Current Metrics: What is Measured Now? Rethinking Measurement in GME

Graduate Medical Education Outcomes and Metrics
National Academies
Washington, DC
October 10-11, 2017
Eric Holmboe
Outline

Learning curves and professional development

Milestones: early findings

Where to next
Assessment of the impact of individual graduates, the performance of programs and the collective contribution of our GME “system” would help inform policy decisions and facilitate efforts to cultivate evidence based GME...

...Ideally, I believe, assessment of clinical competence as an outcome of GME should focus on the unsupervised care delivered by GME graduates; that care has not been systematically measured and linked to GME, though a few investigators have pioneered an effort to do so.
Learning Curves

## Milestone: Level Descriptions

<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>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>
<td>Stretch Goals – Exceeds expectations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What should they be able to do well in the realm of the specialty at this point?</td>
<td>What additional knowledge, skills &amp; attitudes have they obtained?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Are they ready for certification?</td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**
Kirkpatrick Model: Medical Program Perspective

- Triple Aim
- Competencies (Milestones)
  - Changes in professional practice?
  - What knowledge, skills, and attitudes have they acquired as a result?
  - How did the learners react to the work-based learning experience? Was it enjoyable?
Figure 2 Schematic of the proposed framework for academic faculty perspective and educational design of graduate medical education training programs, where both educational and clinical outcomes are centered around the patient. This reorganization recognizes that (1) the dynamic interplay between the faculty, learner, training program, and clinical microsystem ultimately influences the quality of physician that emerges from the training program and the environment, and (2) patient outcomes relate to the quality of education and the success of clinical Microsystems.
The Professional Self-Regulatory Assessment System

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

“Data” Synthesis: Committee

**Residents**

**Faculty, PDs and others**

**Accreditation**

**Certification**

**Public**

**Milestones**

**Research**

**Feedback**

**Judgement**
Logic Model and Outcomes

- **Purpose**: What is the problem?
  - Needs Assessment

- **Inputs**: What resources are required?
  - Conceptual Framework(s)

- **Activities**: What activities are critical and/or unique?
  - Competencies

- **Outputs**: What products or behaviours arise as a result of this program?
  - External Factors

- **Outcomes**
  - Short term
  - Medium term
  - Long term

Adapted from E. Van Melle, Queens University
Milestones Report 2017
National or multi-institutional validity studies have now been published for:

- Internal medicine
- Emergency medicine
- Pediatrics
- Family medicine
- Neurosurgery

Annotated bibliography now available for Milestones research
# Family Medicine

<table>
<thead>
<tr>
<th>Level</th>
<th>PBL102</th>
<th>PBL103</th>
<th>PROF01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lev 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lev 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lev 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lev 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lev 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; Lev 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>PGY1</th>
<th>PGY2</th>
<th>PGY3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGY1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGY2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGY3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2017 ACGME
Ob/Gyn
Residents Attaining Level 4 or Higher for PC Sub-Competencies (June 2015)

Neurological Surgery

<table>
<thead>
<tr>
<th>Year</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yr7</td>
<td>1.0</td>
</tr>
<tr>
<td>Yr6</td>
<td>0.9</td>
</tr>
<tr>
<td>Yr5</td>
<td>0.8</td>
</tr>
<tr>
<td>Yr4</td>
<td>0.7</td>
</tr>
<tr>
<td>Yr3</td>
<td>0.6</td>
</tr>
<tr>
<td>Yr2</td>
<td>0.5</td>
</tr>
<tr>
<td>Yr1</td>
<td>0.4</td>
</tr>
</tbody>
</table>

- PC08 Traumatic Brain Injury
- PC02 Critical Care
- PC01 Brain Tumor
- PC06 Spinal Neurosurgery
- PC05 Pediatric Neurological Surgery
- PC07 Vascular Neurosurgery
- PC04 Pain and Peripheral Nerves
- PC03 Surgical Treatment of Epilepsy and Movement Disorders

© 2017 ACGME
Milestones vs Old Form
More inter-year variation

Old Form

Patient Care Overall***

Medical Knowledge***

Systems-based Practice***

Practice-based Learning and Improvement***

Professionalism**

Interpersonal Communication Skill***
Examples of Resident Trajectories
(n=1069; Those who reached Level 4 or higher)
Examples of Resident Trajectories  
(n=273; Those who did not reach Level 4 or higher)
MEAN TRAJECTORY: LEVEL 4 PASS GROUPING
EM_PC13-Wound Management (n=1069; n=273)

Status of Reaching Level 4  Not Reached Lev 4  Reached Lev 4
Trajectories: Urology
AFMRD-ABFM Family Medicine Survey

- Survey of graduates of family medicine residencies including:
  - Scope of practice
  - Practice organization
  - Preparation for practice
  - Location of practice

- Will enable longitudinal investigation of effects of residency training with Milestones and other data.

*Peterson LE, et. al.*
Seeking the Grail: Practice Outcomes

- Milestones have matured to a point we can begin to explore the correlation of Milestone judgments in residency and fellowship with future practice
- Preliminary conversations with multiple partners to examine performance in practice
- *Longitudinal studies now possible because of longitudinal Milestones data*
Thank You