

Final Report  
SCAMeL Speedy Startups--2019

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

**Principal Investigator:** Catherine Pepper, MLIS, MPH

**Award:** \$6,000

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**Summary**

This observational research project explores 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 AAMC competency-based Core Entrustable Professional Activities (EPAs) for Entering Residency, are assessed and practiced. The project also seeks 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 and MLA's Kronick Fellowship, 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. A specific aim of this project includes determining whether EBM knowledge and skills taught in pre-clerkship didactic sessions are reinforced in students' clinical learning, particularly during patient encounters. Overall 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.

Purpose:

1. Describe methods of teaching evidence-based medicine, and of assessing EBM knowledge and skills, at a large teaching hospital that is participating in the AAMC EPA pilot (<https://www.aamc.org/what-we-do/mission-areas/medical-education/cbme/core-epas/participants>)
2. Describe content, delivery, and assessment approaches of EBM in clinical clerkship activities.

This report presents findings from data gathered from 87 clinical activities, including patient ward rounds, morning report, noon conference, lecture, and small group. Occurrences of EBM teaching were recorded and described and ranked in order of frequency by type of activity. This research has been presented at MLA 2020 annual meeting and will be presented at MLA/SCC 2020. Submissions were accepted at two other conferences, but have been deferred for presentation in 2021 due to the pandemic: annual conference of Academies Collaborative for the Health Professions, Southeast Educational (TEACH-S) Symposium and Canadian Health Libraries Association.

## **Introduction**

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)).

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.

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. However, interviewees consistently stated either a lack of knowledge about whether and how clinical clerkship faculty received training in teaching EBM or an assertion that faculty received no training in teaching EBM.

That study pointed to a gap in knowledge of how EBM is taught in clinical clerkships. Most EBM teaching that librarians are involved with is taught in the pre-clerkship phase—the didactic learning that covers the first 1 ½ to two years. But how and whether that learning was reinforced when medical students begin clinical training with live patients was relatively unknown. Therefore, a logical next step was 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.

I hoped to investigate that gap, which I think could ultimately lead to a standardized model for teaching EBM; this likely requires librarians and medical school faculty working together as a community of practice. Because there is no standardized method of teaching EBM or of assessing students' competencies in EBM, we really don't know how well-prepared medical students are for finding and critically appraising the research literature for clinical questions.

Therefore, my research questions for this study were: “Is Evidence-Based Medicine (EBM) instruction incorporated into clinical clerkships? If so, how and how often? How are these skills assessed?”

Goals were to shadow students in different types clinical clerkship activities, in all clerkships, if possible. The objectives was to describe methods of teaching and assessing EBM competencies in clinical rotations.

### *Research Questions and Hypotheses*

1. Is Evidence-Based Medicine (EBM) instruction incorporated into clinical clerkships?

H1 : Yes, but not to the extent taught in pre-clerkship

2. Which steps of EBM are taught in relation to patient cases seen by students?

H2 : Ask, Apply, Assess

3. What assessment tools, such as the EPA rubrics<sup>2</sup>, are used to assess EBM competencies of clinical clerkship students/residents?

H3 : None

4. How does teaching of other EPAs compare with EPA<sup>7</sup> teaching?

H4 : EPAs 1, 2, 3, 4 are taught with greater frequency and depth than EPA<sup>7</sup>

### **Method**

*Study design.* In contrast to the 2017 study, *Diving Deeper* used an observational study design. The PI shadowed clinical clerkship activities and observed occurrences of teaching and assessing EBM skills. This was also a qualitative study, again with interviews, this time confined to clinicians who served as teaching faculty in the clerkships, or clinical experiences. But the larger component was observations of those faculty as they precepted students in the clerkships.

*Data collection instrument.* To collect data, I created field guides for observations and interviews (Fig. 1). For observations, the guide has prompts that follow the Milestones in EPA<sup>7</sup>, and I added alignments with the steps of EBM. I adapted a couple of those Milestones slightly, to separate out competencies in Acquire, which AAMC has mushed together. Then I added a section to track observations of the 12 other EPAs.

What I wanted to capture was what I called “occurrences”; these were *teaching* behaviors that conformed with any element of a specific behavior outlined in the competencies/milestones. I want to make clear that I wasn’t observing the practice of EBM in the hospital, nor was I evaluating student learning *per se*. I was looking at the teaching occurrences performed by clinical faculty.

