The Evolution of Medical Student Competencies

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Disclosures

• “It’s tough to make predictions, especially about the future”
  – Yogi Berra

• I’m not a physician (but have taken, or been involved in creating, many of the assessments required for licensure)

• Evidence-based medicine should be supported by evidence-based assessment
Objectives

• Explore how the required medical student competencies have changed over time
  – Implications for the curriculum
• Propose some “new” competencies
• Discuss how current assessments are not well-aligned with the evolving competencies
• Suggest a (partial) way forward
Movement Towards Competency-Based Education

What was it before?

A brief history of “Competency-based Medical Education (CBME)”

The ACGME Outcomes Project

<table>
<thead>
<tr>
<th>Pre-1999</th>
<th>1999</th>
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<tbody>
<tr>
<td>Relatively few</td>
<td></td>
</tr>
<tr>
<td>actual</td>
<td></td>
</tr>
<tr>
<td>requirements</td>
<td></td>
</tr>
<tr>
<td>No duty</td>
<td></td>
</tr>
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<td>hour restrictions</td>
<td></td>
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ACGME/ABMS
Adopt 6 Core Competencies
And Sub-competencies
The Needs of the System Should Drive Curriculum

Traditional model

Curriculum

Educational objectives

Assessment

Curriculum drives it

Competency-based education model

Health needs
Health systems

Competencies
Outcomes

Curriculum

Assessment

It drives curriculum
The Problem is Figuring out the “Competencies” (and how to assess them)
Competencies of Entering Medical Students

**INTERPERSONAL**
- Service Orientation
- Social Skills
- Cultural Competence
- Teamwork
- Oral Communication

**INTRAPERSONAL**
- Ethical Responsibility to Self and Others
- Reliability and Dependability
- Resilience and Adaptability
- Capacity for Improvement

**THINKING & REASONING**
- Critical Thinking
- Quantitative Reasoning
- Scientific Inquiry
- Written Communication

**SCIENCE**
- Living Systems
- Human Behavior
ACGME Competencies

• Many of these competencies are difficult to define ... and even more difficult to assess

• We believe in a model (perhaps unrealistically) that competence is property of the individual
  – What about the system?
  – Teams?
Other Frameworks
Competencies, Milestones and EPAs

Entrustable Professional Activity

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Competencies</th>
<th>Milestones</th>
<th>EPAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granularity</td>
<td>Low</td>
<td>Moderate to High</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td>Synthetic/Integrated</td>
<td>Moderate</td>
<td>Low to Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Practicality (application)</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Conceptual</td>
<td>High</td>
<td>Low</td>
<td>Low to Moderate</td>
</tr>
</tbody>
</table>

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The Problem of Competency Contamination

• Competencies overlap

• Definitions vary
  – CANMEDs
  – ACGME
  – GMC
    • Tomorrow’s Doctors

• Need to be very explicit about what you want to measure
  – Professionalism, Situational Awareness, etc.
The Past and the Future (of Medicine)
Knowledge, Skills and Attitudes that are Needed?
Comfort with Technology
Adaptability

• Employ unique analyses
  – Develop innovative methods for obtaining or using resources

• Entertain new ideas
  – Actively seek out and carefully consider the merits of new approaches

• Deal with ambiguity
  – Change plans, goals, actions or priorities to deal with changing situations
Adaptable ... and Technologically Savvy

- Artificial intelligence (AI) will not replace physicians. Physicians who use AI will replace those who do not
- Medical students will need to be able adopt new innovations
- Need to be able to deal with “information overload”
  - There are over 30 million medical articles in PubMed
Curiosity

• “I have no special talents. I am only passionately curious”
  – Albert Einstein

• For doctors, curiosity is fundamental to understanding each patient’s unique experience of illness
  – Common practices in medical education may inadvertently suppress curiosity
Teamwork

• The provision of quality care depends on teams
• More than 70% of medical errors are attributable to dysfunctional team dynamics
• Teamwork is rarely assessed in medical school
Knowledge Access

• Medical knowledge doubles every few months
  – How can clinicians keep up
• Inadequate access to information limits clinicians’ ability to deliver healthcare
• Ability to go and get the (correct) information
• Use of ‘smart’ clinical search engines
Communication (with informed patients)

- Patients are much more informed
  - They can contribute to their own care
- Discordance between patient’s and physicians’ diagnosis could create mistrust (for patient) and frustration (for physician)
- Positive interrelationships between physicians and patients will be much more difficult to maintain
- How we communicate in the future could be quite different

“I would be a lot healthier if you’d stop finding things wrong with me!”
Communication (with other providers)

- Communication with patients may be quite different from communication with peers/other providers
- Communication is not a “singular” competency
- Inter-disciplinary communication skills will be become even more important
Kindness, Compassion, Empathy

• Regardless of technology, practitioners will still need to be kind
  – Patients look to physicians for expertise, guidance and compassion

• Unkind treatment negatively impacts patient care

• Medical students need to develop compassion and empathy
  – How to measure?
Assessments Must Keep Pace

• How much “stored” knowledge must a practitioner have?
• What are the essential and evolving competencies?
• Can we “gamify” assessments “for learning”?
• How will we know if we are doing a good job (validity argument)?
Current Problems with Assessment

- Assessments have not kept pace with evolving competencies
- Often, validity evidence lacking
  - We often measure what is easy to measure
Misalignment of Competencies and Assessment?

• United States Medical Licensing Examination (USMLE)
  – Step 1 (basic science)
  – Step 2CK (clinical knowledge)
  – Step 2CS (clinical skills)
  – Step 3 (application of medical knowledge)

• Do these assessments reflect what is needed to practice?
Assessment of Clinical Skills (Licensure Exams)

- History taking
- Physical examination
- Communication (with the patient)
- Clinical Decision Making

- What’s missing
  - Teamwork
  - Resource management
  - Consultation
  - Trauma
  - Longitudinal care
Technology and Assessment

- Simulation
  - Standardized patient
  - Mannequin
  - Part-task trainer
  - Virtual reality
  - Computer-based case simulations
Presentation Recap

• Medical student competencies will continue to evolve
  – Necessitates changes to curriculum AND assessment programs
• Our assessments may not yield valid scores (or decisions)
• “New competencies” are more difficult to assess
  – Simulation?
Thank You

Maybe ...