

## **SCAMeL Speedy Startup: 2019**

**Title:** "Diving Deeper: Teaching Evidence-Based Medicine in Clinical Clerkships"

**Principal Investigator:**

Catherine Pepper, MLIS, MPH

Associate Professor/Coordinator of Library Field Services

Medical Sciences Library, Texas A&M University

**What is the project?**

**Summary.** This ethnographic research project will explore in detail how—and whether—evidence-based medicine (EBM) is taught in a medical school’s clinical clerkships and residencies, and whether competencies in EBM, as defined in accreditation criteria and in the new competency-based Core Entrustable Professional Activities (EPAs) for Entering Residency, are assessed and practiced. The project will also seek to engage primary stakeholders involved in implementing EPAs, including undergraduate and graduate accreditation agencies and national health sciences libraries associations. This project builds on the findings of the initial 2017 study, funded by SCAMeL, which established that faculty and librarians face complex challenges in teaching EBM, including which teaching methods best fulfill competency standards, students’ negative attitudes, and perplexity over assessment methods. Aims of this project include aligning competency requirements of undergraduate and graduate medical education accreditation agencies with student learning outcomes, and constructing a standardized model for teaching EBM.

**Why is it important (what is the benefit)?**

**Background.** Evidence-Based Medicine (EBM) is a systematic approach to clinical problem-solving that combines the best available research studies with clinical expertise and patient values. Competencies in EBM are now included in accreditation criteria for medical and health sciences education. The Association of American Medical Colleges (AAMC) is currently piloting new guidelines—the Core EPAs, defined as “Unit[s] of observable, measurable professional practice requiring integration of competencies”.<sup>1</sup> EPA 7, “Form Clinical Questions and Retrieve Evidence to Advance Patient Care” details competency levels for EBM ([aamc.org/initiatives/coreepas](http://aamc.org/initiatives/coreepas)).

However, the literature shows that at least three issues hamper student mastery of these competencies. First, no standardized method of teaching or assessing EBM knowledge and skills exists. Furthermore, medical schools face multiple challenges in teaching EBM, from finding time in the curriculum to faculty’s lack of EBM knowledge and skills, as well as students’ difficulty in mastering EBM skills and, often, their dismissive attitudes toward EBM.<sup>2</sup> Finally, the United States Medical Licensing Exam (USMLE), taken in two “Steps” prior to medical school graduation, does not assess EBM knowledge. Therefore, it is currently unknown how well-prepared medical students are in searching, critically appraising, and applying research literature for patient care upon graduation.

Texas A&M University College of Medicine (COM), like other medical schools, has implemented a variety of educational approaches to teaching EBM, with varying levels of success. Complicating these approaches further, COM has multiple campuses, leading to greater heterogeneity of clinical faculty in whether they teach EBM as part of student rotations, how much training they have had in teaching EBM, and how well they teach EBM.

To better understand how other medical schools teach and assess EBM skills and competencies, the PI conducted a qualitative study in 2017, funded by SCAMeL and the Medical Library Association's David A. Kronick Traveling Fellowship, which investigated educational approaches and challenges in teaching EBM, interviewing 90 medical school faculty and medical librarians at 16 institutions. Key findings included: (1) EBM is not consistently modeled in clinical teaching, nor are faculty held accountable for incorporating EBM; (2) Few EBM instructors know how to assess all EBM competencies; (3) A popular clinical information app (UpToDate) appears to have supplanted the perceived need for EBM skills in practice; (4) Assessment of EBM competencies ranges from none all the way to observed clinical skills exams (OSCEs); (5) Incoming residents possessed wide disparities in competencies in practicing EBM, with most requiring remedial training the first year; (6) Wide variability of course content was observed between institutions and between disciplines within an institution; (7) Since EBM is not tested on board exams, students are not motivated to learn the material; (8) A range of involvement of medical librarians was reported, from no participation to full engagement as faculty on the curriculum planning team.

Findings were consistent with concerns expressed by A&M COM faculty--that students do not retain EBM knowledge and skills taught in the first two years, and that students may arrive in residencies without the required competencies for EBM. COM faculty, including MSL librarians, do not know how to ensure or measure these competencies, especially since *no further formal EBM instruction occurs after the second year*. As a consequence, graduating A&M medical students entering residencies may lack the one of the skillsets they need to deliver high-quality care, and they may be among those interns who require remedial instruction in EBM.

