Assessment of Competencies Beyond Medical Knowledge

AAAAI/ACAAI Program Directors Assembly
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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

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Outline

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

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- Assessment limitations

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Changing Environment


Ann Allergy Asthma Immunol 128 (2022) 248–255

Contents lists available at ScienceDirect

ELSEVIER

Annals

Review

Current trends in medical education affecting allergy and immunology physicians and learners

Check for updates

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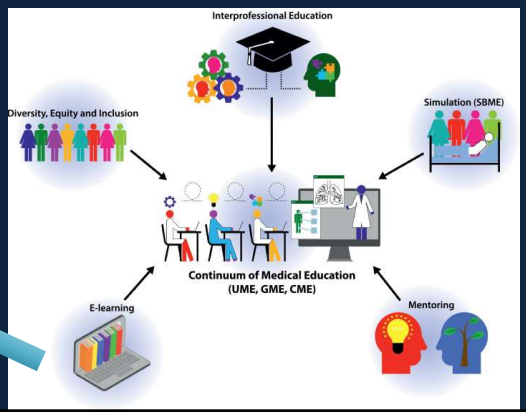
- "Just in Time" (JiT): Search and find capability via Google, Twitter, YouTube information when quick information is needed
- Massive Open Online Courses (MOOCs): Online courses accessible to general public, e.g., Coursera
- Podcasts: Asynchronous, downloadable radio-like talk series typically focused on a single or related topics
- Push Notifications:Messageson mobile devices communicating new information, such as a new website posting to the recipient
- Streaming: Continuous transmission of files from the source to the recipient, e.g., live-stream instructor presentation
- Webinars: Web-based seminar presented via AV and chat function available



Pien LC et al. Ann Allergy Asthma Immunol 128 (2022) 248–255

Van Melle Core Component Framework for Evaluating Implementation of CBME

Van Melle E et al. , *Academic Medicine 2019*;94(7):1002-1009

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

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ACGME/ABMS Core Competency Toolbox

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

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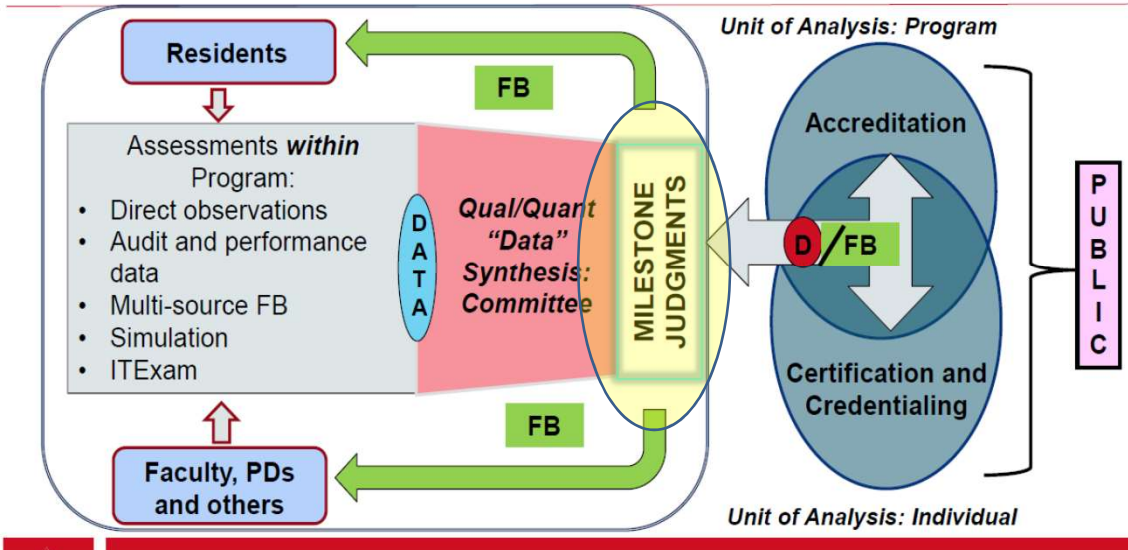
Holmboe ES & Iobst WF. ACGME Assessment Guidebook, 2020

The GME Assessment "System"



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 (SPB-1)
  - System Navigation for Patient-Centered Care (SBP-2)
  - The Physician's Role in Healthcare Systems (SBP-3)