\*Faculty names are included here only for scheduling purposes; they will be stripped prior to data analysis.

Teaching EBM in Clinical Clerkships: Field Guide—Observations

**LIVE DATA**

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Faculty\*: \_\_\_\_\_

Clerkship: \_\_\_\_\_ Type (rounds, didactic, journal club, etc.): \_\_\_\_\_

Site/Location: \_\_\_\_\_ Case # (if rounds): \_\_\_\_\_

**Occurrences of Teaching EPA Competencies (note teaching methods as well as specifics)**

**I. EPA 7**

1. Develop a well-formed, focused, pertinent clinical question based on clinical scenarios or ~~realtime~~ patient care. *(Ask)*

*Assessment:*

2. A. Demonstrate basic awareness and early skills in appraisal of the sources of medical information using accepted criteria.  
 B. Identify and demonstrate the use of information technology to access accurate and reliable ~~online~~ medical information.  
 C. Demonstrate curiosity, objectivity, and the use of scientific reasoning in acquisition of knowledge. *(Acquire)*

a. Tool: \_\_\_ UTD \_\_\_ ~~DynaMed~~ \_\_\_ PubMed \_\_\_ Other: \_\_\_\_\_

b. Search strategy: \_\_\_ Keywords \_\_\_ Controlled vocabulary (e.g., ~~MeSH~~)

*Assessment:*

3. A. Demonstrate basic awareness and early skills in appraisal of the content of medical information using accepted criteria.  
 B. Demonstrate basic awareness and early skills in assessing applicability/generalizability of evidence and published studies to specific patients. *(Appraise)*

4. Demonstrate curiosity, objectivity, and the use of scientific reasoning in application of knowledge to patient care. *(Apply)*

Connected to PICO? \_\_\_ Y \_\_\_ N

*Assessment:*

5. A. Communicate one’s findings to the health care team (including the patient/family).  
 B. Close the loop through reflection on the process and the outcome for the patient. *(Assess)*

*Assessment:*

**II. Other EPAs**

1 H&P	2 DDx	3 Tests	4 Orders/Rx
5 Documentation	6 Oral presentation	8 Handover	9 Collaborate/IPE
10 Urgent care	11 Informed consent	12 Procedures	13 Systems errors

Notes:

Figure 1. Field Guide/Data collection instrument

### *Site and interviewee selection.*

Study site selection was based on four criteria: first, it needed to be one of the 10 medical schools in the EPA pilot, because I wanted to investigate the implementation of a curriculum that was dedicated to the EPAs. Second, the school had to have a teaching hospital associated with it. Third, there had to be an inside champion who could broker my project with clinical course directors and faculty. Dr. Paul Gorman, head of medical informatics at OHSU was a wonderful advocate for this project. And finally, there needed to be a library willing to host me! Kris Alpi, Laura Zeigen, and Andrew Hamilton were very welcoming and eager to work on this project with me. I can't thank them enough.

*Recruitment.* To gain entry to activities of clerkship students, Dr. Gorman sent emails to all clerkship directors, faculty, and coordinators, explaining and endorsing the project and requesting permission for me to shadow as many different activities as possible. Four clerkship directors gave permission, but we never heard back from three others.

*IRB Review.* The Texas A&M University Division of Research reviewed the Initial Review Submission and sent it to Expedited Review. The study was approved on 9/10/2019 as "Not Greater Than Minimal Risk". IRB2019-0272D

## **Results**

*Data Collection.* Data collection took place over a 5-week period: October 1-November 6, 2019. However, the entire month of September was consumed by preparation work, including recruitment of observation opportunities and scheduling observations, and with paperwork required for visiting researchers, including a background check and immunizations.

First-year OHSU medical students all must take an EBM workshop, "Finding Answers". Dr. Gorman and other medical school faculty, and medical librarians lead this workshop. So students have a thorough grounding in EBM principles and methods from the beginning.

I was able to get into 4 clerkships overall: Pediatrics (PICU), Internal Medicine, Neurology, and Family Medicine. I was permitted to shadow 24 events over 5 different activities in these clerkships: Rounds, Noon Conference, Morning Report, Lecture, and Small Group in Family Medicine. The FM clerkship coordinator declined to allow me to shadow rounds or other activities, citing student safety and protection.

