Primary Care Training and the Evolving Healthcare System

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OUTLINE

ABSTRACT

With growing numbers of patient-centered medical homes and accountable care organizations, and the potential implementation of the Patient Protection and Affordable Care Act, the provision of primary care in the United States is expanding and changing. Therefore, there is an urgent need to create more primary-care physicians and to train physicians to practice in this environment. In this article, we review the impact that the changing US healthcare system has on trainees, strategies to recruit and retain medical students and residents into primary-care internal medicine, and the preparation of trainees to work in the changing healthcare system. Recruitment methods for medical students include early preclinical exposure to patients in the primary-care setting, enhanced longitudinal patient experiences in clinical clerkships, and primary-care tracks. Recruitment methods for residents include enhanced ambulatory-care training and primary-care programs. Financial-incentive programs such as loan forgiveness may encourage trainees to enter primary care. Retaining residents in primary-care careers may be encouraged via focused postgraduate fellowships or continuing medical education to prepare primary-care physicians as both teachers and practitioners in the changing environment. Finally, to prepare primary-care trainees to effectively and efficiently practice within the changing system, educators should consider shifting ambulatory training to community-based practices, encouraging resident participation in team-based care, providing interprofessional educational experiences, and involving trainees in quality-improvement initiatives. Medical educators in primary care must think innovatively and collaboratively to effectively recruit and train the future generation of primary-care physicians. ***Mt Sinai J Med 79:451–463, 2012.*** *© 2012 Mount Sinai School of Medicine*

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Primary care internal medicine (PC IM) is on the precipice of change. The pending implementation of the Patient Protection and Affordable Care Act

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(PPACA) in 2014, providing healthcare coverage to America's uninsured, necessitates careful preparation. Primary-care (PC) practices are currently transforming into patient-centered medical homes (PCMH) and are increasingly utilizing team-based interdisciplinary care. All the while, PC physicians are attempting to achieve a triple aim: to provide greater access to and a better experience with care, to improve population health, and to decrease healthcare spending. In the midst of this, medical educators in PC IM are rethinking and reforming the education of our students and resident trainees. Education in this era must take into account training for the future of PC. This is the era of PC evolution, and also arguably the era of PC education revolution at the levels of both undergraduate and graduate medical education.

The Association of American Medical Colleges Center for Workforce Studies estimates a shortage of approximately 45,000 PC physicians in 2020, increasing to nearly 66,000 in 2025.[1] These projections are even more concerning considering that they include not only an increase in the number of patients accessing care following the PPACA, but also a projected moderate increase in the number of residency-program positions and anticipated increased productivity by nonphysician providers, such as nurse practitioners and physician assistants.[1] In response to this workforce crisis, several organizations—the Alliance for Academic Internal Medicine (AAIM), the American College of Physicians, and the Society of General Internal Medicine (SGIM)—have urged the Institute of Medicine to formally begin a process to review and reform graduate medical education (GME).[2]

Medical educators within general internal medicine (GIM) face unique challenges in educating trainees in PC today and preparing them for future practice. Presently, educators in GIM are learning to practice PC medicine within the context of changing practice models and are by definition teaching students and residents within a system that they are only just learning themselves. It has long been difficult to recruit and retain trainees to GIM, as they are lured to careers in subspecialties within IM that pay more and seem to have better quality of life.[3–5] As our healthcare delivery in PC changes, perhaps educators will have greater success at attracting and retaining talented medical students who not only want to be PC providers, but who also will be agents of change and future leaders in healthcare delivery.

In this article, we review (1) the impact of the changing healthcare environment on PC and PC training, (2) the factors and innovations in undergraduate medical education that may improve recruitment of students to PC residencies, (3) the mandate and innovations within GME to better recruit, prepare, and retain trainees for PC practice, and (4) how to alter training at all stages to best prepare trainees to practice within the evolving healthcare system.

