Milestones as a Faculty Development Tool for Career Academic Physicians

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BACKGROUND AND OBJECTIVES: The Accreditation Council for Graduate Medical Education (ACGME) has implemented milestones for progression of residents. Career academic physicians would benefit from similar concrete guidance for scholarly activity and faculty development. After developing milestones across six recognized competencies among our family medicine academicians, we acknowledged the potential benefit of expanding the development of milestones throughout the academic medical center.

METHODS: Milestones that we previously developed were modified by departmental leaders within our institution reflecting levels of career development based on benchmarks in each field. These objective measures for guiding maturation of clinical and academic skill sets were then circulated to clinicians in five residency programs throughout our academic medical center for self-evaluation. We analyzed the completed surveys to determine if an association exists between years in academics and rank across each area of competency.

RESULTS: We received fifty-three responses from the 91 faculty invited. We noted a significant association in the competency of medical knowledge with progression from assistant to full professor, and we noted a trend toward significance in professionalism and progression from assistant to full professor. These objective measures of clinician development and competency suggest association with levels of academic career development by rank within the institution.

CONCLUSIONS: This rubric can be helpful for directing faculty development and faculty mentorship. These milestones are general enough that other physician specialties may be able to adopt them for their own needs.

(Fam Med. 2022;54(3):207-212.)
doi: 10.22454/FamMed.2022.700483

The importance of evaluating competencies in physician education has been prioritized over the last decade by academic governing bodies. The Accreditation Council for Graduate Medical Education (ACGME) has worked to establish milestones[1] to ensure uniform educational standards in graduate medical education. The need for a standardized approach to guide training and progression of academic medicine teachers as they pursue career advancement has been addressed by others as well.[2-5] The purpose of this study was to develop an objective set of criteria for levels of development in each area of competency to help guide academicians in scholarly activity and faculty development.

Methods

We chose to model the educational milestones created by the ACGME to develop milestones for faculty that we previously developed and utilized in our own family medicine department.[6] To externalize our milestones for use in additional medical specialties, we requested input from educators and specialists throughout our medical center. The example rubric (Figure 1) shows the changes made for the radiology department as an example of how the milestones were customized for each discipline. We then administered the milestones as a self-reported survey to physician educators in five residency programs (Ob/Gyn, oral/maxillofacial surgery (OMFS), radiology, pathology, surgery) at the University of Tennessee Graduate School of Medicine.

Statistical Methods

We performed frequency and descriptive statistics to describe the demographic characteristics of the sample. We assessed the distributions of each professional rating for the statistical assumptions of normality and homogeneity of variance. Since we considered the response sets for the ratings ordinal in terms of measurement, if both statistical assumptions were met, we considered the ratings to be at an interval level of measurement and we utilized parametric one-way

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analyses of variance to compare the academic appointment groups. If a significant main effect was detected, then we employed post hoc tests using Tukey's test for pairwise comparisons. Means (M) and standard deviations (SD) were reported for the parametric analyses. If either or both statistical assumptions were violated, then we performed nonparametric Kruskal-Wallis tests to test for significant main effects. We used Mann-Whitney U tests to test for post hoc effects. We reported medians and interquartile ranges (IQR) for the nonparametric analyses. We performed all analyses using SPSS Version 26 (Armonk, NY: IBM Corp.) and statistical significance was assumed at an α value of 0.05.

The Institutional Review Board at the University of Tennessee Graduate School of Medicine examined and approved this study.

Results

The demographic characteristics of the sample are presented in Table 1. The average number of years in academics was 15.8. The majority of faculty members were in the Ob-Gyn department, and most participants were assistant professors.

In total, 53 academic physicians responded. The milestones were administered for self-report and the results are analyzed in Table 2. The most significant findings showed correlation between academic rank (assistant vs full professor) and levels of progression in the competencies of medical knowledge and professionalism. Competencies of patient care, systems-based practice, and practice-based learning also showed statistical correlation with progression from assistant to full professor. The levels of associate professor did not show significant correlation to levels of academic achievement when compared to academic rank above or below.