Table 1. Summary of Data Collection Activities, Oct. 1-Nov. 6, 2019. (n=4)

<b>Clerkship</b>	<b>Rounds</b>	<b>Noon Conference</b>	<b>Morning Report</b>	<b>Lecture</b>	<b>Small Group</b>	<b>TOTAL</b>
Internal Medicine	3	3	3	3	---	12
Pediatrics	5	---	---	---	---	5
Neurology	1	1	3	1	---	6
Family Medicine	---	---	---	---	1	1
<b>TOTALS</b>	<b>9</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>1</b>	<b>24</b>

The results for Rounds are given in Table 2. I observed 59 total cases as I shadowed faculty, students, and other clinicians on the wards. Within those clerkship rounds, I noted 43 occurrences of EPA7 components for 24 cases in IM, 12 for 23 cases in Pediatrics, and 8 for 12 cases in Neurology. In comparison to other EPAs, EPA 1--History and Physical--occurred most frequently, followed by oral presentations. These are not surprising, as most cases began with a rundown of the patient status, and were often presented by a student.

Table 2. Activities--Rounds

Clerkship	Cases	EPA 7	Other EPAs												
			1	2	3	4	5	6	8	9	10	11	12	13	
Internal Medicine	24	43	15	6	6	11	1	1	1	5	0	0	1	1	
Pediatrics	23	12	17	5	0	19	0	15	0	4	0	0	1	0	
Neurology	12	8	18	7	2	17	2	18	0	0	0	1	0	0	
<b>TOTALS</b>	<b>59</b>	<b>63</b>	<b>50</b>	<b>18</b>	<b>8</b>	<b>47</b>	<b>3</b>	<b>34</b>	<b>1</b>	<b>9</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	

The results for Morning Report are shown in Table 3. I attended 6 morning reports between IM and Neurology. Neurology had 3 occurrences of EPA7; IM had zero. EPA7 is about even with observations of other EPAs. Morning Report is led by residents, and focusses on differential diagnosis training, followed by testing choices and treatment plans.

Table 3. Activities—Morning Report

Clerkship	EPA 7	Other EPAs												
		1	2	3	4	5	6	8	9	10	11	12	13	
Internal Medicine (n=3)	0	1	1	1	0	0	3	0	0	0	0	0	0	0
Neurology (n=3)	3	2	3	1	1	0	1	0	0	0	0	0	0	0
<b>TOTALS</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

The results for Noon Conference are shown in Table 4. I attended 4 morning reports between IM and Neurology. IM had 3 occurrences of EPA7; Neurology had zero. By comparison with other EPA, there were far fewer instances of EPA7. Noon Conference is led by residents and offers learning opportunities on various clinical topics.

Table 4. Activities—Noon Conference

Clerkship	EPA 7	Other EPAs											
		1	2	3	4	5	6	8	9	10	11	12	13
Internal Medicine (n=3)	3	2	2	2	1	1	3	1	0	1	1	1	1
Neurology (n=1)	0	1	1	1	0	0	1	0	0	1	0	0	0
<b>TOTALS</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>

The results for Lecture are shown in Table 5. I attended 2 lectures between IM and Neurology. No observations of EPA7 occurred in either clerkship, and only a few occurrences of only 4 other EPAs were observed. Lecture is given by guest lecturers, both internal and external, and offers learning opportunities on various clinical topics. Friday lectures are part of an “Evidence-Based Medicine” series.

Table 5. Activities—Lecture (n=2)

Clerkship	EPA 7	Other EPAs											
		1	2	3	4	5	6	8	9	10	11	12	13
Internal Medicine (n=1)	0	0	2	1	1	0	0	0	0	0	0	1	0
Neurology (n=1)	0	0	1	0	0	0	0	0	0	0	0	0	0
<b>TOTALS</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>

The results for Small Group are shown in Table 6. I attended 1 small group activity in Family Medicine; this was the only activity in Family Medicine that I was permitted to attend. There were 18 occurrences of EPA7—far more than occurred in any other EPA. Small Group is conducted by clinical faculty and last 3 hours.

