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EDITORIAL

Reenvisioning Family Medicine Residency Education

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Eighteen months ago, family medicine set out to reenvision its residency education. The seven academic and clinical organizations defined key questions and then used these questions to frame focus groups, surveys, and commissioned papers leading to a national summit on December 6-7, 2020. All in all, over 3,500 people participated in the process and a permanent website curates the products.[1] The papers in this issue are the products of the process. They are diverse and passionate, like the specialty and the people who created them, but what are the big messages going forward?

The Time Is Now

The increasing gap in health outcomes between the United States and comparable countries[2] is a wake-up call, as are reduction in life expectancy[3] and rediscovery[4] of shameful disparities of health outcomes across race, ethnicity, and class. More broadly, these trends represent the coming of the end of an age in which technical advances from antibiotics through the first steps of genomics have led to dramatic improvement in health but now are increasingly limited by a health care system that provides poor access, is deeply disintegrated and unable to address cost, quality, or many aspects of patient experience. The COVID-19 pandemic has taught us this again. Reform is needed.

The recently published National Academies of Science, Engineering and Medicine report, *Implementing High Value Primary Care*,[5] lights the way. The first National Academies study on primary care in 25 years, the report underscores that primary care is a public good and the foundation of health care. The report argues for access to primary care for everyone, training primary care teams where people live and work, and establishing governmental and financial accountability for the largest health care platform in the United States. Reform is needed.

A good place to start is residency education, and the Accreditation Council for Graduate Medical Education (ACGME) major revision of residency standards in family medicine provides an opportunity. A distinguishing feature of the US health care system is the close relationship between residency accreditation and board certification. We have been the envy of the world, and the development of residency education has been a major driver of the progress we have made since the passage of Medicare and governmental funding of residencies. But the ongoing development of that system, with its bias toward subspecialization and incomplete response to the needs of society has become part of the problem.

Family medicine can play an important role in achieving the needed reforms. The specialty is a child of the social protest of the 1960s. It developed the largest and most widely-distributed group of community-based personal physicians, insisted on recertification throughout a career and ongoing chart audits, brought residency education out of the hospital and included educational objectives, behavioral health, and practice management. Family medicine made a difference in the 1960s. We have an opportunity to do so again.

From the American Board of Family Medicine, and the University of North Carolina School of Medicine, Department of Family Medicine (Dr Newton); and the American Academy of Family Physicians, Division of Medical Education (Dr Mitchell).

Education Matters

It is important to underscore the importance of education. In an age in which information technology has become both ubiquitous and a dominant financial driver of our economy, it is perhaps understandable that education is often likened to downloading a file. But true education in clinical care is much more than information transfer. It is about variety and volume of the right kinds of clinical experience and assessments, the development of clinical judgement and continuity of teachers and teaching. It requires skilled faculty, and coproduction by learners and patients. It also takes time.

Residency is the right initial target for medical education reform. Residency is when MDs and DOs become doctors. Residency matters. Residents learn by doing, and what they learn by doing, they continue to do for at least 20 years. The evidence is mounting that rates of operations and complications, use of medications and the cost-effectiveness of care and location of practice are imprinted in residency practice.[6] If we are serious about improving the health care system, if we want to address the quadruple aim, we must begin with changes in residency education.

A corollary is that the residency practice is the curriculum. A traditional view of education lays out curricular objectives and goals. These are important but not sufficient in the residencies we hope to develop. Part of the challenge is that we need to focus on what is learned rather than what is taught. More importantly, however, we need to understand that residency is much more than knowledge transfer and technical skills. Most important are decision making, judgment, and the professionalism to lean into and respond over time to patient and community needs. And it is in the practice—taking care of patients over time in continuity practice, in hospitals and in many other settings—that critical attitudes and habits are developed. High standards for processes and outcomes in all resident practice settings are therefore foundational.

Should we train new kinds of doctors who can help lead change in health care, or change health care to nurture the development of the right kind of doctors? Our answer is yes; we need to do both. Like many, the authors represented in this special issue have worked hard and with many partners to both ends. Now the need for change is urgent and will take a long time to fulfill. So, we must work on both fronts. This is both the challenge and the opportunity for all residency faculty and program directors.

Evolution or Revolution?

Do the ideas for changes in residency education in this issue constitute evolution or revolution? Of course, the papers are diverse and passionate; it will take further dialogue, innovation, and time to implement change. Asserting first-contact care, continuity, comprehensiveness, and coordination of care as the foundation of family medicine education[7] and maintaining a broad scope of practice harken of our roots in general practice; taken seriously, they suggest a strategy of evolution. On the other hand, making the practice the curriculum,[8] putting patients at the center of the residency,[9] making residencies more accountable to their communities,[10,11] and asking sponsoring institutions to support more robust residency education[12] and care constitute a dramatic change in the directions and intent of family medicine residency education. We hope that these curricular foci will be augmented by implementation of competency-based assessment,[13-16] needed reform of didactic curriculum,[17] and reforms in our national system of graduate medical education.[18,19] Taken together, and with the changes in payment and regulation called for by 400,000 physicians,[20] they can help usher in a new direction for health care. We seek a new paradigm of care—and residency education.[21]

How medical students respond will also be important. In recent months, there has again been dialogue about the tension between quantity and quality of medical students going into family medicine. The goal set by Family Medicine for America's Health—that 25% of American medical students will go into family medicine—is aspirational, and others have questioned both the feasibility and the wisdom of setting such a goal,[22] emphasizing instead the quality of people going into family medicine.[23] We believe both are important. Transformation of health care in the United States will not happen unless there are more family physicians (as well as other members of primary care team)—but that expansion, as well as change in health care, does not happen unless the best and brightest in every medical school class go into family medicine. Best and brightest means looking like our patients, in terms of diversity of race and gender, but also ability, organization, work ethic, and above all the commitment to service to patients and communities. We seek medical students who can go into any residency they choose. We also believe that innovations and outreach to communities by residencies will increase interest in family medicine. The role our residency directors and faculty play will be critical.

The spotlight now turns to the ACGME Review Committee for Family Medicine which writes the residency standards. The major recommendations in these papers—the foundational role of the four Cs, a broad scope of care, the practice is the curriculum, competency-based medical education, and the need for a residency educational system more capable of both innovation and standardization, and more social accountability—are clear. By the time you read this, the ACGME writing committee will have identified the major themes of the changes and will have begun to draft the new residency standards. We encourage all readers to participate in the feedback about the new standards, and we thank you for your significant participation so far.

Beyond the immediate process of drafting new residency standards, we hope for debate and discussion within our discipline. The National Academies report[5] calls for a recommitment to primary care as a public good and as the foundation of medicine and recommends sweeping changes in payment, access, community based education, health information technology, and governmental accountability. As with all major changes, it starts with us, individually, and as a specialty. Now is the future of family medicine.

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SPECIAL ARTICLE

— *Foundations of Residency Redesign* —

Shaping the Future of Family Medicine: Reenvisioning Family Medicine Residency Education

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In winter 2020, the Accreditation Council for Graduate Medical Education (ACGME) announced plans for a major revision of the family medicine residency requirements. Over the last year, the specialty has developed its vision for the future of residency education in focus groups and surveys, a national Starfield summit, and this dedicated issue of *Family Medicine*. The purpose of this paper is to describe this specialty-wide effort and introduce the core questions and the papers in this issue.

This major revision will shape the form and promise of family medicine for the next generation. ACGME major revisions occur approximately every 10 years. Assuming a 30 to 40-year practice life, residents trained under the new standards will be in practice until the 2060s. Furthermore, what happens in residency matters. There is increasing evidence that residencies set fundamental patterns of practice in graduates, ranging from operative rate and medication selection to quality and cost of care.[1-3] These patterns endure for many years, and are thus foundational to any effort to improve health, improve patient experience, and reduce cost.

Coordinating their work with that of the ACGME, the seven clinical and academic organizations of family medicine organized a national initiative to reenvision the future of family medicine residency education. The American Academy of Family Physicians (AAFP), American Board of Family Medicine (ABFM), American College of Osteopathic Family Physicians, the Association of Departments of Family Medicine, Association of Family Medicine Residency Directors, NAPCRG, and the Society of Teachers of Family Medicine each identified one representative to a task force to coordinate the effort. ABFM and AAFP staff led the effort. With input from their organizations, the task force identified and published six core questions[4] for the specialty to address; these were used by the organizations to frame focus groups and surveys to get input. Researchers from the specialty prepared 15 background papers on various aspects of family medicine residency education to support discussions. Table 1 lists focus group topics and surveys conducted in the summer and fall of 2020 by organization. Overall, over 3,500 people participated in the process in some way.

A national summit was held on December 6-7 to build consensus for recommendations to the ACGME writing group. NAPCRG conferred the name Starfield Summit, underscoring the foundational importance of Barbara Starfield's research to residency education in family medicine. After a national call for nominations across all family medicine organizations, over 170 nominations were received, and 52 people were selected, with planned diversity by underrepresented minority, gender, career phase, national geography, rurality, osteopathy, and profession to include behavioral health and pharmacy. Residents, medical students and five patient and public members were also included. Observers included the Accreditation Council for Graduate Medical Education (ACGME) Residency Standards writing group, the ABFM Residency Task Force, and leadership of the American Board of Medical Specialties and the ACGME. In advance of the summit, nine evidence summaries and 24 commentaries were commissioned, and drafts were made available to all participants and observers 10 days in advance of the meeting. The summit was organized to be as interactive as possible, with

From the American Board of Family Medicine, and the University of North Carolina School of Medicine, Department of Family Medicine (Dr Newton); and the American Academy of Family Physicians, Division of Medical Education (Dr Mitchell).

