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—Building a Better System of Residency Education—

Residency Education Redesign:

The Interplay of Innovation and Standardization

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ABSTRACT: Tensions have always existed between innovation and standardization in family medicine, due to the need for rapid responses to changing health issues while ensuring proficiency. For innovation in residency training to be successful, standardization of milestones and frameworks as well as outcomes of residency education are needed and must be clear and rely on measurable effectiveness standards. Standardization without innovation can cause educational stasis, failure to adapt to change, and/or lack of evidence-guided education. Here, we examine possible options for creating the right balance, review what the evidence shows, and make recommendations for the future, including (1) adoption and study of clear, actionable entrustable professional activities (EPAs) as educational standards for residency graduates; (2) core faculty be required to engage in faculty development that includes competency-based medical education using the EPA framework, advanced curriculum development, program evaluation, objective learner assessments aligned with individualized learning plans, and increased opportunities for program directors to gain additional training in the educational sciences; (3) 30% of protected time for core faculty to design, administer, and assess the educational program; (4) required participation in educational collaboratives that rigorously study innovation; (5) required scholarly work that supports program development both clinically and educationally. Taken together, these recommendations represent a vital interplay between cutting-edge innovation and thoughtful standardization using collaboration to graduate residents ready to provide optimal care in their communities, both now and into the future. All stakeholders in the discipline must undertake strategic and deliberate planning designed to adjust direct and indirect costs of residency training to support these recommendations.

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Family medicine (FM) was created in 1969 as an innovative response to decreasing numbers of general practitioners, increasing specialization in medicine, and the need for whole-person and family care.[1] Over the years, with strong leadership from residencies, FM has continued innovating in response to community needs by adopting new therapies, such as medication-assisted treatment (MAT) and transgender health care.[2,3] The COVID-19 pandemic further underscores the need for flexibility, as family physicians quickly transitioned to virtual care, prepared for inpatient surges, and led public health initiatives.[4]

FM residency training requirements have expanded considerably from 4 to over 61 pages,[5] as have innovations in medical education, including graduate medical education milestones[6] and entrustable professional activities (EPAs).[7] While these advances are theoretically compelling, tensions have developed regarding how best to balance innovation and standardization. These tensions generate confusion among FM's specialty colleagues, employers, and the public regarding what to expect from residency graduates in practice scope and expertise across all patient populations (eg, maternity and pediatric care).[8]

Recently, the Accreditation Council of Graduate Medical Education (ACGME) fostered innovation in a number of ways, including identifying "detail" requirements that describe processes that programs may use or not. This latitude permits successful programs to innovate in certain areas.[9] Over the last decade, much has been learned from several collaborative efforts sponsored by the ACGME, FM, and other primary care specialties.[10-12] Yet, it is unclear how standardization fits into this balance.

The aim of this paper is to provide an analysis of how standardization, especially of residency outcomes, and innovation relative to educational structures, methods, measures and requirements have

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helped to advance as well as create complexities in FM, which will help chart a path into the future. We believe both are needed and are interdependent—innovation should only proceed when standardization of milestones and frameworks *as well as of the outcomes of residency training* have been clearly identified so they can contribute to the next iteration of standards. The outcomes of residency education are especially crucial because they contribute so importantly to accountability. If new residency requirements will soon emerge, now is the time to be very explicit about requirements that take advantage of the educational sciences, so residencies can redesign training toward producing an ever-improving physician prepared for the big future changes and unmet needs of their patients. By this, we do not mean to suggest that educational research should replace clinical research or quality improvement. Both are needed. Our analysis will proceed through four phases: (1) The Why, (2) Possible Options, (3) What the Evidence Shows, and (4) Recommendations.

The Why

Innovation in medical education allows for the study of improved educational approaches that contribute to the science of learning.[13] Benefits of innovation include that programs may be highly motivated to try new approaches that can help FM improve and grow. Many residents in innovative programs are freer to explore areas of interest and develop individualized curriculum.[12] Innovation can also drive collaboration among programs, even those that have historically viewed each other as competitors.[14] Innovations inherently involve some risk, as the associated outcomes, both clinically and educationally, are yet to be fully determined.

Benefits of standardized requirements include that they are known, which adds stability. Successful programs using the same curriculum would expect educational outcomes to be similar, if not the same. Residents, employers, and sponsoring institutions have a clear understanding of what to expect of respective programs' graduates. Challenges of standardization include that it can lead to program stasis with failure or delays in adapting to a changing environment. It may also drive training to resource-rich areas where meeting requirements is easier, while decreasing training in underresourced settings serving disadvantaged populations. Standardization also supports an underlying sense that training is driven by ACGME accreditation rather than patient care and communities served; however, it can also impede innovation.