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

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Milestones 2.0 Crosswalk

Theme	Relevant core competency				No. of milestones related to this theme	No. of specialties with milestones related to this theme
	ICS	PBLI	PROF	SBP		
1: Communication with patients	X				73	24
2: Communication with teams	X				65	21
3: Informed consent	X				6	5
4: Self-directed learning		X			88	25
5: Evidence-based patient care		X			20	15
6: Scholarly activity		X			8	5
7: Teaching		X			18	10
8: Attitudes and behaviors			X		75	24
9: Accountability			X		58	24
10: Ethics			X		27	20
11: Limits			X		22	17
12: Administrative tasks			X		19	12
13: Health economics				X	44	22
14: Health care delivery settings				X	13	8
15: Community				X	7	2

Theme	Relevant core competency				No. of milestones related to this theme	No. of specialties with milestones related to this theme
	ICS	PBLI	PROF	SBP		
1: Coordination and transitions of care	X			X	32 (14 ICS and 18 SBP)	21
2: Feedback		X	X		27 (19 PBLI and 8 PROF)	21
3: Medical records and technology	X			X	26 (17 ICS and 9 SBP)	22
4: Patient safety and errors		X		X	23 (1 PBLI and 22 SBP)	21
5: Quality assurance / improvement		X		X	18 (17 PBLI and 1 SBP)	17
6: Confidentiality	X		X		16 (1 ICS and 15 PROF)	13
7: Teamwork			X	X	14 (6 PROF and 8 SBP)	10

High variability in implementation across and within specialties

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

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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

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

- Performance Dashboard

Clinical Data	Educational Data
Chart audits	Online module completion
Procedure/case logs	Direct observation evaluations
Medical record completeness and deficiencies	Attendance data
Case volumes; appointment volumes	Scholarly output
Quality/safety indicators (readmission rates, complication rates)	Rotation evaluations
Patient evaluations/patient experience scores	Semiannual program evaluations

- Validation studies

Author(s), (y)	Target Audience	Assessment
Bhutiani et al (2016)[8]	Third-year medical students	Objective structured clinical examination
Bougie et al (2015)[9]	Obstetrics and gynecology residents in all programs in Canada	Self-assessment; standardized written questions
Epling et al (2018)[6]	Family medicine program directors in all programs in the United States	Program director's needs assessment
Haspel (2010)[13]	Transfusion medicine residents in a university-based program	Journal club curriculum
Lentscher and Batig (2017)[14]	Obstetrics and gynecology residents in a military program	Structured journal club
Patell et al (2020)[10]	Internal medicine residents in both university- and community-based programs	Multiple-choice evidence-based medicine test
Smith et al (2018)[11]	Third-year medical students	Fresno evidence-based medicine test
So et al (2019)[15]	Foot/ankle residents in 2 community-based programs	Structured review instrument for journal club
Thomas and Kreptul (2015)[7]	Family medicine residents	Meta-analysis of available tools
Tilson (2010)[12]	Physical therapy doctorate students	Validation of Fresno test

Fondahn E et al. JGME 2021 April Supplement

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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

TABLE

Citation	Teaching Method	Assessment Method/Tool
Papademetriou M, Perrault G, Pitman M, et al. Subtle skills: using objective structured clinical examinations to assess gastroenterology fellow performance in system based practice milestones. *World J Gastroenterol*. 2020;26(11):1221–1230. doi:10.3748/wjg.v26.i11.1221.	Teaching through formative feedback based on OSCE assessment.	OSCE Milestones assessment with validated checklists used for formative feedback. Domains assessed: • "Works effectively within an interprofessional team" • "Recognized system error and advocated for system improvement" • "Transitions patients effectively within and across health delivery systems"
Dolansky MA, Moore SM, Palmieri PA, Singh MK. Development and validation of the systems thinking scale. *J Gen Intern Med*. 2020;35(8):2314–2320. doi:10.1007/s11606-020-05830-1.	N/A	Validated 26-item scale to assess systems thinking
Samala RV, Hoeksema LJ, Colbert CY. A qualitative study of independent home visits by hospice fellows: addressing gaps in ACGME milestones by fostering reflection and self-assessment. *Am J Hosp Palliat Care*. 2019;36(10):885–892. doi:10.1177/1049909119836218.	Reflection and self-assessment during a designated rotation/experience (hospice home care) • Self-identified knowledge and skill gaps • Implemented self-improvement plans • Enhanced teamwork	Reflection and self-assessment provide a qualitative assessment of SBP knowledge and skills, including teamwork.
Williamson K, Moreira M, Quattromani E, Smith JL. Remediation strategies for systems-based practice and practice-based learning and improvement milestones. *J Grad Med Educ*. 2017;9(3):290–293. doi:10.4300/JGME-D-16-00334.1.	Strategies for remediation of learners struggling with performance in the SBP Milestone domain	N/A
Prince LK, Little DJ, Schexneider KI, Yuan CM. Integrating quality improvement education into the nephrology curricular milestones framework and the clinical learning environment review. *Clin J Am Soc Nephrol*. 2017;12(2):349–356. doi:10.2215/CJN.04740416.	Presents a curriculum design with SBP components: • Systems-based challenges • Design and implementation techniques for system changes	Assessment of SBP Milestones through performance of multidisciplinary quality improvement projects (knowledge, skills, teamwork)

