Assessment of Competencies
Beyond Medical Knowledge

AAAAI/ACAAI Program Directors Assembly
January 7, 2023

Michael Nelson, MD, PhD

Disclosures

- No financial disclosures

- American Board of Allergy and Immunology
- UVA Health & School of Medicine
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Objectives

- Identify and compare assessment methods for non-medical knowledge competencies
- Identify limitations of competency assessments
- Identify medical education environmental influences on core competency assessment during and beyond training

Outline

- Medical education environment influences on assessments
- Assessments of non-patient care and medical knowledge core competencies
- Tools
- Assessment limitations
Outline

- Medical education environment influences on assessments
- Assessments of non-patient care and medical knowledge core competencies
- Tools
- Assessment limitations
Van Melle Core Component Framework for Evaluating Implementation of CBME  
Van Melle E et al., Academic Medicine 2019;94(7):1002-1009

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| **An Outcomes-Based Competency Framework** | o Desired outcomes of training are identified based on societal needs  
 o Outcomes are paramount so that the graduate functions as an effective health professional |
| **Progressive Sequencing of Competencies** | o In CBME, competencies and their developmental markers must be explicitly sequenced to support learner progression from novice to master clinician  
 o Sequencing must consider that some competencies form building blocks for the development of further competence  
 o Progression is not always a smooth, predictable curve |
| **Learning Experiences Tailored to Competencies In CBME** | o Time is a resource, not a driver or criterion  
 o Learning experiences should be sequenced in a way that supports the progression of competence  
 o There must be flexibility to accommodate variation in individual learner progression  
 o Learning experiences should resemble the practice environment  
 o Learning experiences should be carefully selected to enable acquisition of one or many abilities  
 o Most learning experiences should be tied to an essential graduateability |
| **Teaching Tailored to Competencies** | o Clinical teaching emphasizes learning through experience and application, not just knowledge acquisition  
 o Teachers use coaching techniques to diagnose a learner in clinical situations and give actionable feedback  
 o Teaching is responsive to individual learner needs  
 o Learners are actively engaged in determining their learning needs  
 o Teachers and learners co-produce learning |
| **Programmatic Assessment (i.e., Program of Assessment)** | o There are multiple points and methods for data collection  
 o Methods for data collection match the quality of the competency being assessed  
 o Emphasis is on providing personalized, timely, meaningful feedback  
 o Progression is based on entrustment  
 o There is a robust system for decision-making  
 o Good assessment requires attention to issues of implicit and explicit bias that can adversely affect the assessment process. |

Miller Framework for Good Assessments

- **Validity or Coherence**  
  - Evidence based results are appropriate for a particular purpose
- **Reproducibility, Reliability, or Consistency**  
  - Results would be the same if repeated under similar circumstances
- **Equivalence**  
  - Same assessment yields equivalent scores or decisions across different institutions or testing cycles
- **Feasibility**  
  - Practical, realistic, and sensible, given the circumstances and context
- **Educational Effect**  
  - Motivates those who take it to prepare in a fashion that has educational benefit
- **Catalytic effect**  
  - Motivates all stakeholders to create, enhance, and support education driving future learning & improve program quality
- **Acceptability**  
  - Stakeholders find the assessment process and results to be credible

Miller GE. Acad Med 1990;65(9):p S63-7  
Holmboe ES & Iobst WF. ACGME Assessment Guidebook, 2020
**ACGME/ABMS Core Competency Toolbox**