In this article, we review (1) the impact of the changing healthcare environment on primary care and primary-care training, (2) the factors and innovations in undergraduate medical education that may improve recruitment of students to primary-care residencies, (3) the mandate and innovations within graduate medical education to better recruit, prepare, and retain trainees for primary-care practice, and (4) how to alter training at all stages to best prepare trainees to practice within the evolving healthcare system.

EVOLVING US HEALTHCARE ENVIRONMENT FOR PRIMARY CARE

The rapidly evolving healthcare environment in the United States is impacting the way PC physicians practice. The PPACA precipitated a reassessment of payment structure, emphasis on outcomes and quality measurement, and plans for the growing elderly population.[6] In this setting, the identifiable skill set of a PC physician also is ever-evolving. These changes, therefore, will have broad impact on PC training and its key curricular elements.

Impact of Healthcare Reform on Primary-Care Practice and Training

The enactment of the PPACA will increase pressure on the system by newly insuring approximately 32 million individuals, yet simultaneously it will bolster PC through measures that promote innovative changes to the structure of healthcare delivery.[7] Key changes to PC as we know it—and as trainees experience it in academic medical centers—include the following: development of PCMHs and accountable care organizations (ACOs), incorporation of quality measures and patient-centered

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outcomes in partnership with hospitals, expanded access to preventive medicine, care coordination for medically complex and aging patients, and team-based, interprofessional collaboration.[6,8–11]

Patient-centered medical homes, as designated by the Agency for Healthcare Research and Quality, provide accessible, team-based, coordinated care; recognize effective chronic-disease management and prevention strategies; and are given higher reimbursements by some state Medicaid and private insurance companies (eg, Blue Cross/Blue Shield).[12,13] This contrasts sharply with the fee-for-service structure in most academic medical centers that defines the training experience. Accountable care organizations involve the collaboration of physician organizations in providing healthcare to a defined group with a realignment of incentives to provide higher value and better outcomes at lower cost.[14,15] Training in this environment requires consideration of value and accountability to fellow providers as well as patients. The PPACA emphasizes improving patient outcomes and experience, which includes electronic health records, outcomes measurement, and robust systems-based quality improvement (QI) initiatives.[6,11]

In addition, the PPACA and its concomitant changes to Medicare and Medicaid remove barriers to preventive services by eliminating copayments and deductibles for preventive care and for the follow-up tests and interventions needed.[11] To support the above changes, interprofessional collaboration and practice, coordinated care, and outcomes-based medical care will continue to grow as the preferred model of delivery.[16] Trainees must learn to work within this new environment of continuous QI and preventive-care models, and within interprofessional teams, even though most academic clinic settings have not yet fully embraced these changes.

UNDERGRADUATE MEDICAL EDUCATION PRIMARY-CARE RECRUITMENT AND RETAINMENT

Interest in Primary Care

Since the late 1990s, the percentage of medical students entering the PC fields has decreased.[4,17] More specifically, numbers of medical students pursuing careers in PC IM have declined,[4,17–20] whereas those pursuing IM subspecialties have steadily increased.[5,19] A survey of 1200 medical students demonstrated that only 2% of fourth-year medical students planned to enter PC IM in 2007,[21] compared with 9% in 1990 in a similar survey. Data from the National Resident Match Program support this; in 1997, 549 students matched into residencies in PC IM, compared with only 236 in 2009.[22] A number of studies have examined possible reasons for diminished interest in PC among medical students, including a perceived lack of time for patient visits, high workload, and lack of continuity, as well as the perceived uncontrollable lifestyle of the PC physician.[23–27] Factors such as PC clerkships and dedicated PC electives may influence medical students toward PC careers.[28–30] In particular, for students planning to enter PC fields, faculty and residents[28] in PC clerkships were rated more highly influential to career choice than those in non-PC clerkships.[29,30] The hospitalist movement has decreased students' and residents' contact with PC physicians in the hospital and brought concern that this has influenced their career choices away from PC.[31] In kind, medical students report that increased ambulatory-care experiences, more longitudinal relationships with patients, and improving GIM attending-student interaction would increase interest in PC.[26–28]