Abbreviations: OSCE, objective structured clinical examination; SBP, systems-based practice.

Fondahn E et al. JGME 2021 April Supplement

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Assessment of Professionalism
JGME 2021 Supplement

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

- MSF
- Coaching
- Case scenarios
- Assessment scales
- Direct observations
- Patient surveys
- IPA
- Professionalism Mini-Evaluation Exercise (P-MEX)

Selected validated instruments

Tool or Assessment Type	Specialty	Authors
Assessment scale	Internal medicine	Arnold et al (1998)[15]
Critical incident review	Medical students	Hodges et al (2005)[16]
Encounter card	Obstetrics and gynecology	Brennan and Norman (1997)[17]
Multisource assessment	Radiology	Wood et al (2004)[18]
Patient survey	Internal medicine	Abadel and Hattab (2014)[19]
Professionalism Mini-Evaluation Exercise (P-MEX)	Emergency medicine multiple	Amirhajlou et al (2019)[20] Cruess et al (2006)[21]
Simulation	Surgery	Lifchez et al (2015)[22]

Frohna JG & Padmore JS. JGME 2021 April Supplement

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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

- Direct observation
- MSF
- Team assessment
- OSCE
- Self-assessment/recording

Method	Pros	Cons	Feedback Source
Direct observation (sole source)[6,7,9,17–20]	▪ 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)[9–11,13,21]	▪ 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 assessment[12,22–24]	▪ 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 interaction[9,10,17]	▪ 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

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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

Communication

Communication: Impart or interchange of thoughts, opinions or information by speech, writing, or signs; "the means through which professional behavior is enacted." (Arnold and Stern in Stern 2006)

1. Works with members of other health professions to coordinate communication with patients/clients and family members.	☐SD	☐D	☐N	☐A	☐SA	☐N/O
2. Demonstrates active listening with members of other health professions.	☐SD	☐D	☐N	☐A	☐SA	☐N/O
3. Communicates respectfully with members of other health professions.	☐SD	☐D	☐N	☐A	☐SA	☐N/O
4. Communicates with members of other health professions in a way they can understand, without using profession-specific jargon.	☐SD	☐D	☐N	☐A	☐SA	☐N/O
5. Responds to questions posed by members of other health professions in a manner that meets the needs of the requester.	☐SD	☐D	☐N	☐A	☐SA	☐N/O

Provide comments related to the behaviors associated with Communication, including those that are positive and those needing improvement.

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

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- **Tools**
- Assessment limitations

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Ann Allergy Asthma Immunol 128 (2022) 256–262