<table>
<thead>
<tr>
<th>Competency</th>
<th>Competency-Based Assessment Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical Knowledge</strong></td>
<td>• In-training exam</td>
</tr>
<tr>
<td></td>
<td>• Faculty work-based assessments</td>
</tr>
<tr>
<td></td>
<td>• Chart stimulated recall, Assessment of Reasoning Tool, others</td>
</tr>
<tr>
<td><strong>Patient Care and Procedural skills</strong></td>
<td>• Work-based clinical assessment through direct observation of the individual during care delivery</td>
</tr>
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<td></td>
<td>• Faculty and peer assessment</td>
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<td></td>
<td>• Standardized assessments</td>
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<td></td>
<td>• Simulation</td>
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<tr>
<td><strong>Professionalism</strong></td>
<td>• Informed self-assessment</td>
</tr>
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<td></td>
<td>• Multi-source feedback, such as a 360-degree evaluation</td>
</tr>
<tr>
<td></td>
<td>• Patient experience surveys</td>
</tr>
<tr>
<td><strong>Interpersonal and Communication Skills</strong></td>
<td>• Patient reported feedback and experience surveys</td>
</tr>
<tr>
<td></td>
<td>• Multi-source feedback, such as a 360-degree evaluation, especially regarding interprofessional care</td>
</tr>
<tr>
<td><strong>Practice-based Learning and Improvement</strong></td>
<td>• Evaluation of knowledge, skills, and attitudes from participation in systematic efforts to improve the quality, safety, or value of health care services</td>
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<tr>
<td></td>
<td>• Audit and feedback of the medical record</td>
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<td>• Review of medical errors and patient safety events</td>
</tr>
<tr>
<td></td>
<td>• Evidence-based practice logs</td>
</tr>
<tr>
<td><strong>Systems-based Practice</strong></td>
<td>• Feedback from multiple faculty evaluations regarding ability to practice in a complex health care system</td>
</tr>
<tr>
<td></td>
<td>• Multi-source feedback, such as a 360-degree evaluation, especially regarding interprofessional care</td>
</tr>
<tr>
<td></td>
<td>• Assessment of cost-conscious care</td>
</tr>
</tbody>
</table>

Holmboe ES & Isbott WF. ACGME Assessment Guidebook, 2020

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The GME Assessment “System”

- Residents
  - Assessments within Program:
    - Direct observations
    - Audit and performance data
    - Multi-source FB
    - Simulation
    - ITE Exam
  - Qual/Quant “Data” Synthesis: Committee
  - Milestone Judgments
  - FB

- Faculty, PDs and others
  - FB

- Unit of Analysis: Program
- Accreditation
- Certification and Credentialing

- Unit of Analysis: Individual

J Grad Med Educ. 2021 Apr; 13(2 Suppl): 113–119
Milestones

**Milestone 1.0**
- High Variability
- High Complexity
- Implementation challenges

**Variation among 26 specialties:**
230 PROF, 171 PBLI, 176 ICS, 122 SBP

**Milestones 2.0**
- Part of planned iterative improvement
- Enhance community engagement
- Reduce milestone complexity
- Harmonize subcompetencies for SBP/PBLI/PRO/IPC
- 2016 Multidisciplinary development groups
- 2017 Stakeholder surveys & public comment

**Interpersonal and Communication Skills (ICS)**
- Patient- and Family-Centered Communication (ICS-1)
- Interprofessional and Team Communication (ICS-2)
- Communication Within Healthcare Systems (ICS-3)

**Practice-Based Learning and Improvement (PBLI)**
- Evidence-Based and Informed Practice (PBLI-1)
- Reflective Practice and Commitment to Personal Growth (PBLI-2)

**Professionalism (PROF)**
- Professional Behavior and Ethical Principles (PROF-1)
- Accountability/Conscientiousness (PROF-2)
- Self-Awareness and Help-Seeking (PROF-3)

**Systems-Based Practice (SBP)**
- Patient Safety and Quality Improvement (SBP-1)
- System Navigation for Patient-Centered Care (SBP-2)
- The Physician’s Role in Healthcare Systems (SBP-3)

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Edgar L, Roberts S, Holmboe E. JGME 2018;10(3):367-369

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High variability in implementation across and within specialties
Outline

- Medical education environment influences on assessments
- Assessments of non-patient care and medical knowledge core competencies
- Tools
- Assessment limitations

Assessment of Practice-Based Learning & Improvement (JGME Apr 2021 Supplement)

- PBLI-1: Evidence-Based and Informed Practice
- PBLI-2: Reflective practice and commitment to personal growth

Tools
- Structured journal clubs
  - Doesn’t assess application
- Direct observation
- CSR
- Learner generated EBM Portfolio
- Individualized Learning Plans
- Performance Dashboard (clinical & educational)

Fondahn E et al. JGME 2021 April Supplement
Assessment of Practice-Based Learning & Improvement (JGME Apr 2021 Supplement)