In 1999, the ACGME approved six core competencies applicable to all disciplines, after which residency and fellowship programs were expected to use this framework to improve curricula and assessments.[15] Yet, implementation proved difficult as programs struggled with assessments of professionalism, practice-based learning and improvement, and systems-based practice.[16] In addition, research illustrating that standardized graduate medical education requirements produces standardized results, especially for patient outcomes, has been lacking.[17] These challenges led to AGCME's 2010 Milestones project.[18]

The Milestones represent a complex interaction between educational intervention and assessment, both of which are now part of accreditation. Though early assessments are contributing to Milestones validity,[19] more work must be done to fully realize the Milestones' impact. Shortly after ACGME Milestones development, EPAs emerged as a concept that allows faculty to make competency-based decisions regarding the level of supervision required by trainees.[7] Some disciplines, as in the case of the American Board of Pediatrics (ABP), have evaluated the integration of assessment frameworks for determining trainee readiness for independent practice. The ABP now includes core competencies along with both milestones and EPAs because their own research has shown that these fill gaps in assessment that can result when either is used alone.[20]

The current state of education and assessment for accreditation is more integrated than ever before. The competencies, subcompetencies, and milestones developed via the ACGME process are crucial for assessing residents as they progress through their training and represent further standardization.[21] With these measures firmly in place, programs can demonstrate success or failure of innovations tied to explicit outcomes rather than being based on faculty and resident perceptions. Nevertheless, clinical time and residency administrative work can be overwhelming, and staying up to date with existing literature on Milestones and EPAs is challenging. It may be that the balance between standardization and innovation will depend on faculty development; however, what this should include is uncertain. At the specialty level, the role of collaboratives has been shown to be important for implementing and assessing innovation in meaningful ways.[21] Methods for increasing program involvement in such collaboratives are untested at the program level.

Possible Options

What possible options would advance the balance between innovation and standardization? We believe the following are likely to be most impactful: (1) expanding and studying the scope of requirements, (2) adding skill-based rather than time-based faculty requirements, (3) further altering scholarly activities requirements, and (4) requiring participation in multisite collaboratives that include rigorous assessment designs.

Expanding and Studying the Scope of the ACGME Review Committee for Family Medicine Requirements

Current graduate medical education requirements focus primarily on resident experiences, as measured by episodes of care/procedures or time spent in particular settings.[5] As mentioned earlier, competence is primarily assessed through the six ACGME core competencies,[15] and FM has 19 subcompetencies and associated milestones. At present, the evidence supporting these is weak.[22] Preparing residents for independent practice may mean expanding the scope of these requirements to include EPAs, as the American Board of Pediatrics has done. As part of the Family Medicine for America's Health initiative, a task force was created to develop a list of 20 EPAs for the end of family medicine residency training.[23] Ongoing studies of both milestones and EPAs will continue to be needed to advance their development and generate the evidence needed to guide their application.

The benefit of adding EPAs includes the clearer descriptions of what it means to do the work of a family physician. Subcompetencies and milestones describe some of the skills needed but don't describe whether a resident can combine all patient care skills together and were never meant to be assessment tools.[7,24] In addition, the concept of entrustment is more clearly understood by faculty members or specialists working with residents. By making EPA entrustment decisions, faculty are implicitly making competency decisions on subcompetencies and milestones.[25] Though actionable EPAs have been described by pediatrics[26] and Canadian family physicians,[27] not all of FM's current EPAs are as actionable as they need to be in the United States. Revised EPAs that are built into the current competency-based assessment framework, rather than created separately, could facilitate curriculum refinement as well as resident evaluation. The benefit would be that the work of family physicians' and residents' development toward that work are well described and universally understood.[28]

Adding Skill-based Rather Than Time-based Faculty Development Requirements

Programs are required to designate core faculty members who are specifically tasked with devoting a significant portion of their overall full-time equivalent (FTE) to education, administration, teaching, evaluation, scholarship, and provision of formative feedback to residents. Currently, programs are required to have a core faculty, and the faculty development requirements are time-based rather than skill-based. As such, the assessments of faculty development programs should be much more robust and be based on continuous quality improvement principles to ensure continuous assessments result in a truly improved faculty. Core program faculty could benefit from training in leadership, change management, instructional design as well as program evaluation, and learner assessment. The National Institute for Program Director Development Fellowship program of the Association of Family Medicine Residency Directors covers several of these topics, but is not required of residency program directors. In addition, program directors could benefit more from additional training in educational sciences, such as attaining a master of science in education (MSEd), which would provide invaluable training in educational research designs, instrument development, testing, and mixed-methods approaches to analyses. If this is not possible, every residency should have someone with educational research training on the team, similar to the behavioral health requirement. At the very least, programs should have access to educational experts in instructional and assessment designs. This could occur through membership in a consortium where such expertise is available to enrolled members.

