Evidence-based Medicine Curriculum Development

Concurrent Session
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Learning Objectives

• Describe current drivers of EBM curriculum in UME and GME
• Describe the basic process of curriculum design
• Apply these principles to the design of your own learning session(s)
• Discuss curricular successes and challenges you are facing
What might make curriculum deans and committees interested....

WANTING MORE TIME FOR EBM IN YOUR CURRICULUM?
Core Entrustable Professional Activities for Entering Residency
EPA 7: Form Clinical Questions and Retrieve Evidence to Advance Patient Care

Key Functions with Related Competencies

- Combine curiosity, objectivity, and scientific reasoning to develop a well-formed, focused, pertinent clinical question (ASK)
  - KP3 PBL16 PBL11 PBL13
- Demonstrate awareness and skill in using information technology to access accurate and reliable medical information (ACQUIRE)
  - PBL16 PBL17
- Demonstrate skill in appraising sources, content, and applicability of evidence (APPRAISE)
  - PBL16 KP3 KP4
- Apply findings to individuals and/or patient panels; communicate findings to the patient and team, reflecting on process and outcomes (ADVISE)
  - ICS1 ICS2 PBL11 PBL18 PBL19 PC7

Behaviors Requiring Corrective Response

- Does not reconsider approach to a problem, ask for help, or seek new information
  - Developing Behaviors
  - (Learner may be at different levels within a row.)
- Does not discuss findings with team
- Does not determine or discuss outcomes and/or process, even with prompting

Expected Behaviors for an Entrustable Learner

- With prompting, translates information needs into clinical questions
  - Identifies limitations and gaps in personal knowledge
- Seeks assistance to translate information needs into well-formed clinical questions
  - Develops knowledge guided by well-formed clinical questions
- Uses vague or inappropriate search strategies, leading to an unmanageable volume of information
  - Identifies and uses available databases, search engines, and refined search strategies to acquire relevant information
- Refuses to consider gaps and limitations in the literature or apply published evidence to specific patient care
  - Accepts findings from clinical studies without critical appraisal
- Refuses to use new information technologies
  - Employs different search engines and refines search strategies to improve efficiency of evidence retrieval
- Refuses to use new information technologies
  - Judges evidence quality from clinical studies
- Refuses to use new information technologies
  - Applies published evidence to common medical conditions
- Refuses to use new information technologies
  - Seeks guidance in understanding subtleties of evidence
- Refuses to use new information technologies
  - Communicates with rigid repetition of findings, using medical jargon or displaying personal biases
  - Applies findings based on audience needs
- Refuses to use new information technologies
  - Shows limited ability to connect outcomes to the process by which questions were identified and answered and findings were applied
  - Acknowledges ambiguity of findings and manages personal bias
- Refuses to use new information technologies
  - Connects outcomes to process by which questions were identified and answered
  - Applies nuanced findings by communicating the level and consistency of evidence with appropriate citation

This schematic depicts development of proficiency in the Core EPAs. It is not intended for use as an assessment instrument. Entrustment decisions should be made after EPAs have been observed in multiple settings with varying context, acuity, and complexity and with varying patient characteristics.
# AAMC QIPS – 2019 – High Value Care

<table>
<thead>
<tr>
<th>High-Value Care</th>
<th>Improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>10a - Recognizes uncoordinated, wasteful, and unnecessary health care delivery.</td>
<td>10b - Manages the interrelated components of the complex health care systems for efficient and effective patient care. HM-SBP3</td>
</tr>
<tr>
<td>11a - Articulates the ethical case for stewarding resources and cost-conscious care, including the potential impact of clinical decisions on patient affordability.</td>
<td>11b - Considers cost when practicing medicine.</td>
</tr>
<tr>
<td>12a - Recognizes that there are wide variations in health care utilization and care delivery patterns across individuals, health systems, and regions that are not warranted by patient need.</td>
<td>12b - Minimizes unnecessary deviation of practice from recommended guidelines or local standards.</td>
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<td></td>
<td>12c - Contributes to practice and system-level changes to reduce unnecessary and unwarranted variation.</td>
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### ACGME Harmonized Milestone(s)

