



# WHO WILL PROVIDE PRIMARY CARE AND HOW WILL THEY BE TRAINED?

Proceedings of a conference chaired by  
Linda Cronenwett, Ph.D., R.N., FAAN  
and Victor J. Dzau, M.D.



Josiah Macy, Jr. Foundation

April 2010



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# PREFACE

George E. Thibault, M.D.



The Macy conference, “Who Will Provide Primary Care and How Will They Be Trained?” assembled a remarkably accomplished and diverse group of professionals to address one of the most critical problems in healthcare in the country. All participants felt a heavy responsibility to put aside professional, organizational, or institutional biases to engage in a frank dialogue that could lead to consensus recommendations that would be in the public’s interest. And that is exactly what happened.

The dialogue was informed by the outstanding commissioned papers that are contained in this monograph. Bob Phillips reviewed the definitions of primary care so that we would have a common starting point for our discussion. Julie Bynum and Elliott Fisher reviewed the evidence that primary care adds real value to healthcare in terms of quality, efficiency, and patient satisfaction. Lloyd Michener and his team reviewed the possible models for primary care based on the diverse needs of communities. Valerie Stone and her team reviewed the pathways and elements for physician training in primary care in internal medicine, family medicine, and osteopathic medicine. Joanne Pohl and her team reviewed the history and content of nurse practitioner training in primary care, including the regulatory issues that have an impact on how that training will be expressed in practice. Ruth Ballwag reviewed

the educational issues for physician assistants preparing for careers in primary care. Each of the papers provided the historical framework and factual basis for the rich discussions that ensued. They also contained the seeds for some of the consensus recommendations that emerged.

The group was further informed by an extensive reading list and by their own experiences, which they shared with one another during the conference discussions and through the breakfasts, lunches, and dinners that we shared. During one of our lunches we were privileged to have Mary Wakefield, PhD, RN, Administrator of the Health Resources and Services Administration (HRSA) of the Department of Health and Human Services, share her perspectives on the preparation of an adequate work force for the provision of primary care.

The 3 days of discussion were intense and informative, covering a wide domain of issues in medical practice, health professional education, government policy, professional standards, and societal values. It is not surprising that, given the range of issues and perspectives, there was not total agreement on all points discussed. Yet, in spite of the complexity of the issues and the diversity of the points of view, the group came to agreement on many important points:

Everyone agreed that there is great urgency to act now—whether or not other aspects of healthcare reform are enacted.

Everyone agreed that we need well-trained providers from multiple professions working as a team to meet the public's needs.

Everyone agreed that we must proportionally invest more in primary care in all its dimensions if the public is to get the care they want and need and if we are to control costs.

Everyone agreed we must simultaneously reform the delivery and the educational systems if we are to attract more professionals to primary care and improve their training. We must train the next generation of primary care providers in better functioning primary care systems.

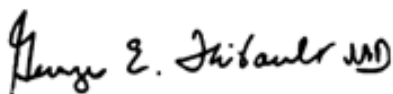
Everyone agreed that academic medical centers with their schools and other affiliations can and should play a leadership role in this transformation.



The sense of urgency was coupled with optimism that we collectively are up to this task. There are many examples of superb primary care models in existence, and there are many committed practitioners and educators across the professions who are anxious to participate in the transformation. More needs to be done to disseminate the good work that has already been accomplished and to provide the leadership and political will to reorient our healthcare system with more of a primary care focus. I am confident that the passion and insights of the Macy conferees will help to start that process.

When we met in January, the fate of the healthcare reform legislation in Congress was uncertain. All agreed that this issue—the future of primary care—must be addressed regardless of the outcome of the legislative process. Since we met, the proposed legislation has become law, and more than 30 million Americans who have not had health insurance will be insured over the next several years. This is a very positive step for the health of the nation, but it adds even more urgency to the need to address the primary care deficit if the public is to reap the full benefit of this legislation. Let us hope that the passage of this historic legislation will, in fact, create an environment that is more receptive to change and more likely to promote action on the excellent recommendations made by the conferees.

I want to thank everyone who participated in this conference, which was one of the most stimulating conferences that I have been privileged to participate in throughout my academic career. I want to particularly compliment Linda Cronenwett and Victor Dzau for their extraordinary leadership before, during, and after the conference. Without their skill, wisdom, and balance we could not have achieved the outstanding results which we did. I also want to thank all of the planning committee and the Josiah Macy, Jr. Foundation staff for all of the hard work and tenacity that brought this to a successful conclusion. It is now all of our collective responsibility to see that action is taken on these important recommendations for the benefit of the American public.