Table 6. Activities—Small Group (n=1)

Clerkship	EPA 7	Other EPAs											
		1	2	3	4	5	6	8	9	10	11	12	13
Family Medicine	18	2	2	2	1	1	3	1	0	1	1	1	1
<b>TOTALS</b>	<b>18</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

*Data analysis.*

Table 7 shows the breakdown of EPA7 milestones for the clerkships. The five steps of EBM are displayed in the columns, and the rows show the totals for each clerkship. There were a total of 87 occurrences of EPA7 teaching across all clerkship activities. IM and FM had the highest observations of EPA7. One surprise was that the highest number of occurrences for an EBM step was Appraise; however, an element of selection bias for what constituted this step may have led to an overcount, which will be discussed in the following section. The Assess EBM step had the lowest number of occurrences, at 11 observations. The activities of Noon Conference in Neurology, Lecture in IM and Neurology, and Morning Report in IM had no observations of teaching EPA7/EBM.

Table 7. Observations of EPA7 Milestones

	EPA7 Milestones/EBM Steps						TOTALS	MEANS
	Clerkship	Ask	Acquire	Appraise	Apply	Assess		
<b>Rounds</b>	IM	8	9	15	5	6	43	8.60
	Pediatrics (NICU)	7	1	2	2	0	12	0.60
	Neuro	1	2	1	3	1	8	1.60
<b>Noon Conf.</b>	IM	0	0	1	1	1	3	0.60
	Neuro	0	0	0	0	0	0	0.00
<b>Lecture</b>	IM	0	0	0	0	0	0	0.00
	Neuro	0	0	0	0	0	0	0.00
<b>Morning Report</b>	IM	0	0	0	0	0	0	0.00
	Neuro	0	1	2	0	0	3	0.60
<b>Small Group</b>	Family Med	2	4	1	8	3	18	3.60
<b>TOTALS</b>		<b>18</b>	<b>17</b>	<b>22</b>	<b>19</b>	<b>11</b>	<b>87</b>	

The overall summary of all observations is given in Table 8. Out of a total of 307 observations, there were 87 overall occurrences of EPA7 teaching compared to 220 for all of the other 12 EPAs together. Overall, for the 24 activities I was able to observe, EPA7 occurrences were captured in this ranked order, with the highest number happening in Rounds, and the lowest number occurring in Lecture--somewhat surprising, as the Lectures were part of what was called the "Evidence-Based" lecture series.



Table 8. Summary of Observations of EPAs in Clerkship Activities (n=307)

Clerkship Activity	Quantity	EBM (EPA7) Teaching Occurrences	EPA 1-6, 8-13 Teaching Occurrences
Rounds	9	63	174
Morning Report	6	3	14
Noon Conference	4	3	21
Lecture	4	0	6
Small group	1	18	5
<b>TOTALS</b>	<b>24</b>	<b>87</b>	<b>220</b>

## Discussion

This analysis suggests that the overarching research question, “Is Evidence-Based Medicine (EBM) instruction incorporated into clinical clerkships?”, may have an ambiguous answer. While it may be true that EBM is incorporated to some extent, the depth of EBM teaching in most of these observations was fairly shallow in comparison to the specific standards of EPA7. Moreover, the PI was lenient in assigning observations to EPA7 components. In many observations, if the attendings merely mentioned the literature or “evidence”, that got counted as an occurrence under the EBM step “Apply”. This is teaching by modeling behavior, but there actually was almost no discussion of how to find evidence or of how to assess its validity.

For example, from a rounds diagnosis of Candidemia, the attending mentioned an article, “Impact of infectious diseases consultation on mortality in candidemia” and discussed the “proportion of evidence-based practices” with regard to this condition. Another attending gave a bit of epidemiology instruction regarding the specificity of “Koenig sign”: “When positive, it increases the likelihood ratio and post-test probability.” While these statements during patient care do exhibit modeling behavior, they are not indicative of assessment of students’ skills. Although the PI allocated these occurrences to the EBM step “Appraise”, the EPA7 behaviors for Appraise are: “Demonstrate basic awareness and early skills in appraisal of the content of medical information *using accepted criteria*” and “Demonstrate basic awareness and early skills in assessing applicability/generalizability of evidence and published studies to *specific patients*.” Likewise, only one instance of teaching PICO (EBM Step 1--Ask) was observed, where the attending asked students about diagnosing bacteria tracheitis vs. deep lung infection. Therefore, observations of most of these occurrences likely represent an overcount had EPA assessment criteria been strictly applied. *Consequently, the data will be re-analyzed to be allocated into “strong” and “weak” categories of all 87 observed occurrences of teaching EBM.*

Almost no assessment of EPA7 competencies occurred during observation times. Some clerkships do have an EBM skills grid, which may be administered sometime during the clerkship. This is ironic, because “assessment was the No. 1 question and concern from the PI’s 2017 study.” However, there is little time during rounds to conduct assessment of EPA7. Some clerkship faculty were aware of the EPAs; none used the EPA7 components to assess student competencies.

