THE GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER
WASHINGTON DC

Introduction

Using a collaborative approach, the librarians of the Himmelfarb Health Sciences Library worked with the director of the Primary Care Clerkship and senior residents in 6 specialty areas in a workshop to:

- review the principles of Evidence-Based Medicine (EBM) with 3rd year medical students.
- assess students' ability to apply these skills in a timely and effective manner in a clinical setting.
- assess the School of Medicine's informatics training incorporated into the first two years.

Background: The Primary Care Clerkship Director is also the coordinator of the School's PBL program for years 1 and 2. He and Library faculty have worked closely to create an informatics curriculum for 1st year students, which incorporates the research and analysis skills necessary for case-based learning. 2nd year students enhance these informatics skills through a mid-year pharmacology project.

The workshop was designed to be non-threatening and engaging. Students are accustomed to the team approach, since all 1st year PBL sessions are led by a clinician and librarian. The session was not graded but attendance was mandatory. The informal discussion format was designed to encourage student participation.

Resources Highlighted

Ovid MEDLINE-- focused search/ MeSH terms/Limits

BMJ Clinical Evidence

MDConsult-- textbooks and guidelines

National Guideline Clearinghouse

Schedule/Outline

Students complete pre-test

11:30 – 1:00 Review of EBM and goals with residents

1:00 – 2:30 Student workshop:

EBM principles/EBM resources/ case review/collect data/ analyze data/apply data to case/repeat.

Students complete post-test.

Preparation:

- All senior residents received advanced copies of an EBM Primer written by Library faculty and a brief summary of Evidence-Based Medicine resources.
- Residents supplied clinical scenarios around which sample search strategies could be devised.
- Librarians worked to narrow cases from 18 to 4 and selected resources to highlight.
- Multiple classrooms and computers were reserved; a workshop outline prepared; and a luncheon session scheduled to prepare residents for the workshop.

Evaluation of Evidence-Based Medicine Search Skills in the Clinical Years

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Sample Case: Primary Care/Medicine

A 32 year old man comes to your office complaining of headaches (HAs). He began having HAs about two months ago. They usually occur at the end of the day, seem to start at the back of his head, and are of a throbbing nature. They occasionally radiate out onto the tops of his shoulders, or up over the top of his head. Ibuprofen OTC usually, but not always, relieves his pain. His PMHx is only significant for childhood asthma, and aside from ibuprofen PRN for the HAs, he takes no other medications. He has recently gotten a promotion at work, and is working 12 hours a day 6 or 7 days a week, and hasn't been to the gym in a month.

The patient states that his 37 y/o first cousin suddenly started having headaches last year and was found to have a brain tumor. The patient demands that you give him a referral for an MRI.

-- Is neuroimaging appropriate in this patient?
-- What are the indications for imaging in patients with HA?
-- What is the most appropriate radiologic screening test in patients with new onset HA?

Variations on a Case:

- Originally over 18 scenarios were submitted.
- The headache case was adapted with minor variations for all 6 specialties: Primary Care, Internal Medicine, Pediatrics, Obstetrics/Gynecology, Surgery, and Psychiatry.
- Case 2 covered RSV for Pediatrics, ECT for Psychiatry, and breast masses for all other specialities.
- Cases were selected that were sufficiently clinical but capable of being covered in 15-20 minutes.

Challenges to Successful Implementation

- Groups too large for good discussion (6 groups of 25 each!).
- More time needed (Several sessions ended in mid-discussion!).
- Resident commitment to EBM practices highly variable (IM versus surgery!).
- Equipment/connections not always reliable.
- Workshop scheduled in classrooms during exam time instead of seminar rooms.
- Large investment of librarians' time for preparation.
- Limited amount of time to prepare residents for workshop.
- Not all students approached workshop seriously.

Evaluation

Do students truly learn effective evidence-based medicine search skills in the non-clinical years?

- According to pre-test results, over 90% of 3rd year students can define EBM.
- Over 80% selected systematic reviews and guidelines as major EBM resources.
- Over 50% identified practice guideline, randomized control trial, and meta-analysis as publication types for limiting to EBM articles in MEDLINE.
- Few students knew where to find guidelines quickly and many rely on case studies and review articles for evidence-based information.
- Students in the workshop were familiar with search software but did not use advanced search techniques.
- Residents and librarians reported that students had difficulties assessing the quality of what they found.
- Students needed help in learning when to cut their losses and move quickly to another source.

Did students exhibit greater knowledge of evidence-based medicine search skills following the workshop?

- Post-test did not demonstrate major changes from pre-test knowledge.
- Areas with greatest improvement were related to the use of guidelines:
  1. Students designating guidelines as a major EBM resource increased by 11%.
  2. Students indicating they would search guidelines as a publication type increased by 24%.
  3. Students listing the National Guideline Clearinghouse as a source for guidelines increased by 28%.
- General comments were positive although there was definitely some negative feedback.

> *"I actually learned something new as opposed to repeats from 1st and 2nd year library lectures. Using real questions to research and having all students assist the one student on the computer was a very effective technique. We used several databases and the librarian gave effective tips of the trade."*

> *"This was a lot of stuff that we already knew. Remember, we are the Internet generation and went through part of high school and undergraduate schooling on the Internet. We know how to use it and search it. What we don't know is many of the new sites that are very useful such as guidelines.gov"*

Assessment of Program

- Overall workshop leaders viewed program as successful.
- PBL planning group looking at ways to reinforce search techniques in the informatics curriculum.
- Residents are clear targets for additional EBM search training.
- Students differ in terms of searching sophistication. Perhaps two-tierd training model is needed.

As part of the pre- and post-test process, students were given the following open-ended question:

A 40-year-old man presents to the ER with left lower quadrant pain, fever, leukocytosis and anorexia. A CT scan made the diagnosis of diverticulitis of the sigmoid colon. In order to find the recommended treatment, what would your search strategy be? Several provided very sophisticated answers, including the following:

> *"I would first use a quick, accessible reference such as a text on my palm pilot to see if it described clear indications for therapy. If the patient's presentation was complicated or unclear or if the disease/treatment modality was controversial or currently under debate, I would look for online EBM data from consensus conferences, Cochrane, or meta-analyses that reflect which treatment strategies are supported by current and reliable research."*