A handwritten signature in black ink that reads "George E. Thibault MD". The signature is written in a cursive, slightly slanted style.

George E. Thibault, M.D.  
President, Josiah Macy, Jr. Foundation



# CO-CHAIRS' SUMMARY OF THE CONFERENCE

Linda Cronenwett, Ph.D., R.N., FAAN  
and Victor J. Dzau, M.D.



## THE URGENCY FOR CHANGE

Abundant evidence shows that healthcare systems with a strong primary care component provide high-quality, accessible, and efficient care. People want primary care providers with whom they can have ongoing relationships. They want to know that when they need help, they have access to someone with knowledge of their health problems and their individual characteristics.

Despite evidence supporting these facts, the healthcare system in the United States has not developed or valued a strong primary care sector, though there are excellent examples of primary care to be found in many regions. The lack of a strong primary care infrastructure across the nation has had significant consequences for access, quality, continuity, and cost of care in this country. It also has had consequences for our health profession educational enterprise and the healthcare workforce, resulting in numbers and geographic distributions of primary care providers that are insufficient to meet current or projected needs.

Regardless of the outcome of current health reform efforts, the country will continue to innovate in attempts to provide access to care to several million additional people and simultaneously improve the health of populations, enhance the patient experience of care (including quality, access, and reliability), and reduce, or at least control, the per capita cost of care. We are facing an economic situation in which the current rate of rise of medical cost is unsustainable, and this situation is exacerbated by an aging population with higher care needs and expectations. These events have created a climate in which it is necessary and appropriate to question the models of care and health professions education on which we have relied.

If we are going to fulfill our nation's promise to the public, and if we are going to produce the healthcare workforce required to accomplish our goals, we will need to enlarge and strengthen the primary care sector of the health system. There is great risk that if we do not do so, a significant portion of the population will continue to be without access to high-quality and efficient care, and healthcare costs will continue to escalate with dire consequences for the economies of individuals and the nation. Because of the magnitude of these problems and the current attempts to reform healthcare, there is great urgency in addressing these issues. These issues have registered in the public and professional consciousness in a way that suggests that unprecedented change is possible. The goal of this change is to produce "better health, better care, lower cost." Failure to act now could put the health of our communities and the economy of the country in jeopardy.

In January 2010, the Josiah Macy, Jr. Foundation convened a conference entitled "Who Will Provide Primary Care and How Will They Be Trained?" Held at the Washington Duke Inn in Durham, North Carolina, the conference was co-chaired by Linda Cronenwett, Ph.D., R.N., FAAN, Professor and Dean Emeritus, School of Nursing, University of North Carolina at Chapel Hill and Victor J. Dzau, M.D., James B. Duke Professor of Medicine, Chancellor for Health Affairs of Duke University and Chief Executive Officer of the Duke University Health System. Attending this important meeting were 49 participants, carefully chosen to represent a diversity of views on primary care, including experts from all professional groups who provide primary care (allopathic and osteopathic physicians, nurse practitioners, and physician

assistants) and experts from the various sectors affected by the challenges related to primary care (consumers, academia, practice, science, journalism, government, healthcare policy, payors, and foundations).

Participants arrived in Durham well prepared to discuss the background papers. For each session topic, the list of people contributing insights was impressive. Many conversations continued well into the evenings. Perhaps the most noteworthy observation was the encouraging consensus that emerged among leaders from different parts of the healthcare system—a general agreement about what needs to be done; a willingness to come together to accomplish goals that will benefit patients, families, communities, and health professionals; and a sense of urgency to bring about major changes that will strengthen primary care in our country.

We began our discussions with a review of the history of primary care and our relative lack of investment in population health (included in the definitions of primary healthcare in most of the rest of the world). When Abraham Flexner put medical education on a scientific footing with his 1910 report, medical education as we know it was created. Medical schools were associated with large teaching hospitals, and highly knowledgeable specialists directed departments organized around organ systems. When the National Institutes of Health were formed, these faculties focused on the creation of yet more specialized knowledge. Healthcare payment structures responded to the technologies and science of these specialists, resulting in the healthcare practices we invest in today. As specialty medicine grew in prestige and reimbursement, general internal medicine, general pediatrics, and the more recent specialty of family medicine took a lower place in the hierarchy, reaching the point today in which a medical student who chooses a primary care specialty does so with the knowledge that he or she is leaving substantial dollars of lifetime income on the table.