The debate continues over the role financial considerations play in medical-student choice not to pursue PC. Whereas in some studies students report choosing non-PC over PC careers because of lack of financial incentives[25,26] and report that financial incentives would make PC careers more attractive,[25,32] other studies show that student debt is not a predictor of PC residency[33] or has only a very modest effect (national study from 2002 of 14,240 medical students).[34] This contradiction may reflect the fact that medical students' personal desires to earn higher incomes are related to specialty choice, although their actual amount of debt is not related to their ultimate career choice.[35] Importantly, interest in PC prior to entering medical school seems to be the most consistent predictor of entering a PC career later.[29,36] However, interest in PC may wane throughout medical school; a study of 942 students at 15 US medical schools demonstrated that only 30% of those originally interested in PC remained so at the end of medical school.[37]

Program Innovations in Primary Care

A number of medical schools have instituted programs to promote student interest in PC careers. These programs attempt to address some of the challenges outlined above, specifically increasing ambulatory experiences and medical-student interaction with generalist faculty and longitudinal relationships with patients, as well as making efforts to capture and retain those interested in PC at the start of medical school. These

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medical-school programs focus on 3 main areas: early preclinical exposure to patients in the outpatient setting, longitudinal experiences as the foundation for clinical clerkships, and PC tracks.[37–41]

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Many medical schools have clinical-skills curricula that enhance preclinical exposure to PC.[40–44] These programs teach preclinical students clinical and communication skills and give students early longitudinal experiences with patients and attending preceptors. In addition, many preclinical programs seek to increase exposure to PC physicians and ambulatory medicine. Many medical schools currently use a model in which students simultaneously learn history-taking, physical-examination skills, and communications skills while spending a half to a full day per week with an ambulatory preceptor. Most programs use predominantly PC physicians as the preceptors (family medicine, GIM, and pediatrics; the distributions depend on regional variation).[40–45] One study suggests that a second-year medical-student community preceptorship may increase interest in generalism immediately after the experience, which may persist even at the end of medical school.[41] Other than this, there are little data in the literature that demonstrate the impact of these curricula on PC career choices.

In the late 1990s, a number of medical schools developed the innovative longitudinal integrated curriculum (LIC) within the clinical years to ensure that students develop the core clinical skills needed for medical practice.[38,43,46] The LICs by design increase ambulatory-care exposure, create meaningful clinical longitudinal experiences, and increase quality exposure to PC physicians.[38,43,46] The Harvard Medical School-Cambridge Integrated Clerkship (HMS-CIC) is one such program designed to accomplish the following goals: to longitudinally follow patients (not in separate clerkships) through the course of their illnesses, for attending physicians to primarily teach and form longitudinal relationships with students (as opposed to residents), and to ensure student exposure to a wide range of "core diagnoses."[46] Students are paired with ambulatory preceptors in IM, neurology, pediatrics, obstetrics/gynecology, and psychiatry for the year-long experience. In the early months, students spend a large part of their time developing a patient panel. Students then follow their patients to consults, admissions, surgeries, and so forth. Based on the results of the pilot study, all 3 major goals are met with this curriculum. Most relevant to promoting PC is that the program does promote longitudinal student-patient relationships; 100% of students in the HMS-CIC reported that they either very often or often saw patients prediagnosis, upon diagnosis and decision for admission, and through the postdischarge period. In addition, the HMS-CIC students felt better prepared than traditional students to deal with the biopsychosocial aspect of medicine.[46] These students also felt deeply connected to their patients, thereby enhancing their idealism.[47] A number of medical schools have similar curricula, including Mount Sinai School of Medicine's InterACT, which has 13 protected weeks of ambulatory medicine dispersed throughout the third year during which students have continuity of care with patients in PC clinics (IM, pediatrics, obstetrics/gynecology) and in their own student-run free clinic.[38,43,48,49] Preliminary survey data show that 6 of the 11 programs demonstrated increases in PC career choices in students who participated in the LIC.[38]