Nevertheless, without realtime assessment, how do educators know whether students have achieved these skills?

### *Risk of Bias.*

The PI detected a possible Hawthorne Effect in several Activities. A form of bias in qualitative research, the Hawthorne Effect occurs when people behave differently because they know they are being watched. Two or three faculty seemed eager to demonstrate their knowledge of EBM in the presence of the visitor. For example, during Internal Medicine rounds with one particular attending, it seemed that an extra effort was being made to mention to EBM concepts. Statements included, “What’s LOE [Level of Evidence] for any of these? There was a mention in UpToDate;” “Look at EB summaries, has been slow on heparin. There’s a meta-analysis that says it’s better—a little better than warfarin. Doax/Lomax should be better;” “Practice changes ahead of studies. Quality of evidence;” and “3 trials: Adams trial rocked world. Higher risk in GI cancers. How to figure out who needs Doax but increased risk and increased clotting. Class B—no end date.” The PI noticed this self-awareness in three different attendings.

### *Additional Observations.*

Some additional key observations and quotes were:

- A Noon Conference presentation that contained no references to claimed facts.
- A Lecture that did have references on slides for some images/graphs, where the speaker said, “this paper is talking about...”
- A Lecture that generalized the speaker’s own knowledge and experience to recommendations for clinical practice: “to me”; “I think”; and “I’ve never seen epidural electrodes, so I’m just going to leave those out”.
- An exchange between two students during Morning Report: S1: “Do we have UTD? Why did you use DynaMed” (grinning as he says this, as though there’s no other legitimate tool to use). S2: “I like DynaMed. It’s more clinical” (defensive). Faculty: “UTD used to be not very good for us, for neuro.” [tribal knowledge]
- Small Group--Faculty: “Information changes every 8 years. Learning not static, learn from each other.”
- During Pediatrics NICU rounds, the attending confided to the PI: “We are not very evidence-based. We are trying to figure out how to be more evidence-based. I’d like to know about methods you recommend.”
- Attendings had trouble distinguishing between background and foreground questions; and between clinical questions and research questions.
- In the Family Medicine Small Group, there were no refs to UTD, but there was little evaluation of articles.
- “That’s what I was always taught”.
- Between patient encounters during IM rounds, in reply to the PI’s question about the pre-clerkship EBM course, one student stated, “I don’t remember much about EBM.”

## **Implications**

The progression of EPA7/EBM teaching observed both from this study and from the 2017 study, as well as from the PI’s experience, is that EBM didactics primarily occur in the pre-clerkship phase (Fig. 1). This is the phase in which most EBM instruction librarians participate. It is presented using many different teaching methods and includes either no assessments or knowledge-based assessments, with occasional skills assessments. EBM teaching during clerkship

varies by clerkship and by individual faculty, with few real-time skills assessments, and little appraisal of articles related to specific patients. “Acquire” is an assumed skill, and no training in searching methods is given. By the time interns enter residency, there are some who have mastered EPA7, but many view EBM as not useful or practical.

