International Journal of Educational Research and Technology
P-ISSN 0976-4089; E-ISSN 2277-1557
IJERT: Volume 8 [2] June 2017: 53-58

Website: www.soeagra.com/ijert.html
ICDS : 5.8 [University of Barcelona, Barcelona]
Global Impact Factor: 0.765 Scientific Journal Impact Factor: 3.72
Journal Impact Factor (JIF) : 1.54

ORIGINAL ARTICLE

OPEN ACCESS

Assessment of Emergency Medicine Faculty Milestone Competencies

Sneha Shah MD, Richard Church MD, Michael Butler MD, Steven B Bird MD
University of Massachusetts Medical School, 55 Lake Avenue North
Worcester, MA 01655
Email: Steven.bird@umassmemorial.org

ARTICLE HISTORY
Received:
10.02.2017
Revised
17.03.2017
Accepted
02.06.2017

ABSTRACT

The new Accreditation Council on Graduate Medical Education (ACGME)Milestones provide a spectra of competencies on which to evaluate resident physicians. Little is known about the application of these Milestones to practicing EM faculty. To determine faculty self-assessment (SA) of their competency on all Milestones and to compare these SAs to just-graduated resident assessments (RA).Six faculty of the University of Massachusetts Medical School emergency medicine residency (3 women, 3 men) performed SA on all 23 Milestones using published Milestone forms (rating from 1 to 5 in 0.5 increments). Eight just-graduated residents performed anonymous assessments of the six faculty and were blinded to the SAs. Mean values for faculty SAs of all Milestones were calculated. The mean values for each individual faculty were calculated from all of the RAs. Correlation of faculty SA and RA were determined using Goodness of Fit. The sum of an individual faculty SA minus the mean RA for all Milestones was then calculated to determine if faculty either under- or over-assessed their competency compared to RA. Mean years since residency graduation for faculty was 7 (range: 2-13). Mean faculty SA of all 23 Milestones was 4.44 (range 4.26 to 4.78). The lowest mean SA was 4.0 on Milestone #12 (goal-directed ultrasound) and #22 (system based practice). The highest mean SA was 5.0 on Milestone #14 (vascular access) and #15 (medical knowledge). The mean of all RAwas 4.50 (range 4.16 to 4.69) with highest and lowest assessment on Milestone #15 (medical knowledge; mean 4.97) and #12 (goal-directed ultrasound; mean 4.15), respectively. There was no statistically significant correlation between faculty SA and RA (slope = -0.248, p=NS). The mean sum of all faculty SA minus the mean of RA was -1.89, with individual range of -8.68 to 6.76.As a whole, faculty SA and RA of faculty competencies are similar and congruent. However, there is considerable individual variation in SAS compared to RAs. The marked range of difference between faculty SA and RA of competencies should be explored as a method to assist in faculty development.

Keywords: *education; competency; milestones; faculty; development*

CITATION OF THIS ARTICLE
Sneha Shah, Richard Church, Michael Butler, Steven B Bird. Assessment of Emergency Medicine Faculty Milestone Competencies**.** Inter. J. Edu. Res. Technol. 8[2] 2017; 53-58.
DOI: 10.15515/ijert.0976 4089.8.2.5358

INTRODUCTİON

In July 2013, as part of the Next Accreditation System,the Accreditation Council for Graduate Medical Education (ACGME) introduced Milestone competency assessments for the seven early adopter specialties of emergency medicine, diagnostic radiology, internal medicine, pediatrics, neurologic surgery, orthopedics, and urology. Some confusion exists around nomenclature of the Milestone project. The five core competencies are patient care; medical knowledge; systems based practice; interpersonal and communication skills; professionalism; and practice-based performance improvement. For emergency medicine, these core competencies are further divided into 23 sub-competencies: patient care has 14

subcompetencies; medical knowledge has one; systems based practice has 3; practice-based performance improvement has one; professionalism has 2; and interpersonal and communication skills has 2 (Table 1). Within these 23 subcompetencies there are 255 individual Milestones.

