Medical Student Teaching and Recruiting: 50 Years of Balancing Two Educational Aims
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BACKGROUND: Family medicine (FM) undergraduate medical educators have had two distinct missions, to increase the knowledge, skills, and attitudes of all students while also striving to attract students to the field of family medicine. A five decade literature search was conducted gathering FM curricular innovations and the parallel trends in FM medical student interest. Student interest in FM had a rapid first-decade rise to 14%, a second 1990's surge, followed by a drop to the current plateau of 8–9%. This falls far short of the 30–50% generalist benchmark needed to fill the country's health care needs. Curricular innovations fall into three periods: Charismatic Leaders & Clinical Exposures (1965–1978), Creation of Clerkships of FM (1979–1998) and Curricular Innovations (1998–present). There is good evidence that having a required third-year clerkship positively impacts student interest in the field, however there is little research regarding the recruitment impact of specific clerkship curricula. Other tools associated with student interest include programming geared towards primary care or rural training and extracurricular opportunities such as FM Interest Groups. Strategic plans to improve the primary care work force should focus funding and legislative efforts on effective methods such as: establishing and maintaining FM clerkships, admitting students with rural and underserved backgrounds or primary care interest, developing longitudinal primary care tracks, and supporting extracurricular FM activities. Rigorous research is needed to assess how best to utilize limited educational resources to ensure that all students graduate with a core set of FM competence as well as an increased FM matriculation.

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From the founding of the Society of Teachers of Family Medicine (STFM) in 1967, leaders in family medicine (FM) have consistently recognized the importance of medical student education. Initial FM Undergraduate Medical Education (UME) work focused on introducing and showcasing FM to students and schools—particularly highlighting early clinical exposure and the uniqueness of comprehensive care within ambulatory-based settings in or near academic medical centers. As the specialty has matured, the focus has shifted beyond mere exposure to the field and on to full curricular parity with other disciplines. The discipline successfully pushed to establish FM clerkships as a required part of the educational experience for all medical students, and FM educators progressively assumed educational leadership positions.

This paper provides a synthesis of the major FM UME work of the past five decades in tandem with medical student interest in the field during this period. To inform our analysis, our team, including a medical librarian, performed a literature search in Medline for articles that examined the relationship between undergraduate medical education, curriculum interventions, and medical students’ choice of specialization in residency and beyond. While this review was not intended to explore every aspect of career choice, it provides a context for our findings and our discussion in this paper. Our findings highlight curricular changes designed to achieve the dual mission of teaching all medical students and recruiting more students into FM. We conclude with the implications of this analysis on the future of FM UME.

FM has always had two distinct missions in UME: (1) to generate a greater number of high-quality family physicians and, (2) to prepare all students with a set of core knowledge, skills and attitudes. These missions can at times conflict with one another. If one seeks only to entice
students to choose FM, then parts of the core content that are less attractive to learners may be avoided. On the other hand, if a curriculum seeks to teach all students core content, limited resources may preclude individualized attention that may assist with the recruitment or retention of students interested in the field.

Because both missions serve the public good, FM educators have sought to balance curriculum emphasis between the two since the founding of the discipline. A core level of competence in FM is important for every graduate regardless of specialty, as patients are best served when every physician has a solid understanding of basic clinical concerns and the unique role of FM (and primary care) within the health care system. Retaining and increasing interest in FM is critical given the state of the US primary care workforce. With the implementation of the Affordable Care Act, the number of patients seeking care is rapidly growing. Simultaneously, an emphasis on value-based care is shifting care to ambulatory settings. As a result, there is a rapidly rising demand for primary care physicians (PCPs) in community-based settings. Concurrently, the supply of primary care physicians is shrinking. Seventy-three percent of those entering the workforce before 2000 were graduates of US allopathic schools and after 2000, this shrank to 46.1%. This decrease in interest among US graduates has been partially compensated by an increase in international graduates entering residencies. More than one-third entering the workforce after 2000 are international graduates compared to 13% prior to 2000. The PCP workforce is aging, further threatening the supply. Near-retirement PCPs (age 56 or older) constitute 25.5% of the urban versus 27.5% of the rural workforce.

As a result of this convergence of increase in demand and fall in supply, the Health Resources and Services Administration, the Graham Center, and others predict a significant shortage of physicians in the generalist specialties. The increasing emphasis on population health further underscores the ongoing challenge of ensuring appropriate support for both missions. While all students need to understand the core principles of FM to develop an effective population health approach to care, the shift toward stewardship of a population’s health requires an even stronger primary care workforce. As FM has a long history of striving to achieve both missions simultaneously, reflection on our past work will help guide our future efforts in medical education.