Altering Scholarly Activities Requirements

Initially, scholarly activities requirements were quite broad in FM, and as a result, residents and faculty sought opportunities elsewhere in their departments to meet these requirements, such as working with research faculty on their clinical areas of expertise. In July 2019, these requirements changed such that scholarly activities were to focus on the program rather than individual interests of faculty. While this is a positive change, more is needed to ensure that faculty and residents tackle topics that advance residency training. More research is needed on resident learning curve development and factors that may predict the need to expand the length of training according to learner development. For such research to be meaningful, there must be flexibility in accreditation standards, such as would occur if a prediction model was developed and validated that could show that additional training may be needed for residents who have certain characteristics. For example, flexibility should be allowed for those having children during residency in FM, a discipline that values families so highly.

Requiring Participation in Multisite Collaboratives

Conducting innovative research in residency training is not generalizable if done in a single program. Thus, requirements could include offering ACGME innovation waivers as part of multisite vetted study protocols designed to answer specific questions in FM training. Examples of successful collaboratives include I3, P4, the Colorado Collaborative, and the Length of Training Pilot, which is still underway. Collectively, these efforts have involved important assessments of innovations

that, in at least one case (I3) included patient outcomes. Partnering in this way would allow for more rigorous study designs, including randomized crossover or prospective case control designs. Establishing such an endeavor would exponentially advance educational science in graduate medical education. Additional requirements would include reporting outcomes back to the ACGME Review Committee for Family Medicine (RC-FM), presenting at national and international meetings and publishing in peer-reviewed journals.

What the Evidence Shows

Expanding and Studying the Scope of RC-FM Requirements

Competency-based medical education (CBME) has been implemented across many specialties and countries over the past several years. The ACGME started this process first with the six core competencies and then with more specific subcompetencies and milestones with the adoption of the Next Accreditation System (NAS) in 2013.[29] At present, the evidence supporting these measures is weak, with one systematic review revealing a lack of evidence that these competencies can be independently measured.[22] This systematic review also found that systems-based practice as well as practice-based learning and improvement are properties of systems rather than of individual trainees.[22] As a program director, the opportunities to fully understand the concept of CBME includes discussion of EPAs,[27] which were foreign concepts at the time the NAS was proposed. How the components of CBME relate to one another was similarly unclear. The ACGME chose to recognize that EPAs could be useful but that the focus, initially, would be at the competency, subcompetency, and milestone levels.

Among the many assumptions made is that the skills of being a physician can be described adequately with competencies, subcompetencies, and milestones. Another is that the same CBME process can be as useful for complex interpersonal interactions (eg, family conferences, breaking bad news) as for technical skills, such as clinical procedures.[30] As an educational model, most of the evidence generated has addressed the development of CBME components, but little has tested these assumptions.[29] While the evidence supporting EPAs as an evaluation model is similarly slim, EPAs do have the advantage of describing complete physician tasks rather than just their components.[31] In spite of the fact that the ACGME currently only requires milestone reporting, there is increasing interest in further work on developing EPAs.[30]

Adding Skill-Based Rather Than Time-Based Faculty Requirements

Faculty development is clearly important for physicians transitioning from solely providing patient care into the role of educator.[32] This is especially true for assessment skills. A review of educational research in family medicine noted that studies tended to be quantitative, suggesting that faculty were not well trained in qualitative study design.[33] These authors also found a large percentage of quantitative and qualitative studies for which no specific methodology was available.[33] A more recent review showed that faculty development programs often do not undertake rigorous assessments of faculty educator outcomes.[34] Emergency medicine has shown that, in addition to the complexity and scope required of faculty skills, attention to faculty development can and should include robust, measurable outcomes.[35]

Altering Scholarly Activities Requirements

Ideally, resident participation in scholarly activities would promote the practice of evidence-based medicine, critical thinking, quality patient care, and provide lifelong learning skills.[36] The ACGME requires scholarly activities of both residents and faculty,[36] but until 2019, these requirements were clinically focused, such as organized clinical discussion on rounds, journal clubs or understanding the basic principles on how to conduct research, evaluate its quality, explain it to patients and apply it to patient care.[36] In July 2019, the scholarly requirements for faculty changed by adding innovations in education to the list of scholarly activities. Missing from this list was scholarship in curriculum development and assessment, which would be necessary for educational development of residency training as well as the ongoing clinical development of master adaptive learners, whose development of self-regulation fosters the use of adaptive expertise in medicine.[37]

Unlike evidence-based medicine, evidence-based or evidence-guided medical education has been slow to evolve. This may be due in part to the fact that studying a single program does not produce generalizable new knowledge, that learners perceive educational innovations as risky and shun participation, and lastly, that there is limited funding to support educational research.

Requiring Participation in Multisite Collaboratives

Multisite educational research collaboratives have successfully fostered innovation while also including robust evaluations.[12, 38] A multisite study conducted by the Association of Pediatric Program Directors Longitudinal Educational Assessment Research Network[26] examined learning curves using EPAs among 1,987 pediatric residents. This is an excellent example of an impactful study in that the investigators found that at least 90% of trainees achieved levels of unsupervised practice for *only eight of 17* EPAs required by the end of residency. This suggests that gaps exist between readiness

for independent clinical practice and current practice standards for general pediatrics, a finding that needs to be addressed with further study.