A third innovation in PC promotion is the medical school "PC track." The PC track increases PC exposure to a select group of students who declare their interest in PC early.[36,50,51] Because student predisposition to PC is predictive of PC career choice, and student interest in PC may wane during medical school, the PC track is critical in maintaining PC interest. A number of these programs were instituted in the late 1980s and early 1990s, when interest in PC was low.[36,39,50,51] Studies demonstrated that interest in PC careers remained constant throughout the course of medical school, that predisposition (ie, choosing the PC track) was most predictive of entering PC, and that higher percentages of those in the PC tracks compared with the traditional students entered PC fields.[36,50,52] Many of the 3- or 4-year accelerated-track models have also shown success in increasing the number of students entering PC with no detriment to standardized testing scores.[53–56] Nonetheless, it is important to recognize that these students are a self-selected group and cannot be truly compared with traditional students and their choices. Recently, these PC tracks are re-emerging. For example, Duke School of Medicine developed a PC leadership track,[57] the University of Maryland is transforming its family care

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track into a PC education track,[58] and Texas Tech has an accelerated 3-year PC track.[59]

GRADUATE MEDICAL EDUCATION PRIMARY-CARE RECRUITMENT AND TRAINING

Interest in Primary Care

Similar to patterns with medical students, the percentage of IM residents entering PC and GIM has decreased since the late 1990s.[18,20] From 1998 to 2003, the proportion of IM residents entering GIM declined from 54% to 27%, and estimations for 2006 were down to 20%.[18,20] Some potential reasons for the decline in residents entering PC may relate to funding cuts to programs and other economic and political forces. In 1976, Title VII legislation defined PC professions as family medicine, GIM, and pediatrics and provided funding for growth of PC IM residency training programs.[60,61] Primary care internal medicine programs grew steadily from the late 1970s through the late 1990s.[61] However, the numbers of PC IM programs and intern positions have decreased since their peak in 1997 (91 programs, 549 positions) to a low in 2009 (50 programs, 236 positions) corresponding with Title VII funding cuts, managed-care changes, market forces, and other factors.[22,61,62] Resident characteristics may also influence the choice to pursue PC. A national study of second-year IM residents demonstrated that female sex, presence of PC role models, and peer and attending encouragement toward PC were associated with a PC career choice.[63] Additionally, the opportunity for continuity of care influenced residents to remain in or choose PC as a career.[18,20,63,64] A study by West and colleagues also showed that long-term relationships with patients, as well as time available to spend with family, were highly rated by IM residents entering GIM, whereas type/number of procedures was not highly rated by this group.[65] Residents and attendings also report that increased mentorship, salary, community-based training, improved lifestyle, and decreased paperwork would encourage more trainees to enter PC fields.[64]

Keirns proposed that the challenging nature of the resident clinic, including patients with chronic complex comorbidities, lack of continuity with patients, burdensome administrative duties, lack of support for coordination of care and disease management, staffing shortages, distraction from inpatient duties, and dissatisfied PC role models, may sway residents against PC careers.[66] A national survey found that many IM resident clinics had a combination of complicated and disadvantaged patients, inadequate clinic resources, and stressed clinic directors (59% felt they had too many things to take care of in a day), and that residents working in these clinics experienced a high level of stress.[67] However, it is unclear whether these specific in-clinic challenges directly influence career choice. Unpublished data suggest that resident higher satisfaction with continuity of care with patients and with the number of clinic patients seen per session may influence their choice toward a GIM career (L. A. Peccoralo, unpublished data.)

Program Innovations in Primary Care

A number of IM residency programs have instituted programs to promote PC careers among their residents. These programs increase PC exposure and mentorship, increase community-based training, improve longitudinal continuity of care with patients, capture and retain those interested in PC at the start of residency, and increase positions in PC programs despite lack of government funding. Programs to enhance PC residency training focus on 2 main areas: enhancing ambulatory curriculum and training for all IM residents, and developing and expanding PC IM programs.[68–85]

Programs to enhance primary-care residency training focus on 2 main areas: enhancing ambulatory curriculum and training for all internal medicine residents, and developing and expanding primary-care internal medicine programs.

