

## EDUCATIONAL ADVANCE

# Medical Student Milestones in Emergency Medicine

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### Abstract

**Objectives:** Medical education is a continuum from medical school through residency to unsupervised clinical practice. There has been a movement toward competency-based medical education prompted by the Accreditation Council for Graduate Medical Education (ACGME) using milestones to assess competence. While implementation of milestones for residents sets specific standards for transition to internship, there exists a need for the development of competency-based instruments to assess medical students as they progress toward internship. The objective of this study was to develop competency-based milestones for fourth-year medical students completing their emergency medicine (EM) clerkships (regardless of whether the students were planning on entering EM) using a rigorous method to attain validity evidence.

**Methods:** A literature review was performed to develop a list of potential milestones. An expert panel, which included a medical student and 23 faculty members (four program directors, 16 clerkship directors, and five assistant deans) from 19 different institutions, came to consensus on these milestones through two rounds of a modified Delphi protocol. The Delphi technique builds content validity and is an accepted method to develop consensus by eliciting expert opinions through multiple rounds of questionnaires.

**Results:** Of the initial 39 milestones, 12 were removed at the end of round 1 due to low agreement on importance of the milestone or because of redundancy with other milestones. An additional 12 milestones were revised to improve clarity or eliminate redundancy, and one was added based on expert panelists' suggestions. Of the 28 milestones moving to round 2, consensus with a high level of agreement was achieved for 24. These were mapped to the ACGME EM residency milestone competency domains, as well as the Association of American Medical Colleges (AAMC) core entrustable professional activities for entering residency to improve content validity.

**Conclusions:** This study found consensus support by experts for a list of 24 milestones relevant to the assessment of fourth-year medical student performance by the completion of their EM clerkships. The findings are useful for development of a valid method for assessing medical student performance as students approach residency.

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The goal of medical education is for trainees to be able to competently practice medicine independently by the end of their medical training.<sup>1</sup> Accordingly, medical educators have sought instruments to assess clinical competence through the continuum from medical school, to residency, to unsupervised clinical practice.<sup>2,3</sup> This movement toward competency-based

medical education has been championed by numerous stakeholders, including the Accreditation Council for Graduate Medical Education (ACGME), American Board of Medical Specialties, and CanMEDS.<sup>4,5</sup> The ACGME subdivided clinical competencies into six initial core competencies. Each competency has defined domains of behavior called subcompetencies, with specified intermediate

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steps toward competency termed milestones.<sup>6</sup> This competency-based progression makes the fundamental skills explicit for learners and teachers, and it allows for the evaluation of learners against specific criteria.

In 2012 the ACGME mandated transition to the Next Accreditation System, which involves implementation of milestones specific to each specialty in an effort to improve competency-based assessment.<sup>7</sup> Under this initiative, the ACGME led a group to define the milestones specific to emergency medicine (EM), with five levels of proficiency, beginning at Level 1 to reflect the competencies expected of a medical school graduate, through Level 5, which is expected of a clinician after years of clinical practice.<sup>8-10</sup>

Notably, while the Level 1 milestones are designed to correspond to the level of competency of graduating students entering residency, the graduate education model of milestones has not yet been adapted to undergraduate medical education. As a result, there is a need for competency assessment of medical students as they progress toward fulfilling the Level 1 milestones. Efforts are under way by the Association of American Medical Colleges (AAMC) to generate core entrustable professional activities (EPAs) for medical students entering residency.<sup>11</sup> These EPAs are means to translate competencies into clinical practice. However, the knowledge and skills expected of medical students in fourth-year EM clerkships both crosscut other clerkships and contain unique EM-specific competencies. The objective of this study was to identify milestones for assessing the competence of fourth-year medical students on their EM rotations.

## METHODS

### Study Design

During fall of 2013, we used a modified Delphi technique to identify the EM medical student milestones. The Delphi technique is an accepted method for identifying desired features of professionals by eliciting expert opinions in successive rounds.<sup>12,13</sup> It has been used recently for internal medicine competencies among others and is a rigorous method for achieving content validity.<sup>12,13</sup> In addition to building content validity, the Delphi technique is an accepted method to develop consensus by eliciting expert opinions through multiple rounds of questionnaires.<sup>14,15</sup> The institutional review board determined this study to not be regulated.