During this same period, and often in response to shortages of primary care allopathic physicians, the numbers of osteopathic physicians, primary care advanced practice nurses (nurse midwives and nurse practitioners), and physician assistants grew. Each group was trained initially within disciplinary silos, with an emphasis on primary care. Gradually, options for specialist careers in medicine emerged for osteopathic physicians, and the percentage of osteopathic graduates

choosing primary care careers diminished. Physician assistants tend to practice where physicians practice. For the most part, therefore, the number of physician assistants in primary care has diminished in accordance with physician practice patterns. Nurse practitioners proved effective in primary care roles, but regulatory and reimbursement policy barriers often prevented efficient and effective use of their services. In many states, such barriers exist to this day.

Meeting participants were enthusiastic about many innovations in primary care today—experiments that use teams of primary care providers; electronic health records and other technologies; and other health professionals in systems of care that meet patient and community needs. But they recognized that these environments were relatively few and far between. Early in our discussions, it became clear that participants believed it would be difficult to alter the downward trajectory of recruitment and retention of primary care physicians, in particular, without significant reforms in reimbursement and care delivery models. Also important is training the next generation of primary care providers within these innovative primary care practice settings, both within and beyond academic health centers. Participants were unanimous in their views that trainees need exposure to effective teams, working within systems that are designed to meet the needs of patients and communities, in order to learn about working in a team-based environment and to appreciate the rich rewards associated with primary care careers.

To ensure these learning environments across the nation, some type of payment reform that provides incentives for investment in primary care infrastructures, technologies, and salaries is essential. Frequently, primary care providers are expected to develop the technological and personnel infrastructures necessary to meet the holistic needs of their patients and communities out of their practice incomes.

Participants emphasized repeatedly that a call for greater investment in primary care was not a call for a greater expense in healthcare overall. In numerous studies, the benefits of investments in primary care are clear—overall healthcare costs per capita decline. Without reformed payment structures, however, the frustrations of not being able to meet all

expectations become overwhelming, and the inevitable result is a decline in numbers of people choosing primary care careers. The bottom line is this: unless trainees from *all* provider groups witness care being delivered by effective and efficient teams of primary care professionals who have the infrastructures to enable patients, families, and communities to achieve goals for individual and population health, the country will produce fewer and fewer primary care providers and will be unlikely to achieve its goals of reducing overall costs of care while improving healthcare quality and access.

Within this context, participants struggled with whether or not they could address the issues associated with what is referred to broadly as primary healthcare. There was a strong desire to address the broader needs of populations—needs that affect health but derive from a community's access, not only to healthcare, but to systems designed to support other public health, social, and educational needs. The participants considered the possibilities of new forms of primary care, through which society might hold healthcare systems accountable for both individual and population health goals. However, in order to have recommendations of substance that could change outcomes in the foreseeable future, participants decided to focus on the central questions posed to them at the start of the conference: namely, who should deliver primary care and how should the primary care practitioners of the future be trained?

As co-chairs, we were gratified to achieve a remarkable consensus on many issues of substance related to these questions, particularly the idea that *all* health professionals need training that ensures they have the skills to lead and work effectively in teams, to represent the interests of the public in ensuring a strong primary care infrastructure, and to expect, within their careers, to assume their share of accountability for continuously improving access to care, care coordination, costs of care, and quality of outcomes related to individual and population health. Health professionals need to develop attitudes that welcome patients as partners in care, moving beyond the current model of intermittent, facility-based contacts. And they need experience with the use of new tools, such as information technology; online monitoring and assessment; and supports for self care, home-based care, and virtual

tele-health interactions, all of which will be part of primary care in the future. These overarching themes led directly to recommendations designed to improve the training of all primary care providers.

We left the conference inspired by the passion and commitment of the participants and with the development of a consensus that would move us toward a preferred future—a future in which our society’s needs for primary care would be met effectively. It is our distinct privilege to have co-chaired this important meeting and to share with you the conference conclusions and recommendations.









# CONFERENCE CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSION I

In order to meet societal needs for primary care and train the right primary care professionals in the right numbers with the right competencies for the most appropriate roles, healthcare systems need incentives to dramatically change the way primary care is valued, delivered, and integrated in evolving healthcare systems. We will not attract and retain sufficient numbers nor achieve the needed geographic distribution of primary care providers unless there is a greater proportional investment in primary care. Our students and trainees must be educated throughout their clinical training in practices that deliver first-contact, comprehensive, integrated, coordinated, high-quality, and affordable care. These practices require teams of professionals who give care that elicits patient and provider satisfaction under conditions of clearly defined roles, effective teamwork, patient engagement, and transparency of outcomes.

