

Using Milestones as Evaluation Metrics During an Emergency Medicine Clerkship.

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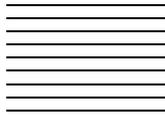
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Education



USING MILESTONES AS EVALUATION METRICS DURING AN EMERGENCY MEDICINE CLERKSHIP

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Abstract—Background: The Accreditation Council for Graduate Medical Education’s (ACGME) Milestones presumes graduating medical students will enter residency proficient at Milestone level 1 for 23 skills. The Next Accreditation System now includes Milestones for each postgraduate specialty, and it is unlikely that schools will document every emergency medicine (EM) applicant’s EM-specific skills in their performance evaluation. **Objectives:** The goals of this research were to determine if assessment of the Milestones was feasible during a medical student clerkship and examine the proportion of medical students performing at Milestone level 1. **Methods:** This study was conducted at a center with Liaison Committee on Medical Education–approved medical training and a 4-year EM residency. Using traditional clerkship, we studied the feasibility of an ACGME EM Milestones–based clerkship assessment. Data led to redesign of the clerkship and its evaluation process, including all level 1 anchor(s) to add “occasionally” (>60%), “usually” (>80%), and “always” (100%) on a Likert scale to on-shift assessment forms. **Results:** During the feasibility phase (2013–14), 75 students rotated through the clerkship; 55 evaluations were issued and 50 contained the Milestone summary. Eight deficiencies were noted in Milestone 12 and three in Milestone 14. After changes, 49 students rotated under the new evaluation

rubric. Of 575 completed on-shift evaluations, 16 Milestone deficiencies were noted. Of 41 institutional evaluations issued, only one student had deficiencies noted, all of which pertained to patient care. All evaluations in this second cohort contained each student’s Milestone proficiency. **Conclusions:** Assessment of the Milestones is feasible. Communication of ACGME EM Milestone proficiency may identify students who require early observation or remediation. The majority of students meet the anchors for the Milestones, suggesting that clerkship assessment with the ACGME EM Milestones does not adequately differentiate students. © 2016 Elsevier Inc. All rights reserved.

Keywords—clerkship evaluation; curricular innovations; milestones

INTRODUCTION

The Accreditation Council for Graduate Medical Education (ACGME) oversees the administration of emergency medicine (EM) residency programs and has recently moved to the Next Accreditation System (NAS). Working together with the American Board of Emergency Medicine (ABEM), a group of 23 Milestones are now central to the evaluation, promotion, and eventual graduation of EM residents (1). The milestones, shown in Table 1, are based on six ACGME competencies that are distributed

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Table 1. Milestones Iterative Changes and Means of Assessment

Milestone	Primary Means of Assessment	Year Two Revisions
1. Emergency Stabilization (PC1)	On shift evaluation	Students required to overtly report abnormal vital signs to faculty
2. History and Physical (PC2)	On shift evaluation	
3. Diagnostic Studies (PC3)	On shift evaluation	
4. Differential Diagnosis (PC4)	On shift evaluation	Students required to present minimum 5-part differential to faculty
5. Pharmacology (PC5)	On shift evaluation	Students required to present drug allergies before suggested therapy
6. Observation/Reassessment (PC 6)	On shift evaluation	Students required to reevaluate their patients hourly and provide an update to the faculty
7. Disposition (PC 7)	Nursing shift	Students locate critical equipment on nursing shift
8. Task-switching (PC 8)	On shift evaluation	
9. General Approach to Procedures (PC9)	Procedure Consult™ quizzes, Student's Procedure Recorder	Faculty attest to use of universal precautions in procedure recorder
10. Airway Management (PC10)	Simulation Lab, Procedure Consult™ quizzes	Cases changes to emphasize bag/valve/mask
11. Anesthesia, Pain Management (PC 11)	Procedure Lab, Procedure Consult™ quizzes, in-house quiz, and Procedure Recorder	Addition to in-house quiz; faculty attest to use of local anesthesia in Procedure Recorder
12. Ultrasound (PC 12)	Ultrasound lecture, Procedure Recorder	Faculty attest to use of ultrasound on shift in Procedure Recorder
13. Wound Management (PC 13)	Procedure Lab, Procedure Consult™ quizzes, and Procedure Recorder	Students required to repair 1 laceration on shift; additional repairs considered for improved grade
14. Vascular Access (PC 14)	Simulation Lab, Procedure Consult™ quizzes, Procedure Recorder, and nursing shift	Addition of femoral stick to simulation laboratory case
15. Medical Knowledge (MK)	Not assessed for SLOE	SAEM test score included, but level 1 status not indicated with this instrument
16. Patient Safety (SBP 1)	IHI Open School	IHI module requirement added
17. Process Improvement (SBP 2)	Automatically passed	As written, we presume students can identify members of a health care team
18. Technology (SBP 3)	Partially assessed; students cannot participate in our EMR	Medicine reconciliation added to nursing shift
19. Practice Based Improvement (PBLI)	Participation in Fresno Test of EBM based 2-hour workshop	
20. Professionalism (PR 1)	On shift evaluation	
21. Accountability (PR 2)	Completion of assignments; social media anchor not assessed	A revised checklist records asynchronous assignment completion
22. Patient Centered Communication (ICS 1)	On shift evaluation	
23. Team Management (ICS 2)	On shift evaluation	