Enhancing the ambulatory curriculum and training for all IM residents is critical not only for increasing interest in PC, but also for preparing IM residents to practice in the ambulatory setting. However, ambulatory-care training of residents is often seen as secondary compared with inpatient training.[68] This is due in part to the competing nature of the "continuity clinic" sessions during inpatient rotations. According to an Institute of Medicine report in 1989, 95% of IM programs structured the continuity-clinic experience as a half-day-per-week experience.[69] In a national survey, residents and program directors reported problems with competing inpatient-outpatient responsibilities (74.9% and 88.1%, respectively) and felt that absence of conflict with inpatient responsibilities is important

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for good outpatient training (69.4% and 74.2%, respectively).[70] Similarly, other studies of residents' continuity-clinic experience demonstrate that they are least satisfied with balancing inpatient-outpatient ward duties.[71] As a result of this and other evidence, organizations such as the AAIM and SGIM have appealed for reform in resident ambulatory training. In 2007, AAIM called for redesign of IM residency programs, with one of the major goals being to improve ambulatory training by providing patient-centered longitudinal care that addresses the conflict between inpatient and outpatient responsibilities.[72] The Accreditation Council for Graduate Medical Education (ACGME) IM program requirements mandate programs to develop models and schedules for ambulatory training that minimize conflict between inpatient and outpatient responsibilities.[73] The SGIM has implored IM residency programs to dramatically increase support for training in the ambulatory setting and offer equivalent opportunities for training in both inpatient and outpatient medicine.[74]

A number of residency programs have created potential solutions to the inpatient-outpatient conflict. The Lehigh Valley Health Network IM residency program directors created a 4:1 scheduling system, in which residents have 4 weeks of inpatient activities alternating with 1 week of ambulatory continuity experience. Residents participate in teams to care for patients and experience more "real-life" practice, as they are present more often for a full day. Overall, residents in this program felt an improved focus on ambulatory education, improved pace and scheduling of ambulatory care, and better patient access to care, and more felt that ambulatory medicine would be an enjoyable field of medicine to pursue. Faculty felt that the new system provided an improved opportunity to learn about ambulatory medicine. Focus groups revealed that residents appreciated the separation of the inpatient/outpatient responsibilities because of the decreased sense of conflict and improved learning environments on both inpatient and outpatient services.[68] A number of programs across the country have now adopted this model in the setting of the ACGME work-hour reforms.

With the help of the ACGME Educational Innovations Project, the year-long ambulatory block was developed at the University of Cincinnati. In this schedule, IM residents spend 11 months in ambulatory medicine during their PGY2/3 years. During this time, residents spend 3 sessions per week in the ambulatory continuity clinic and 1 session in ambulatory curriculum (QI, team meetings, and education topics), and the rest is spent in inpatient or ambulatory electives and outpatient coverage responsibilities. Overall, resident satisfaction with clinic improved; specifically, residents felt they had more time for learning in the ambulatory setting and had an improved ability to focus in clinic without interruption, compared with their pre–long-block experience. In addition, residents reported greater personal reward from the work, a greater sense of relationships with patients, and increased ownership for patient care. Patient satisfaction improved among resident patients after the change and process measures improved, including increased cancer-screening rates and immunization rates.[75] Although no quantitative data have been collected, innovators of the program believe that some residents initially considering subspecialty careers chose PC in part as a result of the ambulatory long-block experience.[76]

Internal medicine PC residency programs are another strategy to increase IM residents entering PC. Studies consistently demonstrate that residents who start in these PC IM programs are more likely enter PC careers.[77–81] One study demonstrated that graduates of PC residency training programs chose careers in PC significantly more often than did graduates of traditional IM tracks (72% versus 54%) and were more likely to practice in underserved communities.[82] Primary-care programs vary in their curriculum and experiences, but most programs have core goals in common: increasing time in community-based ambulatory continuity experiences, increasing PC mentors, care of the underserved, and targeted psychosocial and health services/policy training.[79,80,83,84]

