Milestone Mapping
Leveraging Assessment Results to Inform the CCC

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Disclosures

• Nothing to disclose
Goals

• Describe some best practices for collecting and organizing competency based assessment data

• Discuss field-tested mapping strategies on competency based assessment results to help inform Clinical Competency Committees of resident performance

• Strategize how best to organize and map assessment responses to optimize picture of each resident’s milestone progression
20,000-Foot View

You are here...
How do we know we are training competent doctors?
Six ACGME Competency Domains

- Patient Care
- Medical Knowledge
- Practice-based Learning and Improvement
- Systems-based Practice
- Interpersonal Communication Skills
- Professionalism

“The Milestone Project”
What are “THE Milestones”

ACGME

The milestones are designed only for use in evaluation of residents in context of their participation in ACGME accredited residency or fellowship programs. The Milestones provide a framework for the assessment of the development of the resident physicians in key dimensions of the elements of physician competency in a specialty or subspecialty.
## Context: ACGME regulatory rationale

<table>
<thead>
<tr>
<th>Section</th>
<th>Requirement</th>
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<tbody>
<tr>
<td>V.A.2.b)</td>
<td>The program must:</td>
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<tr>
<td>V.A.2.b).(1)</td>
<td>provide objective assessments of competence in patient care and procedural skills, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice based on the specialty-specific Milestones; <em>(Core)</em></td>
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<td>V.A.2.b).(2)</td>
<td>use multiple evaluators (e.g., faculty, peers, patients, self, and other professional staff); <em>(Detail)</em></td>
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<td>V.A.2.b).(3)</td>
<td>document progressive resident performance improvement appropriate to educational level; <em>(Core)</em></td>
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<td>V.A.2.b).(4)</td>
<td>provide each resident with documented semiannual evaluation of performance with feedback; <em>(Core)</em></td>
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<td>V.A.2.b).(5)</td>
<td>administer the ABP In-Training Examination annually; and, <em>(Core)</em></td>
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<td>V.A.2.b).(6)</td>
<td>create and document an individualized learning plan at least annually. <em>(Core)</em></td>
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<td>V.A.2.b).(6).(a)</td>
<td>The program must provide a system to assist residents in this process, including: <em>(Detail)</em></td>
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<tr>
<td>V.A.2.b).(6).(a).(i)</td>
<td>faculty mentorship to help residents create learning goals; and, <em>(Detail)</em></td>
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<tr>
<td>V.A.2.b).(6).(a).(ii)</td>
<td>systems for tracking and monitoring progress toward completing the individualized learning plan. <em>(Detail)</em></td>
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<tr>
<td>V.A.2.c)</td>
<td>The evaluations of resident performance must be accessible for review by the resident, in accordance with institutional policy. <em>(Detail)</em></td>
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</table>
### ACGME Regulatory Rationale

**V.A.3. Summative Evaluation**

1. **V.A.3.a)** The specialty-specific Milestones must be used as one of the tools to ensure residents are able to practice core professional activities without supervision upon completion.

   *Pediatrics 22*

2. **V.A.3.b)** The program director must provide a summative evaluation for each resident upon completion of the program. 

   This evaluation must:

   1. **V.A.3.b)(1)** become part of the resident's permanent record maintained by the institution, and must be accessible for review by the resident in accordance with institutional policy;

   2. **V.A.3.b)(2)** document the resident's performance during the final period of education; and, 

   3. **V.A.3.b)(3)** verify that the resident has demonstrated sufficient competence to enter practice without direct supervision.
Milestones – Perspective

Example - Pediatrics

6 ACGME Competencies

- Professionalism
- Patient Care
- Medical Knowledge
- Practice-based Learning and Improvement
- Systems-based Practice
- Interpersonal Communication Skills

21 Pediatric Subcompetencies

- 6 - Professionalism
- 5 - Patient Care
- 1 - Medical Knowledge
- 4 - Practice-based Learning and Improvement
- 3 - Systems-based Practice
- 2 - Interpersonal Communication Skills

4-5 Milestone Levels per Subcompetency

- Novice
- Beginner
- Competent
- Proficient
- Expert
Competency-based Assessment

Clinical Observation

Subcompetency Milestone

Competency-based Assessment

Clinical Competency Committee

Recommendation for Advancement and Graduation
Thus, we’ve come full circle...

