The Role of Assessment in Competency-Based Medical Education
E. Holmboe, J. Sherbino, D. Long, S. Swing, J. Frank for the International CBME Collaborators

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Competency-based medical education (CBME), by definition, necessitates a robust and multifaceted assessment system. Assessment and the judgments or evaluations that arise from it are important at the level of the trainee, the program, and the public. When designing an assessment system for CBME, medical education leaders must attend to the context of the multiple settings where clinical training occurs.

The predominant clinical units where trainees work and learn – for example, ambulatory clinics, hospital wards, surgical suites, and intensive care units – are Microsystems. Microsystems provide the context for work-based training and assessment. The authors describe nine factors that have been identified for functional clinical Microsystems:

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<thead>
<tr>
<th>Microsystem success characteristic</th>
<th>Assessment system correlates</th>
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<tr>
<td>Information and information technology</td>
<td>Portfolio, preferably electronic</td>
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<td>Leadership of microsystem</td>
<td>Clerkship and program directors</td>
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<td>Macrosystem support of microsystem</td>
<td>Support and resources from department chair and institution</td>
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<td>Patient focus</td>
<td>Appropriate clinical experiences; measuring patient experience</td>
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<tr>
<td>Staff focus</td>
<td>Faculty development in assessment; involvement of non-physicians in assessment</td>
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<td>Interdependence of care team</td>
<td>Working in interdisciplinary teams; teamwork competence</td>
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<td>Process improvement</td>
<td>Continuous quality improvement of assessment methods and training tools</td>
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<td>Education and training</td>
<td>Competency-based; developmental clinical experiences; milestones and benchmarks</td>
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<tr>
<td>Performance results</td>
<td>Outcomes of training; at minimum, competence needed to advance to next stage</td>
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The authors then go on to explore six key features and components of effective assessment in CBME:

1. Assessment processes are continuous and frequent. Robust, on-going feedback is essential.
2. Assessment is criterion-based, using a developmental perspective. Commonly called milestones or benchmarks, a developmental perspective allows programs to determine

For questions/suggestions please contact Maria Blanco at: maria.blanco@tufts.edu
whether the trainee is on an appropriate ‘trajectory. Milestones provide specific guidance on trainee progress throughout the continuum of their training program.

3. CBME, with its emphasis on preparation for what the trainee will ultimately do, requires robust work-based assessment. Faculty work side by side with trainees on a daily basis and are therefore in an excellent position to provide real-time evaluation and feedback.

4. Training programs must use assessment tools that meet minimum requirements for quality. For CBME to be ultimately successful, we need better assessment tools and an effective approach for helping our faculty apply them.

5. Assessment must incorporate more “qualitative” measures and methods. Research has shown that valuable and defensible information can be obtained during evaluation sessions, especially with respect to difficult competencies such as professionalism and that qualitative methods can be used reliably to judge portfolios.

6. Assessment needs to draw upon the wisdom of the group and to involve active engagement of the trainee. It is conceivable that milestones and other descriptive performance criteria developed as a part of CBME will provide helpful guidance for self-assessment during a physician’s training and career.

Given the importance of assessment and evaluation for CBME, the medical education community will need more collaborative research to address several major challenges in assessment, including “best practices” in the context of systems and institutional culture and how best to train faculty to be better evaluators. Finally, we must remember that expertise, not competence, is the ultimate goal. CBME does not end with graduation from a training program, but should represent a career that includes ongoing assessment.

**Implications for TUSM**

This paper is part of the series of articles that was published in this issue of *Medical Teacher* specifically devoted to CBME (see titles of other articles published in this issue below). The adoption of a competency framework for medical education has become a topic of discussion in the field. As the authors of this paper suggest, establishing specific criteria-based milestones - which can also be referred to as “measurable learning objectives” or “specific competencies” or “outcome-based expectations”- and finding multiple and suitable assessments methods to measure them is a step towards developing a developmental CBME framework across the continuum of medical education.

At TUSM we are already taking this step by refining the expected accomplishments of students by the end of each clinical experience and defining suitable assessment approaches to track their accomplishments. Dr. Kevin Hinchey* and his IM residency team have had a competency based progression for about four years now. They developed 37 milestones for trainees to accomplish, and have been refining them for the past couple of years. Most of their milestone are observable behaviors and are included in their evaluation forms and asked the faculty to fill out. They also used the RIME (reporter, interpreter, manager, educator) developmental approach across the years of residency training as the framework, and have focused faculty development on feedback.

Therefore, key to this endeavor is to continue to engage our clinical faculty, including our resident teachers, in reflecting on and refining their evaluation practices.

For questions/suggestions please contact Maria Blanco at: maria.blanco@tufts.edu
Titles of other articles published in August issue of Medical Teacher

**Toward a definition of competency-based education in medicine: a systematic review of published definitions**
Jason R. Frank, Rani Mungroo, Yasmine Ahmad, Mimi Wang, Stefanie De Rossi, Tanya Horsley

**Competency-based medical education: theory to practice**
Jason R. Frank, Linda S. Snell, Olle Ten Cate, Eric S. Holmboe, Carol Carraccio, Susan R. Swing, Peter Harris, Nicholas J. Glasgow, Craig Campbell, Deepak Dath, Ronald M. Harden, William Iobst, Donlin M. Long, Rani Mungroo, Denyse L. Richardson, Jonathan Sherbino, Ivan Silver, Sarah Taber, Martin Talbot, Kenneth A. Harris

**Competency-based medical education: implications for undergraduate programs**
Peter Harris, Linda Snell, Martin Talbot, Ronald M. Harden

**Competency-based medical education in postgraduate medical education**
William F. Iobst, Jonathan Sherbino, Olle Ten Cate, Denyse L. Richardson, Deepak Dath, Susan R. Swing, Peter Harris, Rani Mungroo, Eric S. Holmboe, Jason R. Frank

*Dr. Hinchey is available for further questions, information and/or suggestions you might want to share with him. ([Kevin.Hinchey@baystatehealth.org](mailto:Kevin.Hinchey@baystatehealth.org))

For questions/suggestions please contact Maria Blanco at: [maria.blanco@tufts.edu](mailto:maria.blanco@tufts.edu)