Harmonizing the Approach to Milestone Assessment of Systems-Based Practice

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ABSTRACT

Background The milestones created by the Accreditation Council for Graduate Medical Education (ACGME) beginning in 2009 were developed by each individual specialty. The lack of standardization across specialties resulted in unnecessary variation, and has complicated the development of validated assessment tools.

Objective We developed a common set of subcompetencies and milestones that could harmonize the milestones for systems-based practice (SBP) across specialties.

Methods A multi-disciplinary, cross-specialty group of medical educators with expertise in SBP was recruited by the ACGME and selected 3 subcompetencies for SBP: Patient Safety and Quality Improvement (SPB-1), System Navigation for Patient-centered Care (SBP-2), and the Physician's Role in Healthcare Systems (SBP-3).

Results A stakeholder survey with 1195 respondents identified that of the 3 subcompetencies, SBP-1 had the highest level of agreement among both specialties and respondent roles for all 3 statements, with most respondents indicating strong agreement. In contrast, SBP-3 had the lowest level of agreement across roles and specialties, especially regarding whether SBP-3 should be used, and if respondents knew how to assess it, with the majority of respondents in the "Needs Revision" category.

Conclusions While the majority of stakeholders surveyed understood and believe they should use the new "harmonized" SBP subcompetencies and milestones, some were not certain how to assess 1 of the 3 subcompetencies, suggesting a need for additional faculty development. The

goal of the approach to the harmonized milestones for SBP is that improved assessment will

contribute to enhanced education that will increase residents' understanding of systems of care,

which will contribute to improved patient outcomes.

Introduction

Milestone assessments based on the 6 competencies were first required by the Accreditation

Council for Graduate Medical Education (ACGME) in 2013.[1] They are a key part of the

ACGME Next Accreditation System. The milestones were developed independently in each

specialty by teams of program directors, faculty, residents, and other stakeholders, using program

requirements, certification examination outlines, curricula, national competency statements,

literature reviews, and results from national consensus-building exercises to guide the milestones

development process.[2,3] Specialties created specific milestones for subcompetencies within each

of the competencies: medical knowledge (MK), patient care (PC), interpersonal and

communication skills (ICS), practice-based learning and improvement (PBLI), professionalism

(PROF), and systems-based practice (SBP). Thematic analysis showed variability in the

milestones for ICS, PBLI, PROF, and SBP across specialties.[4] Focus groups and other efforts to

obtain stakeholder input found stakeholders were dissatisfied with these differences, which make

it more challenging to share assessment tools across programs and provide comprehensive

faculty development across specialties.

In response, the ACGME performed a competency crosswalk, reviewing all specialty

milestones "to identify common and overlapping themes among the interpersonal and

communication skills (ICS), practice-based learning and improvement (PBLI), professionalism

(PROF), and systems-based practice (SBP) milestones of the transitional year and 26 specialties."[4] This effort was the starting point for Milestones 2.0.

The ACGME convened 4 multidisciplinary workgroups to develop a common set of subcompetencies and milestones that could be used by each specialty, creating harmonization across specialties. Specialties will be asked to incorporate these subcompetencies and provide context to the developmental language of the milestones.

Methods

Subcompetency and Milestone Development

The ACGME authorized multidisciplinary workgroups for the 4 competencies that have common threads across specialties: ICS, PBLI, PROF, and SBP. Workgroup members were selected from individuals who submitted an application in response to a call for volunteers. The membership of the SPB workgroup was selected to represent an interprofessional and interdisciplinary voice, including physicians from varying specialties, nurses and allied health professionals, and individuals with content expertise. The overall approach is described in the June issue of the *Journal of Graduate Medical Education*.[5] In this companion paper, we describe the development of the 2.0 Milestones and subcompetencies for systems-based practice.

The SBP workgroup met over 2 days in Chicago in 2016 to develop a draft set of SBP subcompetencies and milestones. The development process was qualitative and iterative in nature, seeking to ensure that the scope of the milestones was forward thinking, broad in nature, inclusive, understandable, and user friendly. A core tenet of the process was to ensure graduating trainees' readiness for practice in the current and changing health care environment.

The process began with an in depth discussion and literature search, which resulted in a definition of SBP as "understanding complex systems and the physician's role in them, navigate them for the benefit of patients, and participate in continually improving them."[5] This definition was central to the milestones development process, to ensure these fundamental concepts would be incorporated into the harmonized milestones.