Contents lists available at ScienceDirect

ELSEVIER

Review

Assessment and feedback methods in competency-based medical education

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Resources

Lee GB & Chiu AM. Ann Allergy Asthma Immunol 2022;128:256–262

Table 3
Resources for Assessment Methods in Allergy/Immunology

Assessment method	Resource
Knowledge Assessments	A/I fellowship in-training examination ACAAI AIM self-assessment https://education.acaai.org/AIMselfassessment ACAAI board review corner https://education.acaai.org/content/board-review-corner ACAAI MOC self-assessment modules https://education.acaai.org/content/moc-part-ii-lifelong-learning-and-self-assessment Journal-based CME and MOC https://www.annallergy.org/ https://www.jacionline.org/ https://www.jaci-inpractice.org/ AAAAI A/I self-assessment https://education.aaaai.org/pipro/2021_selfassessment
Procedural Competency Assessments	ACAAI allergenic extract quiz https://education.acaai.org/content/allergen-extract-mixing AAAAI PDA Toolbox https://education.aaaai.org/tpdtoolbox
Individual learning plans	Resident self-assessment/reflection document, adapted from ACGME recommendations (Supplement) https://www.acgme.org/globalassets/pdfs/milestones/guidebooks/individual-learning-plans.pdf
OSCE	Smee, Sydney. Skill based assessment. BMJ 2003 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1125602/
Simulation	Mawhirt et al,[19] 2019 https://www.annallergy.org/article/S1081-1206(19)30126-7 Barmettler et al,[20] 2020 https://www.jaci-inpractice.org/article/S2213-2198(20)30721-2
Direct observation	Mini-CEX https://www.abim.org/program-directors-administrators/assessment-tools/mini-cex.aspx
Practice assessment tools	ABAI MOC part IV activities https://www.abai.org/qi_modules.asp ACGME case log system https://apps.acgme.org/ADS/CaseLogs/Default/Landing AAAAI quality clinical data registry https://www.aaaai.org/Practice-Management/Quality-Clinical-Data-Registry

Free Apps from ACGME

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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

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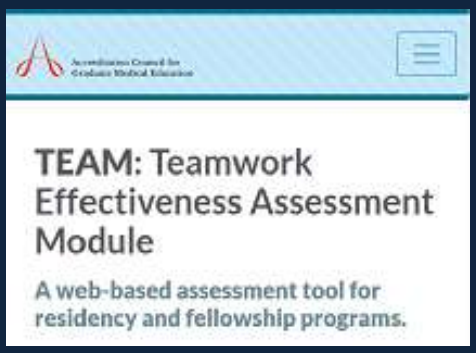
ACGME "TEAM"

- 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



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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

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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

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Entrustable Professional Activities

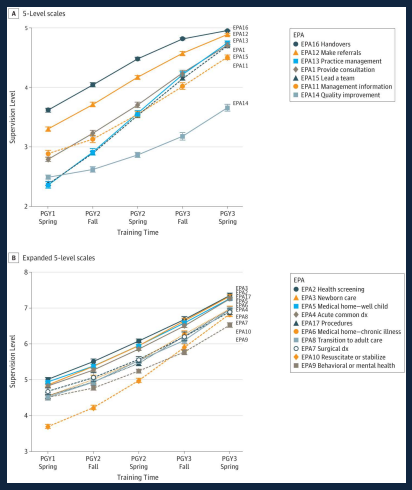

Table 2. Percentages of Graduating Residents Reaching Entrustment With Unsupervised Practice

EPA[a]	EPA Abbreviation	No. of Supervision Levels	Level Associated With Entrustment With Unsupervised Practice	Graduating Residents Reaching Entrustment With Unsupervised Practice, % (95% CI)
1	Provide consultation	5	5	69 (62-75)
2	Health screening	Expanded 5	7	93 (89-96)
3	Newborn care	Expanded 5	7	98 (95-99)
4	Acute common diagnosis	Expanded 5	7	93 (89-95)
5	Medical home—well child	Expanded 5	7	91 (89-92)
6	Medical home—chronic illness	Expanded 5	7	79 (74-83)
7	Surgical diagnosis	Expanded 5	7	83 (75-89)
8	Transition to adult care	Expanded 5	7	70 (64-75)
9	Behavioral and mental health	Expanded 5	7	53 (48-59)
10	Resuscitate and stabilize	Expanded 5	7	77 (71-83)
11	Manage information	5	4	92 (88-95)
12	Make referrals	5	5	82 (77-87)
13	Practice management	5	5	63 (55-70)
14	Quality improvement	5	3	90 (85-93)
15	Lead a team	5	4	94 (93-96)
16	Handovers	5	5	94 (90-96)
17	Procedures	Expanded 5	7	89 (84-93)

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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

Mawhirt SL, Fonacier L Auqino M. Ann Allergy Asthma Immunol 2019;122:248–255

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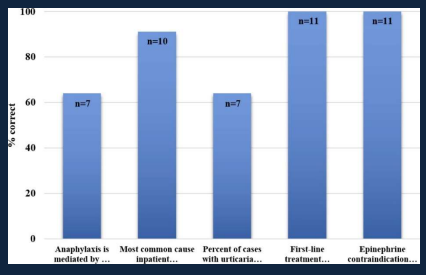
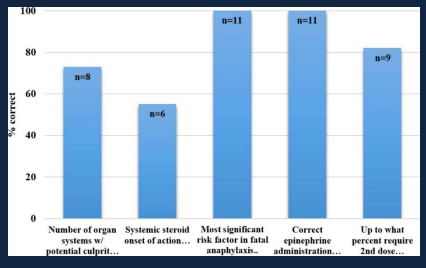
High-fidelity Simulation for Medical Student and Resident Education of Allergic-Immunologic Emergencies