Although PC programs are successful in creating PC physicians, as noted above, the number of residents in these programs has declined over the past 15 years. One potential but challenging solution is to convince legislators to increase Title VII funding.[60] The PPACA contains language expanding loan repayment through the National Health Service Corps and increased funding for training for medical and allied health professions.[85] In debates over the PPACA, some initially promised elements to expand PC training, such as expansion of PC residency positions, have not come to fruition. In the meantime, medical centers should make PC a priority. Medical centers should be invested in these programs because of the increased PC workforce called for by the PPACA, their necessary existence in ACOs, and the PPACA's stipulation that additional GME spots should be prioritized to PC residency programs.[6,11,85]

Financial Incentives for Students and Residents

One factor that students and residents often consider when deciding on a PC career is the financial

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compensation they will receive and the amount of loans they currently have. The literature is mixed as to the financial influence on career choice.[86,87] By one estimate, the annual incomes for subspecialists are approximately $135,000 higher than those of PC physicians, resulting in a lifetime income difference of $3.5 million.[87] There are some financial-incentive programs in the United States that encourage PC training, mostly in underserved areas. These include state-run loan-repayment programs, PC loans, and the National Health Service Corps run by the US Department of Health and Human Services.[88] This program not only entices students to enter PC, it also places them in the areas of most need of PC physicians. Although only about 25% of physicians in the National Health Service Corps remain in their original placements long term, almost all stay in the field of PC.[88] These programs alleviate the loans a student takes on in medical school but do not address the income disparity that ultimately exists.

One factor that students and residents often consider when deciding on a primary-care career is the financial compensation they will receive and the amount of loans they currently have.

For residents and practicing physicians, these loan-repayment programs are important but do not replace appropriate financial recognition for the work that is done. The current encounter-based billing does not account for the vast amount of care coordination that PC physicians perform.[89] Therefore, PC reimbursement needs to change potentially through more team-based care models and medical homes, allowing for reimbursement of chronic-care coordination.[90,91] This issue is currently under national discussion, is already changing with the growth of the PCMH and ACOs, and hopefully will continue to evolve in the next few years to augment salaries of PC physicians and, in turn, the number of trainees choosing PC as a career.

POSTGRADUATE TRAINING IN PRIMARY CARE

Fellowships

Upon graduation, residents can choose to immediately begin practicing PC. However, some may decide to do additional training in GIM or geriatrics. General internal medicine fellowships are not funded through Medicare and are not presently regulated by the ACGME, and thus it is difficult to obtain concrete data for numbers of annual GIM fellowship programs and positions. The residents who pursue these fellowships are often interested in academic careers in GIM and gain additional training in education or research. Rarely are these purely clinical fellowships; approximately 30% (or less) of a fellow's time is clinical, mostly in the ambulatory setting.[92] Many of the graduates of GIM fellowships pursue academic medicine careers and/or provide PC; however, exact numbers are difficult to obtain.

Many IM residency graduates feel they are unprepared to provide PC for geriatrics patients; 52% felt very unprepared, according to one survey.[93] With an aging population that disproportionately accesses healthcare, PC physicians' practices will consist largely of geriatric patients. Therefore, geriatrics fellowships are ideal for building this additional skill set. This training is particularly strong in educating fellows in team-based practice and interprofessional collaboration to coordinate the complex care of frail older adults. In 2009–10 there were 489 first-year geriatrics fellowship positions, 56% of which were filled.[94] Geriatrics fellowships are usually 1 year long, have robust weekly continuity full-day clinics, and allow fellows to train in additional ambulatory settings, such as nursing homes and home visits.[95] Most geriatric fellowship graduates continue providing PC to geriatrics patients; in one study, 75% of graduates of geriatrics fellowships spend ≥50% of their time in the PC of the older adult.[96]

Continuing Medical Education and Faculty Development

It is an exciting time to practice PC within the context of new, innovative models of PC delivery. However, the "teachers" of these new practice models—practicing internists—are just learning how to function in these evolving practices while simultaneously having the responsibility to teach these models to residents and students. The best way to deliver curricula about practice reform is yet to be determined. Presently, PC physicians have the opportunity to engage students and trainees in the change process and learn side by side with them. Some institutions have implemented didactics in which the residents, faculty, and staff all learn about changing practice models together to prepare everyone for the reforms being implemented in real time.[97]