Table 1: Participating Organizations Focus Group and Surveys

Organizations	Focus Group Topics
American Academy of Family Physicians (AAFP)	**Family Physicians** • What does society need from the family physician of the future? • How can residency education support graduates' ability to shift practices and populations over time? **Commission on Education** • What does society need from the family physician of the future? • What is the right balance between regulation and innovation? **Residency Program Solutions Consultants** • What is the right balance between innovation and standardization? • How can we improve the social accountability of graduate medical education? **Residents:** What should we teach? • Which clinical areas are so important in terms of function, morbidity and cost that all residents in the next 15-20 years must learn about them? • How much curricular flexibility should individual residencies and individual residents have to be responsive to local needs and individual residents' interests? • What new curricula and new skills should be present in resident training? **Medical Students:** How should we teach? • What new teaching technologies will improve outcomes in education? • How should competencies be best assessed?
American Board of Family Medicine (ABFM)	National surveys of residents, residency faculty, and early-, mid-, and late-career diplomates about many aspects of residency education, professionalism, and career course.
American College of Osteopathic Physicians (ACOFP)	**Institutions** • What is the right balance between innovation and standardization? • How can we improve social accountability of graduate medical education? **Certification Body** • What does society need from family physicians in the future? • What should we teach? **Practicing Clinicians** • What does society need from family physicians in the future? • How can residency education support graduates' ability to shift practices and populations over time? **Clinical Faculty** • What should we teach? • How should we teach? **Residents** • What should we teach? • How should we teach?
Association of Departments of Family Medicine (ADFM)	**ADFM Chairs** • What should we teach in residency? Specifically, which clinical topics should all residencies of the future incorporate? What nonclinical topics? • What is the right balance between innovation and standardization? How can we incorporate flexibility that allows for diversity and the need to accommodate regional needs/community engagement (the 5th "C"?) • Patients/patient representatives: What would you like your family doctor to take care of? What do you need from your family doctor that you aren't getting now? • What is most important to you in your primary care? **Health Systems Leadership – Federally-Qualified Health Centers/Similar** • What is it you need from family physicians in your health system? • What do you see as the role of family physicians in your system and what do you mean by that? What are our roles in relationship to nurse practitioners and physician assistants? How about internal medicine physicians? • Help us understand what jobs the health care system CEO anticipates being available for family physicians 5, 10, and 20 (range of roles, scope of practice, inpatient vs outpatient vs both) • What do you think we need to include in the training for family medicine residents? What residency training would equip family physicians to be in a leadership role in a health care system? **Health Systems Leadership - Large Health Systems** • SEE ABOVE—similar questions for health systems leadership groups but possibly a bit of framing difference between the groups.

(continued on next page)

Table 1: Continued

Organization	Focus Group Topics
Association of Family Medicine Residency Directors (AFMRD)	• Membership opinions on scope of training to competency • Membership opinions on training to competency in new areas
Society of Teachers of Family Medicine (STFM)	**Behavioral Science Faculty** • How should we teach? • How should residents learn and be assessed? • What is the right balance between experience/time? For example, counting weeks of curriculum or numbers of visits and specific clinical competencies? • How do we prepare physicians to respond to their communities' emerging needs as well as for changing locations, populations, and scope of practice over their careers? **Associate Deans** • What does society need from the family physician of the future? • The four C's (first contact care, continuity, comprehensiveness, coordination of care) were core in the development of family medicine. Should the 4 C's be updated for the 21st century? If so, how? • What does first contact care and access to care mean in an age of increasing non 'face-to face' encounters (such as telehealth)? • How should telehealth and urgent care fit into continuity care? • How will we train physicians to work in and with communities to address disparities and the social drivers of health? • How can we improve the social accountability of graduate medical education? **Physician Faculty Who Are Not Program Directors** • How should we teach? • What is the right balance between experience/time? For example, counting weeks of curriculum or numbers of visits and specific clinical competencies? • How should competencies be assessed systematically? • Should family medicine residencies more fully implement competency based education? • How do we prepare physicians to respond to their communities' emerging needs as well as for changing locations, populations and scope of practice over their careers? **STFM Board of Directors** • What does society need from family physicians in the future? • What should we teach? • How should we teach? • How can we prepare residents for flexibility in scope and population over their whole careers? • What is the right balance between innovation and standardization in residency training? • How can we improve the social accountability of residency training, both at the local level and at the national level?

All results of focus groups and surveys are on the Summit website: https://residency.starfieldsummit.com.

engagement through expected prereading and a variety of techniques, including having the majority of time for discussion, flipped classroom, pre- and postpolling, and small groups; separately, affinity groups by career phase and region of the country met. The participants and agenda are available on the website. Each of the six sessions was brought to closure with straw polls, or, in the case of master adaptive learning, focus groups. The final straw poll results are also posted on the website.[5] Of course, participants were not directly representative of the approximately 115,000 family physicians and family medicine residents in the country, but they do represent the best judgement of a representative group of stakeholders after preparation, presentations, and discussion. The summit website[5] includes the core questions, the focus group and survey results, key documents, the summit agenda and participant list, and will include the papers as they are published. This issue of *Family Medicine* includes the commissioned papers after presentation, peer review, and revision.

In the short term, the goal was to develop recommendations for the ACGME Family Medicine Review Committee as it drafts the new requirements and for the ABFM as it defines future board eligibility. More broadly, however, the stakeholders are the specialty of family medicine and the public. The social contract that binds the profession of medicine to society demands that family physicians self-regulate, and residency education is a fundamental component of that commitment. The AAFP produced the summit; the ABFM developed the permanent website, and the ABFM Foundation is financing this special issue of *Family Medicine*.

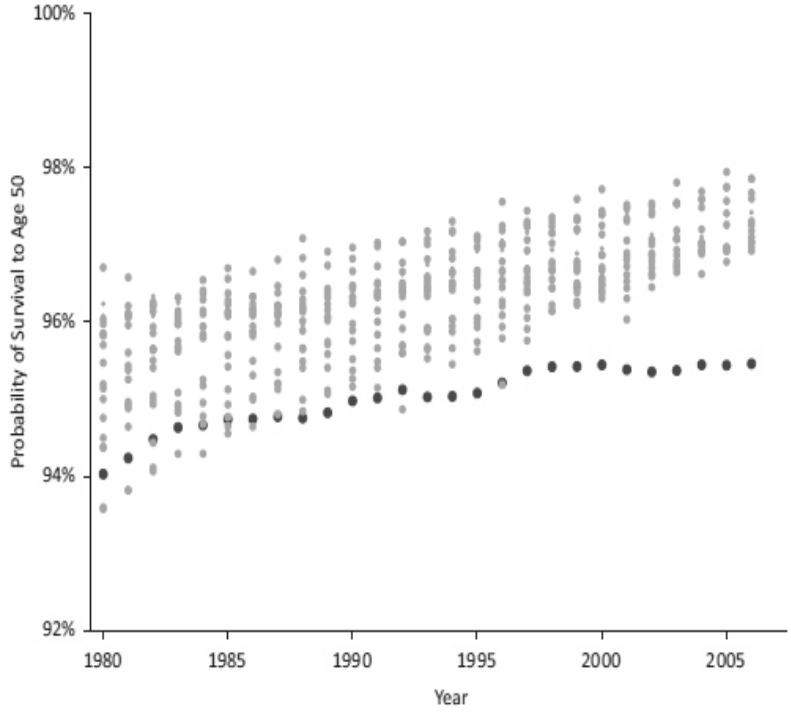
What follows frames the context of the key questions and introduces the

papers. American health care has always been dynamic, but the amplitude and speed of recent changes have not been seen in two generations; they represent *transformation*. Major components include consolidation of hospitals and health systems, rapid spread of integrated electronic health records and employment of physicians. The majority of US physicians are now employed, as are almost 70% of family physicians.[6] A second phase of transformation is just beginning. Augmented intelligence promises to change health care as much as has already happened in banking and retail businesses. Changes in genomics are revolutionizing cancer and autoimmune disease treatment and promise more. Attracted by margin, new business models such as CVS/Aetna are coming into medicine; the COVID pandemic will bring not just telehealth, but also lasting changes in the organization and financing of health care.[7]

Unfortunately, despite transformation of care, and despite health care reform, the population outcomes of health care in the United States are the worst among developed countries and the gap is growing. As the National Research Council demonstrated,[8] Americans are sicker and die earlier than citizens of comparable countries. This is true at all ages and for almost all diseases—and at a health care cost much greater than comparable countries. As examples, Figure 1 depicts the likelihood of survival of women beyond 50,[8] and Figure 2 compares US public and private health care expenditure to similar countries.[9] More recently, it has become clear that US life expectancy has begun to decline, as the result of increased mortality from many diseases.[10] This was apparent even before the COVID pandemic highlighted dramatic disparities of incidence and mortality for Blacks, Hispanics, Native Americans, and the poor. At the same time, however, despite the demands of the Affordable Care Act and huge market demand, numbers of students from allopathic medical schools interested in family medicine have begun to drop, burnout is widespread and scope of practice is diminishing.[11]

Key assumptions for the work are listed in Table 2. The premise of the summit was that the needs of society are changing, and family medicine residencies must change to meet society's needs—and that family physicians must help lead change. Other assumptions included a more than 25-year time frame, and that family physicians will continue to be the largest and most widely distributed tribe of personal physicians, while working in teams with other professionals and patients. Major changes

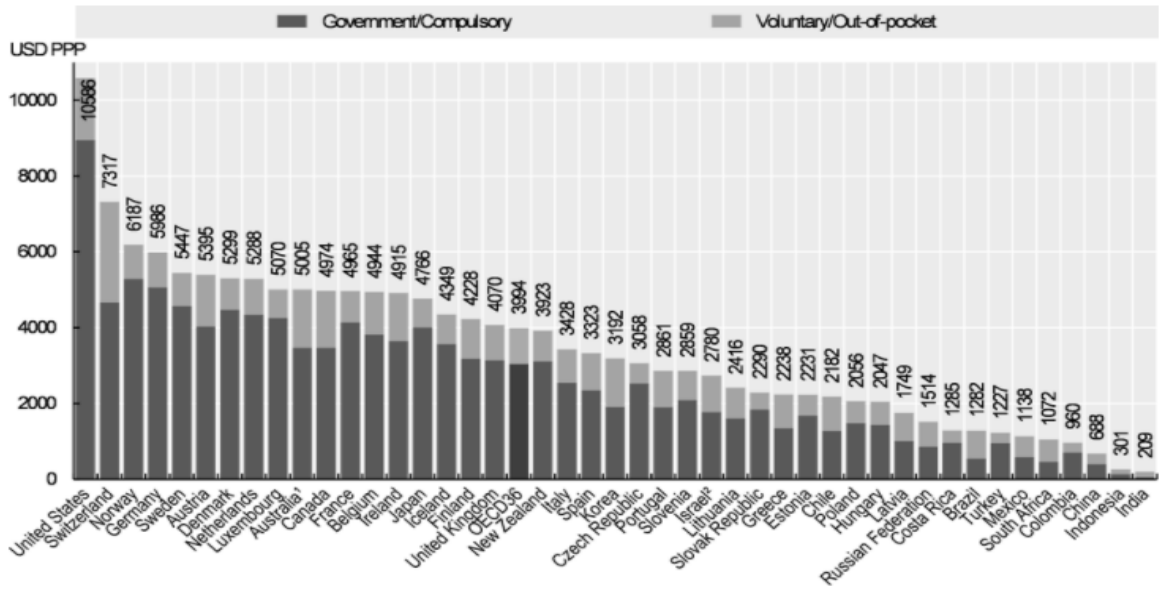
Figure 1: Probability of Survival to Age 50 Years for Females



Probability of survival to age 50 years for females in 21 high-income countries, 1980-2006.