### Study Protocol

**Initial Milestone Selection.** We assembled a research team (clerkship directors, assistant deans, and a medical student) with diverse responsibilities to compile an initial list of milestones relevant to assessing fourth-year medical students during their EM rotations. The team performed a literature review including the ACGME Emergency Medicine Milestones, the ACGME Internal Medicine Milestones, the ACGME Pediatrics Milestones, the Society for Academic Emergency Medicine primer, and the report from the Task Force on National Fourth Year Medical Student Emergency Medicine Curriculum.<sup>1,16-19</sup> From these documents, the team assembled an initial list of 39 milestones (Table 1). We then

achieved consensus on these milestones using a modified Delphi technique modeled after studies conducted by Hauer et al.<sup>12</sup> and Wijnen-Meijer et al.,<sup>13</sup> consisting of two rounds of polling the expert panel to investigate consensus.

**Delphi Panel.** The expert panel consisted of 23 participants from 19 institutions with diverse responsibilities including four program directors, 16 clerkship directors, five assistant deans, one student, and several milestone experts (on the ACGME/American Board of Emergency Medicine EM Milestone committee or leading EM milestone assessment initiatives). Many panelists had multiple roles. The selection for the expert panel used purposeful sampling to obtain a range of views and also included the research team. The research team identified the key roles desired on the expert panel and then used snowball sampling to obtain a panel representing the views of the stakeholders. Delphi polling was via Qualtrics online survey platform. The response rate for each round was 100%.

**Round 1.** In the initial round, participants rated "each milestone based on the level of importance for an average fourth-year medical student (who may or may not be going into EM) at the midpoint of their fourth year to be competent in performing the potential milestone by the end of their EM clerkship." The experts rated each milestone on a five-point scale (1 = absolutely do not include, not important; 2 = not very important; 3 = kind of important; 4 = important; 5 = very important). Participants were asked to comment if they thought items should be changed due to issues with redundancy or clarity. Participants were also asked to suggest additional milestones if they felt that an important domain was missing.

Between rounds, investigators reviewed the results and revised milestones based on comments from the expert panel on issues of redundancy or to improve clarity. Level of agreement was assessed for each milestone.<sup>20-23</sup> By this method, consensus was achieved when a high level of agreement for a particular milestone existed. High level of agreement required that greater than 80% of the survey responses for a particular milestone included two contiguous values in the five-point scale (e.g., high level of agreement was achieved if more than 80% of responses were either a 4 or a 5 for a particular milestone). A medium level of agreement occurred between 70 and 80%, low agreement between 60 and 70%, and no agreement below 60%. Milestones were then sorted for the next polling round into three categories. The first category included milestones that had high levels of agreement and mean scores greater than 4.0. The second category included milestones with either medium or high agreement, but with mean scores less than 4.0 and milestones revised based on comments for issues of redundancy or clarity. The third category included milestones with low agreement.

**Round 2.** In the second round, participants were provided with the aggregate results of the expert panel, including the mean response for each milestone, the standard deviation (SD), the mode, the level of