EBM = evidence-based medicine; EMR = electronic medical record; IHI = Institute for Healthcare Improvement; SAEM = Society for Academic Emergency Medicine; SLOE = standard letter of evaluation; PC = patient care; MK = medical knowledge; SBP = system-based practice; PBLI = practice-based learning and improvement; PR = professionalism; ICS = interpersonal and communication skills.

and abbreviated as follows: 14 Milestones are patient care (PC1–PC14), one milestone is medical knowledge (MK), three are system-based practice (SBP1–SBP3), one is practice-based learning and improvement (PBLI), two are professionalism (Prof 1–Prof 2), and two are interpersonal and communication skills (ICS1–ICS2). The work-group that developed the Milestones has previously described the development process and subsequent validation (2,3). The EM Milestones were developed and validated by educators in the field.

Fundamental to the assumptions built into the NAS are that all medical students will graduate from all medical schools at Milestone level 1. This led to an initial report-

ing method that did not allow programs to report performance lower than Milestone level 1 in the electronic accreditation data system (WebADS).

The Council of Residency Directors (CORD) in EM developed the standard letter of recommendation (SLOR) in 1997, and that group's task force recently took a critical look at their instrument (4). Of note, the name of the SLOR has recently evolved into the standard letter of evaluation (SLOE), but has not been updated to communicate performance on the ACGME EM Milestones, which will serve as the evaluation rubric once students transition to residency. The task force report noted that the included comments often exceed the

recommended limit, and other studies have noted that the communication of student capabilities may be overstated in the SLOR (5).

The information contained in the electronic resident application system (ERAS) for EM programmatic review includes the medical student performance evaluation (MSPE), also named the “dean’s letter.” With the expansion of the NAS to include all postgraduate training, it is unlikely that the MSPE will evolve to communicate specialty-specific Milestone information. This leaves the SLOE as the best vehicle to communicate a student’s abilities from one EM educator to another.

The SLOE can only communicate Milestone information if it has been overtly evaluated. Our investigation sought to determine if, in a 4-week, fourth-year medical student clerkship, assessment of the Milestones was feasible and to examine the proportion of medical students performing at Milestone level 1.

METHODS

The study was conducted at an independent academic center with a 4-year dually-approved EM residency training 13 residents per year. The center is an American Osteopathic Association (AOA) and Liaison Committee on Medical Education (LCME)–approved site for dedicated third- and fourth-year rotations for an out of state medical school. The medical school does not require an EM rotation of students in either clinical year. As such, our clerkship continues to host students predominantly from outside medical schools.

After receiving institutional review board approval, we prospectively analyzed the institutional SLOEs for 2013 and 2014 after the creation of an evaluation rubric consisting of our traditional clerkship activities using the NAS Milestone rubric. The didactics, educational experiences, and requirements of the clerkship were not changed. This first phase was intended to determine the feasibility of creating an ACGME EM Milestone evaluation and reporting process. We determined that the reporting process would be the creation of standardized language placed into the narrative section of the institutional SLOE. The students’ individual performance on the Milestones also was personalized for each SLOE.