### Recommendation 1

Create financial and other incentives for the development of innovative models of primary care and the advancement of knowledge about outcomes that allow us to identify best practices in the achievement of high-value primary care. Strategies may include the following:

- A competitive process for the establishment of Centers of Excellence in Primary Care
- Mechanisms that analyze and better define the roles of various health professionals in best- practice, high-value primary care models
- Development and improvement of national metrics for assessment of patient and population health
- Mechanisms for the diffusion of knowledge about best practices, such as the proposed Primary Care Extension Program.

## Recommendation 2

Coupled with efforts to increase the number of physicians, nurse practitioners, and physician assistants in primary care, state and national legal, regulatory, and reimbursement policies should be changed to remove barriers that make it difficult for nurse practitioners and physician assistants to serve as primary care providers and leaders of patient-centered medical homes or other models of primary care delivery. All primary care providers should be held accountable for the quality and efficiency of care as measured by patient outcomes.

## Recommendation 3

Promote stronger ties between academic health centers and other primary care sites and the communities they serve, setting goals and standards for accountability for primary prevention as well as individual and population health. All health systems, including the primary care practices embedded within them, should be accountable for quality and cost outcomes through well-tested, nationally recognized metrics that address the needs of populations and individuals, with data that are transparent and that can be used for the continuous improvement of models of care.

## Recommendation 4

Invest in primary care health information technologies that support data sharing, quality improvement, patient engagement, and clinical care, with the aim of continuously improving the health and productivity of individuals and populations.

## Recommendation 5

Recognizing that current payment systems create incentives for underinvesting in primary care services, implement all-payor payment reforms that more appropriately recognize the value contributed by primary care through such mechanisms as global payments linked to patient complexity and accountability for the provision of healthcare services, including preventive services, care coordination across settings, chronic disease management, and 24/7 accessibility. Improved costs and quality of health outcomes for patients and populations should be rewarded. In addition, implement legislation that will standardize insurance reimbursement reporting requirements to reduce administrative costs inherent in a multi-payor system.

## CONCLUSION II

In addition to the critical challenges outlined above in the organization and financing of healthcare, current health professional educational models are generally inadequate to attract, nurture, and train the primary care workforce of the future.

### Recommendation 1

Create incentives for innovative projects in health professions education, enlisting funding partners from government, industry, philanthropy, and payors in order to develop models of excellent, high-performing, and advanced interprofessional primary care.

Academic health centers, working with teaching community health centers, area health education centers (AHECs), and other training sites are the logical entities to advance such innovations. Strategies could include the development of Primary Care Translational Centers of Excellence that would perform primary care research and evaluation and provide team-based education, with emphasis on the study of new models of primary care and health delivery transformation.

### Recommendation 2

Medical schools, nursing schools, and other schools for the health professions, which hold the societal responsibility for the education of health professionals, have an opportunity and obligation to increase the size and strength of the primary care workforce. Leaders of health professional schools should implement actions known to increase the number of students and trainees choosing careers in primary care. These actions include the following:

- Establishing programs to prepare and attract a more socioeconomically, racially, and geographically diverse student body
- Revising admission standards to include more emphasis on social science and humanities and the personal qualities of applicants
- Implementing and expanding scholarship and loan repayment programs in partnership with health systems, governmental agencies, and communities for those pursuing careers in primary care

- Promoting early exposure to primary care practices for all students
- Creating longitudinal immersion clinical experiences in community primary care settings
- Implementing special primary care tracks for students and trainees.
- Establishing and strengthening departments of family medicine within schools of medicine.

### Recommendation 3

Interprofessional education should be a required and supported part of all health professional education. This change is especially important for primary care. Regulatory, accreditation, reimbursement, and other barriers that limit members of the healthcare team from learning or working together should be eliminated.