Educational research collaboratives could foster research that can inform training and standards. Many initiatives have shown that residencies not only survive significant innovations, but also actually thrive while doing it.[12] A paper by Schwartz et al, published in 2016, identified 15 Medical education practice-based research networks across the United States.[39] Though several publications have shown that existing networks are not necessarily needed for successful collaboration,[40] innovation within collaboratives would expand the generalizability of findings, allow many programs to benefit, and assist with scholarly activities for both residents and core residency faculty.

Recommendations and Rationale

The opportunity to revise residency requirements should include a change in their focus. Current requirements concentrate on resident development, training setting, and clinical learning environment. It is time to pivot to requirements that focus not just on current state, but also set a solid foundation for future excellence. Toward this end, we recommend that:

1. Adoption and study of clear and actionable EPAs as educational standards for residency graduates. Doing this will foster clearer communication to students, residents, faculty, employers and patients regarding exactly what it means to be a family physician. The EPAs must explicitly align with competencies, subcompetencies, and milestones that have already been developed. A clear definition of measurable outcomes is required for evaluation of any standards or innovation. Importantly, EPAs are the appropriate way to describe those skills which differentiate family physicians from other primary care providers.
2. Core faculty be required to engage in faculty development that includes training on competency-based medical education using the EPA framework, advanced curriculum development, program evaluation, objective learner assessments that align with individualized learning plans. Participation in formal faculty development programs must be required of all new core faculty members. We believe that to achieve this goal faculty will need to devote a minimum of 80 hours to this development, and that such programs should be required to include robust assessments and continuous improvement principles to ensure they are actually developing faculty skills. In addition, increased opportunities are needed to support program directors attainment of training in educational sciences.
3. Core faculty must have a minimum of 30% of their time available for program enhancements, administration, evaluation, resident assessment, and scholarly activities.
4. Require participation in educational collaboratives that rigorously study innovation. Examples of learning collaboratives could be geography-based, such as WWAMI (Washington, Wyoming, Alaska, Montana and Idaho Collaborative) or I3, or educational intervention-based initiatives, such as the Length of Training Pilot, Clinic First, or the American Medical Association's Reimaging Residency initiative. Through these collaboratives, programs would have access to educational experts to assist with instructional design and evaluation. Each collaborative must be engaged in the study of at least one educational innovation using rigorous study designs and evaluation methods.
5. Scholarly activities of residents and faculty support the educational development of residency training via ongoing educational improvement and research projects as well as ongoing clinical development of residents as master adaptive learners.[37]

Summary Thoughts

We believe both standardization and innovation are necessary for the discipline to advance. When programs innovate and evaluate their educational outcomes to find better ways to teach, this leads to future standardization based upon the evidence, and then further innovations can occur. Standards are required if innovation is to have meaning. Innovation is required if standards are to adapt to a changing healthcare landscape. These recommendations are not independent but describe a bold and active approach for continuous reinvigoration of the specialty. The specialty needs a clear statement of what family physicians do. EPAs are a way to achieve this without devolving into a list of conditions to be treated. If there are specific skills that set family physicians apart, we should be able to describe them in actionable ways, eg, what does it mean that a resident or family physician engages in continuity? Second, we need well-trained faculty members who can skillfully create and assess innovations in residency. Such innovations can include didactic curriculum, clinical setting, and the very structure of residency. Third, collaboration is essential if we are to understand the effects of innovation in any meaningful, reproducible way. Fourth, these robust results must then inform future standards for residency education requirements.

Virtually all of the above recommendations will have associated costs. Residency training has long been underresourced, and the federal GME fund flow lacks transparency

and accountability.[40] Being involved in innovation requires faculty time for development, implementation, as well as study/evaluation. The return on investment for the faculty time will be the evolution of residency training that ensures residency graduates are ready to provide the best in contemporary care. Many have called for revisions to GME training funding mechanisms, yet change has not occurred. It is infeasible to add residency requirements without providing resources needed to ensure they are met. These resources represent an investment in the future health of the US population. Residency training support should diversify in ways that engage primary stakeholders, including the federal government (Medicare/Health Resources and Services Administration), health systems/other employer groups and relevant foundations. All stakeholders in the discipline must be included in strategic/deliberate planning to address direct/indirect costs of residency training.

Implementing these recommendations, which represent a vital interplay of thoughtful innovation through broad collaboration toward evidence-guided standardization will help to ensure FM residency-trained graduates are ready to provide the best, most up-to-date care to their patients and communities now and into the future.