At the same time, there are numerous CME courses available to practitioners to continue to hone

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Table 1. *Key Curricular Elements for the Future of Primary Care.*

Teamwork/interprofessional team-based care
Diagnostic reasoning balanced with the presence of technology
Systems-based practice
HIT/informatics
CQI
Patient-centered care
Error prevention
Practice-based learning
Cost-effective care
Efficient care
Culturally sensitive care
Evidence-based care
Advocacy/social activism
Preventive medicine, for young, middle-aged, and older adults

Abbreviations: CQI, continuous quality improvement; HIT, health information technology.
Adapted from Horwitz *et al*,[99] Medicare Payment Advisory Commission,[101] and Hackbarth and Boccuti.[108]

their clinical skills while learning more about new innovations in PC delivery. In fact, the American Board of Internal Medicine recertification process now involves practice-improvement modules that allow practitioners to evaluate their own practice patterns, learn from them, and make meaningful practice changes accordingly.[98]

ADAPTING PRIMARY-CARE TRAINING TO EVOLVING HEALTHCARE ENVIRONMENT

Curriculum Redesign

In order to meet the rising needs of evolving healthcare-delivery systems, additional elements must be woven into the PC curriculum, complementing and building upon knowledge and competencies already present.[99] Examples of needed skills appear in Table 1.

Some argue these "additions" are nonessential, or that they draw residents away from learning the craft of medicine.[99,100] However, the Medicare Payment Advisory Commission reports that trainees are not adequately prepared to care for the chronically ill and aging population.[101] In addition, trainees report feeling overwhelmed by complex comorbid patients and the social complexity that often accompanies chronically ill and older patients.[102,103] Because interest in caring for older patients is highest at the beginning of training and decreases across the course of training, it does not seem that the current training system adequately prepares trainees to cope with the challenges brought by more complex, sick, and frail patients.[102,103] Indeed, the failure of the current fragmented medical system has not only negatively impacted the care of patients, but also dissuaded future physicians from their care, resulting in a "failure of the system to support patients and providers alike."[101]

Teaching content is necessary but insufficient to transform the learning environment and future delivery patterns of effective, efficient PC IM.[104] Instead, educators across both academic medical centers and community centers have noted elements of needed competency for internists to practice PC in this evolving healthcare climate; Table 2 reviews 4 core themes for potential structural change to PC training. To achieve these areas of competency prior to completion of residency training, not only must the content change, but also—potentially—the physical site in which care delivery occurs must change.[104–106] The 4 themes for enhancing PC education in the evolving healthcare system are (1) shifting the location of ambulatory training to community-based practices, (2) encouraging resident participation in team-based care for their patients, (3) providing interprofessional educational experiences, and (4) involving trainees in continuous QI initiatives.[67,104–113] Table 2 expands upon these themes, offering potential strategies published in the literature for engaging academic medical centers and trainees in this restructuring of trainee care sites and curriculum.

The 4 themes for enhancing primary-care education in the evolving healthcare system are (1) shifting the location of ambulatory training to community-based practices, (2) encouraging resident participation in team-based care for their patients, (3) providing interprofessional educational experiences, and (4) involving trainees in continuous quality-improvement initiatives.