### Recommendation 4

The Department of Health and Human Services, through its appropriate agencies and divisions, should be granted additional funding to support interprofessional training, preparation of the primary care workforce, and leadership development programs to produce clinicians to take the lead in new models of primary care. Strategies to accomplish these goals could include the following:

- Expansion of Title VII and Title VIII funding and authority to jointly fund interprofessional programs
- Expansion of Title VII and Title VIII funding to address faculty shortage and educational underinvestment in the development of faculty for primary care
- Increase in AHEC funding to expand its pipeline programs in primary care and to provide community-based, interprofessional educational experiences for all primary care health professions students
- Resumption of the Primary Care Health Policy Fellowship and creation of new programs to prepare clinician-leaders for new models of practice

- Provision of adequate scholarships and loan repayment programs to provide clinicians to underserved areas and to improve diversity
- Expansion and direction of funding for graduate medical, nursing, and physician assistant educational programs (Medicare Graduate Medical Education funding, Title VII, Title VIII) to support trainees and training infrastructure costs in ambulatory settings, including teaching community health centers, AHECs, academic outpatient clinics, and other community-based programs.



# CONCLUSION III

Recognizing that the healthcare system is dynamic and will continue to evolve, strong leadership will be needed to advance the science, teaching, practice, and policy development relevant to primary care.

## Recommendation 1

Develop leaders with a focus on advancing the curricula and learning opportunities for preparing competent primary care clinicians, scientists, and policymakers of the future.

Medical, nursing, and other health profession school faculties should form partnerships with educators from other disciplines, such as business and law, to develop novel educational opportunities for advancing primary care leadership, research, policy, and advocacy. As a routine part of their education, primary care students should be exposed to mentored opportunities to participate in healthcare improvement and policy development and to function within interprofessional and interdisciplinary leadership teams.

## Recommendation 2

Support the further development of science and the scientific leadership necessary to advance the translation of best practices into primary care delivery for the improvement of patient and community health. Initiatives could include the following:

- Funding career development for scientists that can create improved national metrics for assessment of individual and population health
- Providing targeted funding through Clinical Translational Science Awards, National Research Service Awards, and Health Research Services Awards for scientists focused on primary care
- Developing a national healthcare workforce analysis and policy capability for ensuring an adequate and well-prepared primary care workforce over time.

### Recommendation 3

Recognize the need to include representatives of all primary care providers in the leadership of delivery systems and in groups that are responsible for developing healthcare policies at the state and federal level.







# SELECTED COMMENTARY FROM DISCUSSION

Consensus is a highly valued but elusive commodity. The conclusions and recommendations from the Macy conference on “Who Will Provide Primary Care and How Will They Be Trained?” provide a blueprint for one crucial aspect of healthcare reform that is logical, thoughtful, and replete for calls for mutual cooperation among a variety of professionals who are or should be at the frontline of healthcare. But, as remarks at the opening of the conference reveal, achieving consensus is not easy.

## THE CHALLENGES TO CONSENSUS

“What we ask of you in the next two and a half days will definitely take concentration, energy, and a willingness to openly and respectfully discuss somewhat contentious issues within and across our tribal lines.” Such discussions entail some counterintuitive risks. “We might play nice, well, and avoid important issues. We might play ‘you’re stupid’ well and avoid learning from each other. We might be inclined to advance arguments based on the established positions of [our] professional organizations and boards. We might be willing to address the differences in views across professions but avoid intra-professional differences because we’re reluctant to disagree with our colleagues in front of an inter-professional group.”

Then, assuming that these challenges can be overcome, as they were, there are other major barriers to consensus: professional barriers,

professional turf, payment issues, the lack of incentives to encourage collaboration, and, later organizational issues that will strongly influence the “How will they be trained?” question once the “Who” of primary care is defined. “We have a legacy of silos” in American medicine that leads us to ask “Who owns primary care?” We have to “declare a war on siloism” so we can move to a truly new paradigm for practice and training.

Before we can make primary care more attractive to more health professionals, another troubling question must be asked. During the past decade, the numbers of health professionals in training in all of the various tribes has been declining. “I think we need to be brutally honest about why things are the way they are.” One, among many thoughts on that subject, is the need to figure out why there is a chasm between research-oriented academic medical centers and centers focused on education for primary care, such as the nationwide Area Health Education Centers (AHEC). This has worked at two of the country’s leading academic teaching hospitals, who said no one at either school “would think that I have anything to do or any inclination to be interested in primary care.”

In short, the barriers to even having a serious, interdisciplinary discussion about primary care may be as difficult to conquer as the barriers to creating a new, cost-effective, nationwide primary care enterprise. It is also worth noting the topics that came up, without full discussion, that nonetheless are central elements to thinking about the future of primary care.