Notes: Black circles show the probability of a newborn female in the United States will live to age 50 years. Grey circles show the probability of survival to age 50 in Australia, Austria, Belgium, Canada, Denmark, Finland, France, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and West Germany.

Figure 2: OECD Health Expenditures per Capita, 2018 (or Nearest Year)



Note: Expenditure excludes investments, unless otherwise stated.

1. Australia expenditure estimates exclude all expenditure for residential aged care facilities in welfare (social) services. 2. Includes investments.

Source: OECD Health Statistics 2019, WHO Global Health Expenditure Database.

Table 2: Reenvisioning Family Medicine Residency Education: Assumptions

• The overall goal is improving health and health care in the United States.
• The time horizon is 25 or more years. • Family physicians will continue to be the most numerous and most widely-distributed personal physicians, although general internists and general pediatricians will play important roles. • Personal physicians are foundational to health care and must be trained to address both continuing and emerging health care problems. They must also help lead change in health care.
• Family physicians will work in teams with other professionals, patients and the public.
• Major changes in health care and health care education take a long time. Many partners will be necessary and fundamental changes in reimbursement must happen.
• Family medicine's obligation under the social contract is to improve health and health care.

in health and health care will take a long time, many partners will be necessary and fundamental changes in reimbursement must happen. The road is long, but under the obligations of the social contract, the specialty must begin the work.

The Core Questions and Their Rationale

What Does Society Need From the Family Physicians of the Future?

Since the founding of family medicine, patients and health care itself have changed dramatically. Many new major clinical problems have emerged, including greatly increased multimorbidity, epidemic opiate abuse, and the COVID pandemic. In addition, serious disturbances of the health care system have emerged, from increases in maternal mortality, emerging maternity care deserts,[12] continuing cost and quality concerns about hospital care, high-cost and often poor-quality transitions of care, and strikingly unequal care across race, ethnicity, social class, and region. Norman Kahn, MD, describes these changes and argues that a first step toward change is the transformation of family medicine residency practices: we must be the change we wish to see in health care and in society.[13]

Foundational to the discussion is the extensive research exploring the source of the primary care benefit: why and how primary care improves population health, quality, and cost-effectiveness. Andrew Bazemore, MD, MPH, describes the abundant evidence that first-contact care, continuity, comprehensiveness, and coordination of care are all essential to improve population health, describes how they should be updated, and argues that they should be the foundation of family medicine residency education.[14] Moreover, in the context of the civil rights movement triggered by the murder of George Floyd, should we also refocus on

community as an additional pillar of family medicine residency education?

The scope of practice for which family medicine residents should be trained is also a key issue. Should all family physicians be trained to do hospital care, take care of pregnant women, and engage in community interventions? Citing a recent reduction in scope of practice of family physicians, some in our community have argued against full-scope training. Yet in many communities, family physicians' broad scope is essential for day-to-day care. Moreover, the large problems society faces in hospital care and maternity care are getting worse with family physicians moving to the sidelines, even as the pandemic has demonstrated the value of plasticity of the family medicine workforce. Commentaries address the importance of hospital care, maternity care, integrated behavioral health, and engaging communities.[15-18]

What Should We Teach?

The clinical and health care problems for which we train influence curricular time and content. The dimensions are important—hospital care, care of pregnant women, integrated behavioral health, and community engagement—but so too are subjects that need more attention such as multimorbidity, rural health, osteopathic principles, and professionalism, along with enabling competencies such as team-based care and addressing diversity and disparities. Many would demand the development of novel educational structures and curricula. A series of commentaries make specific recommendations for future residency content.[19-25] Adding topics, of course, forces consideration of what to take out of the residency. The website includes results from the AFMRD survey of residency directors[26] and the ABFM surveys of residents[27] and residency faculty,[28] and about this issue. It should be noted, however, that the summit was not organized to focus on the specifics of new curricula and innovations in teaching; ultimately this is the responsibility of the specialty and its faculty.

Beyond scope of practice and elements of curriculum, a broader theme of the summit was that residents' continuity practice is a fundamental part of their education: *the practice is the curriculum*. Residents learn by doing, and what they learn by doing they keep doing for years. The ABFM survey underscores that only a minority of family medicine residents are currently empaneled or get feedback about access or cost-effectiveness. Neutze and her colleagues emphasize the importance of the experience in the residency practice and argue that all patients in residency practices be empaneled, and that the practices meet standards of access, continuity, quality and cost of care, framed within a mission of improving population health and implementing the quadruple aim.[29] Robert Phillips, MD, MSPH, underscores the importance of imprinting of basic habits in residency,[1] while Charles Lehmann, MBA, and Winston Liao, MPH, describe the key importance of patients and a patient advisory committee in the residency practice setting.[30] Finally, Grant Hoekzema, MD, reviews what is known from data routinely collected by the ACGME about residency practices.[31]

How Should We Teach?

Over the last 15 years, there has been increasing interest in robust competency-based education across stages of medical education and across professions. In graduate medical education, the pioneer was orthopedics.[32] Implementation of competency-based graduate medical education (CBGME) in a generalist specialty, however, is a particular challenge. Eric Holmboe, MD, describes the history of CBGME, and lessons for implementation from other specialties and from undergraduate medical education.[33] John Saultz, MD,[34] describes the challenges of faculty time and development that CBGME faces, and Suzanne Allen, MD, MPH,[35] describes lessons learned from the implementation of milestones in family medicine. From the perspective of a similar Canadian commitment to full scope family medicine, Nancy Fowler, MD,[36] describes lessons learned after years of emphasis on competency-based education. She distinguishes between competence and confidence, and underscores the implications of social accountability of family medicine residency education.

Critically important to the residency standards is the duration of family medicine residencies and the initial phase of clinical education. Over the last 7 years, there has been a formal trial of 3 vs 4 years duration of family medicine residencies; long-term outcomes are now beginning to be published, with initial papers on admissions and finances.[37-39] Alan Douglass, MD, and Donald Woolever, MD, present a point/counterpoint on this issue.[40] Warren Newton, MD, MPH, broadens the discussion by describing best practices from other specialties, including more substantial individual learning plans in pediatrics, oral examinations to assess judgment and complex decision making in many specialties and a phase of education and support for 1-2 years after residency.[41]

Pedagogy for didactic sessions is also important, given the dramatic advances in the science of learning since our founding in 1969. Simulation and observed structural clinical exams (OSCEs) have become important methods of teaching and assessment of medical trainees. An abundance of evidence shows that interactive teaching has much better outcomes than traditional lectures.[42-44] Todd Zakrajsek, PhD, summarizes this data, and the website provides ABFM resident[27] and faculty[28] survey data about the prevalence of active learning nationally in residency didactic conferences.[45]

How Should We Train for Clinical Adaptability Over Careers and Across Communities?

As the pandemic has taught us, clinical adaptability, both of scope of practice and over careers, is fundamental to what society needs from personal physicians. How should family medicine residencies train for adaptability? What combination of broad initial training, specific skills, and commitment to meeting the changing needs of patients and communities will prepare residents for their future careers? The ABFM survey documents the high frequency of changes in practice, populations, and scope of practice over careers,[27] and the website documents curricular ideas generated by small groups at the summit. Lou Edje, MD, MHPE, describes the emerging literature on master adaptive learning and gives initial recommendations about how to train for it.[25]

Building a Better System of Family Medicine Residency Education

What Is the Right Balance Between Innovation and Standardization?

The needs of society demand ongoing innovation in residencies as clinical needs and health care change. What, how, and where residents learn need to evolve. At the same time, standardization of training is also critical; we need to be able to promise to the employer and the community what a family physician will be able to do. Roger Garvin, MD, frames the tension between innovation and standardization in residency requirements and underscores the need for both, with emphasis on competency-based assessments to guide progress and assess outcomes of innovations and the need to develop networks of residencies to evaluate and spread innovation.[46] ACGME milestones use a developmental perspective and provide national data on standardization. These data show that significant numbers of family medicine residents are not meeting many of the milestones. Deborah Clements, MD, reviews these data and emphasizes key issues to keep in mind as the specialty seeks to improve its system of residency education.[47] Finally, it will be important to measure longer-term outcomes of residency outcomes. One important tool is the ABFM/AFMRD residency graduate survey. Lars Peterson, MD, describes its methods and potential value in improving the national system of residency education.[48] The broader issue is using outcomes after residency to guide improvement of residencies while monitoring the changing needs of society.

How Effective Is Continuous Quality Improvement of Residency Programs?

The United States relies on a voluntary but universal system of residency accreditation through the ACGME. Current accreditation standards require residencies to use principles of continuous quality improvement to improve their residencies, and the ACGME uses administrative data and annual resident and faculty surveys to monitor residencies annually. Site visits are every 10 years or as necessary based on the recommendations of the Review Committee. How effective are these processes? ABFM survey data reveal a glass half full: most residency faculty believe that improvement does occur, but that important issues at both the residency and the institutional levels are missed.[28] Peter Carek, MD MS, former chair of the Family Medicine Review Committee, describes the current ACGME procedures and expectations for ongoing improvement, and proposes new guidelines for improving self-improvement, suggesting that residencies address clinical and community outcomes in addition to educational outcomes.[49] Public commitment to reporting would help the system be more robust.

How Can Social Accountability of the GME System Be Improved?

In most countries, there are explicit standards for social accountability of medical education.[50] In the United States, however, the term is only rarely used and is not a part of formal policy. Yet our society's needs have changed since the inception of Medicare funding of GME.[51,52] Our expenditures on GME are substantial, in both public and private sectors, and the system has little formal oversight beyond financial accountability. How should we improve the social accountability of our national GME system? Arthur Kaufman, MD, and colleagues describe the current GME system through the lens of social accountability and propose steps to improve social accountability at the regional, state, and national levels.[53]

The Future of the Specialty

The summit focused on how changes in family medicine residency can meet the emerging needs of society. Another important issue, however, is the future of the specialty—what should residencies do to help the specialty develop and thrive over the next generation? Yeri Park, MD, gives a resident's perspective on what is needed to make residencies attractive, and Stephen Wilson, MD, MPH, summarizes the challenges of recruiting, developing, and maintaining residency faculty and teachers.[54,55] Yalda Jabbarpour, MD, underscores the importance of diversity of the family medicine workforce and describes how it may change, both in terms of demographics and in comparison to other specialties and professions focusing on primary care.[56] The upcoming major revision also provides an opportunity to address a major strategic weakness of our specialty: the lack of a widespread and sustained tradition of research on issues of practice and policy critical for family medicine and primary care. Diane Harper, MD, MS, gives initial recommendations about how residencies

can encourage and support future researchers.[57] Finally, it will be important to train the leaders of the future to achieve improved health and health care. Myra Muramoto, MD, MPH, gives recommendations about how family medicine residencies can support development of future leaders across all the missions.[58]

Conclusion

Since its founding in 1969, family medicine has met society's need for access to community-based physicians. The specialty has grown to become the largest and most widely-distributed group of personal physicians, delivering care for patients and communities across the country. Now, however, the amplitude and pace of transformation of health care in the United States is greater than at any other time in the last two generations. Despite enormous investment, technology-driven innovation, and the beginning of health care reform, the performance of our health system is falling further behind peer countries. Health indicators are not adequately improving, life expectancy is decreasing, and health inequities continue to plague us.