**Student Interest in Family Medicine**

Student interest in FM has varied considerably since the creation of the first 15 residencies in 1968 but has never come close to achieving the 30-50% generalist benchmark recommended by many workforce experts. The first decade was a period of explosive growth, and by 197 14% of US MD seniors were choosing FM training at 364 residency programs. During this time, the specialty was “enjoying considerable public support and remarkable student enthusiasm.” For almost four decades, statistics about students entering FM residencies have been analyzed annually for trends in numbers, regions, and school administrative structure. As can be seen in Figure 1, the percentage of US MD seniors entering FM has shown five distinct trends over time: (1) the aforementioned explosive growth in the first decade to 14%, (2) a 15-year period of slight but persistent decline to just under 11%, (3) a six-year period of rapid rise to almost 17%, (4) a fall over the next 10 years to a new low just under 8%, and (5) the period where it has remained essentially constant between 8.9% for more than a dozen years.

Various interpretations have sought to explain these trends and our inability to attract the number of students into FM to best serve our health care system. Likely associated factors include features of the clinical healthcare delivery system as well as the undergraduate and graduate medical education systems (UME and GME). Salaries in the subspecialties have outpaced those in primary care and work-life balance is perceived by many students to be better in subspecialties. GME during this time period has had disproportionate growth of positions in subspecialties relative to primary care specialties. The hidden curriculum of medical schools likely plays a role, and primary care has faced a longstanding culture of hostility at academic medical centers. Lastly, preparedness for practice may play a role, recent data looking at the American Board of Family Medicine (ABFM) In-Training Exam taken by graduates of US and Canadian UME programs upon entry to FM GME training showed the Canadian graduates outperformed those from the United States.

A question fundamental to the relationship between student interest in FM and the role that UME can play is whether students are predestined for FM, or if they are enticed during their educational process. Students who indicate at matriculation that they intend to pursue careers in FM are three times more likely to do so with about 30% retaining FM at graduation. However, 69% of students who at graduation planned to practice FM came in either undecided or interested in a different specialty. This supports the notion that students interested in FM at matriculation are more likely to go into FM, but that the majority of students who go into FM are recruited during their UME experience. This highlights the need for focusing on curricular changes that can increase student interest in FM, while also enhancing the broader education of medical students.

Over the years, FM educators have had a substantial influence on the curricula in medical schools and often provide a counterbalance to the rapid shifts in the health-care market. We next examine the
contributions of FM to undergraduate medical education (UME) and explore the links between FM curricular innovations and specialty choice.

**Curricular Innovations to Undergraduate Medical Education**

**Charismatic Leaders and Clinical Exposure (1965–1978)**

UME in FM has evolved greatly since 1965 when Lynn Carmichael described the logistics and objectives of a clinical rotation in family practice. Objectives included introducing the concept of FM to the medical school; encouraging students to acquire the requisite knowledge, understanding, and skills of FM; and developing students’ positive appreciation for FM’s comprehensiveness, humanitarianism, responsibility for patients, and intellectual requirements. The quest for existence in the UME curriculum began before the specialty was formally recognized. In 1967, a founding objective of STFM was to, “Aid in the development of training programs in FM at all levels of medical education.” It was bold intellectual generalists and leaders from other fields advocating for generalist training that blazed the trails of academic FM. Among these pioneers were charismatic leaders such as Nicholas Pisacano, the first chair of the ABFM, Theodore Phillips, chair of the University of Washington Department of FM, Gayle Stevens, who articulated the philosophical basis of the specialty, Edmund Pellegrino, founder of the Pellegrino Institute of Biomedical Ethics at Georgetown, Robert Hagerty, the founding medical director of the Family Health Care Program at Harvard, Joel Alpert, strong supporter of the importance of primary care education, and Ward Darley, the president and dean of the University of Colorado School of Medicine.

Despite these efforts, FM UME was slow to gain influence within medical school curricula. The contact FM educators had with students to acquire the requisite knowledge, understanding, and skills of FM, and developing students’ positive appreciation for FM’s comprehensiveness, humanitarianism, responsibility for patients, and intellectual requirements. The quest for existence in the UME curriculum began before the specialty was formally recognized. In 1967, a founding objective of STFM was to, “Aid in the development of training programs in FM at all levels of medical education.” It was bold intellectual generalists and leaders from other fields advocating for generalist training that blazed the trails of academic FM. Among these pioneers were charismatic leaders such as Nicholas Pisacano, the first chair of the ABFM, Theodore Phillips, chair of the University of Washington Department of FM, Gayle Stevens, who articulated the philosophical basis of the specialty, Edmund Pellegrino, founder of the Pellegrino Institute of Biomedical Ethics at Georgetown, Robert Hagerty, the founding medical director of the Family Health Care Program at Harvard, Joel Alpert, strong supporter of the importance of primary care education, and Ward Darley, the president and dean of the University of Colorado School of Medicine.