The focus when creating these subcompetencies and Milestones was,by necessity, the learner. However, littleresearch has been performed to evaluate the competency of emergency medicine faculty on the subcompetencies or Milestones. The goal of this investigation was to determine the self-assessed Milestone subcompetencies of a diverse group of faculty members and to compare these self-assessments to senior resident assessments of the same faculty.

METHODS

We performed a prospective evaluation of practicing EMphysicians in our academic medical center and 8 just-graduated residents from July 1, 2013 through August 31, 2013. After a 4-hour introduction to the Milestones and Next Accreditation system to the faculty, a paper copy of the published Milestones were given to 6 core faculty members (3 male and 3 female) of the emergency medicine residency to perform self-assessments (SA) on the 23 emergency medicine subcompetencies (here referred to as Milestones). The 6 core faculty were chosen to provide a range of clinical experience, subspecialty training, and years of clinical practice. Our academic institution is a Level I trauma center with a 3-year ACGME-accredited EMresidency and an annual volume of 96,000 emergency department visits.

Participating faculty were asked to rate themselves on each ofthe 23 Milestones using the 1-5 scale (with 0.5 increments) outlined by theEM Milestone Task Force (Figure 1shows a representative Milestone assessment form for the ACGME Patient Care 1 subcompetency for emergency stabilization – PC1). These self-assessment (SA) data were analyzed using GraphPad Prism(GraphPad Software, San Diego, CA).The project was deemed exempt from consent by the local Institutional Review Board.

For resident assessments of the faculty, 8 just-graduated residents from our emergency medicine residency were asked to anonymously evaluate the same 6core faculty on identicalpaper Milestone forms. These represent the resident assessments (RA).

Mean values and ranges of all faculty SA and RA were calculated. In order to determine if a faculty member over- or under-assessed their competency relative to the residents, the difference of SA and mean RA for each Milestone was calculated. Lastly, we used data from anonymous yearly evaluation of all faculty that residents perform each Spring to compare the overall faculty rank of each of the six faculty with their own SA and the RA. The faculty ranking is performed each Spring using the residency management program E-Value (Minneapolis, MN, USA). For this evaluation, each resident evaluates all faculty on a 5-point Likert scale on 12 questions (Table 2). E-Value then calculates means and standard deviations for these 12 questions and provides a ranking of all faculty from highest to lowest.

RESULTS

The mean number of years since residency graduation for the 6 faculty was 7.0 (range: 2-13). Overall, the mean faculty SA of all 23 Milestones was 4.44 (range 4.26 to 4.78). The lowest mean SA was 4.0 on Milestone #12 (goal-directed ultrasound) and #22 (system based practice). The highest mean SA was 5.0 on Milestone #14 (vascular access) and #15 (medical knowledge). All of the faculty self-assessments are presented in Table3.

Overall, 94.2% of all SAs were at competency levels of 4 to 5. Just 5.8% of all SA responses were at competency levels of 3.5 or less.36.2% were level 4; 19.6% were level 4.5, and 44.2% were level 5.

The mean valueof all resident assessments of faculty (RA) was 4.50 (range 4.16 to 4.69) with highest and lowest assessment on Milestone #15 (medical knowledge; mean 4.97) and #12 (goal-directed ultrasound; mean 4.15), respectively (Figure 2). Of the potential 1,104 resident assessments (8 residents assessing 6 faculty on all 23 Milestones), 1052 were completed (95.3%). Most commonly residents did not feel that they could adequately assess faculty on Milestone 14 (vascular access – 8 omissions) and Milestone 17 (practice-based performance – 6 omissions). One resident did not evaluate one faculty member on any Milestone. Overall, 93.7% of all RAs were at competency levels of 4 to 5 and 6.3% of all RA responses at competency levels of 3.5 or less: 0.2% were at level 2; 0.7% were level 2.5; 2.6% were level 3.0; 2.9% were level 3.5; 23.0% were level 4; 31.2% were level 4.5, and 39.4% were level 5.