IOM

ACGME

Public

Competency-based Medical Education
Clinical Competency Committee & Milestone Reporting

• Milestone-based assessments will be vetted by CCC and recommendations for advancement and graduation
• Milestones can be used as a roadmap for individual residents growth
• The ACGME will collect milestone reports and use de-identified data along with other metrics towards the accreditation of individual residency programs
• Conceptually this all makes sense...

• Logistically, what is at the core...
Overview of Evaluation Strategies

Mapping Clinical Observations to the ACGME Milestones
Disclosures

• Employed at New Innovations, Inc
Assessment of Milestones

- Milestones are NOT an assessment tool
  - Do not put the 21 competencies with their Milestones into a new Global Assessment form!

- They are descriptors of behavior along a continuum of performance.
  - Existing tools will need to be used and new tools will need to be developed to assess resident Milestone achievement
  - Assessment requires their measurement within a clinical context*

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Existing Tools

Rating Scale

Boolean
New Tools - EPAs

Identify, evaluate, and manage patients with acute, common, single system diagnoses in inpatient settings (such as UTI, bronchiolitis, asthma, pneumonia, gastroenteritis, Kawasaki Disease, meningitis, soft tissue infection, febrile neonate, neonatal jaundice, bone and joint infections, and dehydration).

Resident trusted to perform this activity

<table>
<thead>
<tr>
<th>As an observer and/or assistant</th>
<th>Under proactive, ongoing, and direct supervision</th>
<th>Under indirect or reactive supervision</th>
<th>Mostly independently &amp; supervise more junior learners</th>
<th>Completely independently &amp; teach/model at level of master clinician</th>
<th>Did not observe</th>
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### (Endocrine) Medical Knowledge

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<tr>
<th>Critical Deficiencies</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
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<tr>
<td>This resident does not have medical student clerkship basic knowledge about common endocrine disorders such as thyroid dysfunction, hyperparathyroidism.</td>
<td>This resident has medical student clerkship basic understanding of the symptoms, signs and treatments of - the broad diseases of endocrine surgery (such as adrenal insufficiency, adrenal mass, thyroid cancer). - common surgical conditions of endocrine disease. - essential surgical operations of acute care surgery (thyroidectomy and parathyroidectomy).</td>
<td>This resident has basic knowledge about many of the “broad” diseases (primary hyperaldosteronism, hyperparathyroidism and “essential” operations (such as thyroidectomy and parathyroidectomy) and can complete an initial consultation, recommending appropriate initial care.</td>
<td>This resident meets level 2 and also has also basic knowledge of the focused diseases in endocrine surgery (recurrent hyperparathyroidism, multiple endocrine neoplasia), and can complete an initial consultation, recommending appropriate initial care for the patient with these presentations.</td>
<td>This resident has comprehensive knowledge about varying patterns of presentation and alternative and adjuvant treatments and can make the diagnosis and provide the initial treatment for complex patients in endocrine surgery.</td>
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| | | | | Not Observed |
New Tools - Templates
What is Mapping?

Can Locate Nose:
• Cannot Locate
• With Direct Supervision
• With Indirect Supervision
• Mostly independently
• Independently
Does this really indicate Expertise?

**Can Locate Nose:**
- Cannot Locate
- With Direct Supervision
- With Indirect Supervision
- Mostly independently
- **Independently**
Two general mapping styles
Keep the end in mind

**PC 5**

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<th>JAN</th>
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**AVG** 4.13  **PEER** 3.86  **PRIOR** 3.5
Mapping EPA responses to Subcompetencies
Entrustable Professional Activities (EPAs)

- Measure of entrustment of the trainee
- Observable behavior
- Being used as a means to map observable behavior to Subcompetency Milestones
Entrustable Professional Activities
~Many Flavors~

Specialty-Specific EPAs

Rotation-Specific EPAs

Fellowship-Specific EPAs

Subspecialty-specific EPAs

Competency-Specific EPAs

Observable Professional Activities
Example 1

- Pediatrics
- Rotation-specific EPAs
- EPAs based on goals and objectives
- Map directly to subcompetency milestones
Example 1 continued...