#### PBL1: Evidence Based and Informed Practice

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates how to access and use available evidence, and incorporate patient preferences and values in order to take care of a routine patient</td>
<td>Articulates clinical questions and elicits patient preferences and values in order to guide evidence based care</td>
<td>Locates and applies the best available evidence, integrated with patient preference, to the care of complex patients</td>
<td>Critically appraises and applies evidence even in the face of uncertainty and conflicting evidence to guide care, tailored to the individual patient</td>
<td>Coaches others to critically appraise and apply evidence for complex patients; and/or participates in the development of guidelines</td>
</tr>
</tbody>
</table>

|   |   |   |   |   |

**Comments:**
DESIGNING A LEARNING SESSION
Start at the End

• What do you want your learners to be able to do by the time they have completed the curriculum?
  – May require needs assessment

• Start with goals of the curriculum
  – Map to learning objectives for individual sessions
  – Develop educational sessions based on these objectives

• Assess learning
  – Should measure learning objectives

• Revise

Sample Curricular Goals and Objectives

<table>
<thead>
<tr>
<th>Course Length</th>
<th>Learner Level</th>
<th>Goals [This course will...]</th>
<th>Objectives [Learners will be able to...]</th>
</tr>
</thead>
</table>
| Short Course  | Novice (MS, PGY-1) | • Introduce the language of EBM  
• Illustrate question formation, study selection, and the hierarchy of evidence  
• Introduce core EBM definitions for different types of clinical questions  
• Highlight sources of bias in studies  
• Provide resources and references for critical appraisal and model several examples | • List the components of a well-structured question  
• Name the best study design for a clinical question  
• Identify sources of bias in studies on diagnostic testing and therapy  
• Calculate absolute risk reduction, relative risk reduction, number needed to treat  
• Interpret confidence intervals and describe their relationship to precision  
• List resources for evidence-based critical appraisal |

Miller’s Pyramid - Assessment

MILLER’S PRISM OF CLINICAL COMPETENCE (aka Miller’s Pyramid)

it is only in the "does" triangle that the
doctor truly performs

Based on work by Miller GE, The Assessment of Clinical Skills/Competence/Performance; Acad. Med. 1990; 65(9); 63-67
Adapted by Drs. R. Mehay & R. Burns, UK (Jan 2009)
PLHET: A recipe for designing successful sessions

- Prep – What assignments or activities are expected of the learner prior to the session?
- Link – How does this relate to the learners’ prior knowledge?
- Hook – What’s motivating the learner?
- Engagement – What teaching method(s) and format(s) will you use to address different learning styles?
- Transfer – How are learners expected to use the information in the future?

Practice!
Resources

Participant Expectations

Materials

Registration

Workshop Directors

- Duke Medical Center Library Clinical Tools: PubMed, UpToDate, Cochrane Library, etc.
- JAMA Evidence: Rational Clinical Exam series, Users Guides to the Medical Literature, education guides, etc.
- Duke EBP Guide: links to teaching EBP tips articles, critical appraisal templates, tutorials, etc.

Logistics / Expectations

- Participant Planning Guide
- Zoom Tips for Participants
- Examples of presentations for small groups
- Tips for Tutor Trainees
- 6 Ts for Teaching / Feedback

Large Group Presentation Slides

- Large group presentation slides will be added during the workshop and posted for a limited time after the workshop ends.

Workshop Manual (Participants will also receive a print copy of the Users’ Guide to the Medical Literature, 3rd ed.)

- 2021 EBP Workshop Manual (PDF)
- 2021 EBP Workshop Manual (Word)
From MedEd Portal:
Good Assessment is Difficult
to find and implement!
Resources


• Tips for Teachers of Evidence-based Medicine


• Maggio, Lauren; MS, MA; Cate, Olle; Irby, David; OBrien, Bridget
  Designing Evidence-Based Medicine Training to Optimize the Transfer of Skills From the Classroom to Clinical Practice: Applying the Four Component Instructional Design Model. *Academic Medicine*. 90(11):1457-1461, November 2015.