Repeat questions (post)



New questions (post)



- 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

Mawhirt SL, Fonacier L Auqino M. Ann Allergy Asthma Immunol 2019;122:248–255

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Clinical Questioning Tools

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"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

Presentation of Patient by Trainee		*Think Aloud* by Supervisor
Robert—10-mo-old child. Referred because of bouts of abdominal pain, vomiting, and diarrhea.	PAUSE	*Presentation most commonly due to gastroenteritis.* *Other serious conditions, particularly surgical problems, present in a similar way.*
Robert—youngest of 3 children. Siblings (ages 3 y and 5 y) have been well recently. Attends day care, but none of the children there have been sick. Normal vaginal delivery without any complication or resuscitation needed. He is growing (weighs 20 lbs.) and developing normally. Fully immunized and has no known allergies.	PAUSE	*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.*
Vomiting in the last 12 hours. Vomit is now a green color, but there is not as much volume as initially and not projectile. Mother has noted 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. Some lightly blood-tinged diarrhea noted the last 3 h.	PAUSE	*Green vomitus is a significant sign because it is often a manifestation of intestinal obstruction.* *I am worried about a surgical condition—malrotation, intussusception (he is in the right age group for this because it peaks 6–18 mo). Appendicitis is a little less likely because he hasn't been febrile.* *Summary: Acute onset of bile-stained vomiting in a 10-mo-old infant with irritability and bloody diarrhea is very suggestive of intussusception.*
Any fluids taken this morning have been vomited. Not eaten for 8 h. Difficult to ascertain the number of wet diapers with the diarrhea. Robert's mother says he is now looking listless and tired.	PAUSE	*This information of very poor oral intake suggests he is at risk of becoming dehydrated and may need intravenous fluids.*

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One Minute Preceptor

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

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SNAPPS

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

S Summarize briefly the history and findings	• Obtains a history, performs a physical examination, and presents a summary of their findings to the preceptor. The summary should be brief and concise and should not utilize more than 50% of the learning encounter (~3 minutes maximum to present)	*"Eric is a 7-year-old male with a 3-month history of right knee pain and swelling that occurs daily. No other joints are affected. He reports difficulty playing soccer. He denies current or previous illnesses, recent travel, or injury. Daily ibuprofen provides little benefit."*
N Narrow the differential to two or three relevant possibilities	• Provides two to three possibilities of what the diagnosis could be • Presents their list prior to the preceptor revising the list	*"Given the length of the symptoms, my differential diagnosis includes: juvenile idiopathic arthritis, reactive arthritis, and injury."*
A Analyze the differential comparing and contrasting the possibilities	• Discusses the possibilities and analyzes why the patient presentation supports or refutes the differential diagnoses • Thinks out loud in front of the preceptor	*"I think juvenile idiopathic arthritis is highest on my differential diagnosis given the age of the patient and the length of the symptoms. Reactive arthritis is lower due to the length of symptoms and no history of previous illness. Injury is low on the differential due to no history of injury."*
P Probe the preceptor by asking questions about uncertainties, difficulties, or alternative approaches	• Discusses areas of confusion and asks questions of the preceptor • Allows the preceptor to learn about their thinking and knowledge base • Prompts discussion from the preceptor on clinical pearls or areas of importance	*"Is there anything else that you would include on your differential?"* *The preceptor may discuss the importance of considering septic arthritis in the differential diagnosis.*
P Plan management for the patient's medical issues	• Discusses a management plan for the patient or outlines next steps • Commits to their plan and utilizes the preceptor as a source of knowledge	*"I would begin a prescription-strength anti-inflammatory medication and order an ANA."*
S Select a case-related issue for self-directed learning	• Identifies a learning issue related to the patient encounter • Discusses the findings from the learning issue with the preceptor	*"I would like to understand the relationship of the ANA and the need for ophthalmology monitoring in juvenile idiopathic arthritis."*

Wolpaw TM et al. Acad Med. 2003;78(9):893-8
Wolpaw T et al. Acad Med. 2009; 84(4):517-24

Do They Work?