Table 1  
Importance for Fourth-year Student to be Competent in the Following

No.	Milestone	Round 1			Round 2		
		Mean	Level of Agreement	Outcome	Mean	Level of Agreement	Outcome
<i>Patient Care</i>							
1	Recognizes abnormal vital signs.	4.91	High	Round 2	5	High	Milestone
2	Recognizes when a patient is unstable requiring immediate intervention.	4.65	High	Round 2	4.91	High	Milestone
3	Correctly identifies "sick versus not sick" patients.	3.96	Medium	Remove: redundant	—	—	—
4	Performs and communicates a reliable, comprehensive history, and physical exam.	4.3	High	Round 2	4.41	High	Milestone
5	Performs and communicates a focused history and physical exam that effectively addresses the chief complaint and urgent patient issues.	4.43	High	Round 2	4.68	High	Milestone
6	Constructs a list of potential diagnoses based on chief complaint and initial assessment.	4.39	High	Round 2	4.64	High	Milestone
7a	Constructs a list of potential diagnoses, based on the greatest likelihood of occurrence.	4.04	High	Revise	—	—	—
7b	Constructs a list of potential diagnoses with the greatest potential for morbidity or mortality and includes likelihood of occurrence.	—	—	—	4.32	High	Milestone
8	Constructs a list of potential diagnoses with the greatest potential for morbidity or mortality.	4.22	High	Remove: redundant	—	—	—
9	Uses all available medical information to develop a list of ranked differential diagnoses including those with the greatest potential for morbidity or mortality.	3.96	Low	Remove: redundant	—	—	—
10	Revises a differential diagnosis in response to changes in a patient's course over time.	3.91	Medium	Round 2	3.91	High	Milestone
11	Formulates basic diagnostic and therapeutic plans based on differential diagnosis.	4.22	High	Round 2	4.64	High	Milestone
12	Applies medical knowledge for selection of appropriate agent for therapeutic intervention.	3.52	Medium	Round 2	3.68	Low	Remove
13	Reevaluates patient's response to therapeutic intervention; monitors patient.	4.14	High	Round 2	4.45	High	Milestone
14	Describe basic resources available for care of the ED patient.	3.48	Low	Remove: low agreement	—	—	—
15	Manages a single patient amidst distractions.	4	Medium	Round 2	4.14	High	Milestone
16a	Task switches between different patients.	3.22	Medium	Revise	—	—	—
16b	Task switches between two patients.	—	—	—	3.55	Low	Remove
31a	Recognizes and interprets significant radiology results.	3.91	Low	Revise	3.91	High	Milestone
31b	Recognizes and interprets significant plain films (e.g. fx, CHF, SBO).	—	—	—	—	—	—
32a	Recognizes and interprets significant ECG results.	4	Medium	Revise	4.05	High	Milestone
32b	Recognizes and interprets significant ECG abnormalities (e.g. STEMI, a-Fib RVR, peaked T-waves).	—	—	—	—	—	—
<i>Professionalism</i>							
17	Demonstrates behavior that conveys caring, honesty, genuine interest and tolerance when interacting with a diverse population of patients and families.	4.7	High	Round 2	4.86	High	Milestone
18	Demonstrates basic professional responsibilities such as timely reporting for duty, appropriate dress/grooming, rested and ready to work, delivery of patient care as a functional physician.	4.83	High	Round 2	4.95	High	Milestone
19	Maintains patient confidentiality.	4.57	High	Remove: redundant	—	—	—
20	Adheres to professional responsibilities, such as conference attendance, timely completion of clerkship documents (patient logs, etc.).	4.61	High	Remove: redundant	—	—	—
<i>Practice-based Performance Improvement</i>							
21a	Consistently recognizes limits of knowledge in common and frequent clinical situations and asks for assistance.	4.39	High	Revise	—	—	—
21b	Consistently recognizes limits of knowledge in clinical situations and asks for assistance or searches for information.	—	—	—	4.45	High	Milestone

Table 1  
(continued)

No.	Milestone	Round 1			Round 2		
		Mean	Level of Agreement	Outcome	Mean	Level of Agreement	Outcome
<i>Interpersonal and Communication Skills</i>							
22	Establishes rapport with and demonstrates empathy toward patients and their families.	4.39	High	Round 2	4.64	High	Milestone
23a	Listens effectively to patients and their families.	4.39	High	Revise			
23b	Effectively listens and communicates with patients and their families.				4.73	High	Milestone
24a	Reviews hospital course and patient education instructions with patient, family, or caregiver at discharge.	3.52	Medium	Revise			
24b	Reviews ED course, patient education, and instructions with patient, family, or caregiver at discharge.				3.82	Low	Remove
25	Participates as a member of a patient care team.	4.48	High	Remove: redundant			
26a	Communicates pertinent information to emergency physicians and other health-care colleagues (nurses, techs).	4.26	High	Revise			
26b	Communicates pertinent information to health care colleagues (nurses, techs).				4.23	High	Milestone
27	Communicates patient information to a consult service or admitting team on an uncomplicated patient.	3.83	Medium	Round 2	4	High	Milestone
28a	Understands roles of members of health care team (e.g., nurses, technicians, security).	3.74	Medium	Revise			
28b	Works effectively by understanding responsibilities of members of the health care team (e.g., nurses, technicians, security).				3.68	Low	Remove
<i>Systems-based Practice</i>							
29a	Reviews and interprets electronic health record accurately.	3.78	Medium	Revise			
29b	Reviews and reports data from electronic health record accurately, if accessible.				4.18	High	Milestone
33a	Provides accurate and organized documentation (history and physical) in the medical record when appropriate.	4	Medium	Revise			
33b	Provides accurate and organized documentation (history and physical) when appropriate.				4.27	High	Milestone
37	Identify a medical error, near-miss, or patient safety issue and report it to the appropriate party in a timely manner.	3.3	Medium	Remove: low agreement			
38	Identify and address important safety issues in the patient in routine care plan (e.g., identification of risk of falls, potential adverse drug reactions).	3.17	Low	Remove: low agreement			
39	Use a formulary or insurance information to control medication costs.	2.48	Medium	Remove: low agreement			
<i>Procedures (Patient Care)</i>							
34	Perform venipuncture or place IV.	3.7	Low	Remove: low agreement			
35	Place IV.	3.48	Low	Remove: low agreement			
36	Perform basic laceration repair using simple interrupted suture technique.	4.13	Medium	Round 2	4.18	High	Milestone
40	Performs basic life support (e.g., AED placement, bag/valve mask, chest compressions).	—	—	Added Round 2	—	4.27	High