While impact studies on specific interventions are lacking from this period, the unprecedented growth in student interest in FM and rapid growth in FM GME programs speaks to their success.

**Creation of Clerkships of Family Medicine (1979–1998)**

In 1979 a working party was established, which led to the publication in 1981 of “Predoctoral Education in Family Medicine.” As FM faculty members dedicated to UME grew, and contact with educators in other specialties increased, FM faculty began the long journey seeking to be an equal partner in the curriculum. As most students choose or solidify their specialty choice during the clinical years of medical school, faculty early on determined that a critical step toward parity was the establishment of FM clerkships.

Incorporating a FM clerkship into the curriculum required support of curriculum committees and educators in other disciplines. These
In addition to recognizing the substantial contribution to the rise in interest in FM, other factors played a role in the development of FM clerkships. An in-depth overview of the first 30 years of general FM curricular development has been described previously. The manuscript “Predoctoral Education in Family Medicine” was followed in 1990 by the companion piece “Teaching Family Medicine in Medical School” and the formation of the STFM working committee to Develop Curricular Guidelines for a Third-year Clerkship.

Other changes in the health care system, most notably the growth of managed care, likely made a substantial contribution to the rise in interest in FM. Nevertheless, it has been well documented that schools with required third-year FM clerkships have more success producing FM-bound graduates compared to schools without FM clerkships. In the mid-90s, research demonstrated an association between having a required third-year FM clerkship and student interest in FM. Later it was shown that the implementation of a required clerkship is associated with an increase in interest. Interestingly, it appears that required preclinical courses with family physicians do not seem to have this same benefit to student interest in the field.

National Resources and Curricular Innovations (1998–present)

During the most recent time period, FM has moved beyond establishing local curricular parity to national initiatives that support and expand the core curriculum. The innovations center on several curricular themes, including competency-based medical education, special tracks for learners, and extracurricular activities such as free clinics. Concurrently, several national initiatives have established guidelines and resources for the three components of any curriculum: (1) learning objectives, (2) learning activities, and (3) assessment of student learning and competence. These curricular guidelines, resources and innovations have continued to refine FM’s contributions to the general education of all physicians and to broaden and deepen the appeal of FM as a career choice.

The HRSA-funded Family Medicine Curriculum Resource (FMCR) project started in 2000 and was described in a special issue of Family Medicine in 2007. This resource sought to provide ready-to-use objectives and resources for the preclinical, third-year clerkship, senior curriculum, and special focus topics. FMCR brought together general internal medicine and pediatrics colleagues with FM educators to collaborate on creating a core set of preclerkship prerequisites. FMCR also linked objectives and resources to the ACGME competencies, a major innovation at the time. This linkage to the residency training competencies has since expanded throughout the entire undergraduate curriculum at many medical schools.

Building from the FMCR project, and focusing specifically on the clerkship, the STFM convened a task force that defined a set of core clerkship objectives in 2009. A second task force followed in 2010 with a more detailed set of objectives and conditions, accompanied by resources for learning and assessment. This work resulted in a national clerkship curriculum website, updated regularly by an editorial board consisting of leading FM educators.

Using FMCR and the STFM’s National Clerkship Curriculum objectives, STFM collaborated with the educational non-profit organization iInTIME to create a set of virtual patient cases for the family medicine clerkship, called fmCASES. The authors and editors of fmCASES created a self-contained curriculum for use within the clerkship, with national learning objectives, the learning activities provided by the cases, and also a multiple-choice question exam. FM educators participated through iInTIME’s interdisciplinary collaborative of educators in pediatrics, internal medicine, surgery, and radiology to develop new projects that span the entire curriculum and focus on specific topics such as High-Value Care and effective clinical reasoning.

While the fmCASES National Exam provides one opportunity for assessment of learning, many schools prefer to use the National Board of Medical Examiners’ (NBME) FM Subject Exam. One criticism of the FM Subject Exam in the past was that the content did not match well with the clerkship’s activities. A national initiative to improve the NBME’s FM Subject Exam has been aligning exam content with STFM National Clerkship Curriculum objectives and FM educators’ recommendations over the past few years.