Figure 1: Milestones for Academic Physicians, Edited for Department of Radiology

Years in Academic Medicine_____ Current Academic Appointment_____ Academic Department_____

Area	Level 1	Level 2	Level 3	Level 4
Patient care	• Coordinates care for patients requiring urgent/emergent medical care • Applies clinical guidelines in the treatment of patients and facilitates their efforts in managing chronic conditions • Uses shared decision-making in explaining health promotion and disease prevention recommendations to patients/families • Links patients with community resources to achieve health promotion goals • Addresses psychosocial implications on acute and chronic medical problems • Applies imaging guidelines in follow-up of incidental lesions • Uses contrast media for imaging studies appropriately • Works with referring physicians and patients to promote appropriate use of imaging screening programs	• Teaches learners to coordinate the care of acutely ill patients with consulting services • Leads clinical care teams in ambulatory and inpatient settings • Teaches learners to manage patients with chronic disease and comorbidities • Teaches learners disease prevention and health promotion • Writes a case report for publication • Learns new procedural/clinical skill	• Teaches learners through role modeling the integration of the clinical practice with community data to improve population health • Expands medical acumen into new arenas filling voids in learners knowledge • Expands skills and teaches others • Presents podium presentation/ workshop in national or regional venue	• Leads patient care teams into rural, mission field, inner city, or other settings/activities to improve care for patients lacking access • Presents a keynote podium presentation or workshop in national or international venue

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Figure 1: Continued

	Level 1	Level 2	Level 3	Level 4
Medical knowledge	• Achieves board certification • Teaches learners to coordinate the care of acutely ill patients requiring interventional radiology services • Teaches learners to manage patients with contrast reactions and allergies	• Maintains certification • Writes a review article for publication or a book chapter • Demonstrates ability to effectively convey medical knowledge to learners • Presents a poster at a conference • Presents/leads a topic/workshop at a conference	• Develops local clinical practice or imaging guidelines • Serves as a reviewer for medical journals	• Authors a medical book • Serves as editor of textbook • Participates in national guideline setting panels • Is invited to comment in national press on areas of expertise • Chairs a national medical organization • Serves on national educational committee • Directs national meetings or conferences
System-based practice	• Analyzes personal and systemic causes of medical errors common to medical specialty • Partners with patients to increase efficiency and effectiveness in patient care being conscious of resource use and cost in your practice • Uses team-based care to provide accountable and coordinated care to meet patient needs • Demonstrates knowledge of billing and the health insurance system and its effect on patients • Participates in a roots cause analysis • Partners with clinicians to decrease medical costs by adhering to imaging appropriateness criteria	• Leads ambulatory and inpatient teams in using resources efficiently and cost conscientiously in complex cases • Serves on a hospital committee • Serves on an academic committee at own facility • Leads a QI project in your program • Leads a roots cause analysis • Teaches seamless transitions of care	• Serves as a director of a division (PreDoc, Residency, Research, Clinical) within department • Serves as officer or delegate to local or state professional organization • Serves as chairman of committee within educational system or medical center	• Serves as delegate, officer, or chairman of a national or international organization • Serves as consultant to national or international committees • Serves as chair of an academic department • Serves as a member of clinical/multidisciplinary national committees academically or clinically

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Figure 1: Continued

	Level 1	Level 2	Level 3	Level 4
Practice-based learning & improvement	• Demonstrates critical appraisal of research using set criteria • Analyzes personal development as a physician and uses a learning plan to advance skills • Initiates quality improvement project in clinical or radiological endeavor • Principles of evidence-based care and information mastery are foundation of clinical practice	• Designs, performs, and analyzes a case-control study • Design/leads a journal club on critical appraisal of medical literature • Manages quality improvement for a clinical entity • Supervises/ directs quality improvement initiatives for learners	• Designs, performs, and analyzes prospective studies (double-blind, controlled) • Creates protocols for continuous review of practice procedures and outcomes in department or medical community • Strives through clinical systemic activities to improve the patient experience of care, improve the health of populations, and reduce the cost of health care • Submits and receives funding for a research project • Constructs a faculty development curriculum/ seminar	• Designs, performs, and analyzes meta-analyses on medical topics • Maintains R01 or similar funding sources of grant funding • Manages quality improvement for multiple clinical entities in an organization
Professionalism	• Fulfills the professional obligations/ responsibilities of your medical specialty • Models professional personal behavior exhibiting self-awareness, self-management, social awareness and relationship management • Demonstrates value for a patient's beliefs, mores, and cultural practices in shared understanding of patient care plans • Recognizes problems and seek to find solutions	• Develops a shared appreciation of learner and work in partnership to meet their personal and professional goals • Demonstrates ability to work effectively with faculty in meeting department/ residency/ institutional goals • Serves as a mentor for learners	• Demonstrates a high-level of ethics in working with the media, representatives of regulatory bodies, and the government • Demonstrates a high-level of ethics and understanding in professional/ personal relationships with colleagues • Serves as mentor for faculty	• Exemplifies and role models leadership, scholarship, and professionalism in all aspects of interaction • Receives recognition for outstanding service and dedication in field of practice in national or international arena