- Performance Dashboard
- Validation studies

<table>
<thead>
<tr>
<th>Author(s), (y)</th>
<th>Target Audience</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhutani et al (2016)²</td>
<td>Third-year medical students</td>
<td>Objective structured clinical examination</td>
</tr>
<tr>
<td>Bougie et al (2015)²</td>
<td>Obstetrics and gynecology residents in all programs in Canada</td>
<td>Self-assessment; standardized written questions</td>
</tr>
<tr>
<td>Eppling et al (2018)³</td>
<td>Family medicine program directors in all programs in the United States</td>
<td>Program director's needs assessment</td>
</tr>
<tr>
<td>Haspel (2016)³</td>
<td>Transfusion medicine residents in a university-based program</td>
<td>Journal club curriculum</td>
</tr>
<tr>
<td>Leventhal and Botig (2017)⁴</td>
<td>Obstetrics and gynecology residents in a military program</td>
<td>Structured journal club</td>
</tr>
<tr>
<td>Patell et al (2020)⁴</td>
<td>Internal medicine residents in both university- and community-based programs</td>
<td>Multiple-choice evidence-based medicine test</td>
</tr>
<tr>
<td>Smith et al (2016)⁵</td>
<td>Third-year medical students</td>
<td>Fresno evidence-based medicine test</td>
</tr>
<tr>
<td>So et al (2019)⁵</td>
<td>Foot/ankle residents in 2 community-based programs</td>
<td>Structured review instrument for journal club</td>
</tr>
<tr>
<td>Thomas and Krentz (2015)⁵</td>
<td>Family medicine residents</td>
<td>Meta-analysis of available tools</td>
</tr>
<tr>
<td>Tilson (2010)⁶</td>
<td>Physical therapy doctorate students</td>
<td>Validation of Fresno test</td>
</tr>
</tbody>
</table>

Assessment of Systems Based Practice (JGME Apr 2021 Supplement)

- SBP1: Patient Safety and Quality Improvement
- SBP2: System Navigation for Patient-Centered Care
- SBP3: Physician Role in Health Care Systems
- SBP4: Community and Population Health

- 360-degree evaluations
- Self-assessment
- QI project performance
- Surveys
- OSCE
- Simulated cases with examinations
- Web-based tools
- Direct observation w/ real time assessments & feedback

- Limited validity evidence
- Unclear if predicts domain performance

Fondahn E et al. JGME 2021 April Supplement
Assessment of Professionalism
JGME 2021 Supplement

- PROF1: Professional Behavior and Ethical Principles
- PROF2: Accountability and Conscientiousness
- PROF3: Self-Awareness and Help-Seeking

Selected validated instruments

<table>
<thead>
<tr>
<th>Tool or Assessment Type</th>
<th>Specialty</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment scale</td>
<td>Internal medicine</td>
<td>Arnold et al (1998)1,7</td>
</tr>
<tr>
<td>Critical incident review</td>
<td>Medical students</td>
<td>Hodges et al (2000)9,9</td>
</tr>
<tr>
<td>Encounter card</td>
<td>Obstetrics and gynecology</td>
<td>Brennan and Norman (1997)2,7</td>
</tr>
<tr>
<td>Patient survey</td>
<td>Internal medicine</td>
<td>Abadie and Mattles (2014)1,7</td>
</tr>
<tr>
<td>Simulation</td>
<td>Surgery</td>
<td>Li et al (2013)21,11</td>
</tr>
</tbody>
</table>

Frohna JG & Padmore JS. JGME 2021 April Supplement

Assessment of Interpersonal and Communication Skills
(JGME Apr 2021 Supplement)

- IPC1: Patient and Family-Centered Communication
- IPC2: Interprofessional and Team Communication
- IPC3: Communication within Health Care Systems

<table>
<thead>
<tr>
<th>Method</th>
<th>Pros</th>
<th>Cons</th>
<th>Feedback Source</th>
</tr>
</thead>
</table>
| Direct observation (sole source)1,7,9,17,20 | - Individualized feedback  
- Versatile as to setting (simulation vs real life) and skill being assessed  
- Can teach observer the skills necessary to do this well | - Most reliable with validated instrument  
- Subject to the opinion of the observer so works best with trained observer | - Standardized patient  
- Live patient  
- Observed structured clinical examination |
| Direct observation (multisource)1,7,13,21  | - Individualized feedback  
- Versatile as to setting (simulation vs real life) and skill being assessed | - Subject to the biases of the observer as often the observers have not undergone formal training and lack specific skills | - Standardized patient  
- Live patient  
- Observed structured clinical examination |
| Team assessment1,12,20-24  | - Team feedback  
- Team building  
- Works with simulated and real-life scenarios | - Unique to the composition of that team  
- Can be subject to the power dynamics of the team hierarchy | - Team members  
- Direct observers  
- Formal debriefing session |
| Recording of interaction9,14,17  | - Allows trainee to see themselves | - Added pressure of recording process may alter behavior | - Standardized patient  
- Live patient  
- Observed structured clinical examination |