agreement, and their responses during the first questionnaire. They again were asked to rate level of importance for the first and second category of milestones (high and medium agreement). For the third category (low agreement), they were asked to “please indicate whether you agree with removing the following milestones” (where 1 = disagree, keep this milestone; and 2 = agree, remove this milestone).

Consensus determination was made by high level of agreement after the second round. Milestones in the high and medium agreement categories following the first round were included if they achieved high agreement after the second round. Those who did not achieve high agreement after the second round were dropped. All of the milestones that were in the low agreement category following the first round were dropped after the second round.

Once consensus was reached after two rounds, the list of milestones was shared with a volunteer reactor panel consisting of 24 educators involved in both graduate and undergraduate medical education. The reactor panel was formed by a call for volunteers on the Council of EM Residency Directors and Clerkship Directors in EM (CDEM) list-serves. The panel members each reacted through an on-line survey and during one of two conference calls. We did not intend for this group to supersede the expert panel, but rather to provide broad-based reactive discussion to the proposed milestones for the purpose of additional content validity.

### Data Analysis

At the end of each round, the mean, SD, mode, and level of agreement were calculated for each milestone using Microsoft Excel 2008. Comments were reviewed for suggestions on whether to revise milestones based on issues of redundancy or clarity, and a final list of milestones was determined. Validity evidence was collected through content (literature review and expert panel), response process (e.g., ensuring instructions to expert panel were clear), internal structure (revision for clarity), and relation to other variables (mapping to EM milestones and AAMC’s Core Entrustable Professional Activities for Entering Residency [CEPAER]).<sup>24</sup>

## RESULTS

The results of the expert panel regarding the importance of each proposed milestone that a student should be able to achieve by the end of the EM clerkship are presented in Table 1. After the first round, 12 milestones were revised based on participant comments on issues of clarity or redundancy. There were 12 milestones selected for removal due to low agreement (confirmed during the second round) or because they were consolidated into other milestones. One milestone (basic life support/cardiopulmonary resuscitation) was added based on comments. In the second round, the 12 milestones selected for removal had medium or high levels of agreement to drop them. The 24 milestones presented on the final list all had high levels of agreement; consensus was achieved by the expert panel.

The initial 39 proposed milestones spanned 16 of the 23 competencies outlined by the ACGME for EM residents. The final 24 milestones cover 13 of the 23 competencies (Data Supplement S1, available as supporting information in the online version of this paper). The competencies that were not included in the final list are also listed in Data Supplement S1.

## DISCUSSION

The 24 milestones identified in this study are aligned with the AAMC’s CEPAER, as well as the ACGME EM milestones for residents to confirm content and relationship to other variable validity.<sup>1,11</sup> The EM medical student milestones cover the majority of both the EM Level 1 milestones as well as the CEPAER.

These milestones include some skills integral to EM practice, such as identification of “sick” patients, focused differential diagnosis, and recognizing emergency conditions. In addition, standard skills found in other clerkships, such as the ability to perform history and physical examination, professionalism, and communication, are included. It is important to remember we were attempting to determine competencies for all students in EM clerkships, not just those who will choose EM for residency. Therefore, some of the EM specific Level 1 milestones such as procedures and ultrasound were not included, as graduates entering other specialties may not be expected to be competent in these areas.