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Figure 1: Continued

	Level 1	Level 2	Level 3	Level 4
Communication	• Demonstrates respect for a patient's autonomy in their health decisions • Delivers difficult information regarding personal health issues empathetically and effectively • Uses electronic health Record in communicating with health care team • Demonstrates effective and ethical use of communication systems • Delivers information to fellow members of the academic community empathetically and effectively using multiple forms of communication	• Builds effective rapport with learners in a clinical environment • Presents didactic information in small group and lecture formats demonstrating recognition of learning style of students/residents/ clinicians • Demonstrates ability in leading an ambulatory, inpatient, or imaging team/ service that fosters trust, respect, and understanding	• Works well with difficult learners and develop remediation plans which may accomplish learner and institutional goals • Recognizes and utilize the principles of conflict management in difficult situations • Demonstrates success in managing change at the department/ institutional level	• Demonstrates leadership in cultural proficiency, understanding of health disparities, and social determinants of health in national/ international situations • Excels in conflict management and in deescalating difficult situations

Table 1: Demographic Characteristics

Variable	Level	Statistic
Years in academia	-	15.8 (12.2)
Academic department		
	Ob-Gyn	21 (39.6%)
	OMFS/ENT	6 (11.3%)
	Pathology	5 (9.4%)
	Radiology	8 (15.1%)
	Surgery	13 (24.5%)
Academic appointment		
	Instructor	2 (3.8%)
	Assistant professor	23 (43.4%)
	Associate professor	9 (17.0%)
	Professor	18 (34.0%)

Abbreviations: Ob-Gyn, obstetrics-gynecology; OMFS, oral and maxillofacial surgery; ENT, ear, nose and throat.

Discussion

The milestones (Figure 1) identify four levels of progression in a career in academic medicine. The initial level defines those skills based on the six core competency categories for physicians who recently graduated from their residency program. Each core competency establishes activities universal in academics, helping to additionally recognize the differences in patient care based on specific fields of medicine. Those faculty reaching level two may be approaching midcareer progression. Level three defines a mature faculty physician with leadership positions. Those academic physicians who reach positions of leadership on the national or international stage will qualify for level four.

The competency of communication did not appear to correlate well with years of teaching and academic rank. This may be for a variety of reasons including the need for physician educators to have established skill sets in communication, or it may be related to self-perceived competency and difficulty on self-evaluation of competency. This may be an area that is more challenging to assess and quantify without external grading and mentorship.

While it is difficult to score accomplishments across a diverse set of faculty respondents, overall higher academic rank resulted in meeting a higher level of competency. Success in an academic career does not necessarily correlate with a level of competency achievement. The development of doctor/patient relationships, clinical skills, and the internal satisfaction gained from helping develop medical learners and heal patients are fulfilling regardless of academic promotion or career progression. Physicians will gravitate to the levels of their interest and expertise based on their personal characteristics and skills. It is for this reason that these guidelines should

Table 2: Descriptive Statistics for Between-Subjects Analyses

Area	Assistant Professor	Associate Professor	Professor	*P* Value
Patient care	3.0 (1.5)	3.0 (0.0)	4.0 (1.0)	.037
Medical knowledge	2.7 (0.8)	2.9 (0.7)	3.4 (0.5)	.008
System-based practice	2.0 (2.0)	2.5 (1.3)	4.0 (1.0)	.001
Practice-based learning and improvement	2.5 (1.0)	2.5 (0.5)	3.0 (0.9)	.001
Professionalism	3.1 (0.9)	2.8 (0.6)	3.5 (0.6)	.055
Communication	3.0 (2.0)	3.0 (0.3)	4.0 (1.0)	.620

not function as a ruler or plumb line to evaluate an individual's success or serve as an essential process in defining a productive academic career, but rather should function only as a tool for faculty development.

Limitations

We scored this rubric as a self-assessment only, possibly limiting the reliability of the data, since physicians can have difficulty with self-assessment.[7] It is difficult to ascertain the utility of this tool based on the current methods of administration. The methods could be strengthened if each faculty surveyed also submits a curriculum vitae (CV) for review by the investigators using a rubric to match achievements on the CV to the milestone model. One-on-one interviews with the faculty could allow examiners to explain the criteria to more accurately complete the milestone rubric. Further customization of the rubric may be necessary to reflect alternative tracks for career advancement, such as a primarily clinical track.

Conclusions

This rubric has been helpful in our institution, providing feedback for directing faculty development and establishing career scholarly activity goals and faculty mentorship. We have recently recruited from within our residency program,[8] and it has helped our new faculty to quickly become knowledgeable about the expectations of an academician. These milestones are general enough that other physician specialties may be able to adopt them for their needs. The next goals are to externally validate the milestones, first among departments of family medicine, and then among similar academic medical centers, and ultimately establish uniform guidance for the professional development of career physician educators. Further studies could also focus on the usefulness of this rubric to help retain faculty within academic medicine.

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