Residency educators may select meaningful QI projects utilizing process measures for trainees that engage national guidelines or local initiatives yet

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Table 2. *Themes for Structural Change of Primary Care Training and Potential Curricular Strategies.*

Structural Change: Need	Strategic Examples
Shift location of ambulatory training: AMCs lack financial incentives to develop PCMHs and community training sites.	AMCs partner with community leaders to develop PCMHs as ambulatory training sites. Links AMCs with community.[104] "Teaching health centers," community-based ambulatory care centers that operate a PC residency program.[105] Train residents in a well-functioning environment, with a skill set needed in future practice, while maintaining service to the underserved, reducing shortage areas, and employing team-based care.[106]
Team-based care: complex patients' needs are best met by an interprofessional team, yet residents rarely encounter interprofessional teams.[67,109]	The RRC mandates coordination of care and teamwork as part of training.[67] One-third of residents practice without a team-based system despite caring for complex patients.[67,109] Develop partnership and leadership with an interprofessional team, focusing on the specific capabilities of the physician. Utilize patient-centered outcome measures to offer feedback to the team. Interprofessional education together with multiple disciplines beginning early in each training.[110]
IPE: IPE occurs when members of ≥2 professions learn with, from, and about each other to improve collaboration and quality of care.[111]	Curricula involving collaboration in an interprofessional team, identifying provider roles, and analyzing situations in which varied services would be appropriate. Partner with health professions schools such as pharmacy and nursing to enable IPE. Incorporate IPE curricula involving "... accountability, coordination, communication, cooperation, ... mutual trust and respect."[109]
Involve trainees in CQI: educators and supervisors rarely involve residents in the institutional culture of QI, despite their role as front-line providers.[107,112,113]	Assess resident performance utilizing process and outcomes measures, mimicking "dashboards," reports on patient outcomes while in practice. Involve trainees in identifying process and outcomes to measure. Employ practice-based learning and improvement models for meaningful measurement, also meeting RRC-IM requirements to instruct residents in self-improvement.[67] De-emphasize the "artisan" approach to medical care, instead embracing leadership of interdisciplinary teams, shared decision-making, and care coordination.[108,112,113]

Abbreviations: AMC, academic medical center; CQI, continuous quality improvement; IPE, interprofessional education; PC, primary care; PCMH, patient-centered medical home; QI, quality improvement; RRC, residency review committee; RRC-IM, residency review committee for internal medicine.

simultaneously reflect reasonable expectations for residents' growing competency.[107] Opposition is present; some argue that emphasizing outcomes measures and self-reflective practice "ignore the reality of disease and illness with which we must ... cope."[100] However, an alternative approach acknowledges that through QI initiatives, practice-based improvement, and "thoughtful standardization," care may be improved for chronic medical conditions.[67] Overall, the shifting culture of PC delivery seeks to regain the "social contract" with the public, as Horwitz and colleagues write, emphasizing the public's expectations of "service as healers, morality and integrity, transparency, accountability, and guaranteed competence."[99] By redefining the role of the IM-trained PC physician as achieving these qualities, in a time when the healthcare structure is changing to a system wherein improved health is accessible by more people than ever, PC IM can thrive, with trainees learning to provide the highest quality of care in the most effective manner.

CONCLUSION

Now is the time for PC physicians and educators, academic centers, and medical schools to embrace the changing landscape of healthcare. Our evolving

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healthcare system has imposed an educational imperative on medical schools and residency programs to rethink and restructure medical training. Medical educators must respond to the growing workforce shortage in PC by inspiring students and residents to enter meaningful careers in PC. In medical school, this means developing PC clerkships, electives, or tracks; increasing longitudinal relationships with patients; and improving GIM attending-student interactions. For residency, this includes strong recruitment efforts, dedicated PC tracks, and improved continuity experiences. In addition, although the data are mixed regarding financial aspects influencing career choice, there is a discrepancy in future earnings between PC and other specialties. Improving this through low-interest loans, loan repayment, and increased future salaries may help recruitment and retention in PC. In addition, medical educators must redesign the PC training curriculum in order to prepare trainees to practice in the evolving healthcare environment and teach trainees to be flexible and creative in their own practice to adapt to future changes that are likely to arise. Medical students and residents should be immersed in new community practice models, team-based care, and interprofessional education in order to accomplish these educational objectives. To be successful in these efforts, curriculum development will need to be a bit "out of the box" and evolve over time, with students and residents learning alongside educators. We must prioritize these educational objectives in order to expand and advance the exciting field of primary-care medicine.

DISCLOSURES

Potential conflict of interest: Nothing to report.

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