial and review quizzes*

For students…
- Some had browser/computer problems with frames
- Instructions were confusing to some
- They wanted immediate feedback

For librarians…
- Difficulty identifying the source of some technical problems encountered by students
- Tutorial needs major revision on account of 2008 MeSH changes

Future Plans

- Revise the tutorial based on quiz results, evaluation comments, and MeSH changes
- Provide clearer instructions (possibly using screenshots or video)
- Include a final summary screen reminding them of major concepts (e.g., PICO)
- Include more options for learning advanced skills
- Investigate ways to streamline the grading process while still collecting meaningful data and giving students useful feedback!

*Credit: PubMed Tutorial of the Gustave L. and Janet W. Levy Library of Mount Sinai School of Medicine - http://www.mssm.edu/library/tutorials/pubmed.html