Many factors outside of the curriculum correlate positively with students choosing a career in FM. Rural background, lower parental socioeconomic status, values, income expectations, a lack of desire for a research career, and career intention at matriculation are all positively associated with the eventual pursuit of FM. In addition to recognizing that having a required clerkship shapes student interest, there has been growing literature on how specific innovations can affect learner outcomes. Special longitudinal
community-based primary care experiences have been shown to impact student attitudes towards primary care and the number of students entering generalist careers. These programs along with rural, primary care, and longitudinal training tracks have demonstrated the ability to produce higher proportions of graduates entering FM than the traditional curriculum. Innovations outside of the formal curriculum in this period have also been recognized for their ability to influence students. Participation in Family Medicine Interest Groups (FMIGs) is associated with student entry into FM. Participation in a free clinic sponsored by a FM department has also been shown to have a significant association with students going into primary care generally and FM specifically.

Conclusions and Future Direction
Student interest in FM at allopathic schools has waxed and waned over the past 50 years. In reviewing the history of interest and the story of FM UME curricula it is clear that this is a complex problem but that there are factors within the control of FM UME educators and departments. Having or implementing required FM clerkships, and having specific programs geared towards primary care training or rural training, are associated with student interest in FM. As a large proportion of students who choose FM do so later in the curriculum, efforts to increase FM specialty choice should focus both on retaining and developing those who enter medical school with an interest in FM, while also attracting and supporting those who identify as FM interested after their clerkship experiences. There has been little research on how specific FM curricular innovations within clerkships or other courses such as FM electives compare to one another in retaining or increasing student interest and this is an opportunity for future research.

When creating a strategic plan for increasing FM specialty choice locally, regionally, or nationally, it would be wise to focus funding and legislative efforts on the four interventions which, with certainty, are shown to help with recruitment: (1) establishing and maintaining required FM clerkships, (2) admitting students with backgrounds and interests that align with FM choice (rural or underserved backgrounds, expressed interest in primary care, etc.), (3) developing longitudinal or track programs which focus on primary care, and (4) having extracurricular activities which support and showcase FM such as robust FM interest groups and free clinics run or supported by family.

Given that 30% of those who believe at matriculation to medical school they will go into FM ultimately do, they should be considered a priority group on which to focus resources. However, if activities and curriculum focus only on students with initial FM interest, a significant proportion of future FM physicians will be overlooked as the majority of students who ultimately pursue FM come in believing they will practice something else. We believe that formal FM curriculum and FMIG activities should be intentionally designed to nurture students who come in with high levels of interest, and provide a community of vibrant peer and faculty support for those attracted to FM during their UME experiences. Because institutional regard for FM can alter student interest the FMIG support system retention strategy may be especially important at institutions where negative perceptions of the field are pervasive. The FMIG system can individually respond to and counter any non-FM-friendly messages and also demonstrate positive attributes of FM through activities and community engagement such as free clinics.

Another future direction is to leverage the breadth of FM to increase FM clinical exposure in the light of recent changes in many medical schools. GME level competencies, milestones and entrustable professional activities (EPAs) have been described and in an effort to translate this work to UME level, the AAMC began a pilot in 2013. The AAMC looks at 13 EPAs that “all medical students should be able to perform upon entering residency, regardless of future career specialty.” Little has been published about the application of these concepts in a specialty-specific way to assess how well-prepared students are for the transition from UME to GME. There has been some work in pediatrics and this has been the subject of a recent hot topic presentation at the STFM conference on medical education 2016 meeting. As FM offers a variety of experiences in many settings, FM educators may be able to identify and work to fill curricular gaps for specific competencies. FM has the unique opportunity, as compared to other specialties, to participate in teaching in nearly every area of medicine. Thus, as more schools transition to integrated curricula and competency-based educational design, FM is well positioned to utilize this reform as an opportunity to increase the FM clinical exposure of students.

To best focus these efforts, there is a need for rigorous, multi-institutional studies on the effects of incorporation of national guidelines and core resources, in addition to implementation of specific curricular and extracurricular interventions. Curricular research should focus on the dual missions of family medicine education—evaluating not only short-term outcomes such as the effectiveness of transmitting FM knowledge, attitudes, and skills to all students, but also the long-term outcomes of how different curricula affect student interest in and positive regard for the specialty. Educators need clarity and consensus regarding what outcomes and competencies we hope that all students will have through our teaching. The STFM National Clerkship Curriculum and other national initiatives represent a major step toward this clear consensus.
Further study may determine how well schools are implementing these national curriculum resources and innovations, correlating implementation with outcomes that matter: all students with a strong, positive regard for FM and with a core set of competence in FM, along with a healthy matriculation of medical students into FM residency training.

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