Fondahn E et al. JGME 2021 April Supplement
Interprofessional Professional Collaborative

- NBME & 11 entry-level health professions
- Developed the Interprofessional Professionalism Assessment (IPA)
  - Online tool kit available to teach interprofessional professionalism
  - 26 items or observable behaviors representing six domains of professionalism
    - Altruism and caring
    - Excellence
    - Ethics
    - Respect
    - Communication
    - Accountability
  - tested by 233 preceptors

http://www.interprofessionalprofessionalism.org/toolkit.html

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Review
Assessment and feedback methods in competency-based medical education

Gerald B. Lee, MD; Asiani M. Chiu, MD

* Division of Pulmonary, Allergy and Immunology, Cystic Fibrosis, and Sleep, Department of Pediatrics, Emory University School of Medicine, Atlanta, Georgia
** Division of Allergy, Asthma, and Clinical Immunology, Department of Pediatrics, Medical College of Wisconsin, Milwaukee, Wisconsin

Table 3

<table>
<thead>
<tr>
<th>Assessment method</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Assessments</td>
<td>A/J fellowship in-training examination</td>
</tr>
<tr>
<td></td>
<td>ACAA AI AIM self-assessment</td>
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<tr>
<td></td>
<td><a href="https://education.acaai.org/AIMSelfAssessment">https://education.acaai.org/AIMSelfAssessment</a></td>
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<td></td>
<td>ACAA board review corner</td>
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<td><a href="https://education.acaai.org/content/board-review-corner">https://education.acaai.org/content/board-review-corner</a></td>
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<tr>
<td></td>
<td>ACAA MOC self-assessment modules</td>
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<tr>
<td></td>
<td><a href="https://education.acaai.org/content/moc-part-ii-lifelong-learning-and-self-assessment">https://education.acaai.org/content/moc-part-ii-lifelong-learning-and-self-assessment</a></td>
</tr>
<tr>
<td>Journal-based CME and MOC</td>
<td><a href="https://www.aansallergy.org/">https://www.aansallergy.org/</a></td>
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<td></td>
<td><a href="https://www.jacionline.org/">https://www.jacionline.org/</a></td>
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<td><a href="https://www.jaci-inpractice.org/">https://www.jaci-inpractice.org/</a></td>
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<td>ACAA AI self-assessment</td>
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<tr>
<td></td>
<td><a href="https://education.acaad.org/puproj/2041_setassessment">https://education.acaad.org/puproj/2041_setassessment</a></td>
</tr>
<tr>
<td>ACAA allergic extract quiz</td>
<td><a href="https://education.acaai.org/content/allergen-extract-mixing">https://education.acaai.org/content/allergen-extract-mixing</a></td>
</tr>
<tr>
<td></td>
<td>ACAA FDA TestFix</td>
</tr>
<tr>
<td></td>
<td><a href="https://education.acaad.org/pdtoolbox">https://education.acaad.org/pdtoolbox</a></td>
</tr>
<tr>
<td>Simulation</td>
<td>Mawhirt et al., 2019 <a href="https://www.allergology.org/article/S1091-1206(19)30126-7">https://www.allergology.org/article/S1091-1206(19)30126-7</a></td>
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<tr>
<td></td>
<td>Barnet et al., 2020 <a href="https://jaci-inpractice.org/article/52213-2198(20)30721-2">https://jaci-inpractice.org/article/52213-2198(20)30721-2</a></td>
</tr>
<tr>
<td>Practice assessment tools</td>
<td>AAI MOC part IV activities <a href="https://www.aai.org/ui_modules.asp">https://www.aai.org/ui_modules.asp</a></td>
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<tr>
<td></td>
<td>ACGME case log system <a href="https://apps.acgme.org/ACDS/CaseLog/Default/Landing">https://apps.acgme.org/ACDS/CaseLog/Default/Landing</a></td>
</tr>
<tr>
<td></td>
<td>ACAA quality clinical data registry <a href="https://www.acaad.org/Practice-Management/Quality-Clinical-Data-Registry">https://www.acaad.org/Practice-Management/Quality-Clinical-Data-Registry</a></td>
</tr>
</tbody>
</table>
Free Apps from ACGME

