Defining Competencies Through Milestones to Achieve Desired Outcomes

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Accreditation Council for Graduate Medical Education
Disclosures

- Eric Holmboe works for the ACGME and receives royalties from Mosby-Elsevier for a textbook.
Outline

- Fundamental characteristics of CBME
- Defining competencies through Milestones
- Early Milestones research and experience
CBME Definition

An outcomes-based approach to the design, implementation, assessment and evaluation of a medical education program using an organizing framework of competencies

Fundamental Characteristics of CBME

- Graduate outcomes, in the form of achievement of predefined desired competencies, are the goal.

- Competencies are derived from the needs of patients, organized into a coherent guiding framework.

- Time is a resource for learning, not the basis of progression of competence.

- Teaching and learning experiences are sequenced to facilitate an explicitly defined progression of ability in stages.

Adapted from van Melle, E. Queens University
Fundamental Characteristics of CBME

- Learning is tailored, to the extent possible, to the learner's individual progression.

- Numerous direct observations and focused feedback contribute to effective learner development of expertise.

- Assessment is planned, systematic, systemic, and programmatic.
The Professional Self-Regulatory System

Assessments within Program:
- Direct observations
- Audit and performance data
- Multi-source FB
- Simulation
- ITEAM

Qual/Quant "Data" Synthesis: Committee

Judgment

Milestones and EPAs as Guiding Framework and Blueprint

Facult, PDs and others

Residens

FB

Unit of Analysis: Program

Accreditation

Certification and Credentialing

Unit of Analysis: Individual

PUBLIC

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AAMC
Overview: CCC Processes

Institutional Culture

Info Sources:
- Faculty Evals
- Direct Obs
- Multisource FB
- Patient surveys
- ITExams
- +/- Simulation
- Critical events
- Informal (e.g. "hallway talks")

Pre-meeting Data Preparation

Group Process Known Variables:
- Group composition
- Info presentation
- Evidence vs. verdict
- Hierarchy
- Info context
- Time pressures
- Additional info

Program Culture

Judgment

Feedback

Learner

Institutional Culture
Milestones
The Next GME Accreditation System — Rationale and Benefits

Thomas J. Nasca, M.D., M.A.C.P., Ingrid Philibert, Ph.D., M.B.A., Timothy Brigham, Ph.D., M.Div., and Timothy C. Flaherty, M.D.

A key element of the NAS is the measurement and reporting of outcomes through the educational milestones...


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**Milestones**

- By definition a milestone is a significant point in development.
- Milestones should enable the learner and training program to know an individual’s trajectory of competency development.
### PC1. History (Appropriate for age and Impairment)

<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>Acquires a general medical history</td>
<td>Acquires a basic clinical history including medical, functional, and psychosocial elements</td>
<td>Acquires a comprehensive clinical history integrating medical, functional, and psychosocial elements</td>
<td>Efficiently acquires and presents a relevant history in a prioritized and hypothesis driven fashion across a wide spectrum of ages and impairments</td>
<td>Gathers and synthesizes information in a highly efficient manner</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seeks and obtains data from secondary sources when needed</td>
<td>Elicits subtleties and information that may not be readily volunteered by the patient</td>
<td>Rapidly focuses on presenting problem, and elicits key information in a prioritized fashion</td>
</tr>
<tr>
<td>Specific Milestone</td>
<td></td>
<td></td>
<td></td>
<td>Models the gathering of subtle and difficult information from the patient</td>
</tr>
</tbody>
</table>

**Competency**

**Sub-competency**

**Developmental Progression or Set of Milestones**
Purposes and Implications

ACGME
- Accreditation – continuous monitoring of programs; lengthening of site visit cycles
- Public Accountability – report at a national level on competency outcomes
- Community of practice for evaluation and research, with focus on continuous improvement

Training Programs
- Framework for CCC
- Guide curriculum development
- More explicit expectations of trainees
- Support better assessment
- Enhanced opportunities for early identification of under-performers

Milestones

Certification Boards
- Research for CBME

Residents and Fellows
- Increased transparency of performance requirements
- Encourage informed self-assessment and self-directed learning
- Better feedback

Milestones are a Formative Assessment Framework
Dreyfus & Dreyfus Development Model