Personal physicians can and must contribute to improving health and health care, one patient at a time, one community at a time, one health system at a time, and one state at a time. Family medicine can help meet this challenge, as the specialty did 50 years ago, by changing our educational systems in service to society's needs.

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SPECIAL
ARTICLES

— Foundations of Residency Redesign —

Redesigning Family Medicine Training to Meet the Emerging Health Care Needs of Patients and Communities:

Be the Change We Wish to See

Norman B. Kahn, Jr, MD

ABSTRACT: This paper reflects a vision of how family medicine residency training will be redesigned to prepare graduates to meet the health care needs of their patient populations and regional communities. Family physicians are needed to serve as personal physicians and as the patient's usual source of care, as recognized in historic documents that have defined the specialty's enduring role in society as the foundation of the health care system.

Modern residency practices will include residents as junior partners and members of multidisciplinary faculty teams. Residency practices will measure and improve care consistent with the triple aim: enhancing the experience of care for patients, improving outcomes of care for populations, and reducing waste and the cost of care in the system. Curricula will include core elements of the roles of family physicians, including the development of therapeutic relationships with patients and families, recognizing patients' needs and expectations, professionalism, the identification and management of acute and chronic illness, maternity care, and the care of hospitalized patients.

Also included will be emerging expectations of family physicians, including team roles, expanded care through telehealth and patient portals, identifying and intervening in modifiable social determinants of health, addressing structural racism, closing gaps of inequitable care for their patient populations, managing addiction as a treatable chronic illness, improving performance through clinical data registries, personalized medicine, and leadership. Wellness and assurance of a satisfying career will be a priority focus of preparation for career-long practice. Residents will become competent in the comprehensive scope of practice needed to serve in the role of continuous personal physician on multidisciplinary teams that serve as the usual source of care for populations in regions where the residencies are located.

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"General practice is (and ever shall be) for general practitioners.... Thus, general practice…has been preserved for posterity...."[1]

"Every individual should have a personal physician who is the central point for integration and continuity of all medical and medically related services to his patient.... His [sic] concern will be for the patient as a whole, and his relationship with the patient must be a continuing one."[2]

"What is wanted is comprehensive and continuing health care.... A different kind of physician is called for.... We suggest that he be called a primary physician."[3]

"Medicine needs a new kind of specialist, the family physician who is educated to provide comprehensive personal health care."[4]

"Our vision is to transform the health of our country, not just its medical care. A robust family medicine foundation is necessary but not sufficient to achieve this vision."[5]

From the Department of Family Medicine, University of Kansas School of Medicine, Kansas City, KS.

> "We can insist that family medicine take its rightful place as the foundation of a high-quality health care system, a system that serves the needs of everyone. We can achieve these things … 'by force of our demands, our determination and our numbers.'"[6]

The challenges currently facing health care in the United States need family medicine to again be the solution. Family medicine was conceived of American society's call for the profession of medicine to dedicate its newest family member to altruism, and born embodying that aspect of professionalism which puts the needs of patients, populations and communities first. In 1966, three seminal reports, all external to the specialty, were published which created the new discipline of family medicine to meet the health and health care needs of American society. [2-4]

Family medicine is the incumbent specialty in primary care, yet family medicine will always be a reform movement. While the core role of the family physician is enduring, the environment continually demands that newly identified needs be addressed and newly recognized challenges be met. Family medicine is a change agent on which society has repeatedly called, even if it was called by different names, and even if society did not always recognize that family medicine had previously responded to the call. Family medicine identifies as generalists, personal physicians, primary physicians, family physicians, and the foundation of the health care system.

Now family medicine is again being called upon, with expectation and hope, to assure that quality health care and population health are delivered in an affordable system. Family medicine will again respond because FM has a culture of servant leadership. The specialty of family medicine recognizes that to meet the new challenges, it is time to re-envision medicine, specifically through re-designing family medicine residency training at this time. This is family medicine's vision for the future.

It is time for family medicine to own our vision, to assert leadership and take full responsibility for putting the vision of family medicine into practice. We will not succeed if we call upon and wait for others to create conditions we believe may be required to enable our vision to become reality. While we do not have control over the entire health care delivery system and therefore cannot control all aspects of the current practices of family physicians, we will start with changing our residency programs, and the accreditation requirements thereof.

Owning the Triple Aim

> "Health professions education has not kept pace with 'changes in patient demographics, patient desires, changing health system expectations, evolving practice requirements and staffing arrangements, new information, a focus on improving quality, or new technologies.'"[13]

> "Family medicine will transform health care, starting with our own 'grass roots' residency practices, pushing the system to change."[14]

> "Changes in both the practice environment and in residency education since the specialty was created have resulted in a need to re-evaluate and revise the traditional family medicine training model."[8]

For decades, the US health care system has persistently ranked lower in international measures of quality and higher in costs than other nations.[15] The United States remains the only developed nation in which a portion of the population is uninsured.[16] In response, the current foci of the health care delivery system in the United States are often referred to as the triple aim: enhancing patients' experiences of care, improving outcomes for populations, and reducing the cost of care in the system. These aims define the concept of value in health care. Emerging from the game-changing 2001 Institute of Medicine *Quality Chasm* report,[17] the triple aim was first identified by Don Berwick and others at the Institute for Healthcare Improvement.[18] These goals were then integrated into the payment policies of the Center for Medicare and Medicaid Services (CMS) beginning in 2010 during Berwick's tenure as CMS administrator,[19] and incorporated into the National Quality Strategy, promulgated in 2016 by the Agency for Healthcare Research and Quality (AHRQ, https://www.ahrq.gov/workingforquality/about/nqs-fact-sheets/fact-sheet.html). It is through addressing the triple aim that family medicine will meet the service, quality, and cost goals for patients and for the population.

To Enhance Patients' Experience of Care…

Residents will learn that patients' experiences of care focus on their personal physician's accessibility, communication skills, and recognition of the patient's physical and emotional health (Table 1).[20]

At the same time, patients struggle to understand concepts such as comprehensiveness and quality.[12] Family physicians deliver on the primary care promise of comprehensive care when they provide care in which they are trained and competent, and arrange and coordinate care to be delivered by others when the patient needs care that is beyond the knowledge and skills of the family physician.

Lacking the ability to measure quality, most patients assume that they are receiving quality care. Patients in residency practices will serve as partners in their care, ranging from shared decision making[21] in their own care, to participating in reviewing and advising on the performance of the practice in achieving the triple aim. In this way, the patients of the practice will come to learn how to measure and recognize quality of care. Representatives of the community served by

Table 1: Patients' Expectations of the Practice of Their Personal Physician

Patients expect the practice of their personal physician to:
• Be in their health insurance plan, • Be conveniently located to the patient, and • Have open appointments when the patient perceives the need for care.
In addition, patients expect their personal physician to:
• Have nonjudgmental, understanding, supportive, honest, and direct interpersonal communication skills, which includes listening and explaining effectively to the patient; • Attend to patients' physical and emotional health; • Have a relationship with them over a long period of time, in which the patient feels a partnership in maintaining health; and • Coordinate and be part of their care in settings other than their personal physician's practice setting.

the practice, including patients of the practice, will participate in the governance of the practice.

To Improve Outcomes of Care for Populations…
Faculty role models will nurture residents' natural curiosity for the evidence that underlies their choices of interventions for their patients.

Gaps often persist between our health care practices and what is most effective. These gaps are closed through using the tools of population health, including practice-based research, clinical guidelines, performance measures, data warehouses, clinical data registries, and performance reports. Faculty will model the use of these tools as core elements of the residency practices. All family medicine residency practices will use clinical data registries and performance reports to monitor and facilitate their achievement of improved outcomes of care for their patient populations.[22]

To Reduce Waste and the Overall per Capita Cost of Care in the System…
Through modeling by faculty during patient care and through structured learning, residents will become aware of the complexities of determining costs versus charges, what insurance plans will pay versus copays and deductibles, and resultant burdens to patients that serve as barriers to adherence. As part of shared decision-making, residents will learn to incorporate inquiry about what patients can afford. Residents will also learn what factors impact the cost of care to the system, including utilization, limiting unnecessary referrals, meeting patients' needs outside of the emergency room, prevention of hospitalizations, and preventing readmissions through immediate and ongoing follow up of patients in the practice.[23]

The Residency Practice as the Curriculum

> "For a noble purpose as complex as improving health and health care, real change actually happens by taking risks and learning together."[7]

> "You must be the change you wish to see in the world." (Attributed to Mahatma Gandhi)

Family medicine will create interprofessional and collaborative residency practices (residents, faculty, team members, patients) that will function as the health care delivery system designed to meet the ongoing and emerging needs of their local and regional patient populations.[8] These residency practices will hold themselves accountable to their communities to continually measure their progress toward meeting the identified needs of their patient populations.

Family medicine residencies will welcome new residents as new members of their practices. Residents will be oriented on how the care and learning model they just joined is designed and functions to meet the needs of the patient population served by the residency, as well as that of the institution and community. Since the majority of family medicine graduates will practice within 100 miles of where they train,[9] it is reasonable during residency to practice and learn in a manner that will prepare residents for regional practice as family physicians, as well as to adapt to the changing needs of their patient populations and communities. Family medicine residents will be specifically recruited, and then expected to learn the necessary knowledge, skills, and attitudes to enter a career of serving their community as a personal physician and usual source of care.[10,11]

While subspecialties are defined by their content, family medicine is primarily a context-based specialty, managing the needs of patients in an environment of increasing complexity. As residents join the residency practice, they will begin developing relationships with their patients and learning the processes of care in their new practice, supervised by faculty teams. Continuity of relationships with patients is communicated as the core principle of being a family physician, as are first contact and comprehensive care.[12] The residents will join the faculty and team members as partners in the practice in which all practice members will model these enduring core values of family medicine. Team members will reflect the added value of contributing roles in the delivery of primary care, including full- or part-time physicians, nurses, nurse practitioners,

physician assistants, clinical pharmacists, social workers, public health officers, behavioral health faculty, nutritionists, patient educators, community health workers, and others.