From the discussion involving the reactor panel, two key themes emerged. The first is that context of different institutions creates different expectations of their medical students. Examples include the proposed milestone “performs venipuncture or place IV” and use of the electronic medical record. Some institutions expect achievement of these milestones for their medical students, while others do not find it important for medical students to perform these tasks or lack the resources or have policy issues that prevent students from performing these tasks. The second theme from the reactor panel is that many panelists felt the list of 24 milestones is too long, would be difficult to assess in 1 month, and could be further consolidated. In response, we asked the reactor panel which milestone within a competency would be most appropriate for the assessment of medical students, and using the feedback of the reactor panel we pared down the list of 24 into 15 milestones to reduce redundancy within each ACGME competency (Data Supplement S2, available as supporting information in the online version of this paper). We present both the full list and the abbreviated list for consideration of EM medical student education leaders to begin the discussion of which competencies should be assessed. In the end, we believe that there should be a core set of competencies for all fourth-year medical students. However, programs may choose to add additional competencies based on their context and priorities. For example, at University of Michigan Medical School, students are assessed on delivery of bad news by a rigorously developed standardized patient program. Therefore, advanced communication would be determined to be a competency at this program.

## LIMITATIONS

The inherent limitation with the use of a Delphi panel is the potential for bias. To address this we ensured that the expert panel was of reasonable size and that the experts included a variety of responsibilities to allow for diverse opinions and maintained 100% response rate. Nonetheless, we noted that while the process of providing the panelists the results of the entire panel to reflect on prior to responding for round 2 is intended to create consensus, some panelists were unmoved by the consensus and maintained close to their original scores. This was particularly noted on the context-related items such as IV placement. Further, some of the EM subcompetencies were not included in the medical student milestones. For graduating students entering EM, there will need to be curricular content and assessment to address the Level 1 milestones of these subcompetencies.

In addition, this is an initial determination of milestones requiring further validation and feasibility, possibly through the CDEM and medical student input. These milestones are intended for fourth-year students and may need adjustment for third-year students.<sup>25</sup> With EM being offered at more than 50% of medical schools in the United States, the EM clerkship can play a key role in helping students reach ACGME Level 1 milestones and core entrustable professional activities.<sup>26</sup>

## CONCLUSIONS

Our study found consensus support by experts for a list of 24 milestones for competency assessment of fourth-year medical students by the completion of their EM clerkships. The findings are useful for development of a valid method for assessing medical student performance as the student approaches residency. Notably, this allows each institution to tailor its curriculum toward the goal of having its students achieve these milestones by the end of their EM clerkships.