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COMMENTARY

—Building a Better System of Residency Education—

Milestones in Family Medicine:
Lessons for the Specialty

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As we embark on the next iteration of our Accreditation Council for Graduate Medical Education (ACGME) specialty requirements, striking a balance between standardization and innovation is key for the future of family medicine and how we, as program directors, prepare our residents to serve our communities. The national data we collect through the Milestones assessment of residents will be essential in charting that path.

With the introduction of the ACGME Outcomes Project in 2001, we began to focus the assessment of residents and residency curriculum on six established, standard competencies. These initial efforts to move away from proxy measures of competency such as time-based curriculum, numbers of procedures, and counting patient encounters were difficult, especially in family medicine. The changes in assessment required us to identify opportunities for multisource feedback. These tools include direct observation, quality and safety data, incorporation of patient experience, and traditional examinations. All of these required an appreciation of the differences in individual learner trajectory toward graduation and board certification. With many family medicine programs based in community settings we are often faced with limited academic infrastructure, faculty development support, and scant protected time for thoughtful interaction with learners. Collectively, we sought a framework with greater specificity to guide our assessments.

In 2014, the Family Medicine Milestones 1.0 were introduced.[1] This tool was designed by an expert panel of family medicine educators with major input from the ACGME Family Medicine Review Committee and the American Board of Family Medicine. At the outset, program directors adopted this tool as a mechanism to improve residency program curriculum as reflected by the performance of individual residents over the course of their training. The Milestones were also designed to facilitate resident professional development through both curriculum and formative assessment.

With the introduction of the Next Accreditation System, the Clinical Competency Committee (CCC), and the 2015 ACGME Requirements for Family Medicine, the call for renewed focus on competency-based medical education shifted our use of Milestones data from primarily program assessment to also include individual resident assessment as a product of the curriculum. As depicted in Figure 1, multisource feedback and input from the CCC results in continuous improvement for both individual residents and the program measured against an objective set of standards.

Recognizing that the consequences of an assessment affect how an assessment is used, the Milestones were deliberately intended to be low stakes. As a formative assessment of the individual program, family medicine program directors took their responsibility seriously, avoiding halo assessment, leniency error, and straight-line assessments of residents as evidenced by early national trends in family

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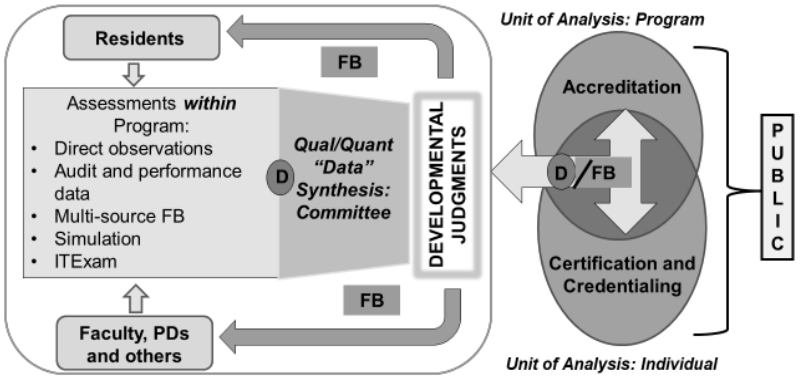
Figure 1: The GME Assessment System



Abbreviations: FB, feedback; D, data; Qual, qualitative; Quant, quantitative; PDs, program directors; IT, in-training.

medicine reporting to the ACGME.[2] For our specialty, this is a cause for celebration. We recognize that milestones do not measure the latent ability of the individual residents and appropriately use the full range of developmental scale options.[3]

Milestones are recorded by all program directors on every resident, representing an unprecedented opportunity to examine our national system of graduate medical education and its outcomes in a longitudinal way. Aggregate Milestones 1.0 data from 2017-2019, the first full cohort of residency graduates, demonstrates that family medicine program directors report the full range of performance on each of the 22 milestones, underscoring our thoughtful reporting and the usefulness of the data. Granted, the system is evolving, but it has improved our ability to look at competencies beyond medical knowledge and patient care in a deliberate manner. The data collected represent a unique, national resource and are available online at https://www.acgme.org/What-We-Do/Accreditation/Milestones/Resources.