- Develop Rotation-specific EPA
  - Look to goals and objectives for rotation
  - Identify activity that is germane to the competence of a practitioner in that rotation
  - Once written, identify subcompetency milestones that bear its root(s)
Example 1 continued...

Example: Inpatient Team

Rotation-specific EPA:

EPA 1- Identify, evaluate, and manage patients with acute clinical deterioration in inpatient settings, including communication with families and team members.

Maps to...

Subcompetencies:

PC1- Gather essential and accurate information
PC2- Safe, effective, efficient patient care
PC4- Informed diagnostic and therapeutic decisions
PC5- Develop and carry out management plans
ICS1- Communicate effectively with patients and families
ICS2- Demonstrate insight and understanding into human emotion
Prof5- Trustworthiness in caring for patients
Prof6- Recognize and utilize resources in dealing with uncertainty
“Identify, evaluate, and manage patients with acute clinical deterioration in inpatient settings, including communication with families and team members.”
Competency-based Assessment

Clinical Observation

Rotation-specific EPAs

Subcompetency Milestone

Competency-based Assessment

Clinical Competency Committee

Recommendation for Advancement and Graduation
Mapping to Individual Milestones
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**Boolean**

- Yes
- No
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<td>Yes</td>
<td>Yes</td>
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4 yeses out of 5 total assessments
Progressive thread of behavior

<table>
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</table>
1. Cannot Locate
2. With Direct Supervision
3. With Indirect Supervision
4. Mostly independently
5. Independently
Competency-based Assessment

Clinical Observation

Specialty Specific Template mapped to Milestones

Subcompetency Milestone

Competency-based Assessment

Clinical Competency Committee

Recommendation for Advancement and Graduation
A word of caution...
Should we be doing this?

Is the mapping strategy of EPAs valid and reliable?

In fact, the very milestones to which we are mapping lack thorough validity and reliability testing…
There have been some initiatives...
EPA 1
“Identify, evaluate, and manage patients with acute clinical deterioration in inpatient settings, including communication with families and team members”

EPA 1
“Identify, evaluate, and manage patients with acute clinical deterioration in inpatient settings, including communication with families and team members”

Milestone Assessment
By Entrustment Evaluation

Milestone Assessment
By Subcompetency Evaluation

Study Methods

Milestone 1
1.5

Milestone 2
2.5

Milestone 3
3.5

Milestone 4
4.5

Milestone 5

PC 1

“Gather essential and accurate information about the patient”

Observable Behavior

Level 1
1-2

Level 2

Level 3
2-3

Level 4
3-4

Level 5
4-5

Intern

PL 2

PL 3
Study Conclusions

1. Content validity supports EPAs being mapped directly to subcompetency milestones (using a Dreyfus-based entrustment scale)

2. It appears that rotation-specific EPAs can reliably map to subcompetency milestones and inform competency-based evaluations

3. Some rotation-specific EPAs map to subcompetency milestones more reliably than others, and the concept of EPA mapping needs further studies
Considerations & Next Steps

• Larger study to further validate and perhaps standardize Dreyfus-based entrustment scale

• Further characterize success of rotation-specific EPA success
  – Verbiage and mapping of EPAs
  – Clinical area (some have more personal and direct observation of residents)
  – Size of residency training program
  – Individual vs. Group Evaluator
  – Some core competency domains might lend themselves better to rotation-specific EPAs than others
More work needs to be done...
Looking Ahead
Progression of Milestone concern

Phase 3
I need my milestones

Phase 2
Build the perfect form

Phase 1
I need more data
Thank You & Questions

Milestone Mapping
Leveraging Assessment Results to Inform the CCC

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References

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