ACGME “DOCC 3.0”

- Free app recently upgraded
  - Easier installation (personal or servers)
  - Easier workflow implementation
- On-the-spot or scheduled direct observation assessments
  - H&P
  - PE
  - Effective clinical reasoning
  - Informed decision making
  - Breaking bad news
  - Safe hand-offs
ACGME “TEAM”

- Teamwork Effectiveness Assessment Module (TEAM)
  - Adapted from ABIM original version

- Website enabling collection of MSF on residents and fellows
  - Professionalism
  - Interpersonal and communication skills
  - Interprofessional teamwork
  - Aspects of systems-based practice

- Learner registers on site and initiates assessment permission for various evaluators

Entrustable Professional Activities

- Essential activities that physicians are entrusted to perform safely and effectively without supervision
- Collectively span scope of practice & KSA needed for a specialty or subspecialty
- Integrates multiple subcompetencies into a meaningful clinical context
- Assessed on levels of supervision entrustment
- Serial low stakes assessments fostering independence
- Supplements/informs milestones
- Increasingly popular tool for CBME implementation
Entrustable Professional Activities
American Board of Pediatrics

- General Pediatrics: 17 EPAs
- Subspecialties:
  - 7 common, 3-6 subspecialty specific EPAs
  - Provide consultation to other health care providers caring for children and adolescents and refer patients requiring further consultation to other subspecialty providers if necessary
  - Contribute to the fiscally sound, equitable, and collaborative management of a health care workplace
  - Use Population Health Strategies and Quality Improvement Methods to Promote Health and Address Racism, Discrimination, and Other Contributors to Inequities Among Pediatric Populations
  - Lead an interprofessional health care team
  - Facilitate handovers to another health care provider either within or across settings
  - Engage in scholarly activities through the discovery, application, and dissemination of new knowledge
  - Lead within the subspecialty profession

Schumacher DJ et al. JAMA Netw Open 2020;3(1):e1919316
High-fidelity Simulation for Medical Student and Resident Education of Allergic-Immunologic Emergencies

- 12 groups
- 45 med students & residents
- Anaphylactic shock and ACEI angioedema cases
- Pre/post/6mo follow-up assessments


- Delayed diagnosis of anaphylaxis (~5min)
- EAI administration inexperience
- 6 of 8 groups diagnosed ACEI induced angioedema; multiple incorrect treatments
- Encouraging educational outcomes
  - immediate knowledge
  - knowledge retention
  - participant-expressed course satisfaction
Clinical Questioning Tools

“think aloud”

- Small group or 1 on 1 away from pt
- Pauses for verbalizing thought processes
- Trainees verbalizing thought processes enables clinical reasoning assessment
- Supervisors verbalizing thought processes enables learning and modeling by trainee

<table>
<thead>
<tr>
<th>Presentation of Patient by Trainee</th>
<th>Think Aloud by Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert—5-year-old child. Felt sick because of pain in the abdomen, vomiting, and diarrhea.</td>
<td>Repeatedly mention the signs and symptoms. Other serious conditions, particularly surgical problems, present in a similar way.</td>
</tr>
<tr>
<td>Robert—younger of 5 children. Siblings ages 3 and 5 yrs have been well recently. Tender due unsure, but none of the children have been sick. Normal term delivery without any complication or resuscitation needed. He is growing weights 20 lbs and developing normally. Fully immunized and has no known allergies.</td>
<td>Absence of a history of contact with a child with diarrhea doesn’t exclude the possibility of infectious gastroenteritis; but together with the fact that he is immunized, it makes it less likely.</td>
</tr>
<tr>
<td>Vomiting in the last 24 hours.</td>
<td></td>
</tr>
<tr>
<td>Vomit is now green color, but there is not as much volume as initially and not projectile. Mother has noticed that Robert has been very irritable and looking like he is in pain at times. He has been drawing up his legs and screaming on occasions.</td>
<td>Given vomiting is a significant sign because it is often a manifestation of intestinal obstruction. I am worried about a surgical condition—intoxication, intussusception is in the right age group for this because it looks 4–10 yrs old. Approach is a little too likely because he has been dehydrated. Summary: Acute onset of vomiting in an otherwise well infant with irritability and bloody diarrhea is very suggestive of intussusception.</td>
</tr>
<tr>
<td>Any fluids taken this morning have been vomited. Not eaten for 6 h. Difficult to ascertain the number of wet diapers with the diarrhea. Robert’s mother says he is now looking listless and tired.</td>
<td>This information of very poor oral intake suggests he is at risk of becoming dehydrated and may need intravenous fluids.</td>
</tr>
</tbody>
</table>
One Minute Preceptor