Fulfilling the core principle of continuity, residents will participate in the care of their patients in whatever settings their patients receive their care: in the family medicine ambulatory practice, through telehealth, via asynchronous patient portals, through necessary consultations, in the hospital, in labor and delivery settings, in surgery, in nursing homes, and at home. Patients of these practices will experience their personal physician as "being there for them" in all their health care, even if another physician in another setting is temporarily managing the patient's care. In addition to being there, residents will learn to coordinate the care of their patients in various settings.

Core and Emerging Curricular Elements

> "Given the changes taking place in the specialty and within the broader health care system, it is clear that the traditional family medicine curriculum, although successful in the past, cannot meet the needs of the future."[24]

Specific attention will be given to preparing residents to meet today's and tomorrow's needs of local and regional patient populations. Many patient expectations are enduring, such as for ongoing trusted relationships between patients and their personal physician and addressing patients as whole people with integrated physical and mental health needs.

Early in their new continuity practice, residents will have the opportunity to arrange—with the guidance of faculty mentors—in-depth learning experiences in other medical, public health, and community settings. These additional learning experiences will be specifically designed to best prepare residents to serve as comprehensive primary care physicians to meet the needs of the patient populations of the institution, community, or region. The residents' continuity practices with their panel of patients will be maintained, albeit at times reduced, during additional in-depth learning experiences.

Residency practices will assure that residents have experiences and achieve knowledge and skills in both enduring and emerging elements of primary care (Table 2). Residency practices will model and teach the use of new tools to facilitate successful primary care practice:

- Office technology is evolving, such as using point-of-care ultrasound. Family physicians will enhance the experience of care for their patients beyond office-based visits through telehealth[25] and ongoing communication with patients asynchronously through patient portals.
- Genetically-based treatments are anticipated to become more available as all physicians enter the future of personalized medicine.[26]
- The challenge to effectively address opioid use disorder as a chronic illness for which there are effective treatments[27,28] persists in large part from the War on Drugs, a term popularized in 1971, which codified a judgmental view of drug addiction as criminal and sociopathic behavior. Residents will learn to use behavioral therapies in conjunction with medication-assisted treatment as tools in their practices to successfully manage and intervene in the chronic illness of opioid use disorder.[29,30]

We commit that family physicians will be prepared to address current additional challenges, which have been either frustratingly persistent or steadily growing in importance:

- Research into diagnostic and therapeutic aspects of medical care has eclipsed the role of social determinants of health.[31] Residency practices will support the experience of residents

Table 2: Core Elements of the Family Medicine Curriculum

• Behavioral health skills and the development of therapeutic relationships, including shared decision-making
• Professionalism: altruism and ethical behaviors
• Effective team roles
• Beyond in-person care: telehealth and asynchronous patient portals as part of continuity
• Using social determinants of health and public health interventions to improve care for vulnerable members of the patient population
• Community needs assessment
• Primary mental health care, including medication-assisted treatment for opioid use disorder
• Performance measurement and improvement through clinical data registries and performance reports, as well as incorporation of practice-based research
• Personalized health care through health assessment and genomics
• The scope of primary care from health promotion through primary and secondary prevention; recognition and management of acute injuries and illnesses, chronic illnesses and multimorbidities; and preparation for emerging infectious diseases and pandemics
• Maternity care and care of newborns
• Care of hospitalized patients, hospital-community transitions, including rehabilitation services and end of life care
• Leadership to advocate for and make necessary changes in the health system to achieve the triple aim with their patient populations

learning about the social determinants of health and effective interventions in community settings.

- Persistent inequities of care persist for people with disabilities. Inequities also manifest as racial, ethnic, language, and class disparities that are not limited to the urban core.[32] Structural racism has been identified as an underlying contributor to inequities of care and must be addressed during the training of family physicians. Gaps in the processes of care for patients violate the triple aim. No one specialty can address disparities in care across the system. Generalists who care for patient populations, particularly family physicians and their practice teams, will be called upon to advocate for and accept this set of population-based challenges. Residency practices will be designed, and residents will learn to model successful approaches to identifying and closing care disparity gaps.
- The fragmented US health system continues to deliver inequities in care and outcomes for populations which remain geographically isolated from needed care. For example, many areas are maternity care deserts with a lack of maternity care providers and no hospital offering obstetric care.[33] Family centered maternity care will be a part of the training of all family physicians and a substantial element of such training when practicing maternity care will be a core part of their practices in their communities.[34]
- An aging population brings with it people who develop and live with multiple chronic illnesses. The newly coined term "multimorbidity" calls attention to an historically recognized and currently central role of family physicians to manage over time their patients with multiple chronic conditions.[35]
- While COVID-19 may be a once-in-a-hundred-year pandemic, the population has been threatened repeatedly by other epidemics of emerging infectious diseases, including such recent examples as HIV-AIDS, Zika and Ebola.[36] While experts in infectious diseases and public health are required to address these repeated epidemics, primary care is where people affected by epidemic diseases will present. Therefore, family medicine residency practices will be prepared and will prepare graduates.

Residents will be graduated from the residency program when they demonstrate that they have met the goals and objectives of the training program, are deemed to be competent family physicians who are prepared to serve their patients populations as personal physicians and as their patients' usual source of care, and who have completed at least 3 years of residency practice and training. Both competency and time of experience are valid measures to determine successful completion of training and readiness for their next stage of practice.

Assuring Satisfying Careers

> "The principal driver of physician satisfaction is the ability to provide quality care."[37]

Since "burnout among the health care workforce threatens patient-centeredness and the triple aim," residency practices will prioritize the well-being of its practice partners. Faculty will model and residents will participate in interventions designed to promote clinician well-being. This focus on well-being has been incorporated into the concept referred to as the quadruple aim.[37]

The residency practice will recognize and address elements of the practice system that result in obstacles to the ability to provide quality care. After first addressing frustrations in the practice system, residents will be encouraged and supported to implement personal wellness interventions, such as mindfulness, meditation, exercise, and other interventions that have been demonstrated to be useful in facilitating mental wellness and avoiding burnout. System and practice interventions must be addressed, however, before personal interventions can be expected to be successful.[38]

Upon being accepted into the residency, residents will be matched to faculty mentors who will guide the new resident members of the practice through orientation to the care and learning system, building the resident's curriculum, knowledge and skill acquisition, formative performance review, and prioritizing personal wellness. These mentors will continue to be available to residents after graduation to help mentees continue to develop and implement a plan for lifelong learning, including advances in medicine, but also seeking opportunities to learn new skills to enhance the ability of their practices to achieve the triple aim with their patient populations and in their communities.

Medical students will be inspired to seek educational experiences that display the satisfaction and excitement of resident practice partners who successfully develop rewarding ongoing relationships with patients, provide comprehensive care, and demonstrate measurable, continuous progress in achieving the triple aim. It can be expected that medical students will then seek to join a family medicine residency practice as a new partner.

Residency practices will model lifelong learning for family physicians.[39] Ongoing personal development will include a commitment to service, personal wellness and growth. Professional development will include self-evaluation and attention to the tasks of career stages, including skill building, practice building, leadership, governance, and mentoring. Scholarship will include practice-based research, evidence-based reviews, and translation of

knowledge and practice guidelines into primary care relevance.

As residents transition into their communities of practice, they should serve as extensions of the residency practices of the sponsoring institution into the community and region. This multiplies sites for resident experiences, increases faculty role models, and enhances the resources available to the community practices to achieve the triple aim by being linked to the residency practices and sponsoring institution.

> "The challenge now facing family medicine is to take the initiative for change, engage others truly committed to reform, and to see the process through—in all its complexities and risks—to a successful conclusion."[8]

Family medicine residency practices will initiate a new reputation for the specialty[40]:

- *Family physicians* will model satisfying and rewarding careers, with continuous intellectual stimulation, a sense of being of service, making a difference in the lives of patients and communities and enjoying professional and financial security.
- *Other health professionals,* including team members and consultants, will view family physicians with professional respect and esteem, recognizing that family physicians have a reputation for quality care, satisfied patients, and effective collegial communication among health professionals.
- *Payers* will see family medicine practices serving as the patient's medical home, delivering accessible, 24/7/365, comprehensive, continuity, coordinated, and efficient, and affordable care for patients in the practice.
- *Medical students* will see family physicians serving as positive role models, providing technologically advanced care, receiving positive feedback from patients regarding relationships and care and enjoying career satisfaction.
- *Communities* will recognize family physicians as partners in public health, adapting to the needs of the community as they arise.
- *Patients* will choose a family physician as their personal physician, and the family physician's practice as the patient's personal medical home and their usual source of care. In so doing, patients will be assured that their family physician will establish an ongoing relationship with them, be available to meet their health care needs, will listen and explain, will stay current, will incorporate appropriate technology to improve their care effectively and efficiently, will demonstrate a whole-person approach to their care over time, and will advocate for the patient and their family members in the health care system.

DISCLOSURES: The author's career has included relationships, experiences, and perspectives that might be perceived by others as resulting in biases.

The author trained in an early family medicine residency that was designed to prepare graduates to meet the needs of the underserved population in the local urban community. He then practiced full-scope family medicine in a rural community with one medical office, 100 miles from his residency.

The author served as director of both a community-based and academic health center-based family medicine residency, as well as director of a university-affiliated network of predominantly rural family medicine residencies. He worked for the American Academy of Family Physicians and served as staff executive for the Future of Family Medicine project (2002-2004). He spent a decade leading the Council of Medical Specialty Societies, which focused on professionalism and performance improvement in practice.

The author currently teaches health system science, professionalism, and leadership to graduating family medicine residents in each of the three family medicine residencies in his local community. He is a member of the Advisory Board for the Center for Professionalism and Value of the American Board of Family Medicine.

The author has for the past 8 years received his own personal health care from an academic family medicine residency program. His personal primary care physician is a resident who changes every 3 years.

The plans described in this article reflect the vision of family medicine that has evolved from the seminal reports of 1966 (Millis, Willard, Folsom), through the publications of the Future of Family Medicine project in 2004, Family Medicine for America's Health in 2015, and many intercedent publications. All of these remain relevant. Society's need for the role of the family physician as the generalist personal physician is enduring.