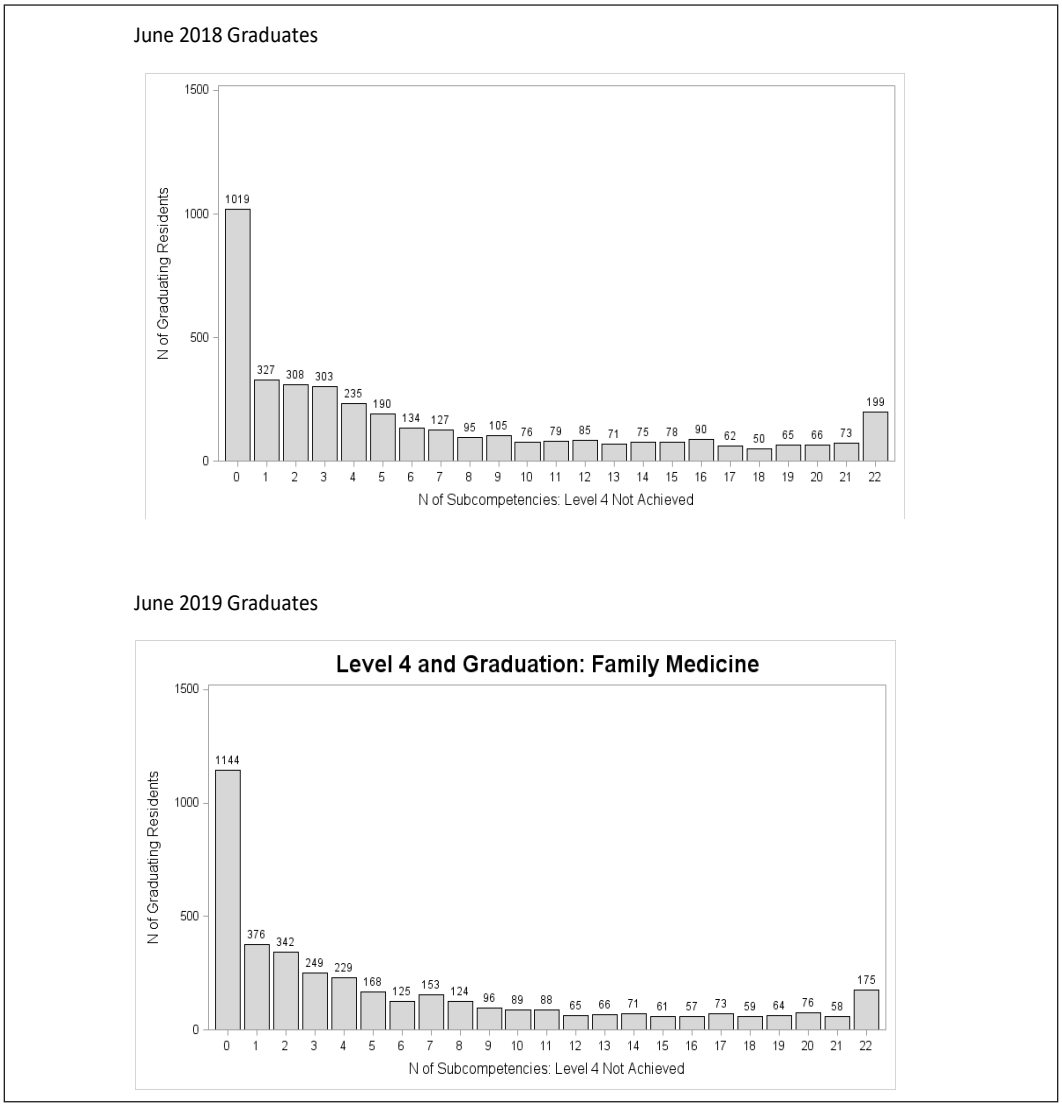
So what have we learned? In 2019, of the 4,008 PGY-3 family medicine residents, 1,144 (28.5%) achieved a level 4 in all 22 of the Milestones. This level represents the recommended graduation target as roughly correlated with proficiency in the Dreyfus model and readiness for unsupervised practice. At the other end of the spectrum, 175 (4.3%) of the PGY-3 residents in 2019 did not reach a level 4 on *any* of the 22 milestones, and approximately 20% did not reach level 4 on half or more of the 22 milestones (Figure 2). Nationally, we reported a below-mean rating on SBP-1 "Provides Cost-Conscious Medical Care," SBP-3 "Advocates for Individual and Community Health," and PBLI-3 "Improves Systems in Which the Physician Provides Care," all of which are fundamental components of family medicine.[4]

What does this mean? Did these residents train in programs that were simply more stringent in their ratings? Did programs struggle with curriculum and effective assessments in key Milestones, especially in the domains of system-based practice and practice-based learning? What happened to these graduates once they entered practice? As the discipline begins to implement Milestones 2.0, family medicine has an opportunity to explore these questions, and more importantly, the outcomes of its graduates from 2017 to 2019.

During the recent pandemic, we have experienced upheaval of our planned educational experiences and traditional assessment tools. We have also acknowledged the implicit and explicit biases in our society and are wrestling with changes to our systems that have been deferred for far too long. For at least the next few years, program directors will be unable to rely on our traditional metrics for ascertaining resident competence to practice independently. We have reached a critical juncture in needing reliable ways to define minimum expectations based on competency, not scheduled rotations or numbers of procedures. The importance of competency-based medical education and processes for meaningful assessment have been accelerated. Whether the Milestones data have meaning and validity is unclear, but we must avoid the tendency to disregard imperfect data.