1. Get a commitment from the learner. Ask, “What is the likely diagnosis in the case being presented?”
2. Probe for supporting evidence/underlying reasoning. Ask, “What supports/contradicts this diagnosis?”
3. Teach general rules relevant to the topic.
4. Reinforce what was done right by the learner. Provide positive feedback.
5. Correct mistakes with suggestions on how to approach a similar situation next time.

SNAPPS

- Learner-centered teaching
  - Discusses patient encounters beyond the facts
  - Verbalizes clinical reasoning
  - Engages in follow-up learning

Wolpaw TM et al. Acad Med. 2003;78(9):893-8
Do They Work?

A Systematic Review of the Quality and Utility of Observer-Based Instruments for Assessing Medical Professionalism

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Domains Measured</th>
<th>Definition of domain</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professionalism MS</td>
<td>1) Doctor-Patient Relationship Skills</td>
<td>Doctor-patient relationship skills: A doctor’s communication and interpersonal skills encompass the ability to gather information in order to facilitate accurate diagnosis, counsel appropriately, give therapeutic instructions, and establish caring relationships with patients</td>
<td>1-4</td>
</tr>
<tr>
<td></td>
<td>2) Reflective Skills</td>
<td>2) Reflective skills: Reflection means letting future behaviour be guided by a systematic and critical analysis of past actions and their consequences/Using concrete practical situation as a basis for critical self-reflection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Time Management</td>
<td>3) Time Management: the ability to use one’s time effectively or productively, especially at work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Inter-professional Skills</td>
<td>4) Inter-professional skills: learning occurring when two or more professions learn with, from and about each other to improve collaboration and the quality of care</td>
<td></td>
</tr>
</tbody>
</table>

| EOS group questionnaire | 1) Professionalism | 1) Professionalism: 
- Demonstrates respect for the patient’s Culture
- Demonstrates respect for nurses
- Demonstrates respect for support staff
- Maintains confidentiality of patients and their families
- Shows compassion for patients and their families
- Seeks consultation/supervision when appropriate
- Functions effectively as a member of the team
- Demonstrates responsibility
- Completes assigned tasks
- Manages personal stress responsibly
- Answers pages in a timely fashion | 1-5   |
|                        | 2) Interpersonal and communication skills | 2) Interpersonal and communication skills: 
- Communicates effectively with patients
- Communicates effectively with patient’s families
- Communicates effectively with other health care professionals
- Communicates referral information to patients
- Maintains complete medical records |       |

Systematic Review of 16 studies and 10 instruments

CONCLUSION
“We identified 2 instruments with best psychometric properties, with 1 also showing acceptable utility for assessing professionalism in trainees. The P-MEX may be an option for program directors to adopt as an observer-based instrument for formative assessment of medical professionalism.”

Professionalism Mini-Evaluation Exercise (P-MEX)

Strengths
- Feasibility of use
- Good reliability and validity
- Extensive evaluator training is not required.
- Only tool validated in 2 different cultural contexts (Canada, Japan) and learner levels (MS, residents)
- Formative assessment promoting direct observation and timely feedback.