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— *Foundations of Residency Redesign* —

Sailing the 7C's:

Starfield Revisited as a Foundation of Family Medicine Residency Redesign

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ABSTRACT: Amidst a pandemic that has acutely highlighted longstanding failings of the US health care system and the graduate medical education (GME) enterprise that serves it, educators prepare to embark on another revision of the program requirements for family medicine GME. We propose in this article a conceptual framework to guide this endeavor, built on a foundation of the core functions that Barbara Starfield suggested might explain primary care's salutary effects. We first revisit these "4C's"—first **C**ontact, **C**ontinuity, **C**omprehensiveness, and **C**oordination—and how they might inform design thinking in primary care GME guideline revision. We also propose the addition of **C**ommunity engagement, patient-**C**enteredness, and **C**omplexity. Training residents to deliver on these "7C's," functions critical to the delivery of high-performing primary care, is essential if family medicine residency graduates are to serve the clearly articulated, but unrealized, quadruple aim for US health care: improved patient experience and population health at lower costs while preserving clinician well-being. Finally, we highlight and illustrate examples of four critical enablers of these 7C core functions of primary care that must be accommodated in training guidelines and reform, suggesting a need for resident competencies in **T**eam-based, **T**ool- and **T**echnology-enabled, **T**ailored ("4T's") care of patients and populations.

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Prior to COVID-19, the US health care system was already associated with a sicker population, living shorter lives, with less accessible and affordable health care, facing mounting health disparities, at much greater expense than peer countries.[1-3] Over the last 4 decades, the gap in life expectancy between the United States and other countries of similar wealth had grown,[4,5] achieving a pre-COVID milestone not seen since the 1917-1918 flu pandemic: 3 consecutive years of declines in life expectancy. While other nations have heeded *Declaration of Alma Ata* guidance that primary care is "essential health care" and should be the "central feature and main focus" of all countries' health systems, the United States has consistently underinvested in primary care and its workforce, which currently constitutes only 30% of all practicing physicians despite decades of efforts to reverse its steady declines. [6-9]

Ominously, despite nearly $18 billion in public investment and federal advisory board calls to push primary care above 40% of the total workforce, only 25% of the products of US graduate medical education enter primary care.[10,11] Pediatrics and internal medicine produce increasing proportions of subspecialty graduates each year, their primary care outputs further compounded by growing entry into hospitalists careers.[7,12,13] As leaders of the largest contributor to the primary care workforce—family medicine—enter a new decade seeking to redefine its program requirements, we must also consider its role in a health system that has failed to achieve its quadruple aim: excellent patient experience and population health at lower costs all while preserving waning clinician well-being. And if family medicine GME reform requires a conceptual compass to navigate these rough waters, Dr Barbara Starfield provided an excellent starting point. She defined the core functions of primary care thought responsible for its positive effects on access, equity, cost and quality using "4C's": first **C**ontact, **C**ontinuity, **C**omprehensiveness, and **C**oordination. We propose these as a conceptual foundation for the next era of training in family medicine, but suggest the need for three additional "C's": **C**ommunity engagement, patient-**C**enteredness, and **C**omplexity, and competency in "4T's": **T**eams, **T**ools, **T**echnology and **T**ailoring, for the future family medicine residents to emerge ready to serve the quadruple aim.

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Explaining Primary Care's Salutary Effects: Starfield's 4C's

Over a 25-year research career, Dr Starfield generated substantial evidence of primary care's positive effects at the national, health system, state, and county level.[14] She suggested that these benefits derived from four foundational functions served by primary care in health systems: the provision of first contact, continuous, comprehensive, and coordinated care. Since their inception, the 4C's have explained the benefits of primary care, but have yet to be used together in total to guide graduate medical education in family medicine. A brief reexamination of each and its implications for family medicine GME redesign follows.

First Contact

In Lord Dawson's 1920 UK report, primary care was initially declared the ideal point of first contact with health services, and a facilitator of entry into the rest of the health system.[15] Unlike most highly developed nations, in the United States, residents train in a system that offers neither universal nor equitable access to insurance or first contact primary care.[14] In fact, recent US nationally-representative surveys reveal that fewer than one in five Americans report having a personal or individual "usual source of care," that this has been declining for decades,[16] and that this trend disproportionately impacts the most vulnerable of US populations.[17] Given growth in new first-contact options competing with primary care residency graduates such as online health avatars, urgent and retail clinics, and direct marketing by hospitals, primary care GME reformers should first be concerned with the demonstration that there is continued value in primary care as first contact. Fortunately, its effect in achieving desirable health system outcomes has been shown in a number of studies. In one US investigation, it was associated with an over 50% reduction in ambulatory episode-of-care expenditures.[18] Evidence also suggests that patients who use a primary care physician as an initial point of contact use specialists and emergency rooms less frequently than those who do not have this relationship.[19-21] Starfield herself demonstrated that first contact with a primary care physician is associated with more appropriate, more effective, and less costly care.[22] New GME guidelines training must help residents and graduates build skills in, and habits of retaining first contact with patients. This can be done by measuring access and time to third available virtual and in-person appointments, maintaining comprehensiveness, using telehealth, asynchronous communication, open-access scheduling, artificial intelligence and online apps to help patients find them rather than first turning to "Dr Google," specialty care, urgent and emergency care services. While the predominance of fee-for-service payment in the United States has made this function easy to ignore or to declare "beyond my control," value-based payment and measurement will make allowing patients to unnecessarily use urgent, emergent, or no health care services more obvious, more costly, and less excusable. As such, training residents to be measured and accountable for first-contact care must be a priority in new family medicine GME guideline creation.

Continuity

According to Starfield, continuity of care implied individual use of their primary or usual source of care over time for most health care needs.[14] The Institute of Medicine labeled continuity a defining characteristic of primary care, and Francis Peabody's famous "Care of the Patient" declares there to be an implicit contract between physician and patient in which the physician assumes ongoing responsibility for the patient, and frames the personal nature of medical care, in contrast to the dehumanizing nature of disjointed care.[23,24] That continuity benefits health is borne of the idea that knowledge, trust, and respect develop between the patient and provider over time, allowing for better interaction and communication. Of all the 4C's, these effects have perhaps the strongest evidence base, as continuity of primary care has been repeatedly associated with a host of benefits, including greater satisfaction with care, lowering undesirable utilization and costs of care, and numerous disease outcomes.[25-28] While continuity has been recently conceptualized as a physician-level measure, and one associated with lower costs and care utilization that is potentially applicable to faculty modeling and resident evaluation, it is also important for residents to learn how to deliver and enhance continuity in the context of team-based primary care.[29] Training programs must impart to residents how best to engage medical assistants, nurse colleagues, behaviorists and other teammates in team approaches to continuous care, and how delivery design, technology, and handoffs can be executed in training and practice without sacrificing continuity and its benefits to patients.[30] Trainees should exit residency with an understanding not only of the positive effects of continuity on outcomes, but also of the negative impacts of disruptions in continuity of care.[31] Educators living in an age of increasing fragmentation, shift work, open-access scheduling, and care seeking through technology must understand how each of these pose threats to patient-to-clinician continuity and decide how to use educational policy levers to retain continuity in training.

Comprehensiveness

Among the 4C's, comprehensiveness remains perhaps the most conceptually diffuse, though Starfield explained:

> Comprehensiveness means that all problems in the population should be cared for in primary care (with short-term referral as needed),

except those that are too unusual (generally a frequency of less than one or two per thousand in the population served) for the primary care practitioner or team to treat competently.[14]

Since Starfield, many in the primary care community have debated whether comprehensiveness refers to the breadth of the conditions a physician cares for, the depth of their ability to take care of each condition, care in various settings, or provision of a multitude of services.[32] Despite debates over its measurement, we know that comprehensiveness is inherent to the delivery of whole-person care, and a feature that distinguishes primary care physicians from other specialists as well as non-physician providers in both behaviors and overall costs. In addition to finding that countries with higher primary care scores also had higher quality and access to care at lower costs, Starfield declared the degree of comprehensiveness to be "the feature of primary care most salient in distinguishing [these] primary care-oriented countries from others."[33,34] As the subject-matter expert on patients themselves, it is perhaps concerning to witness decreases in many dimensions of comprehensiveness among family physicians, including declines in provision of inpatient, obstetric, pediatric and procedural care.[35-38]

Educators revising residency guidelines should be aware that comprehensiveness, like continuity, has been recently demonstrated as measurable at the physician level and associated with lower medical costs and hospitalizations.[39] Also important is its association with lower levels of burnout,[40] and the finding that intended scope of practice among family medicine graduates is broader than actual practice. These suggest the need not only for reform in training but also payment, as market forces shape environments unfavorable to graduates intending broadly-scoped practice. Reformers must consider the risks versus reward of revising training for an age when less fee-for-service and greater value-based capitated payments reward residency graduates with competency in delivering team-based, broadly-scoped practice.

Coordination

Coordination of care consists of leading, organizing, and integrating patient care across different locations, specialties, and phases of care, a virtue that Starfield found lacking even in high-performing health systems.[14] As a result, there is less evidence linking primary care coordination with outcomes, but real opportunity for family medicine GME reform to empower residents to better demonstrate this functional use of new technology, tools, and team-based care. Evidence makes clear the critical importance of primary care's coordinating role from a patient perspective, again suggesting opportunity to enhance guidelines for residency training.[41] Federal reports have declared primary care's coordination role to be integral to improving effectiveness, safety, and efficiency of care, noting that most health care systems are disjointed, with variable processes, unclear patient expectations with most referrals, and unfamiliarity hampering patients' capacity to assess and choose among services available to improve their health.[42] This concept also applies to coordination of decision-making together with patients and families, including the facilitation of their understanding of treatments or procedures to be performed. Educators should consider guidelines that promote and assess resident competencies not only in directing referrals, but also being present—synchronously or asynchronously, and regardless of their continued presence in inpatient and procedural settings—when key decisions are being made by or about their patients. Guidelines should be built on expectations that resident responsibilities extend far beyond the visit, require digital and communication tool literacy, and employ principles of self-study and continuous quality improvement in testing different approaches to excellent coordination of care.[43]

4C's or 7C's?: Additional Constructs to Explain the Value of High-Performing Primary Care

Over time, some have asked whether Starfield's framework should be revisited, while others have suggested additional constructs that might also explain how primary care positively influences quadruple aim outcomes. In the following sections, we propose and elaborate on several such constructs.