## WHO WILL PROVIDE PRIMARY CARE?

### Physicians—Nurses—Physician Assistants

In the ideal world that conference participants envision, primary care will be provided by teams of health professionals working together to care for a patient, a patient as part of a family, and families as part of communities.

Attracting physicians is, perhaps, the greatest challenge because for at least a decade decreasing numbers of new doctors, whether graduates of

allopathic or osteopathic medical schools, are electing to practice in one of the primary care specialties.

Amid the consensus that is reflected in the main sections of this report, there were also bluntly stated concerns. “From where I sit, I have come to believe that primary care doesn’t stand much of a chance in our present health system so I really think without health reform we can say what we want to and do what we want to but until we can provide a system that supports primary care, I just don’t see how it is going to rise to the prominence that we all feel it should have.”

Then this view, “The way care is delivered and the incentives are structured. If that isn’t changed we could talk all we want about curriculum reform and interdisciplinary models but it’s not going to happen.”

In short, the path ahead is fraught with obstacles and they are recognized. Nonetheless, there is a commitment to forge ahead on all fronts. Training, which will be discussed below, is deeply embedded in any nationwide program to strengthen primary care. But picking the right people seems to be equally important.

Physicians: The declining interest. “We found that there are two key reasons for this decline. First is decreased compensation of primary care physicians as compared to specialists. Along with that goes a lack of perceived respect.”

Data show that students who choose primary care “are choosing to leave \$3.5 million on the table in terms of lifetime income.”

“Secondly is the uncontrollable lifestyle...wherein physicians cannot predict how long they’ll be working on a given day.”

That said, medical schools should recognize and capitalize on data that show there are personal characteristics that predict entry into primary care, and they are “older age, being from a rural state, being female, and being married.” “We would recommend considering modifying admission criteria for U.S. medical schools to emphasize some of these personal characteristics that are known to predict entry into primary care.”

Nurses: Attracting nurses into primary care is more successful for reasons that may hold important lessons. “Sixty-six percent of nurse practitioners out in the country are in primary care settings... [or about] 87,000 nurses. Why is this the case? “Nurse practitioners are basically, not always, but generally well paid.” And many are satisfied that they are working at the top of their training. “We have developed significant strides toward self regulation just in the last four years that includes standardizing and linking educational competencies, accreditation, licensure, and certification.”

Physician Assistants: Again, though the situation may be imperfect, PAs are an active and essential component of the primary care system. Originally, a large number of PAs were military corpsmen. “Interestingly enough that group is available again, and I’m not sure that any of us are doing enough to recognize or recruit those individuals.” But a target pool of talent has been identified. On recruitment of PAs generally: “I think these are a different breed of people and we really have to identify them ahead of time. My sense is that we still rely on who shows up at the door,” when we should be more aggressively seeking individuals who are likely to make good physician’s assistants to maintain a strong and engaged workforce.

## HOW WILL THEY BE EDUCATED?

Whether speaking of physicians, nurse practitioners, physician assistants, or other health professionals (including specialists), discussion at the conference revealed a remarkable consensus.

Primary care providers need, in one way or another, first, to be exposed to primary care while in school and second, to be trained together in various programs. A comment about medical students is applicable to all: “Students were more likely to choose careers in primary care if they had a required family medicine rotation. And the longer the rotation the more likely they were to enter primary care. Also, rural medicine rotations predicted entry into primary care, as did community-based rotations.”

It is something of a “show them and they will come” approach that was consistently held up as a key to success in generating a strong primary care workforce.



Linking AHECs more closely with academic medical centers is one way to encourage the kinds of training experiences that appear to be effective. And the AHECs are eager. “AHEC is in 47 states. AHEC is an educational machine. AHEC is dying to work with academic centers in a much more substantive way than they’ve been able to in most states.” So there is one obvious place to start that highlights a signal observation made early in the conference.

“Almost regardless of what you’re looking for, it already exists somewhere in the United States in healthcare. We have to find the best of what we’re already doing, understand how and why that’s working and then amplify and disseminate it.”

What about primary care versus specialty care? Some participants argued effectively that the “versus” attitude is a problem, particularly because part of a primary care provider’s job is to refer to and work collaboratively with specialists when it is appropriate.

“I deal with every specialist every day. These are good, hard-working, confused individuals just like everybody in the room here, looking for their identity and what their mission is. The point is they are not the enemy. Nobody is the enemy. We have met the enemy and they are us.” Education comes into play because “we have to focus on the training of primary care physicians to know how to interact with specialists.”