Weaknesses/limitations
- Low reliability for peer to peer evaluations
- Risk for phenomenon of “failure to fail”
- Lacks evidence of educational effect
- No studies examine whether the instrument improves learning, clinical skills, quality of patient care or whether assessed lapses correspond to unprofessional conduct in practice

Assessing Medical Professionalism:
A systematic review of instruments and their measurement properties

- COSMIN checklist
- Reliability
- Validity
- Responsiveness
- 74 instruments (incl. 22 ACGME, 12 ABIM, 7 RCPSC)
- 2 major categories
- Comprehensive construct
- Facet of competency
- 7 assessment subcategories
- Self-administered ratings
- Multisource Feedback (MSF)
- Simulations
  - OSCEs and high-fidelity patient simulations
  - Patients’ opinions
  - Direct observations
- Role model evaluation
- Professionalism environment

Li H et al. PLOS One May 12, 2017
Assessing Medical Professionalism:
A systematic review of instruments and their measurement properties

- Diverse tools and target populations
- Only a limited number of studies were methodologically sound
  - Only 2 Nursing and 1 medical student instruments of 74 rated highly
  - Variable methodologic quality and performance
  - Content & criterion validity most negative or indeterminate ratings

- Needs
  - Longitudinal studies
  - Physician and GME high quality instruments
  - Systematic improvement of existing instruments use in more diverse populations

Outline

- Medical education environment influences on assessments
- Assessments of non-patient care and medical knowledge core competencies
- Tools
- Assessment limitations
One Size Does Not Fit All

- Reminder of Miller Framework & inherent variability impacting instrument:
  - Validity or Coherence
  - Reproducibility, Reliability, or Consistency
  - Equivalence
  - Feasibility
  - Educational Effect
  - Catalytic effect
  - Acceptability
- Implicit bias
- Beyond training applicability

Miller GE. Acad Med 1990;65(9):p S63-7
Holmboe ES & Iobst WF. ACGME Assessment Guidebook, 2020

Racial and Ethnic Differences in Internal Medicine Residency Assessments

- Retrospective cohort study

- 9026 IM graduates of ACGME accredited IM residencies in 2016 & 2017
  - 36.1% Asian
  - 13.5% URiM

- Primary outcome:
  - Midyear & year-end total ACGME milestone assessment score

Boatright D et al. JAMA Netw Open. 2022;5(12):e2247649
Racial and Ethnic Differences in Internal Medicine Residency Assessments

- Every 6 month Total Milestone Scores (fully adjusted model)
- Asian & URiM residents rated lower for Years 1 & 2

Conclusions

- URiM & Asian IM residents received lower ratings than their White peers (1st & 2nd yrs)
- Gap narrowed during 3rd year
- Asian residents 20-25% less likely to be rated for unsupervised practice 6 mos prior to graduation
- URiM residents >=15% less likely to be rated for unsupervised practice in 4 of 6 competency domains
- IM programs may benefit from evaluating additional outcomes for racial and ethnic inequities
- More diversity in program trainees and faculty needed
  - 18% programs excluded for lacking Asian/URiM residents across the 2 study years

Table 2. Likelihood of Postgraduate Year 3 Residents Being Rated Ready for Independent Practice

<table>
<thead>
<tr>
<th>Group</th>
<th>Overall</th>
<th>Patient care</th>
<th>Medical knowledge</th>
<th>Systems-based practice</th>
<th>Practice-based learning and improvement</th>
<th>Professionalism</th>
<th>Interpersonal and communications skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midyear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>0.76 (0.69-0.83)</td>
<td>0.76 (0.66-0.84)</td>
<td>0.75 (0.68-0.83)</td>
<td>0.76 (0.68-0.84)</td>
<td>0.79 (0.72-0.88)</td>
<td>0.77 (0.70-0.85)</td>
<td>0.79 (0.71-0.87)</td>
</tr>
<tr>
<td>URiM</td>
<td>0.92 (0.78-1.09)</td>
<td>0.86 (0.75-1.00)</td>
<td>0.79 (0.68-0.91)</td>
<td>0.89 (0.77-1.02)</td>
<td>0.83 (0.72-0.96)</td>
<td>0.85 (0.74-0.98)</td>
<td>0.83 (0.72-0.99)</td>
</tr>
<tr>
<td>End year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>0.95 (0.85-1.06)</td>
<td>0.91 (0.80-1.05)</td>
<td>0.91 (0.78-1.06)</td>
<td>0.88 (0.76-1.02)</td>
<td>0.93 (0.81-1.07)</td>
<td>0.92 (0.79-1.08)</td>
<td>0.83 (0.70-0.99)</td>
</tr>
<tr>
<td>URiM</td>
<td>1.05 (0.9-1.22)</td>
<td>1.02 (0.85-1.22)</td>
<td>0.85 (0.71-1.03)</td>
<td>0.90 (0.74-1.10)</td>
<td>0.89 (0.74-1.07)</td>
<td>1.01 (0.83-1.25)</td>
<td>0.89 (0.7-1.12)</td>
</tr>
</tbody>
</table>