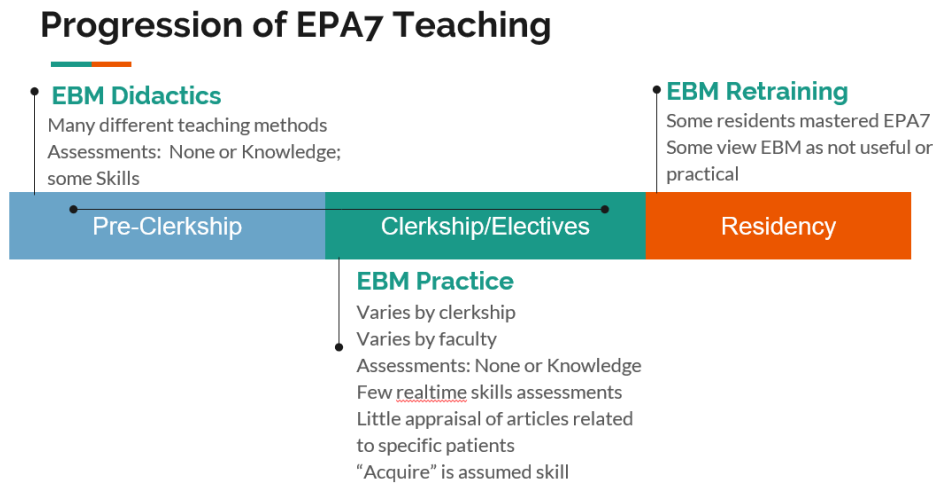


Figure 2. Progression of EBM Teaching

The implications to be drawn from all this are quite concerning. Adult learning theory states that skills learning becomes actualized through skills practice. If EBM is neither assessed on boards nor reinforced in clinical practice, *then students will not implement EPA 7 competencies*. This could explain why residencies are seeing a deficit in EPA 7 competencies in interns:

When program directors were asked for possible reasons for residents’ lack of preparation for EPA 7 (form a clinical question), responses ranged from residents **relying on online reviews** and **not using primary literature** to the lack of modeling from senior residents and faculty.

Because this skill is **routinely emphasized** during medical school, the low program director confidence rate is concerning and may **reflect needed emphasis on assessment of this EPA in undergraduate medical education in a summative fashion.**<sup>2</sup>

### Limitations

Several limitations of this study must be noted. First, these were small sample sizes in one medical school, and there was a limited amount of time to conduct observations; therefore, this analysis may not be considered as representative. More activities in more clerkships were needed. Second, there were institutional barriers to this outside researcher, including a need for a known medical faculty to broker permissions with clerkship directors for observations; the PI was admitted to four clerkships only. Selection bias was present, as shadowing on rounds was likely due to attendings’ positive viewpoint on evidence-based medicine. Several of these attendings evinced a likely Hawthorne Effect, indicating that observations of EPA7 occurrences did not represent their usual teaching methods.

## Conclusion

Despite these limitations—indeed, because of them—this study, as well as recent literature, indicates a great need for further qualitative studies of EBM teaching in clinical clerkships. The deficits observed in this study suggest that very little actual teaching and assessment of EBM skills arose during the observed clerkship activities. Teaching EBM in pre-clerkship will not “stick” if pre-clerkship knowledge acquisition is not transitioned into EPA 7 behaviors in clinical practice. This recognition must lead to the very real concern that pre-clerkship instruction in EBM may be largely worthless, thereby signifying the great effort expended by medical librarians to teach these skills during pre-clerkship didactics may have less value than is assumed. Librarians are relying on clinical faculty to continue EBM instruction in the clinical phases of students’ training, but this assumption may, in fact, be faulty.

Along with the 2017 study, this research has helped to articulate the need for the development among stakeholders—particularly instruction librarians and clinical faculty—for a “blueprint” for teaching EBM. It supports a nationwide call for a consensus on the structure, delivery, value, and assessment of skills in teaching and of practicing EBM. To that end, further research and work will go toward building a shared repository and forum for all EBM teaching faculty and medical librarians, to include teaching materials, assessments, and an area for posing questions to a community of practice, and providing experiences, outcomes, materials. It is now time to build on the research and go to the next level: Engage all stakeholders, resolve identified common issues, and act to ensure that EPA7/EBM competencies are completely and effectively integrated into medical education.

## 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. Pearlman RE, Pawelczak M, Yacht AC, Akbar S, Farina GA. Program Director Perceptions of Proficiency in the Core Entrustable Professional Activities. *J Grad Med Educ*. 2017;9(5):588-592. doi:10.4300/JGME-D-16-00864.1

## Expense Report

The entire \$6,000 was expended for the categories identified in the proposal: Lodging, Gasoline, and Meals. This trip was supplemented by the PI’s personal contributions.

## Recognition of Funding Support

The PI and the Director of the Texas A&M University Medical Sciences Library wish to express our sincere gratitude to the South Central Academic Medical Libraries Consortium (SCAMeL) for its grant from the SCAMeL Speedy Startups: The Pilot Season 2019 program. It should be mentioned that this report represents only a fraction of the analysis that is yet to be performed on these data. The information gleaned is so robust and complex that it can be sifted and viewed from many different angles and at different levels. We plan to continue data analysis for additional findings and conclusions.

Respectfully submitted,

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