Speed Mentoring!
Common Challenges to Implementing an EBM Curriculum

• Balancing “required” (e.g. USMLE) with necessary (e.g. needed to practice) content
• Recruiting and retaining core faculty
• Buy-in of stakeholders
• Teaching in clinical environments
• Experiential learning
• Evaluating curricula and demonstrating benefit
• Sustainability
A FEW EXTRA SLIDES
Table 1

<table>
<thead>
<tr>
<th>Component</th>
<th>Preclerkship level</th>
<th>Clerkship level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning tasks</td>
<td>For whole-task content, learners are:</td>
<td>For whole-task content, learners:</td>
</tr>
<tr>
<td></td>
<td>- Provided with a written patient case derived from real-life practice that focuses</td>
<td>- Identify a patient case from their own clinical experience or adopt a patient</td>
</tr>
<tr>
<td></td>
<td>on a single, familiar condition.</td>
<td>case identified by a preceptor in morning rounds.</td>
</tr>
<tr>
<td></td>
<td>For whole-task format, learners are:</td>
<td>For whole-task format, learners:</td>
</tr>
<tr>
<td></td>
<td>- Provided a set of clinical questions and asked to complete the remaining EBM</td>
<td>- Identify a clinical question and execute all steps of EBM.</td>
</tr>
<tr>
<td></td>
<td>steps.</td>
<td></td>
</tr>
<tr>
<td>Supportive</td>
<td>Prior to the activity, learners:</td>
<td>Prior to the activity, learners:</td>
</tr>
<tr>
<td>information</td>
<td>- Read an article on critically appraising diagnostic articles.</td>
<td>- Watch a short video of a physician thinking aloud through her EBM reasoning</td>
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<tr>
<td></td>
<td>- Listen to a librarian describe her thought process for selecting a database to</td>
<td>process.</td>
</tr>
<tr>
<td></td>
<td>find diagnostic articles.</td>
<td></td>
</tr>
<tr>
<td>Procedural</td>
<td>During the activity, learners are:</td>
<td>During the activity, learners are:</td>
</tr>
<tr>
<td>information</td>
<td>- Provided with a step-by-step handout to guide question formulation.</td>
<td>- Offered an online checklist to guide the critical appraisal of articles.</td>
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<tr>
<td></td>
<td>- Offered over-the-shoulder feedback from roving teachers while working on a search</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or appraisal task.</td>
<td></td>
</tr>
<tr>
<td>Part-task practice</td>
<td>During the activity, learners are:</td>
<td>During the activity, learners:</td>
</tr>
<tr>
<td></td>
<td>- Provided data on four screening modalities and challenged to calculate the</td>
<td>- Do not engage in part-task practice if they have achieved mastery of the</td>
</tr>
<tr>
<td></td>
<td>likelihood ratio for each test.</td>
<td>recurrent elements of EBM.</td>
</tr>
</tbody>
</table>

*Ideally, throughout medical school, learners engage in multiple EBM activities organized from simple to complex, depending on their level.

*Based on a patient case, learners are asked to perform the steps of EBM (ask, acquire, appraise, apply) to propose the best next step for further investigation or treatment of the patient case.

A useful breakdown of how to package EBM skills learning for earlier medical school, and then latter med school. You’ll recognize some of these approaches from the Duke workshop!
Kolb: Learning Styles

- **Concrete Experience**
  - Accommodating: Getting things done, leading, taking risks, initiating.
  - Diverging: Being imaginative, understanding people, recognizing problems, brainstorming.

- **Abstract Conceptualization**
  - Converging: Solving problems, making decisions, reasoning, defining problems, being logical.
  - Assimilating: Planning, creating models, defining problems, developing theories, being patient.

- **Reflective Observation**
  - Active Experimentation: Being adaptable, being practical.

Taken from Kolb Learning Style Inventory, p10
Teaching to Learning Styles

- Active learners learn by direct interaction with the material; prefer group communication.
- Reflective learners like to think about the material; prefer individual or very small group communication.

- Visual learners are better able to remember images they have seen (charts, graphs, pictures).
- Verbal learners are better able to remember written or spoken words.

- Sensing learners are detail-oriented and practical with a preference for concrete facts and real world applications.
- Intuitive learners have a creative disposition and are drawn to the theoretical and abstract.

- Sequential learners prefer learning linearly, with logical steps.
- Global learners prefer a holistic approach and seem to learn almost randomly by fitting pieces together into a big picture.

Taken from: Kolb Learning Style Inventory.
How did your study of biostatistics and epidemiology prepare you for clinical clerkships and electives?

<table>
<thead>
<tr>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.7%</td>
<td>23.7%</td>
<td>43.3%</td>
<td>26.6%</td>
</tr>
</tbody>
</table>

And standard 6.3 – information-seeking skills