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

Instruments	Domains Measured	Definition of domain	Scale
Professionalism Mini-Evaluation Exercise	1) Doctor–Patient Relationship Skills 2) Reflective Skills 3) Time Management 4) Inter-professional Skills	1) 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 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 3) Time Management: the ability to use one's time effectively or productively, especially at work 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	1-4
EOS group questionnaire	1) Professionalism 2) Interpersonal and communication skills	1) Professionalism • Demonstrates respect for the patient's Cultu • Demonstrates respect for nurses • Demonstrates respect for support staff • Maintains confidentiality of patients and the • Shows compassion for patients and their fam • Seeks consultation/supervision when appro • Functions effectively as a member of the tea • Demonstrates responsibility • Completes assigned tasks • Manages personal stress responsibly • Answers pages in a timely fashion 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.

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Kwan YH et al. J Grad Med Educ 2018;10(6):629

Professionalism Mini-Evaluation Exercise (P-MEX)

Strengths

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

Weaknesses/limitations

a. Low reliability for peer to peer evaluations
b. Risk for phenomenon of "failure to fail"
c. Lacks evidence of educational effect
d. No studies examine whether the instrument improves learning, clinical skills, quality of patient care or whether assessed lapses correspond to unprofessional conduct in practice

Rating	Description of Behaviour
Unacceptable	Lapses of professional behaviour that are intentional, are likely to harm, and for which there are no mitigating circumstances.
BELow expectations	Lapses of professional behaviour that are unintentional, result in minimal to no harm, or for which there may be mitigating circumstances.
MET expectations	Demonstrated the performance expected for the level of the student/resident.
EXCeeded expectations	Exceptional performance, demonstrating the behaviours expected of an outstanding physician-to-be.
Critical Event	A clear breach of professional boundaries. Documentation of a critical event is sent directly to the appropriate authority for immediate action.

Evaluator:_____
Student/Resident:_____
Level: (please check) 3rd yr 4th yr res 1 res 2 res 3 res 4 res 5
Setting: Patient Related: Patient Present Patient Not Present
Ward Clinic OR ER
Non Patient Related: ie – general teaching, small group teaching, etc.

	NA	UN	BEL	MET	EXC
Listened actively to patient					
Showed interest in patient as a person					
Recognized and met patient needs					
Extended his/herself to meet patient needs					
Ensured continuity of patient care					
Advocated on behalf of a patient					
Demonstrated awareness of limitations					
Admitted errors/omissions					
Solicited feedback					
Accepted feedback					
Maintained appropriate boundaries					
Maintained composure in a difficult situation					
Maintained appropriate appearance					
Was on time					
Completed tasks in a reliable fashion					
Addressed own gaps in knowledge and skills					
Was available to colleagues					
Demonstrated respect for colleagues					
Avoided derogatory language					
Maintained patient confidentiality					
Used health resources appropriately					

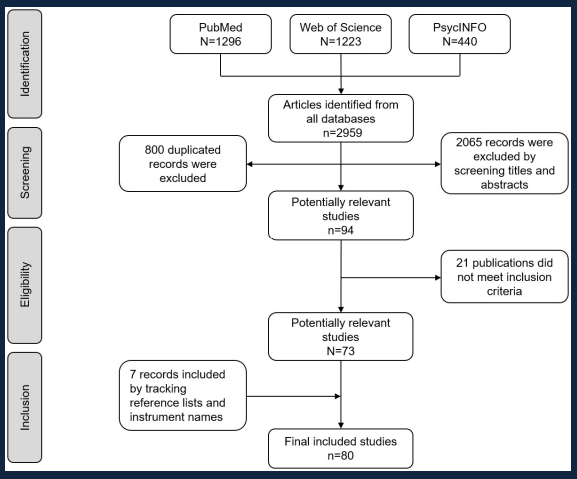
► Please rate this student's/resident's overall professional performance during THIS encounter:
UNacceptable MET expectations
BELow expectations EXCeeded expectations
► Did you observe a critical event? no yes (comment required)
Comments:_____

Evaluator's signature:_____
Student's/Resident's signature:_____
Date & Time:

Modified from: Gathright M. MedEdPORTAL (AAMC), Oct 14, 2014

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-administrated ratings
  - Multi-source Feedback (MSF)
  - Simulations
    - OSCEs and high-fidelity patient simulations
  - Patients' opinions
  - Direct observations
    - clinical enc., min-CEX and P-MEX, supervisor evals
  - Role model evaluation
  - Professionalism environment



Li H et al. PLOS One May 12, 2017

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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

Li H et al. PLOS One May 12, 2017

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Outline

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

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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

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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