If we assume that Milestones measure essential expectations of family medicine residency training and that they are reported accurately, we must answer some critical

Figure 2: Distribution of Residents Not Achieving Level 4 by Number of Subcompetencies at Presumed Time of Graduation



questions. We cannot be willing to accept that nearly 72% of our graduates are leaving our programs with at least one subcompetency below that recommended for unsupervised practice. Even more critical is that we continue to graduate family physicians who meet none of the recommended subcompetencies. Establishing an acceptable floor for individual residents is essential to program standardization. Do these findings reflect the competency of individual residents or the adequacy of our training programs? Family medicine has been expanding at one of the most rapid rates in our history and of all medical specialties to meet the nation's primary care needs. We must ensure that our expansion has not been too fast to ensure competence of our graduates. Assurance of competence should accompany any latitude to innovate.

Milestones 2.0 arose as an expansion of the original process, including a call for volunteers, adding resident members and a public member. The new version revisited appropriate standards of performance and includes a detailed supplemental guide. The tool then underwent substantial public comment before implementation in July 2020. These revised measures may more accurately reflect our expectations of our curriculum and, as a result, will improve resident attainment of recommended competencies. Our individual CCCs and Program Evaluation Committees should use these data to revise our curriculum through an iterative, continuous improvement process to

ensure that each resident has an opportunity to reach their potential. We must be willing to hold programs accountable to our shared standards. Finally, we must continue to advocate for adequate protected faculty time and development to allow for thoughtful assessment of residents and evaluation and improvement of our programs. Our ability to innovate hinges on our assurance that residents meet a minimum standard of performance.

To fulfill our commitment to society to deliver what we say a family physician is and can do, we must continue to study the data we are collecting and leverage our findings to individually and collectively improve family medicine residency education.

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COMMENTARY

—Building a Better System of Residency Education—

Using the Family Medicine National Graduate Survey to Improve Residency Education by Monitoring Training Outcomes

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What Is the Graduate Survey?

Family medicine program requirements have required residencies to survey their graduates to assess outcomes. Prior to 2016, these surveys were typically institutional or regional, lacked comparable data, and had low response rates. The Family Medicine National Graduate Survey (Graduate Survey) was developed by the Association of Family Medicine Residency Directors (AFMRD) and the American Board of Family Medicine (ABFM) to provide programs more consistent, reliable feedback from their early-career graduates. The goal of the Graduate Survey is to provide programs with useful feedback and increase the specialty's capacity to improve preparation for practice.[1] The process of creating the survey has been previously published.[2]

Beginning in 2016, the Graduate Survey has been administered to ABFM diplomates 3 years after residency graduation via their online ABFM physician portfolio. Once data are collected, they are aggregated at the program level and shared with residencies, along with national comparison data, via each residency's ABFM Resident Training Management portal. To protect diplomate confidentiality, residencies are only provided program-specific data if three or more graduates completed the survey. National-level reports are available on the ABFM website.[3] An AFMRD/ABFM oversight committee has met annually to review survey performance and monitor content for currency and continued relevance. The conduct of the survey is primarily for programmatic evaluation and was deemed to not require institutional review board review; however, use of the data secondarily for research has received institutional review board approval. Researchers may request deidentified data from the ABFM, subject to review.

Results

From 2016 to 2019, the response rate has been 66.7% to 73.6% (Table 1). The number of programs with eligible graduates has increased from 439 to 460, with 85.2% to 90.9% of programs receiving a program specific report on their graduates each year. Nearly two-thirds of programs with eligible graduates in all 4 years received four reports (Table 2). An additional 20.9% received three reports, 12.3% received one or two reports, leaving only seven programs (1.5%) that have yet to receive a program-specific report.

In each year, nonrespondents were more likely to be DOs, international medical graduates, and male, but these differences have been minimal and not statistically significant (Table 3). However, international medical graduates have increasingly not responded to the survey, which may further limit residency reports for programs with high numbers of such trainees.

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Table 1: Response Rates and Number of Programs Receiving Program Specific Reports Each Year

Year	Response Rate	Programs With Eligible Graduates	Programs Receiving Specific Reports	Percent of Programs Receiving Specific Reports
2016	67.8%	439	376	85.6%
2017	66.7%	441	376	85.2%
2018	67.8%	457	394	86.2%
2019	73.6%	460	418	90.9%

Table 2: Number of Reports Generated per Program

First Year With Eligible Graduates	Number of Residencies	Number of Residency-Specific Reports				
		0	1	2	3	4
2016	437	2 (0.5%)	13 (3.0%)	26 (5.9%)	96 (22.0%)	300 (68.6%)
2017	1	1 (100%)	0	0	0	0
2018	10	0	4 (40%)	6 (60%)	0	0
2019	12	4 (33.3%)	8 (66.7%)	0	0	0
Total	460	7 (1.5%)	25 (5.4%)	32 (6.9%)	96 (20.9%)	300 (65.2%)