The SBP milestones workgroup was provided with the results of a thematic analysis of the milestones crosswalk for the 26 core specialties and transitional year,[4] data collected through focus groups, and biannual milestone submissions to ACGME. Through the review of this information, 3 overarching themes were identified as subcompetency domains: patient safety and quality improvement (SPB-1), system navigation for patient-centered care (SBP-2), and the physician's role in health care systems (SBP-3). The selection of these subcompetencies is supported through research showing that quality improvement (QI) and patient safety (PS) had a median appearance in 10 milestones per specialty.[6] Of the 869 QI and PS references analyzed, 40% were about the residents' functionality in the health system.[6]

The workgroup then identified common and essential themes within the 3 subcompetency domains, and identified milestone anchor threads for each theme beginning with the ability to identify and describe (Level 1), to readiness for unsupervised practice (Level 4), to an aspirational level of leader and change agent (Level 5). For example, in the system navigation for patient-centered care subcompetency, the care coordination thread progresses from a basic understanding of care coordination, to interacting effectively with interdisciplinary team members, to performing care coordination, and then role modeling effective interdisciplinary patient-centered care coordination, the level necessary for unsupervised practice. At the

aspirational level (Level 5), the physician would be a leader in analysis and improvement of care coordination processes.

Once working drafts of their work were completed, the PBLI and SBP milestones workgroups shared their products, providing each other with informative feedback. These draft subcompetencies and milestones were also shared with more than 100 attendees, at a 2016 ACGME Milestones Summit. The workgroup reviewed this feedback, and made additional revisions to the milestones.

Stakeholder Feedback

The ACGME solicited feedback from a national group of stakeholders through 5 surveys: a survey with all 4 competencies included, and 4 separate surveys, each addressing 1 of the harmonized competencies. An invitation to participate, along with a link to the surveys, was sent electronically to email addresses included in the ACGME mailing list. The letter and survey links were also posted to the ACGME website, and reminders to complete the survey were included in weekly ACGME e-Communications. Participants were asked to identify their role in GME, their specialty (if applicable), and their agreement with 3 statements about each subcompetency: (1) whether the subcompetency should be used; (2) whether respondents understood it; and (3) whether respondents knew how to assess it. Respondents included PDs, associate PDs, program coordinators (PCs), Clinical Competency Committee (CCC) chairs, CCC members, designated institutional officials (DIOs), institutional coordinators, and others (eg, residents, other educators).

Results

The ACGME received 1195 complete responses to the stakeholder survey for the harmonized milestones. The data was analyzed in 2 ways: (1) by specialty, with 249 hospital-based, 577 medical-based, and 205 surgical-based; and (2) by role in graduate medical education. The most responses came from PDs, with 750 responses.

Each data set was analyzed for percentage of agreement with the 3 statements. Agreement was defined as the percent of respondents who selected either agree or strongly agree for each statement. Level of agreement by specialty is shown in TABLE 1, and agreement by role in GME is shown in TABLE 2. For each subcompetency, the responses to each statement were categorized into 3 groups: > 85% agreement = Strong Agreement; 75%–85% = Acceptable Level of Agreement; < 75% agreement = Revision Needed. Additional online materials include the level of agreement for all 11 subcompetencies by role in GME (Appendix A), and by specialty grouping (Appendix B).

TABLE 1
Percent of Respondents Who Agree or Strongly Agree by Specialty

		All (N = 1195)	Hospital (n = 249)	Medical (n = 577)	Surgical (n = 205)
SBP-1	1 – Should Use	89.05	89.13	90	88.89
	2 – Understand	94.79	94.32	95.56	94.71
	3 – Know How	86.11	84.14	87.05	86.96
SBP-2	1 – Should Use	81.51	71.93	86.61	80.54
	2 – Understand	91.46	90.18	92.58	90.22
	3 – Know How	78.09	68.02	80.77	80.56
SBP-3	1 – Should Use	70.54	66.67	71.31	68.85
	2 – Understand	83.37	85.4	82.01	82.87

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3 – Know How	60.99	58.22	61.51	58.19

Abbreviation: SBP, systems-based practice.

TABLE 2

Percent of Respondents Who Agree or Strongly Agree by Roles

		Program Director (n = 750)	Associate PD (N = 74)	CCC Chair (N = 59)	CCC Member (N = 107)	DIO (n = 53)	Faculty (n = 192)	Program Coord. (n = 237)	Institut. Coord. (n = 17)	Other (n = 58)
SBP-1	1 – Should Use	86.75	82.26	87.76	88.66	91.84	88.3	95.34	92.86	96
	2 – Understand	94.04	95.16	89.58	95.83	95.74	95.86	96.86	100	96.08
	3 – Know How	85.63	77.42	81.25	93.81	85.11	88.76	92.27	85.71	82
SBP-2	1 – Should Use	78.51	67.74	81.63	80.41	85.11	77.25	92.23	100	92
	2 – Understand	90.57	85.48	79.17	92.78	86.67	89.76	95.74	100	98.04
	3 – Know How	76.24	59.68	70.83	78.35	77.78	77.58	87.15	100	84.31
SBP3	1 – Should Use	67.94	56.45	69.39	65.98	78.72	67.66	79.58	85.71	79.59

2 – Understand	84.09	74.19	68.75	76.29	86.67	82.42	83.33	100	86
3 – Know How	58.79	41.94	52.08	48.45	66.67	58.79	70.22	71.43	58

SBP-1 had the highest level of agreement among both specialties and respondent roles for all 3 statements, with most respondent subgroups (by specialty and role) indicating strong agreement. In contrast, SBP-3 had the lowest level of agreement across roles and specialties, especially regarding whether SBP-3 should be used, and if respondents knew how to assess it, with responses for the majority of respondent subgroups (by specialty and role) in the "Needs Revision" category.