Table 1. Demographic Characteristics of the Internal Medicine Residents

Characteristic	Finding[a] (N = 9026)
Sex	
Male	5032 (55.8)
Female	3994 (44.2)
Race and ethnicity[b]	
Asian	3258 (36.1)
Asian only	3129 (34.7)
Asian and White	129 (1.4)
URiM	1216 (13.5)
URiM only	998 (11.1)
URiM-multiracial	218 (2.4)
White	4552 (50.4)
USMLE Step 2 CK scores	
Mean (SD)	239.8 (17.2)
Median (range)	241.0 (163.0-285.0)

URiM
1) Hispanic only
2) Non-Hispanic American Indian, Alaska Native, or Native Hawaiian/Pacific Islander only
3) Non-Hispanic Black/African American

Boatright D et al. JAMA Netw Open. 2022;5(12):e2247649

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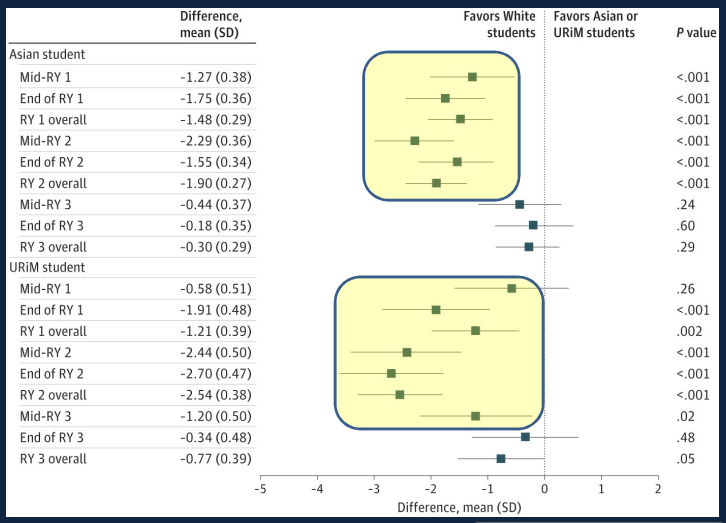
Racial and Ethnic Differences in Internal Medicine Residency Assessments

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



Boatright D et al. JAMA Netw Open. 2022;5(12):e2247649

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

Group	OR (95% CI) Overall	Patient care	Medical knowledge	Systems-based practice	Practice-based learning and improvement	Professionalism	Interpersonal and communications skills
Midyear							
Asian	0.78 (0.69-0.88)	0.76 (0.68-0.84)	0.75 (0.68-0.83)	0.76 (0.68-0.84)	0.79 (0.72-0.88)	0.77 (0.70-0.85)	0.79 (0.71-0.87)
URiM	0.92 (0.78-1.09)	0.86 (0.75-1.00)	0.79 (0.68-0.91)	0.89 (0.77-1.02)	0.83 (0.72-0.96)	0.85 (0.74-0.98)	0.83 (0.72-0.95)
White	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]
End of year							
Asian	0.95 (0.85-1.06)	0.92 (0.80-1.05)	0.91 (0.78-1.06)	0.88 (0.76-1.02)	0.93 (0.81-1.07)	0.92 (0.79-1.08)	0.83 (0.70-0.99)
URiM	1.05 (0.9-1.22)	1.02 (0.85-1.22)	0.85 (0.7-1.03)	0.90 (0.74-1.10)	0.89 (0.74-1.07)	1.01 (0.81-1.25)	0.89 (0.7-1.12)
White	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]

Abbreviations: OR, odd ratio; URiM, underrepresented in medicine.