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## References

1. The Accreditation Council for Graduate Medical Education. Emergency Medicine Core Competencies. Available at: [http://www.acgme.org/acgmeweb/Portals/0/PDFs/FAQ/110\\_emergency\\_medicine\\_FAQs\\_07012013.pdf](http://www.acgme.org/acgmeweb/Portals/0/PDFs/FAQ/110_emergency_medicine_FAQs_07012013.pdf). Accessed May 8, 2014.
2. Van der Vleuten CP. The assessment of professional competence: developments, research and practical implications. *Adv Health Sci Educ* 1996;1:41–67.
3. Epstein RM. Assessment in medical education. *N Engl J Med* 2007;356:387–96.
4. Swing SR. The ACGME outcome project: retrospective and prospective. *Med Teach* 2007;29:648–54.
5. Frank JR, Danoff D. The CanMEDS initiative: implementing an outcomes-based framework of physician competencies. *Med Teach* 2007;29:642–7.
6. LaMantia J. The ACGME core competencies: getting ahead of the curve. *Acad Emerg Med* 2002;9:1216–7.
7. Nasca TJ, Philibert I, Brigham T, Flynn TC. The next GME accreditation system—rationale and benefits. *N Engl J Med* 2012;366:1051–6.
8. Beeson MS, Carter WA, Christopher TA, et al. The development of the emergency medicine milestones. *Acad Emerg Med* 2013;20:724–9.
9. Academic Board of Emergency Medicine. Emergency Medicine Milestones. Available at: <https://www.abem.org/public/publications/emergency-medicine-milestones>. Accessed May 8, 2014.
10. Korte RC, Beeson MS, Russ CM, Carter WA; Emergency Medicine Milestones Working Group, Reisdorff EJ. The emergency medicine milestones: a validation study. *Acad Emerg Med* 2013;20:730–6.
11. Association of American Medical Colleges Drafting Panel. Core Entrustable Physician Activities for Entering Residency (UPDATED). Available at: <http://www.mededportal.org/ijcollaborative/resource/887>. Accessed May 8, 2014.
12. Hauer KE, Kohlwes J, Cornett P, et al. Identifying entrustable professional activities in internal medicine training. *J Grad Med Educ* 2013;5:54–9.
13. Wijnen-Meijer M, Van der Schaaf M, Nillesen K, Harendza S, ten Cate O. Essential facets of competence that enable trust in graduates: a Delphi study among physician educators in the Netherlands. *J Grad Med Educ* 2013;5:46–53.
14. Linstone HA, Turoff M, eds. *The Delphi Method: Techniques and Applications*. London, UK: Addison-Wesley Publishing Company, 1977.
15. Landeta J. Current validity of the Delphi method in social sciences. *Technol Forecast Soc Change* 2006;73:467–82.
16. The Accreditation Council for Graduate Medical Education. Internal Medicine Core Competencies. Available at: [https://www.acgme.org/acgmeweb/Portals/0/PFAssets/2013-PR-FAQ-PIF/140\\_internal\\_medicine\\_07012013.pdf](https://www.acgme.org/acgmeweb/Portals/0/PFAssets/2013-PR-FAQ-PIF/140_internal_medicine_07012013.pdf). Accessed May 8, 2014.
17. The Accreditation Council for Graduate Medical Education. The Pediatric Milestones Project: Pediatrics Core Competencies. Available at: [http://www.acgme.org/acgmeweb/Portals/0/PFAssets/Program-Resources/320\\_PedsMilestonesProject.pdf](http://www.acgme.org/acgmeweb/Portals/0/PFAssets/Program-Resources/320_PedsMilestonesProject.pdf). Accessed May 8, 2014.
18. Clerkship Directors in Emergency Medicine. Emergency Medicine Clerkship Primer. Available at: [http://www.saem.org/docs/students/em-clerkship-primer\\_0\\_0.pdf?sfvrsn=2](http://www.saem.org/docs/students/em-clerkship-primer_0_0.pdf?sfvrsn=2). Accessed May 8, 2014.

19. Manthey DE, Coates WC, Ander DS, et al. Report of the task force on national fourth year medical student emergency medicine curriculum guide. *Ann Emerg Med* 2006;47:E1-7.
20. De Loe RC. Exploring complex policy questions using policy Delphi: a multi-round, interactive survey method. *Appl Geogr* 1995;15:53-68.
21. Dekker-Groen AM, Van der Schaaf MF, Stokking KM. Teacher competences required for developing reflection skills of nursing students. *J Adv Nursing* 2011;67:1568-79.
22. Van der Schaaf MF, Stokking KM. Construct validation of content standards for teaching. *Scan J Educ Res* 2011;55:273-89.
23. Wijnen-Meijer M, Van der Schaaf M, Nillesen K, Harendza S, ten Cate O. Essential Facets of Competence That Enable Trust in Graduates: A Delphi Study Among Physician Educators in the Netherlands [Supplemental Appendix]. Available at: [www.jgme.org/doi/suppl/10.4300/JGME-D-11-00324.1/suppl\\_file/wijnen-meijer.1.suppl.doc](http://www.jgme.org/doi/suppl/10.4300/JGME-D-11-00324.1/suppl_file/wijnen-meijer.1.suppl.doc). Accessed May 8, 2014.
24. Downing SM, Haladyna TM. Validity and its threats. In: Downing SM, Yudowsky R, eds. *Assessment in Health Professions Education*. New York, NY: Routledge, 2009.
25. Santen SA, Rademacher N, Heron SL, Khandelwal S, Hauff S, Hopson L. How competent are emergency medicine interns for level 1 milestones: who is responsible? *Acad Emerg Med* 2013;20:736-9.
26. Khandelwal S, Way DP, Wald DA, et al. State of undergraduate education in emergency medicine: a national survey of clerkship directors. *Acad Emerg Med* 2014;21:92-5.

### Supporting Information

The following supporting information is available in the online version of this paper:

**Data Supplement S1.** Source of milestone and EM subcompetencies not included.

**Data Supplement S2.** Reactor panel milestone list.

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