The SBP workgroup considered the survey results, and made modifications to the milestones. The draft milestones were reviewed for clarity and alignment across each thread. The workgroup created a supplemental guide to help PDs, CCC members, and evaluators better understand milestones implementation. The guide offers intent, examples of how residents might demonstrate achievement of milestone goals in various contexts, assessment models and tools, and resources to assist program leadership with remediation.

Discussion

The ACGME requires programs to assess residents' and fellows' performance in a specified set of subcompetency domains using defined milestones. Programs have struggled to develop and implement reliable methods to assess the current specialty-specific SBP subcompetencies. The core concepts of SBP cross specialties and disciplines, and require practitioners to think outside

of their usual framework. This made it essential that the harmonized SBP milestones be developed by a workgroup that had cross-specialty representation. To limit the volume and complexity of the subcompetencies and milestones required for assessment, those developed by the SBP workgroup do not represent the full context of that competency, and specialties are welcome to add subcompetency domains. A common set of SBP milestones will allow focused training for faculty and development of educational methods and assessment tools that can be shared, tested for validity evidence, and implemented across specialties.

SBP may be 1 of be more challenging competencies to describe and assess, with 4 levels of systems salient to health care delivery: the patient; the care team (including family members); the organizations where care is delivered (hospitals, clinics, nursing homes); and the environment (regulatory, market, policy).[7] To be effective at SBP, physicians must understand the interrelation of their involvement in the delivery of health care.[7–9] Additional difficulty in describing and assessing SBP emanates from the fact that its recognized cornerstone, *systems thinking,* falls outside the scope of current medical training.[10] The ACGME SBP milestones include observable behaviors such as "identification," "analysis," "description," and "innovation," yet appropriately do not specify the methods or processes that should be used to achieve optimal results. Without training, this may leave some at a loss for how to implement education and assessment in this competency domain.

Systems theory, tools, and techniques enable physicians to increase their understanding of system attributes; foster understanding of the environment within which each system exists; help identify system structures and improvement processes; and enable performance monitoring over time.[11–14] This helps discern patterns, trends, and interdependencies, identify cause and effect relationships, and recognize the impact of structure and mental models on behavior.

Education regarding the management of a diabetic patient requiring insulin provides an example

of a systems approach to care. Traditional medical education has focused on the pathophysiology

of insulin production and resistance in diabetes, and reviews the pharmacologic differences

between basal and bolus insulin dosing. Systems thinking analyzes the components involved in

the process from prescribing to administration of a basal-bolus insulin regimen for a patient.

Systems-based practice incorporates shared decision making with the patient regarding insulin

prescribing, uses community resources to help the patient afford their diabetes medication, and

evaluates the quality of care for patients with diabetes at a clinical site. As long as physicians

lack training in systems thinking, SBP cannot achieve its full potential, and this may be 1 factor

in the lower level of agreement regarding whether the harmonized SBP milestones should be

used and whether the respondents know how to assess this competency. Significant faculty

development is needed if faculty are to develop residents and fellows' knowledge and skill in

this domain, and assist trainees in integrating systems thinking into their everyday approach to

patient care.

While the harmonized milestones were designed to be broadly applicable across multiple

training programs, there are limitations to their development. In addition, to keep the number of

milestones manageable, several themes from current specialty milestones are not reflected in the

2.0 milestones. Specialties have the option to identify and require additional subcompetencies

and associated milestones deemed essential for trainee development. To date, while specific

validity evidence for the use of the 2.0 milestones in resident assessment has not yet been

collected, the broad literature for the components of the 3 SBP subcompetencies, and the validity

evidence available on the current milestones, make the new harmonized SBP a reasonable

approach to resident and fellow assessment. Future work should include the development of methods for educating and assessing trainees in this competency.

Conclusion

The goal of the milestones approach to assessment of SBP is that better training and assessment will contribute to improved patient outcomes. It is hoped that the harmonized SBP subcompetencies will enhance the understanding of trainees, program leaders, and representatives from different clinical specialties of systems of care, and how to navigate them, leading to a shared mental model of this important, yet more abstract concept.

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