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

Boatright D et al. JAMA Netw Open. 2022;5(12):e2247649

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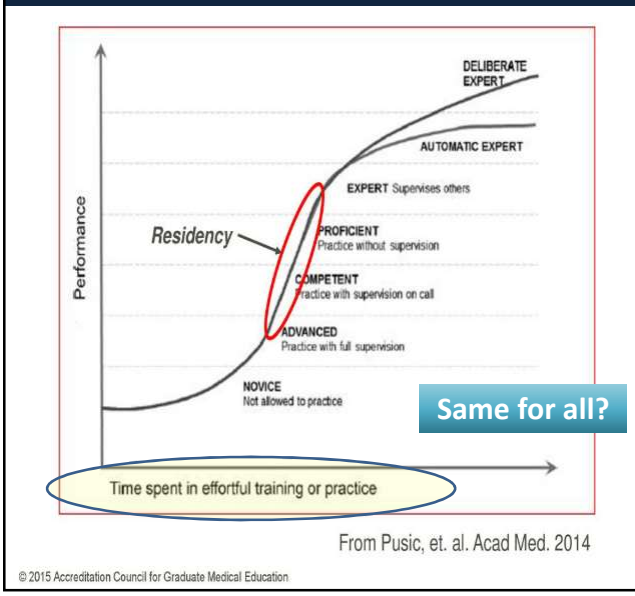
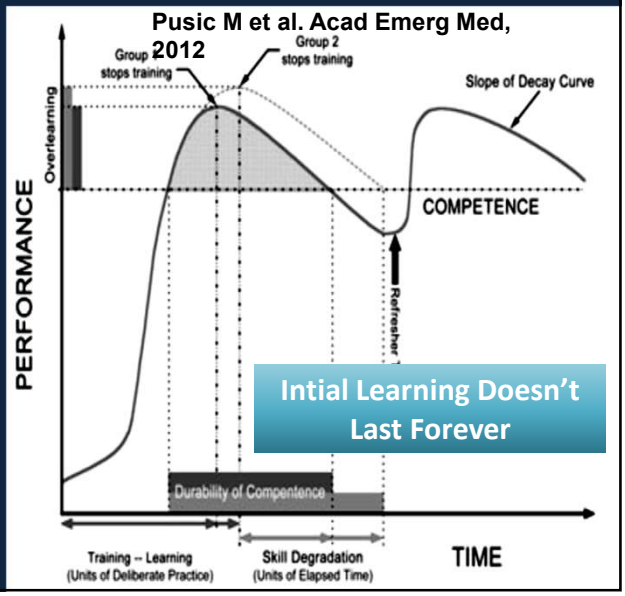
Learning Curves





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)

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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

Trust, verify & fortify

- 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

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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

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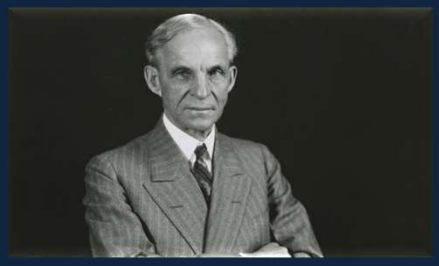

"Anyone who stops learning is old, whether at twenty or eighty. Anyone who keeps learning not only remains young but becomes constantly more valuable"

Henry Ford

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Questions

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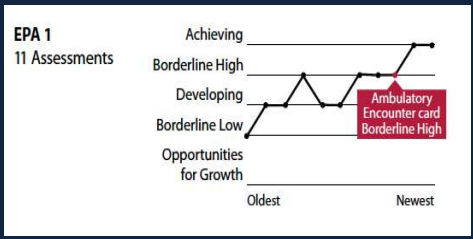
CBME Potential?

- 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/

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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

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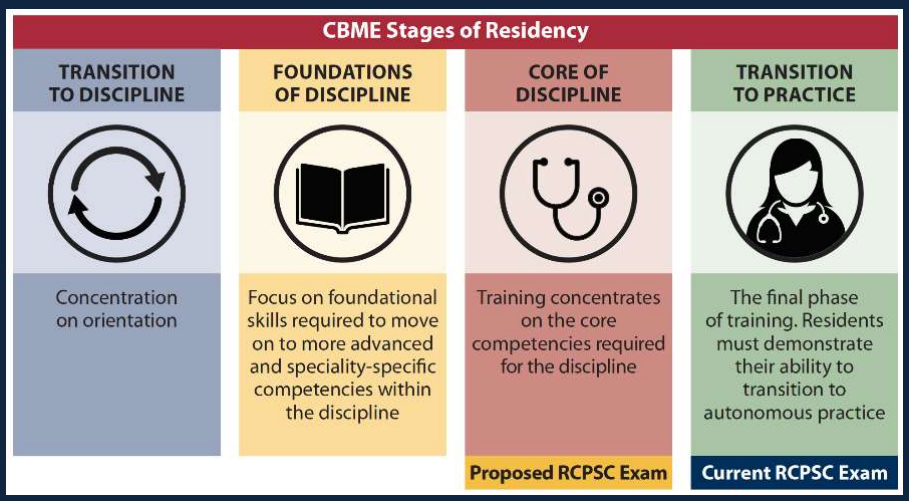
Queen's University School of Medicine



https://meds.queensu.ca/academics/cbme/how-cbme-works

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