Despite these deficiencies that were consistently voiced from multiple interviews, the data showed two widely-held assumptions: (1) Clinical faculty know EBM and incorporate it into teaching, and (2) Graduating MDs possess EBM competencies. Therefore, a logical next step is to observe how and whether EBM instruction is incorporated into clinical clerkships, and to identify points where librarian involvement could improve the EBM teaching experience for both faculty and students.

**Method.** This next study builds on the 2017 research and will perform a gap analysis on six identified factors that contribute to the key elements of teaching EBM: content and integration into the curriculum, delivery and teaching/learning methods, acceptance and attitudes, assessment, faculty knowledge and readiness to teach, and librarian involvement. The study will observe EBM teaching and competency assessment in clinical clerkships, third- and fourth-year electives, and in residencies at a medical school.

In October 2018, Ms. Pepper was approved by the Texas A&M University Dean of Faculties for Faculty Development Leave to take place in Fall 2019. The leave will take place in two locations:

Oregon Health Sciences University (OHSU), Portland, OR and satellite campuses/residency locations, and Chicago, IL at the Medical Library Association (MLA) headquarters. Letters of support from both of these study sites are attached.

During the first part of the leave, Pepper will initiate a longitudinal, qualitative study of the OHSU EBM programs, observing and describing these elements in its medical school program as well as in its nursing, pharmacy, physician assistant, and public health programs. In cooperation with the OHSU Library and medical school, the study design will be ethnographic participatory research, consisting of interviews with faculty and librarians who teach EBM and of observation of classes and clinical teaching in clerkships. Participants will act as “co-researchers”, and will be asked to recommend solutions as instances of the eight issues identified in the 2017 study are encountered. OHSU is especially instructive as a reference site, since its program extends across a wide geographic area in Oregon and Washington. Unlike other medical schools in Texas (University of Texas health sciences centers each report to the system level), OHSU’s distributed structure is similar to that of A&M’s College of Medicine regional campuses, suggesting that findings could be incorporated into a framework that could be adapted by COM and other multi-campus medical schools. Also, OHSU provided some especially valuable interview data in the 2017 study.

Data collection will be conducted by the PI, who will “shadow” clinical rounds in clerkships and in a residency, and who will observe instances of EBM teaching and practice, including whether and how EPA 7 competencies are assessed. The PI will also observe “morning report” and journal clubs at OHSU residency locations. Semi-structured and unstructured interviews will be conducted with medical librarians and medical school faculty to address project goals and objectives. The gap between existing and ideal states of students’ master of EBM competencies will be discerned through observation of clerkship teaching and as described through interviews with faculty, librarians, and students if possible. A field guide will be used to collect data, allowing the PI to capture demonstrations of EBM instruction, practice, and competency as they occur. The field guide will be comprised of functions, competencies, and behaviors as described in EPA 7. Research and activities conducted later in the leave will produce instruction and assessment items that can be tested with this population, within agreed-upon parameters, to begin to build a teaching model. Content and framework analyses will be performed manually, with two independent raters.

The second part of the leave will take place in Chicago, where, in conjunction with key staff from the American Association of Health Sciences Libraries and from the Medical Library Association, the PI will seek to meet with representatives from accrediting agencies for both undergraduate (Liaison Committee on Medical Education (LCME)) and graduate medical education (ACGME), as well as—hopefully!--the National Board of Medical Examiners (NBME), the developer of the USMLE board exams. Potential discussions will explore the following: (1) Reasons for a seeming lack of communication between these accrediting bodies about EBM teaching; (2) Why EBM is not tested on the board exams—and how can it be included in the future; (3) Why EBM teaching is not tracked or assessed in the clinical years; and (4) How LCME, ACGME, NBME, and library organizations can work together to align competencies with curricula. The PI recognizes that bringing all of these stakeholders to the same table may be a long-term effort, and that these

proposed conversations would touch on sensitive topics for the national medical education agencies. However, it is essential that a start is made if ever the teaching of EBM is to be fully integrated into all medical school curricula—which is not currently the case. The PI will work with AAHSL to ensure a mutually agreeable approach.