Community Engagement

While foundational influences on a new discipline called family medicine such as Millis, Willard, and Folsum imagined a community-facing discipline at the epicenter of "Communities of Solution," modern residents train in a health care paradigm increasingly asked to attend to the social determinants of health, to care not only for individual patients and families, but also panels and communities with a goal of achieving population health.[44,45] This demands the more explicit declaration of a "C" only tacitly addressed in Starfield's model: Community engagement. If family medicine residents are to remain counterculture[46] to modern, reductionist and institution-bound GME, it will be because of their embrace of Virchow's notion that "Medicine is a social science, and politics… medicine on a large scale"; of generalist John Snow's curiosity beyond the office in tracing community-level sources of disease[47]; of Sidney and Emily Kark's revolutionary principles of community-oriented primary care in addressing with communities their own health problems[48]; of Paul Nutting's guidance to structure one's practice to take a community-oriented approach to primary care[49]; of John Grant's "regionalization of health care" and embrace of community partners in achieving health. Each of these legendary generalists intuited and revealed the futility of

attempting to address social determinants of health with clinic-based activity and training alone.[50-52]

While training alone will not fix systematic inattention to social determinants and inequity, new family medicine GME guidelines cannot permit residents to graduate without basic competencies in community-engaged practice. For starters, residents should be able to gauge the size of their patient panel better than practicing family physicians,[53] to estimate the geographic area that they serve and the resources available to those living within it, and to understand simple tools available to guide population health assessment and interventions such as PHATE and HealthLandscape.[54,55] They should be at least versed in health policy, health systems, advocacy, and multisectoral partnerships (public health, medical-legal, social services, housing among them) required to advance the needs of their patients and communities. These competencies must be framed widely to allow tailoring to local community needs and resident interests, and fortunately, there are a growing number of examples of community engagement in the primary care training environments for educators to draw upon and an increasing array of data, tools, and curriculum in this digital age.[56-58] New requirements for community engagement should include not only competencies, but also involvement and service within the community and in the advancement of policies and community action favorable to health.

Patient-Centeredness

Conversations and considerable action over the last 2 decades have returned the patient to the center of US and global health system design and delivery. Most residents today train in patient-centered medical homes(PCMHs), theoretically places of rapid cycle innovation, built around patient-centered care concepts such as "nothing about me without me."[59,60] However, the practice of modern medicine remains fundamentally disease-centered, a construct served by value-based payments for mostly illness-based quality measures. A relational discipline by nature, family medicine training must resist these tendencies and continue to emphasize and build on a growing evidence base that supports excellent patient experience. In this regard, the residency clinic itself and its approach to care truly are the classroom. Guidelines should emphasize and embrace whole-person and team-based care that is centered around patient needs rather than physician convenience, including meeting the patient where they are with information when they need it. The overarching ideal of shared decision-making—understanding a patient for who they are as a person rather than a disease, identifying patient goals, and adjusting plan of care based on a patient's understanding and capability—is also central to providing patient-centered care and demands attention in curriculum redesign.[61] This requires adaptive competency in an array of apps, portals, and other means of virtual and asynchronous communication. It is essential that family medicine educators model, teach, and hold residents accountable to the shared principles of what it truly means to be patient-centered in a family, occupational, and community context, and how to serve patients' "physical, emotional, psychological and spiritual well-being, as well as cultural, linguistic and social needs."[62] Residents should understand that this is achieved not merely through PCMH certification, yet be well versed in the lessons emerging from over a decade of innovative PCMH experiments in patient-centered primary care, a literature that continues to expand each year.[63] Revisers of the Family Medicine Residency Review Committee guidelines can draw upon a growing array of single-program and collaborative approaches to building competencies in patient-centered care, but must also acknowledge patient-centeredness across all FM curricular requirements.[64-66]

Complexity

In addition to patient-centeredness, complexity has also emerged as the defining construct for primary care and its graduate medical education enterprise. As previously noted, our population is growing older, more obese, more diverse, and increasingly multimorbid, driving up both costs of care and mortality rates while our strategies for care grow increasingly fragmented, subspecialized, and siloed by disease and organ system. Family medicine represents an antidote to this tendency. As T.F. Fox famously noted, "the more *complex* medicine becomes, the stronger the reasons why everyone should have a personal doctor,"[67] and it is no surprise that generalist disciplines deliver the most quantifiably complex care of all specialties when measured by quantity of inputs and outputs per encounter and their variability and diversity of work across the spectrum of care.[68] New FM residency guidelines must walk a fine line in requiring residents to demonstrate minimum quanta of visits or care for certain disease categories (obstetrics, orthopedics, and so on), while also showing a more qualitative competency in addressing multimorbidity, caring for complex and undifferentiated illness and functioning in complex adaptive systems of care.[69] This will require not only familiarity with disease-specific guidelines and tools, but the ability to synthesize and to adapt care to patient and population complexity, and understand and implement interventions that improve outcomes for patients with a growing array of multiple chronic conditions.[70]

Sailing the 7C's Is Not a Solo Voyage: 4T's to Enable a Successful Journey

It is critical to note that burden of conveying and achieving competency as a purveyor of such multidimensional primary care cannot be borne

by the individual educator and resident alone. Success will depend on many enabling factors in the residency built environment, among them training in teams, using tools, technology, and tailoring to local context. A built environment that models high-performing primary care, as defined by its attention to the 7C's functions, with attention to these enablers and translation into measurable milestones, give opportunity for imprinting positive downstream behaviors and achieving desirable health system outcomes (Figure 1).

Teams

The age of the doctor-diva is long past, replaced with an awareness that physicians must respectfully operate within health care teams. Achievement of each of the 7C's functions depends on such competency, which begins in the structure of a training-built environment in order to imprint positive team behaviors downstream. This requires curricular inclusion of skills in team-based care, leadership, and knowledge of the optimal deployment of a range of teammates in the delivery of comprehensive, complex, community engaged care. These should include not only certified health care teammates from other specialties, the fields of nursing, pharmacy, oral, behavioral, and allied health, but also lay partners bearing an array of labels: community health worker, patient navigator, family caregiver, and patients themselves. Optimally, training also includes lessons or experience in optimal engagement with data and information scientists, public health officials, and social services. Fortunately, many residents already perceive that they are well trained in team-based care, but much work remains to embody true team-based training and practice.[71]

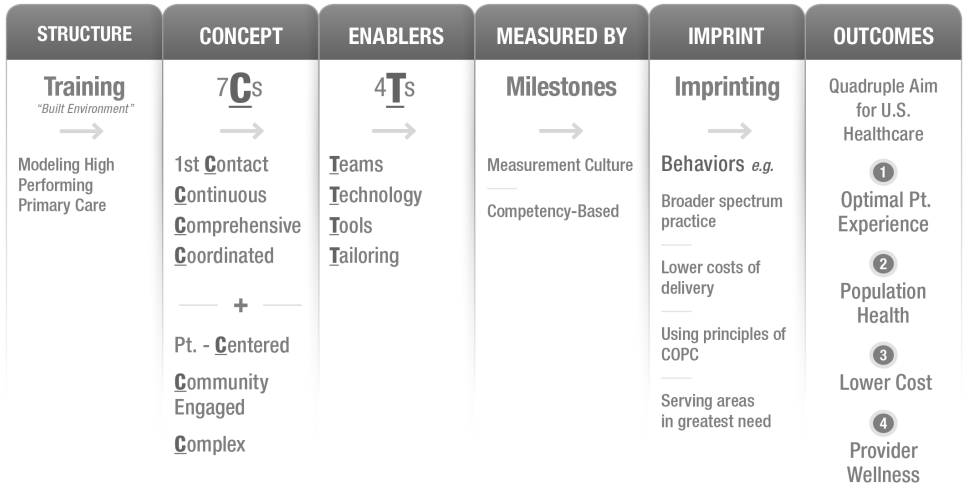
Tools

It is impossible to imagine achieving continuous, coordinated, complex and community-engaged care absent familiarity with myriad tools now available to generalist physicians. Graduating without a demonstrated understanding of smartphone-based apps, tools for asynchronous care management, registries such as PRIME, population health implements, or measurement tools will condemn residents to burnout and failure in an evolving health system.[72,73] Available tools for future physicians include not only technology as described in the following section, but separately information review in journals, patient handouts and information, peer education, networks of educators and contacts throughout subspecialties, and other implements that empower further resident and patient understanding of disease. Education on available information will provide residents and family physicians the tools to deliver improved patient- and community-centered care.

Technology

Technology is a tool of sufficient importance to warrant particular attention. Technology interconnects the health care world and the primary care environment in ways we couldn't imagine in previous updates to training requirements. The COVID-19 pandemic has only heightened our dependence on previously underutilized telehealth, and many providers are now working on their third or fourth electronic medical record systems or portal for asynchronous communication with patients or other providers. While not all residents can undertake informatics fellowship training, curricular guidelines for their future success must include appropriate understanding and employment of advanced technology. As noted before, any hopes to improve care coordination begin with technologically

Figure 1: A Conceptual Approach to Family Medicine Residency Redesign



Abbreviation: COPC, community-oriented patient care.

competent generalists. Conversely, residents graduating without technologic competence adaptable to an increasing and ever shifting digital platform can hardly be expected to maintain professional wellness. Family medicine and its training enterprise must help to shape and direct how artificial intelligence and machine learning, genomics, and biometrics are used to address delivery processes and patient care, lest they see "solutions" not built for or tested in the primary care space continue to be imposed upon them by commercial entities and hospital systems. Such "solutions" likely to create more unintended costs, health care disparities, undesirable side effects, fragmentation, and burnout. Finally, overcoming trends when fewer and fewer patients are inclined to in-person visits and longitudinal relationships with primary care depends on our embrace of technology, and putting the right information in the hands of the patient when and where they want it. In short, ensuring technologically fluent generalists is an obligation for creators of new family medicine GME guidelines.