Another pertinent educational issue: Who is primary care for? “We have had two distinct discussions about what primary care is. One is what I’m going to call primary care for all or in the U.S. system primary care for the privileged, the insured.” The other is primary care for the uninsured. “In our academic centers we have a confusion about what primary care is. From the medical student’s perspective these are incredibly different primary cares. Now what happens in many medical centers is primary care is taught for that second population. It’s an almost impossible task without a very well-organized system that is very different from the medical care system because it’s largely social care with medical care attached to it.” Knowing the patient base is essential to designing the right kind of educational experience.

## PRIMARY CARE AND THE LOCAL ECONOMY

Pursuing another avenue to the importance of primary care is the notion that if you build it, companies will come. One observation from a representative of a large corporation: “Our perspective as a large buyer of care is that we absolutely have to have a horizontal platform, a foundation of robust prevention in primary care that delivers comprehensive, integrated, coordinated, and accessible care versus the disintegrated, episodic, procedure-based care that we now get. It’s an end-game for us as buyers of care. When we have this kind of care, and there are places in the United States where we do, it costs us one third less money. Our patients have a 19 percent lower mortality. They’re 12 percent less likely to be smokers, and they’re 7 percent less likely to be obese. We look for places with that kind of care for where we place our jobs.” Many Fortune 500 companies are adopting this policy, which could be as powerful a pull as any to make changes in the system for educating primary care professionals and designing effective systems for delivering care, as education and delivery are hard to separate in the big picture.







# EXCERPTS OF REMARKS BY HRSA ADMINISTRATOR MARY K. WAKEFIELD, Ph.D., R.N.

## ON PRIMARY CARE

The Health Resources and Services Administration (HRSA) has always been about developing the health professions workforce and delivering healthcare services—primary care services, specifically.

I hope all of you feel that, too, when it comes to primary care...that sense of urgency. Necessity is the mother of invention. If we feel that urgency, it might drive us a little bit harder, with a little bit more commitment and a willingness to use all resources—technical, human—pulled together in the same harness...moving in similar directions.

At the end of the day, when I speak with the heads of the bureaus at HRSA, it's not about the type of care that we're giving; it's not about a particular discipline that we're preparing; it's about the patient population that we're here to serve...If we start there—with a conversation about the populations that we're here to serve—I think sometimes then the dialogue can take us to a different place.

You see that the focus on primary care...is reflected pretty strongly in recent legislative activity and in recent administration work through the Recovery Act. As a matter of fact, HRSA was the first agency to move Recovery Act stimulus funds out of HHS. All of a sudden, you see a \$2.5 billion investment in primary care, and in health centers. That was a

very significant investment...It essentially doubled the number of federal dollars going into the health center system.

I'd like to see a much stronger commitment and deployment of resources in the area of primary care measures...a sharp, crystallized focus on primary care, so policymakers understand what it means to have access to those services.

A lot of what we're trying to do within HRSA is focus on primary care in the context of public health. I am not a public health provider...but I have a strong appreciation for population health focus and a community health focus that I brought to the work that we do in primary care. And so we've really tried to...thread across our HRSA programs a new orientation of primary care in the context of public health. I don't see them as separate.

## ON THE HEALTHCARE WORKFORCE

It's incumbent upon us to have as much as possible a shared understanding when we think about a healthcare workforce that delivers primary care....Having co-chaired the Institute of Medicine report on health professions education, *A Bridge to Quality*, we talked a lot about competencies. We certainly talked about provider types, too; but we talked about what it was that patients needed. We thought about what the competencies were that clinicians needed to have to deliver that care. That's a lot of where we started that conversation. It wasn't about just the education of one provider or another.

As we try to rebuild that capacity, we're also trying to do it with a nod toward issues like cultural competency that we think are so critically important. It's with an eye toward minority representation within our health professions, so healthcare providers resemble more the populations we serve. So as we think about the primary care workforce, it isn't just the supply of different types of providers. It's their skill set; their competencies; how they engage together; and how they engage with technology. It's so darn easy to count heads, and so much more difficult to think about deploying a primary care workforce that's multi-dimensional.