The PI will share the results of this research with SCAMeL, MLA, MLA/SCC, University Libraries and COM faculty, and will submit abstracts for oral presentations and posters to national and international conferences in medicine and medical librarianship. Manuscripts will also be submitted for publication in two journals. These outputs will be of value to medical librarians and health sciences faculty who teach EBM courses in various disciplines, helping to answer widespread, expressed needs for guidance on issues identified in Pepper's 2017 research and in the EBM published literature.

IRB is in the process of submission; exempt status is expected, as no patient data will be recorded.

### **References**

1. Association of American Medical Colleges (AAMC). The Core Entrustable Professional Activities for Entering Residency. May 2014. <https://www.aamc.org/initiatives/coreepas/>
2. Maggio L, ten Cate O, Chen H, Irby D, O'Brien B. Challenges to Learning Evidence-Based Medicine and Educational Approaches to Meet These Challenges. *Academic Medicine*. 2016;91(1):101-106. doi:10.1097/acm.0000000000000814.

### **What institution is involved?**

Texas A&M University Medical Sciences Library is the lead institution. The primary study site is the Oregon Health Sciences University Library and School of Medicine. The Medical Library Association will also participate, and the American Association of Health Sciences Libraries has informally indicated interest in potential participation.

### **Who will carry out the project and what are their roles?**

The Principal Investigator is Catherine Pepper, MLIS, MPH. Ms. Pepper will lead all segments of the study, including data collection and analysis, recruiting participants, and writing reports and journal papers. Other members of the study team include qualitative expert Louann Cole, MHA, Care Analyst, Center for Clinical Effectiveness, Baylor Scott & White Health; and Kelly Thormodson, MLIS, Director, Library Resources, School of Medicine and Health Sciences, University of North Dakota (as of April 1, 2019); Ms. Thormodson was a member of the 2016-18 AAHSL Competency-Based Medical Education Task Force. Esther Carrigan, Director of the Medical Sciences Library, will oversee overall execution of the study and the budget expenditures.

### **What is the timeline?**

Data collection at OHSU will take place over a 3-week period, during August-September of 2019. The MLA portion of the study will take place in Chicago over 2-week period in September. The PI will drive to study locations. Data analysis will be conducted from October 2019 to February 2020, and the final report will be completed by May 2020. Manuscripts will be submitted in 2020 to two peer-reviewed journals for publication. Abstracts for research papers will be submitted for Medical Library Association (MLA) and MLA/South Central Chapter 2020 conferences, as well as for the 2020 annual conference of AAMC (Association of American Medical Colleges).

**How much money do I need for the project (budget)?**

This is a large, ambitious project, and will require funding beyond the allowed grant amount. Some professional development funding will be available from MSL, but the remainder will be funded by the PI.

***Lodging:***

OHSU: 24 nights @ \$120/night = \$2880

Chicago: 18 nights @ \$140/night = \$2520

*Total Hotel:* \$5400

***Gasoline:*** \$700

***Food:*** \$900

GRAND TOTAL: \$7,000

Total Requested from SCAMeL: \$6000

Remaining \$1000 to be funded by other sources, including MSL and/or Principal Investigator.


February 28, 2019

Dear SCAMeL Research Committee Members:

It is a pleasure to provide this letter of support for the project proposal submitted by Cathy Pepper. It is important to note that the foundational research upon which this proposal is based externally funded through the David A. Kronick Traveling Fellowship from the Medical Library Association and an additional research award from the South Central Academic Medical Libraries Consortium, a solid external validation of the value of this research. She has presented on this project at MLA and SCC, as well as sharing her project report through an SCR webinar. She has been granted a Faculty Development Leave for Fall 2019 by Texas A&M to continue her research into the next phase of this project. The next stage of her work will expand the stakeholders beyond those teaching evidence-based practice skills into the professional organizations involved in shaping standards and program accreditation expectations.

Ms. Pepper has put together a plan for her faculty development activities that is ambitious and detailed, yet very strategic. It is evident that she understands the key stakeholders and the critical roles they will play in building a new vision and future for teaching evidence-based practice skills. Her continuing research activities on this project have the potential to redefine the teaching of evidence-based practice skills not only for medicine, but across all the health professions. Ms. Pepper has the knowledge, expertise and interpersonal communication skills to be successful in this faculty development leave project. I recommend her and her project for this SCAMeL award without reservation.