Tailoring

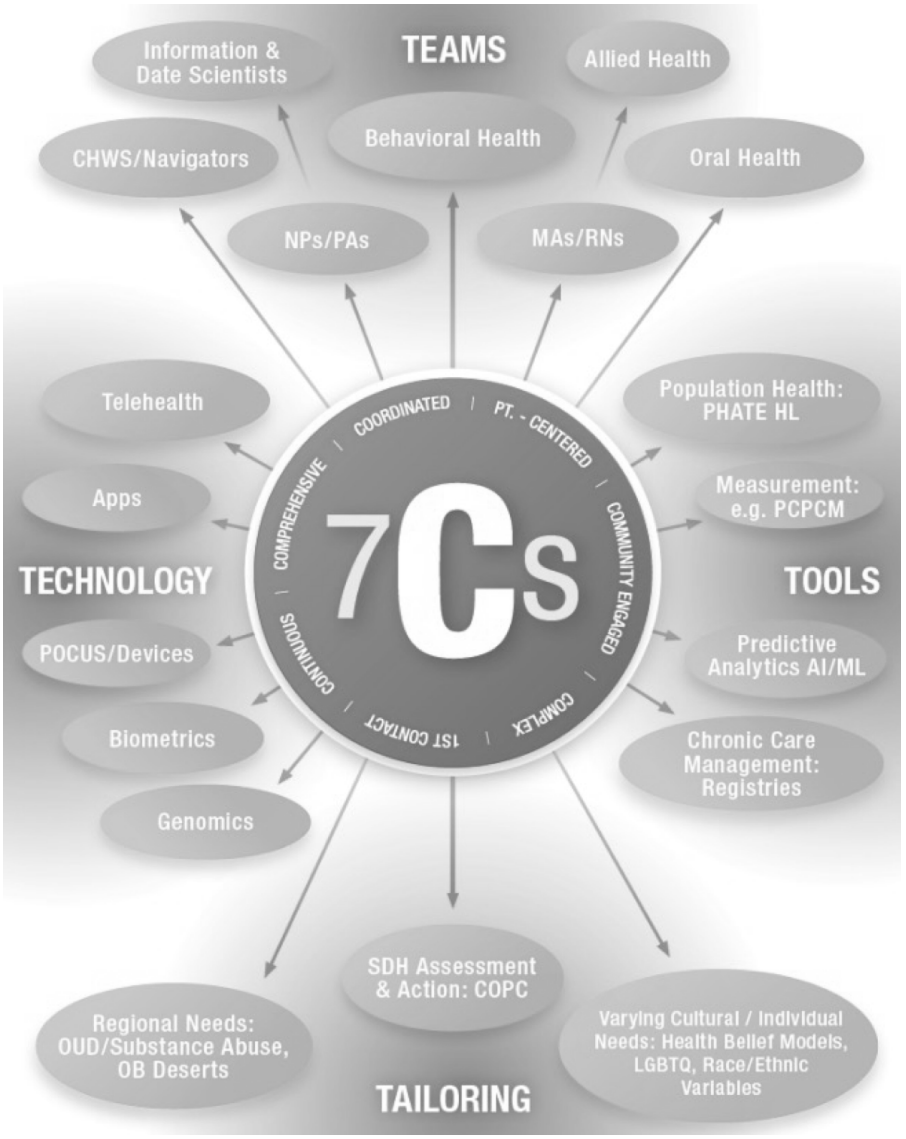
To deliver on the seven core features that explain the value of primary care, the family medicine resident must be trained to think and act the part of the tailor. Instead of being rigidly bound to an increasing array of evidence-based chronic care and preventive guidelines common to lower levels of clinician training, the primary care physician must adapt broad knowledge and tailor care to the complexity, needs, health care beliefs, and care-seeking behaviors of the whole patient. A contemporary iteration of Fox's "personal physician,"[67] this extension of patient-centeredness will require skills or competencies to be developed in many areas not traditional to disease- and organ-based education, among them cultural humility and awareness; how conceptualization of race in health care shapes decisions, trust, and outcomes; and the specific health needs related to differences in gender identity, health belief models and trust.[74] Training the "tailor" would also enhance continuity and coordination, as some patients and populations will best be approached with a heavy dose of apps, telehealth, wearable technology, and asynchronous delivery, while others will continue to prefer and be best served by predominantly synchronous and visit-based care. At the community level, program directors must also train them to tailor their comprehensiveness of training to community needs and population demands, trained across a broad array of care and settings but also able to refine, enhance, or add new skills based on local or evolving demands. And once again, this likely requires explicit training and experience in engagement and advocacy, as well as data-driven understanding of panel size, community and service area characteristics unfamiliar to most current FPs.[53,75] This concept of adapting to local need is of particular importance to the family medicine GME enterprise, whose small, widely distributed, and largely community-based training sites yield graduates particularly likely to practice within 100 miles of GME training.[76]

Implications for Residency Redesign and Evidence Gaps

Current GME standards, like current payment models and their resulting delivery system, are insufficient to ensure resident competency across the broad architecture we propose. It is also important to recognize that these 7C's are hardly orthogonal, and occasionally competing; tradeoffs must be accommodated in Residency Review Committee guidelines that might otherwise push residents to increase first-contact care through open access and greater outpatient presence, but at the expense of more continuity visits and greater comprehensiveness through increased nonoutpatient training. That said, these core values can instead be seen as mutually synergistic; increasing first-contact care may provide opportunity for expansion of one's patient panel and improvement in continuity, and the diversity of undifferentiated signs and symptoms experienced in first-contact care would provide training in comprehensive care. Seeking balance across the competing obligations and principles of generalist training is nothing new for the leaders of family medicine education. Their greater risk lies in a microscopic gaze or a reductionist approach to revising program requirements. To lose sight of core principles and a macroscopic view of the goals of training risks producing not the ideal definition of a contemporary family physician as recently declared by the discipline, but instead its foil (Figure 2). Others would point out that requirements have evolved considerably and positively in ways that already support the 7C's and onto which further integration is easily imagined. For example, evaluation of first contact might already be found in the ACGME Milestones for Family Medicine "Ongoing Care of Patients With Undifferentiated Signs, Symptoms, or Health Concerns."[77] Perhaps further integration of first contact as a foundation of family medicine training could be achieved through definitional refinement rather than complete restructuring of evaluation.

Measurement skeptics will undoubtedly question whether current guidelines are consistent with attaining the ideals of Starfield's Cs. They might point out that a hard minimum patient number doesn't lead to greater competency as a provider of continuity and community health as other metrics might, for example, the ability to identify one's patient panel or the number of patients that consider a resident their principal and trusted source of care. Some might advocate for broader Residency Review Committee guidelines for continuity, the specifics of which could be defined by residency programs tailored to the needs of their individual panels or community. For the numerically-inclined, could an alternative to 1,600+ total visits be

Figure 2: Enablers of Successful Family Medicine Redesign to Achieve the Quadruple Aim



Abbreviations: CHWs, community health workers; NPs/PAs, nurse practitioners/physician assitants; MAs/RNs, medical assistants/registered nurses; PCPCM, patient-centered primary care measure; POCUS, point-of-care ultrasound; PHATE, HL, Population Health Assessment Engine - HealthLandscape; AI/ML, artificial intelligence/machine learning; SDH, social determinants of health; OUD, opiod use disorder; COPC, community-oriented primary care.

a requirement for residents who have at least 200 patients, identifiable by patient and provider alike as a "continuity panel," with whom the resident has a minimum number of visits. The current structure of continuity clinics as block rotations in many programs meets service demands, but not necessarily educational demands. Restructured longitudinal requirements for continuity clinics could support follow-up with the same resident as a primary care physician and assist with imprinting the importance and efficacy of longitudinal patient continuity on future family physicians. ACGME Milestones already exist that examine continuity relationships with patients, leaving one to hope that its measurement would require expansion, not invention.

Comprehensiveness remains a cornerstone of residency requirements in family medicine, but its dimensions must be reexamined in the face of scope declines, graduate challenges finding positions commensurate with training and intent, and opportunities for collective comprehensiveness delivered across teams and practices. Measurement of first-contact care warrants attention in curriculum redesign; time to third available appointment has been used to measure access previously; how

should this indicator be adjusted as residencies incorporate telehealth? Coordination of care is listed among the new ACGME Resident Milestones, but revisions could consider its specifics, eg, whether to require participation in care coordinator rounds, review of social service work with hospital or clinic patients, or rotations that involve explicit care coordination or social work resembling practice management requirements. It will also be important to explicitly define and outline the differences between community engagement and coordination of care, as well as the advocacy and policy development activities already reflected in the new

Table 1: Questions for Educators to Consider as They Engage in Family Medicine Guideline Updates

Domain	Question
First contact	Is first contact with patients actionably measurable in a residency setting, whether for undifferentiated illness, chronic, or postacute needs?
	How can practice processes, tools and technology be deployed to improve the likelihood of residents serving as first contact with their continuity patients?
Continuity	How are technology, evolving patient preferences, primary care transformation, and changes to payment/delivery systems shaping trends in continuity of care in the residency setting, and what steps can residencies take to mitigate its declines?
	What do consolidation and increasing physician employment mean for continuity in training and eventual practice?
	How can requirements balance the need for ethical workplace practices (eg, work hours, shifts) for trainees with patient benefits from greater continuity of care?
	How does practice or team-based continuity differ from individual continuity in its measurable outcomes at the patient level?
Comprehensiveness of care	Is comprehensiveness an absolute or relative trait in the FM GME graduate? (ie, Should this vary by community need?)
	Given competing demands, what are the minimum requirements for training a comprehensive physician ?
	How do we balance individual comprehensiveness vs. "collective comprehensiveness" via team-based care in future primary care practice and how can we train residents to work as part of a comprehensive team?
Coordination of care	What training enhancements regarding coordination would be most feasible and offer highest reward—better coordination with specialists and referral management, taking ownership of coordinating social services, other areas?
	What other aspects of coordination are important for residents to receive training in?
	How can we evaluate residents' ability to coordinate care?
Community engagement	How should primary care trainees balance care for individual patient social needs with addressing the needs of the community and populations they serve?
	How might public health and community-based organizations participate in or at least collaborate in family medicine education and residency training?
	What type of training curriculum is best for teaching about the social needs of our patients and communities (lecture, precepting, rotation, longitudinal, scholarly work)?
Patient-centeredness	What training approaches and curricula are most effective in optimizing patient centered care in primary care residencies, and how can they be monitored and evaluated over time?
	What will technology, patient preferences, primary care transformation, and payment and delivery reform mean for residents seeking to deliver patient-centered care in the future?
Complexity	What are best practices in training residents to address multimorbidity and complex care?
	How can we translate these into guidelines that create competencies in addressing the increasing complexity of primary care?
For all 7C's	Is measurement of each of the 7C's in the residency setting feasible, sustainable, and actionable?
	How do we best ensure the 'Imprinting' of desired behaviors and 7C's competencies on downstream graduate practice?
	In the post-COVID era, how can health information technology and increased asynchronous and distanced communication between physician and patient better facilitate 7C's behaviors?

Abbreviations: FM, family medicine; GME, graduate medical education.

ACGME milestones. Patient-centeredness and complexity will face similar questions concerning best practices, feasibility and burden of measurement, and competing demands. In short, educators considering a 7C's framework have many questions to consider, of which we capture only a sample in Table 1.

Conclusion

Using a simple 4C's mnemonic, Barbara Starfield provided not only an explanatory framework for the benefits of investing in high-performing primary care, but also a guidepost if family medicine GME reform is to produce graduates relevant to the aims of public, payor, and policy stakeholders. Such relevance will require graduates to attend to the additional core primary care functions of community engagement, patient-centeredness, and complexity, and to competently harness the power of teams, tools, technology and tailoring to achieve a national quadruple aim. We hope that the family medicine residency review committee will find such a conceptual model useful in linking revised residency requirements to imprinted graduate behaviors capable of serving desired national outcomes for our expensive and underperforming health care system.

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