There was no statistically significant correlation between faculty SA and RA (slope = -0.248, p=NS, Figure3). The mean sum of all faculty SA minus the mean of RA was -1.89, with individual range of -8.68 to 6.76 (a more negative number indicating that residents assessed the faculty member higher than the faculty member assessed himself or herself).When the faculty SA minus the RA were plotted against the faculty's ordinal ranking amongst all faculty (which is done anonymously every year by the residents), there was a significant correlation (p=0.04) (Figure4).

Table 1. The 23 Emergency Medicine ACGME Milestones	
ACGME Core Competency	Domain NAS Milestones for EM
Patient care	PC-1 Emergency stabilization
	PC-2 Performance of focused history and physical exam
	PC-3 Diagnostic studies
	PC-4 Diagnosis
	PC-5 Pharmacotherapy
	PC-6 Observation and reassessment
	PC-7 Disposition
	PC-8 Multitasking (task-switching)
	PC-9 General approach to procedures
	PC-10 Airway management
	PC-11 Anesthesia and acute pain management
	PC-12 Other diagnostic and therapeutic procedures: ultrasound
	PC-13 Other diagnostic and therapeutic procedures: wound management
	PC-14 Other diagnostic and therapeutic procedures: vascular access
Medical knowledge	MK Medical knowledge
Practice-based Learning & Improvement	PBLI-1 Teaching
	PBLI-2 Practice-based performance
Interpersonal and Communication Skills	ICS-1 Patient-centered communication
	ICS-2 Team management
Professionalism	P-1 Professional values
	P-2 Accountability
Systems-Based Practice	SBP-1 Patient safety
	SBP-2 Systems-based management

Table 2	Domains of evaluation of faculty by residents.
1	Was available for help and supervision.
2	Effectively communicated medical knowledge (i.e. in presentations and in articulation of clinical reasoning process).
3	Stimulated problem solving (asked effective questions).
4	Served as a role model for relationships with other physicians/staff.
5	Demonstrated a caring attitude towards patients and families.
6	Served as a role model for use of medical evidence (i.e. from the medical literature).
7	Demonstrated a commitment to teaching.
8	Provided an appropriate balance between independence and supervision.
9	Was supportive (i.e approachable, patient, empathetic, available).
10	Provided effective feedback regarding my diagnostic and management decisions.
11	The attending physician is a good role model.
12	Overall teaching effectiveness.

Table 3. Scores of 6 faculty on the 23 ACGME milestones						
Milestone #	Faculty 1	Faculty 2	Faculty 3	Facutly 4	Faculty 5	Faculty 6
1	4	4.5	4.5	4	5	5
2	4.5	5	4.5	4	5	4.5
3	4.5	4.5	5	3	5	4.5
4	4.5	5	5	4.5	5	4.5
5	3.5	4	4	4	5	4
6	4	4	4	4	5	4.5
7	4	4	4.5	4	5	5
8	4	5	4.5	3.5	4	5
9	5	5	5	5	5	5
10	4	5	4.5	4	5	5
11	5	4	4.5	4.5	5	4.5
12	3.5	4	4	5	4	3.5
13	4.5	4	4	3.5	5	5
14	5	5	5	5	5	5

15	5	5	5	5	5	5
16	4	4	4.5	4.5	5	4
17	3.5	4	4	4	5	4.5
18	4	4	4.5	4.5	5	4.5
19	4	4	4.5	5	5	5
20	5	4	5	4	4	4.5
21	4.5	4	4	4	4	4
22	4	4	4	4	4	4
23	4	3.5	4	5	5	4