Sincerely,

A handwritten signature in blue ink that reads "Esther Carrigan". The signature is written in a cursive style.

Esther Carrigan, MLS, AHIP



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PHONE 312.419.9094  
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October 5, 2018

Office of the Dean of Faculties  
Faculty Development Leave Committee  
MS 1126  
YMCA Building, Room 108  
Texas A&M University  
College Station, TX 77843-1126

Dear Faculty Development Leave Committee:

MLA is pleased to support Catherine Pepper's research on teaching evidence-based medicine by contributing to the discussions, knowledge and collaboration with her on specific requests related to the project. We also will be pleased to facilitate meeting space with nearby health sciences libraries where she can conduct her research while in the Chicago area.

As the primary membership association for medical and health sciences librarians, MLA (<https://www.mlanet.org/>) believes that quality information is essential for improved health. MLA aspires to be the association of the most visible, valued, and trusted health information experts. To that end, MLA fosters excellence in the professional practice and leadership of health sciences library and information professionals in order to enhance the quality of health care, education, and research throughout the world. One of MLA's key areas of concentration is evidence-based medicine (EBM).

Ms. Pepper received the 2017 David A. Kronick Traveling Fellowship, a \$2,000 award given annually to one recipient by the Medical Library Association. She used this award to conduct a novel qualitative study on issues surrounding the teaching of EBM, interviewing 90 medical librarians and health sciences education faculty at 16 institutions in the Pacific Northwest and Midwest. She presented her findings at MLA's 2018 annual conference in Atlanta to an appreciative audience.

We are pleased that Ms. Pepper is leveraging the results of her 2017 study to engage with key stakeholders in EBM education. Ms. Pepper's proposed research on teaching evidence-based medicine (EBM) is quite timely and relevant to MLA's initiatives in this area. For example, Competency 5 of [MLA's 2017 Competencies for Lifelong Learning and Professional Success](#) calls for *health information professionals to evaluate research studies, use research to improve practice, conduct research, and communicate research results.*

The potential impact of this proposed study could extend not only to medical libraries and medical school education, but to changed accreditation standards. MLA advocates increased recognition of the essential need for medical librarians to be key stakeholders in defining competences in EBM. Therefore, MLA heartily agrees to support Ms. Pepper's research effort by contributing to the discussions, knowledge, and collaboration with Ms. Pepper in this critical area, and to facilitate study space in the Chicago area for her faculty development leave.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kevin Baliozian', with a long, sweeping underline that extends to the right.

Kevin Baliozian, MBA, CAE  
Executive Director





October 8, 2018

Office of the Dean of Faculties  
Faculty Development Leave Committee  
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Dear Faculty Development Leave Committee:

OHSU Library in Portland, Oregon would like to extend an invitation to Catherine Pepper to conduct part of her proposed faculty development leave at our site. We expect that Ms. Pepper will spend about a month during the Fall 2019 semester at OHSU.

Ms. Pepper's proposed research on teaching evidence-based medicine (EBM) aligns well with OHSU Library's strong EBM instruction program in the health sciences areas that we serve: medicine, pharmacy, nursing, public health, and dentistry. We believe that Ms. Pepper's research will shed light on some issues that our EBM instruction librarians have encountered, including ways to ensure that EBM instruction is integrated into clinical clerkship instruction and increasing librarian involvement in teaching EBM. We are especially interested in how to design assessment instruments that effectively measure student competencies in EBM, particularly searching for evidence in the published literature and critically appraising the research literature for quality patient care.

Although Ms. Pepper's study will take place at OHSU, we see the potential for its findings to impact other health sciences libraries. Creating an evidence-based standardized model for teaching EBM that could be adapted to other health sciences educational settings would provide solid justification for health sciences librarians to be included in the planning and delivery of EBM curricula. Most libraries would also welcome a shared repository of EBM teaching materials and a forum for exchanging ideas and solutions.

Therefore, we would be pleased to serve as a host institution for Ms. Pepper's faculty development leave.

Sincerely,

A handwritten signature in blue ink that reads "Maija Anderson". The signature is written in a cursive, flowing style.

Maija Anderson  
Interim Director of Library Operations  
Director of Curatorial Services