Abbreviations: OR, odd ratio; URiM, underrepresented in medicine
Learning Curves


American Board of Medical Specialties (ABMS) Certification Assessments

- 940,000 board certified diplomates
- 24 Member Boards
- 40 specialties
- 88 subspecialties
- Initial Certification (40 specialties)
  - 30 single proctored exam
  - 10 multiple proctored exams
  - 19 practical/oral assessment
- Continuing Certification (24 MBs)
  - 24 Longitudinal assessment programs
  - 16 Proctored exam alternative to LAP (dropping)
  - 20 Practice assessment/QI/Professional Practice activity
  - 18 Registry participation
  - 2 Peer review
  - 1 Case list review
  - 1 M&M attendance (Chief of Staff attested)
Medical Education & Clinical Practice Assessment Continuum?

- ACGME/programs
  - In-training exam
  - Faculty work-based assessments
  - Chart stimulated recall
  - Assessment of Reasoning Tool
  - Direct observation
  - Faculty and peer assessment
  - Standardized assessments
  - Simulation
  - Informed self-assessment
  - Multi-source feedback
  - Patient reported feedback & surveys
  - Audit and feedback of the medical record
  - Medical error & patient safety event review
  - Evidence-based practice logs
  - Assessment of cost-conscious care

- ABMS MBs/certifying bodies
  - Initial Certification
  - Proctored exams
  - Practical/oral assessment
  - Longitudinal assessment programs
  - Proctored exam alternative to LAP
  - Practice assessment/QI activity
  - Professional practice activities
  - Registry participation
  - Case list review
  - Professional peer review
  - M&M attendance (Chief of Staff attested)

Closing Thoughts

- Although ideal, one size does not and will not fit all
- Need for vigilance in identifying implicit bias in chosen assessments
- Need for validation studies needed for most assessments
- Need for alignment of in-training and post training assessments
- Need for further harmonization across programs & specialties
  - Does A&I need to consider EPAs?
- The ultimate trust in launching graduates for independent practice appropriately lies with the PD and CCC
“Anyone who stops learning is old, whether at twenty or eighty. Anyone who keeps learning not only remains young but becomes constantly more valuable”

Henry Ford

Questions
CBME Potential?

- Tailored learning
- Flexible training
- Flexible duration of training
- Systematic Assessments
- Innovative Assessments
- Meaningful Focused Feedback
- Preparedness for Practice
CBME Tools

- Milestones
- EPAs
- Feedback

From: https://meds.queensu.ca/academics/cbme/

CBME Challenges

- Competency definition and assessment implementation
- Adequacy of assessments to address all specialty requirements
- Learning & teaching culture change
  - Early engagement of tech & educ resources
  - Program champions & leadership
- Increased admin & tech requirements
- Flexibility for individual learning plans
- Assessment dependence on clinical context
- Milestones & EPA overreliance (overall dev. gaps)
- Mapping interventions to outcomes

Clinical competence ≠ sum of subcompetencies
Marathon, not a sprint
### CBME Stages of Residency

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transition to Discipline</td>
<td>Concentration on orientation</td>
</tr>
<tr>
<td>Foundations of Discipline</td>
<td>Focus on foundational skills required to move on to more advanced and specialty-specific competencies within the discipline</td>
</tr>
<tr>
<td>Core of Discipline</td>
<td>Training concentrates on the core competencies required for the discipline</td>
</tr>
<tr>
<td>Transition to Practice</td>
<td>The final phase of training. Residents must demonstrate their ability to transition to autonomous practice</td>
</tr>
</tbody>
</table>

[Link to Queen’s University School of Medicine](https://meds.queensu.ca/academics/cbme/how-cbme-works)