1. Emergency Stabilization (PC1) Prioritizes critical initial stabilization action and mobilizes hospital support services in the resuscitation of a critically ill or injured patient and reassesses after stabilizing intervention.					
Has not Achieved Level 1	Level 1	Level 2	Level 3	Level 4	Level 5
	Recognizes abnormal vital signs	Recognizes when a patient is unstable requiring immediate intervention Performs a primary assessment on a critically ill or injured patient Discerns relevant data to formulate a diagnostic impression and plan	Manages and prioritizes critically ill or injured patients Prioritizes critical initial stabilization actions in the resuscitation of a critically ill or injured patient Reassesses after implementing a stabilizing intervention Evaluates the validity of a DNR order	Recognizes in a timely fashion when further clinical intervention is futile Integrates hospital support services into a management strategy for a problematic stabilization situation	Develops policies and protocols for the management and/or transfer of critically ill or injured patients
☐	☐	☐	☐	☐	☐
Comments:					

Figure 1. Example of an ACGME Milestone (PC1) demonstrating subcompetency levels and scoring mechanism.

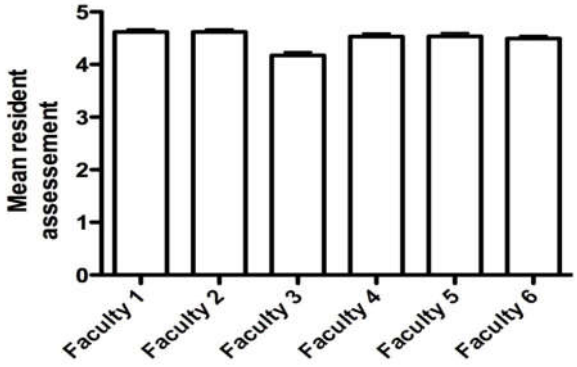

Figure 2. Mean of resident assessment of 6 faculty on all Milestones (error bars represent standard error of the mean (SEM))

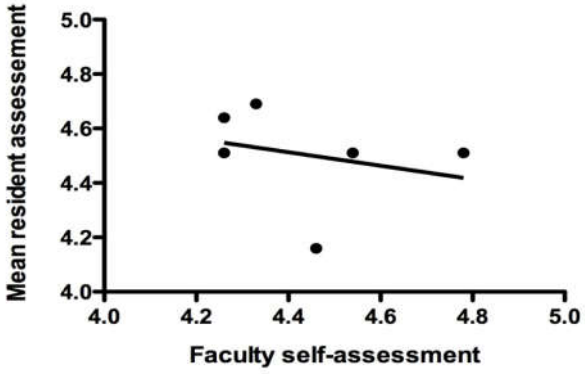

Figure 3. Graph of faculty self-assessment on all 23 Milestones and the resident mean assessment of the faculty's competency. The slope of the line is non-significant.

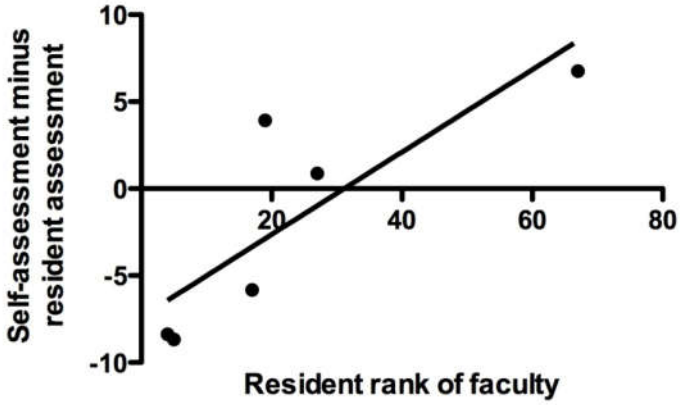

Figure 4. Graphic of the faculty's self-assessment of their own competency minus the mean resident assessment of their competency plotted against the overall rank of the faculty as determined by all residents.