MILESTONES

Curriculum Assessment
Curriculum Assessment
Curriculum Assessment
Curriculum Assessment
Curriculum Assessment

Expert/Master
Proficient
Competent
Advanced Beginner
Novice

Development is a non-linear phenomenon

Time, Practice, Experience

Dreyfus SE and Dreyfus HL. 1980
Carraccio CL et al. Acad Med 2008;83:761-7
<table>
<thead>
<tr>
<th>Competency</th>
<th>Subcompetency (Milestones)</th>
<th>EPA in Training</th>
<th>EPA in Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Knowledge</td>
<td>MK¹</td>
<td>&quot;Lead&quot; a care team</td>
<td>Lead &amp; work within IP health care teams.</td>
</tr>
<tr>
<td></td>
<td>MK²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Care</td>
<td>PC¹</td>
<td>Care for patients with chronic illness with indirect supervision</td>
<td>Manage care of patients with chronic diseases</td>
</tr>
<tr>
<td></td>
<td>PC²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionalism</td>
<td>Prof¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal Skills</td>
<td>ISC¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ISC²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systems-based Practice</td>
<td>SBP¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SBP²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice-based learning</td>
<td>PBLI¹</td>
<td></td>
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<tr>
<td></td>
<td>PBLI²</td>
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</tr>
</tbody>
</table>

**Shared Mental Models and Frameworks**

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In general, Milestones are ...

- Developmental in nature
  - Grounded in Dreyfus model

- Behaviorally-based
  - Describe a learner using narratives
  - Independent of level of training

- Overarching trajectory of training

- Report meaningful outcomes to ACGME to help inform CQI for GME nationally
Early Milestones
Research and Experience
Listening Tour: General Themes

Areas of Milestone Positive Impacts:
- Quantity and quality of feedback to residents
- CCC process
  - Improving assessment
  - Dealing with residents in difficulty
- Curriculum
  - Facilitates examination of curriculum
  - Helps with curricular improvements
- Faculty development
  - Improving assessment of faculty
- CQI nature of system
Listening Tour: General Themes

Areas of Milestone Challenges:
- Logistics and data entry/transfer
- Assessment processes
  - Negative wording of some Milestone sets
  - Faculty struggling – need for faculty development
  - Construct misalignment (old evaluation forms do not fit with developmental model)
  - Language in subset of Milestones (selected specialties)
  - Harmonize some subcompetencies across specialties
- Synthesize multiple assessments into a Milestone judgment
- Time and resources ("RVUs always win")
EM Milestone Study 1

Milestone Attainment Distributions by PG Year

Milestone judgments converted to numeric ratings for analysis

Figure 1. Mean scores across all items by year (N = 5,780).

Learning Curves

Milestones, A Preliminary Snapshot
Milestone Data Mean/SD of Sub-Competency Means
Each Level of Training, June 2014

Overall Competency Means by Year of Training

1 2 3 4 5
"Level"

Year1 Year2 Year3 Year1 Year2 Year3 Year1 Year2 Year3 Year1 Year2 Year3 Year1 Year2 Year3
Patient Care Medical Knowledge Systems-Based Practice Practice-Based Learning Professionalism and Improvement Interpersonal and Communication Skills

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Box-and-Whisker plot

Distribution of Rating for Patient Care Core-Competency

Note: Unit of analysis=Resident’s average rating based on PC sub-competencies
## Generic Milestones Template

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the expectations for a beginning resident?</td>
<td>What are the milestones for a resident who has advanced over entry, but is performing at a lower level than expected at mid-residency?</td>
<td>What are the key developmental milestones mid-residency?</td>
<td>What does a graduating resident look like?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stretch Goals – Exceeds expectations</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

**Comments:**

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Residents Attaining Level 4 or Higher

3-Year Specialty – June, 2014

Proportion

PGY1  PGY2  PGY3

---PC  ---MK  ----SBP  ---PBLI  ---PROF  ---ICS
Residents Attaining Level 4 or Higher

Surgical Example (June 2015)

Proportion

PGY1  PGY2  PGY3  PGY4  PGY5  PGY6  PGY7

--- PC --- MK --- SBP --- PBLI --- PROF --- ICS

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Questions and Discussion

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