After a planned analysis of these SLOEs, the clerkship structure and evaluation process was iteratively changed in order to increase the rigor of the clerkship’s educational delivery and assessment. Statistical analysis of the SLOEs and iterative changes were descriptive. All on-shift information was recorded in New Innovations medical education software (New Innovations, Uniontown, OH).

RESULTS

During the 2013 to 2014 phase, 55 institutional SLOEs were issued for 75 medical students, of which 50 contained our standard Milestone summary and personal performance indicators. No students were from our LCME-approved host site, because the program had matured to the third year only. Eight deficiencies were noted in Milestone 12 (PC 12) and three in Milestone 14 (PC 14). The remaining ACGME EM level 1 Milestones were determined by the prospectively established criteria to have been met by students. The overall institutional SLOE reported an ACGME EM Milestone proficiency rate of 99% for this cohort [(50*23)–11/(50*23)]. During this phase, students’ performance for anchors above level 1 was also recorded.

The iterative changes in the curricular design and evaluation are described in Table 1. This table notes the movement from the traditional teaching and measurement to one focused on the Milestones. Evaluation of 16 of the 23 ACGME EM Milestones resulted in changes, the vast majority with additions to our traditional clerkship. Three anchors were dropped from the evaluation process, including technology (#18 or SBP3), anchor A (use of the electronic medical record) and accountability (#21 or Prof 2), anchor C (use of social media). The third, medical knowledge (#15 or MK), was assessed and communicated in the SLOE with Society for Academic Emergency Medicine test scores, but we did not interpret the scores as meeting the level 1 anchor, instead leaving that to the SLOE reader. We were not able to determine a way to measure process improvement (#17 or SBP2) as the anchor was written. Our rubric gave every student credit for the ability to “identify members of a health care team” (1).

Notable patient care changes included more explicit discussion during presentations. Reminders for the faculty to ensure this discussion took place occurred in the form of institutional review board–approved fliers that were placed in the emergency department. The on-shift evaluation was changed to include the addition of positive anchors in an attempt to solicit discriminative feedback (6). Percentages were listed over the anchors in both phases, and 80% observed behavior was prospectively deemed to meet competency with that anchor. The nursing shift was changed to ensure compliance with several anchors. Additions to our simulation cases were made to meet procedural anchors. Multiple additional tracking forms were added to the New Innovations software to capture other procedural data.

Attempts during the feasibility phase to measure and report anchors other than level 1 were abandoned for the second cohort in order to focus on the observation

and evaluation of the students. The initial, traditional single-page student clerkship tracking sheet evolved in this phase into a white coat pocket-sized booklet explicitly denoting the anchors being signed off on by faculty. The evaluation of activities contained on the daily shift evaluation was pass/fail in both cohorts. The criteria for clerkship grading were not changed during this process; neither was the manner by which the standard elements of the SLOE were determined.

For the 2014 to 2015 academic year, 49 students rotated under the new rubric from July through November. Three were from the host LCME institution. Data generated in this new rubric included 575 on-shift evaluations. Despite the overtly selected positive anchors, from the 575 evaluations, only 16 Milestone deficiencies were noted with an overall on-shift proficiency rate of 99.8% [(575*20)-16/(575*20)]. Of 41 institutional SLOEs issued, only one noted deficiencies in Milestones 2 (PC 2), 3 (PC 3), 4 (PC 4), 5 (PC 5), and 8 (PC 8), for an overall SLOE proficiency rate of 99.4% [(41*20)-5/(41*20)].

DISCUSSION

In our cohorts, both a traditional approach and an attempt at more precise measurement led to a similar state; 99% of Milestone level 1-anchored skills appear to be observable and were met in a cross-sectional group of medical students. This happened despite our hypothesis that the iterative changes would result in a greater ability to discriminate among student performance as is currently reported by our institutional SLOE. For example, we overtly selected positive anchors for our Likert scale in an attempt to solicit both positive and negative (or in this case, “less positive”) feedback. This success rate may show that the EM milestones may be too easy to accomplish and they are “setting the bar too low.”