DİSCUSSİON

In 1999 the ACGME introduced the Outcomes Project, a multiyear effort to accredit all U.S. residency programs based on the assessment of individual resident performance within six domains of competency: 1) patient care, 2) medical knowledge, 3) practice-based learning and improvement, 4) interpersonal and communication skills, 5) professionalism, and 6) systems-based practice.In 2012 the ACGME introduced the Next AccreditationSystem[1] (NAS), which builds upon the principles ofthe Outcomes Project by defining competency performancemilestones within each of the core competencies. Emergencymedicine was an early adopter of the NAS in July 2013.

An important change introduced by the NAS was the requirement to submit resident competency data biannual to the ACGME.However, as the milestones have been rolled out, no validated assessment tools were provided to help programs reliably assess competency. Furthermore, the degree to which faculty possess competency in each milestone is unknown.

A study by Peck et al[2] examined faculty self-reported competency on 9 of the 23 EM Milestones. And while Milestone Level 4 is intended to reflect the competency of graduating residents (and theoretically, therefore, American Board of Emergency Medicineboard certification standards),Peck et al found that 23% of attending self-responses did not meet the ABEMLevel 4 competency. Peck et al astutely questioned whether their findings demonstrate that the Milestones are not valid. Williams et al have emphasized the critical role that direct observation plays in accurately determine clinical competency[3] and how many educational models of soliciting resident performance feedback generally utilize a subjective global assessment.

Because the Milestones are still novel in academic medicine, few studies have sought to determine the validity of methods to evaluate performance. Such education research is critical if we are to fully realize the potential of Milestones assessments. Tomisato et al have taken that first step in psychiatry training.[4] However, as demonstrated by these investigators, faculty education is critically required in order to standardize evaluations. And even though their evaluation instrument itself was found to be reliable, faculty demonstrated continued variability in their style of competency rating.

Our results demonstrate that a smallminority of surveyed facultydid not self-identify as meeting ABEM certification competency level of 4 (just 5.8% of self-assessments) and 44.2% were self-identified as having met Level 5 milestone competency, which ismeant to represent an expert clinician. Interesting, as Peck et al point out, the fact that Level 5 competency exists at all in the ACGME resident competency paradigm (despite no explicit requirement from the ACGME to train residents up to that competency), may create not only confusion amongst educators, faculty, and residents, but has the potential to influence public reporting and potential reimbursement. As they astutely pointed out, "If the rates of milestoneachievements are reported to the public, residencieswill surely be pressured to attempt to train their residentsto Level 5."

LİMİTATİONS

Several limitations exist in the study. First, we used a convenience sample of EM faculty. This was largely done for convenience of the residents who performed assessments of the faculty. As each resident was required to rate competency on all 23 milestones, to require the residents to perform assessments on more than 6 faculty members would have severely decreased compliance and the validity of the data. While it is true that increased numbers of assessments lead to improved reliability and validity (up to a

point),[5] after three years of resident training, each of the residents certainly had many opportunities to interact with, observe, and assess each faculty member.

It is also decidedly unclear if self-assessments of competency are accurate reflections of an individual's true competency. However, this method of milestone self-assessment has been done previously,[2] and there is no single or best way to assessment one's competency short of frequent and extensive validated external assessments. Such self-assessments are an understudied aspect of medical education, and the limitaions were poignantly described by Davis et al[6] who stated, ''while suboptimal in quality, the preponderanceof evidence suggests that physicians have alimited ability to accurately self-assess. The processescurrently used to undertake professional developmentand evaluate competence may need to focus more on external assessment."

CONCLUSİONS

As a whole, faculty self-assessments and resident assessments of faculty competencies on all 23 EM milestones are similar and congruent. However, there is considerable individual variation in self-assessments compared to resident assessments. Faculty self-assessed their own competence least on goal-directed ultrasound and systems-based practice, while residents assessed faculty competency lowest on goal-directed ultrasound. The marked range of difference between faculty self-assessments and resident assessment of competencies should be explored as a method to assist in faculty development.

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