Table 3: Characteristics of Respondents vs Nonrespondents for the 2016 to 2019 National Family Medicine Graduate Survey

	Respondent	Nonrespondent	*P* Value
2016	(N=2,069)	(N=994)	
Mean age in years	36.1	36.4	.06
MD	1,767 (85.4%)	828 (83.3%)	.13
Female gender	1,169 (56.5%)	528 (53.1%)	.08
International medical graduate	762 (36.8%)	398 (40.0%)	.09
2017	(N=2,159)	(N=1,077)	
Mean age in years	36.4	36.6	.06
MD	1,807 (83.9)	901 (83.7)	.89
Female gender	1,193 (55.4)	560 (52.0)	.07
International medical graduate	739 (34.3)	407 (37.8)	.05
2018	(N=2,255)	(N=1,072)	
Mean age in years	35.8	36.0	.29
MD	1,823 (80.8%)	855 (79.8%)	.46
Female gender	1,301 (57.7%)	606 (56.5%)	.53
International medical graduate	713 (31.6%)	427 (39.8%)	<.0001
2019	(N=2,511)	(N=900)	
Mean age in years (SD)	35.6	36.2	<.001
MD	1,994 (79.4%)	731 (81.2%)	.24
Female gender	1,391 (55.4%)	485 (53.9%)	.44
International medical graduate	793 (31.6%)	358 (39.8%)	<.001

Research studies using data from the Graduate Survey have shown a large gap between practice and preparation[4] with further variation between academic- and community-based programs.[5] Other studies using the data have shown lower odds of burnout with broader scope of practice,[6] state-level variation in burnout,[7] associations between residency training and buprenorphine prescribing,[8] barriers to practicing obstetrics,[9] provision of contraceptive services and abortion care,[10,11] and participation in loan repayment programs.[12]

Possible Uses and the Future

With multiple years of data, residencies have the capability to identify persistent gaps in their curricula and make changes. These data may also inform training outcomes on a larger scale by connecting with other data sources to investigate associations between program characteristics, self-assessed preparation for practice, quality and claims-based outcomes, and success on continuous certification.[13,14] Longitudinal analyses have the potential to improve individual program and physician performance. For example, early family medicine Milestones data found that a relatively lower proportion of family medicine residents graduate at level 4 (ie, proficiency) in the systems-based practice Milestone 3 (advocates for individual and community health) than others.[15] Examining this finding in the context of what graduates are actually doing in practice may help inform curriculum changes and assessment around a particular subcompetency and Milestone.

Feedback to residencies could be enhanced with even more data. The ABFM collects practice intentions and satisfaction with training when residents register for their initial certification examination.[16] Aggregate reports of these data could be made available to programs to monitor intentions and practice. The ABFM collects other data later in a diplomate's career which could also be fed to residences to track outcomes even farther from graduation. Medicare claims data may offer a window into practice by providing data on all graduates on comprehensiveness, continuity, costs of care, and low-value care.

Data from the Graduate Survey could also be repackaged to meet the needs of other stakeholders, while still respecting respondent confidentiality. State-based organizations such as academies of family medicine often advocate for graduate medical education (GME) training expansion and practice incentive programs, and graduate survey data on how many graduates remained in state, worked in underserved settings, or provide care in specific areas may provide the outcomes data needed to further those efforts.[17] If residencies were willing to be identified, summary data could be used for improvement efforts on outcomes between programs with disparate outcomes. Medical students could use data to guide their residency selection by seeing which programs produce graduates with the practice they desire.

Using data from the survey, each residency can determine if it is meeting its mission and goals. For residencies with a mission to produce physicians for underserved areas or populations, practice addresses are geocoded and linked to rural status and practice in a Health Professional Shortage Area. Residencies with strong procedural or obstetrics focus can also track if their graduates are applying these skills in practice.

While the Graduate Survey has provided data to residencies to improve residency education, there are limitations to the methodology. First, since the ABFM administers the survey to its diplomates, recent graduates who either certify with other boards or do not certify are not included. This issue will be exacerbated with the single accreditation system and large numbers of programs whose graduates may largely certify with the American Osteopathic Board of Family Physicians (AOBFP). Collaboration with the AOBFP on combined delivery of a survey to their diplomates would enhance the utility of the survey. Second, in order to protect respondent confidentiality, three or more graduates must respond for a program to receive a report. The ABFM is working on a dashboard that would allow pooling of data over years to ensure all programs get reports. Finally, the content of the survey is broad to ensure generalizability, but may lack detail specific to some residencies' mission and needs.

In conclusion, the Graduate Survey provides a model for partnership of certifying boards and the GME community to create meaningful measures and feedback to residencies.[13] Data from the survey has the potential to improve residency education, track trends in the delivery of care by early-career family physicians, and promote social accountability of GME funds.

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