Alternatively, it may be related to faculty being resistant to providing negative feedback. Previous reports in the literature seem to indicate that this problem is not unique to EM (7,8).

Published survey work by Santen and Rademacher et al. noted a concerning low rate of Milestones knowledge and their measurement for EM medical students and interns (9). A possible benefit of our work may be addressing these deficiencies. The rotating students' knowledge of the Milestones was not measured here, but including them in the evaluation could be assumed to increase their knowledge. It may be further speculated that other local attempts at measuring the NAS Milestones may improve the local measurement of the same behaviors for postgraduate year 1 physicians and may create a more streamlined evaluation system than the creation of a separate group of medical student milestones, as has been previously suggested (10).

The issue of assessing Milestone level 1 anchors ultimately needs to be addressed at the undergraduate or graduate level. Hauff et al. describe a system for each program to perform intake assessment (11). Knowing that time during orientation is often scarce, the assessment might be possible at a Clerkship Directors in Emergency Medicine (CDEM) participating site after the match but before the new interns' arrival. Alternatively, ACGME Milestone assessment could be conducted as “standard” during all CDEM participating fourth-year clerkships. If this approach is viewed favorably by the EM education community, the question remains whether Milestone assessment or attestation becomes part of or an amendment to the SLOE. Finding that 17% to 27% of our rotating students did not receive institutional SLOEs raises the following issues: 1) applying the resources to conduct ACGME EM Milestone assessment of medical students not entering EM, and 2) the limitation that students who rotate on our clerkship—hailing from other medical schools—do not always request an institutional SLOE for ERAS. The latter issue is one that has been discussed on the CORD listserv at length.

Throughout this manuscript, we have used the phrase, “ACGME EM Milestones.” With the publication by Santen et al., a vernacular means to differentiate the graduate from the undergraduate Milestones may be helpful (10). Unfortunately, our work showing 99% ACGME EM Milestone proficiency may be interpreted to raise concerns that, despite the rigor used to develop the Milestones, the level of expectation might have been set too low for graduates of medical school/incoming interns. The development of a joint CDEM/CORD working group to address these issues may be of benefit.

Limitations

The most significant limitation of this work is its single-site nature. While our students have a cross sectional component, our assessing faculty do not. In addition, our students may not be representative of all those applying to EM programs. Our traditional and now iteratively changed curriculum and assessment may not represent clerkship teaching and grading trends nationally. We also acknowledge that in order to communicate our ACGME EM Milestone assessment, we exceeded the recommended character limit on the SLOE, an issue previously reported (5).

CONCLUSION

Based on our experience, assessment of the Milestones is feasible. The majority of fourth-year medical students meet the ACGME Milestone level 1 anchors. While Milestone proficiency may identify students who require early

observation or remediation, our findings suggest that the anchors cannot be used to discriminate medical student performance. The institutional SLOE may be a vehicle to report ACGME EM Milestone performance from the undergraduate to the graduate training institution.

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ARTICLE SUMMARY

1. Why is this topic important?

The Accreditation Council for Graduate Medical Education's (ACGME) Milestones presumes that graduating medical students will enter residency proficient at Milestone level 1 for 23 skills. The Next Accreditation System now includes Milestones for each postgraduate specialty, and medical schools may not document every emergency medicine (EM) applicant's EM-specific skills in their performance evaluation.

2. What does this study attempt to show?

We sought to determine whether assessment of the Milestones was possible during a medical student clerkship and to determine the proportion of medical students performing at Milestone level 1.

3. What are the key findings?

Seventy-five students did clerkship rotations; 55 evaluations were issued, of which 50 contained the Milestone summary. Eight deficiencies were noted in Milestone 12 (PC 12) and three in Milestone 14 (PC 14). After changes resulting from a redesign of the clerkship, 49 students rotated under the new evaluation rubric. Of 575 completed on-shift evaluations, 16 Milestone deficiencies were noted.

4. How is patient care impacted?

Communication of ACGME EM Milestone proficiency may identify students who require early observation or remediation. EM residencies can anticipate the need to develop contingency plans for students who do not meet the ACGME/American Board of Emergency Medicine–required Milestones.