In North Dakota, we have a tremendous shortage of pharmacists—so much so that we were seeing the little local retail druggists shuttered. And if you don't have that little local retail druggist, you don't have a pharmacist at the 25-bed hospital. You are out of luck. If you lose that person...you're losing that pharmacist in the local hospital. So by necessity, the mother of invention, the pharmacists sat down with state legislators and said 'Wow! Our communities are losing access to pharmaceuticals. What can we do to solve their problem?' So now what do you see? You see out in that state a pharmacist located in one location, a pharmacy tech in that rural community, audio-video technology to hook up that pharmacist who can educate and counsel that patient when they're coming in to have that prescription filled.

The dispensing function is virtual, if you will, but it's a pharmacy tech that's out there....We don't have a pharmacist in every community. But we still have the service. But you might say, 'well, but what about quality (when) you've got somebody other than the pharmacist filling the prescription?' What happens with your medical errors, with your drug prescription errors? In fact, across the state of North Dakota we're better than the national norm.

What implication does that have for care and for access to a healthcare workforce if you're deploying technology and thinking beyond just counting heads? Issues around insuring a competent primary care workforce are pretty complex. It isn't as simple as just projecting numbers of healthcare providers...rolling them forward. It's really about harnessing everything we have available right now.

Having visited some of our Ryan White HIV/AIDS clinics, I can tell you that community health workers are extremely important. Having visited some of our Healthy Start sites—which are based in places that had horrific infant mortality—if they didn't have wraparound services, things would look a whole lot worse: Those young mothers wouldn't have been at the clinic without the transportation to get them there. It doesn't matter if you have a nurse-practitioner there. You could have 15 of them. It doesn't matter if she can't get there. So that's a bigger issue, that's the backdrop to some of our thinking.

I would like to see a much stronger analytic capacity built around workforce. It's critically important that we've got a better understanding

of our healthcare workforce. That is a big agenda, for all the reasons I just mentioned. But if we can move the needle in that direction, I think that will have been time well spent.

So priority items are strengthening our health professions workforce programs by having a better understanding of what it is we're producing through them; having better workforce research analytic capacity; better understanding of workforce supply and demand; and a very sharp focus on primary care against the backdrop of public health. So, those are the areas that we're focusing on and that we're trying to define with greater clarity through our internal strategic planning process.

## ON PARTNERSHIPS

We've got some very smart folks at HRSA, obviously. But we're looking for the very best thinking about how to leverage the resources that the government's making available through our programs right now. It's the reasons why concrete recommendations...are so very important to us. It's a shared agenda, and it crosses disciplines. So when you have the Macy Foundation pulling a group of people together, it makes it easier for us when we engage other policymakers on Capitol Hill or our colleagues within HHS.

The notion of partnering with foundations and other entities...we're open to that. HRSA is open for business, and that business is not just our business. It's a shared agenda and while we have resources, the largesse is not massive, and I think it's most effectively used if we can partner together. We're looking for those opportunities and would welcome them. Again, it's not that all good ideas are going to come from inside HRSA.

It's not about continuation of the status quo. It's about trying to be very strategic and focus like a laser on how we can use our resources most effectively moving forward, and that's where the help of people from the outside looking in can give us that kind of an assist—hopefully, groups like this one.

We are very much looking for next-generation thinking about how we can best use our resources, so the door is open for those ideas. Thank you for your time.













# THE NATURE OF PRIMARY CARE

Robert L. Phillips, Jr., M.D., M.S.P.H.  
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The term “primary care” is widely used, as if it were consistently defined or well understood. In fact, neither is the case, as there is considerable divergence of opinion about what is and is not primary care. Through this paper, we aim to define and describe primary care from a variety of perspectives: some historical, others theoretical, and finally, through illustrative examples of where primary care is done well and what value it provides.

## WHAT IS PRIMARY CARE?

### History and Context

The 1920 Dawson Report from the United Kingdom is often cited as the progenitor to the concept of primary care because it distinguished three levels of healthcare services: primary health centers, secondary health centers, and teaching hospitals.<sup>1,2</sup> By establishing primary care trusts, this plan provided families with doctors and access to broadly scoped health centers for the entire population. The National Health Service Act of 1946 established the primary care function as the underpinning for the National Health Service (NHS), where it remains today the “source of 80 percent of all interactions between patients and the NHS.”<sup>3</sup> While neither the Millis<sup>4</sup> nor Willard<sup>5</sup> reports of the 1960s formulated an explicit definition of primary care, both reports contributed to the

current form of primary care in the United States. Millis referred to the need of every individual for a primary physician, and Willard focused on family medicine as a needed reform of general practice to balance an overemphasis on medical specialization.<sup>4,5</sup> Canada's Lalonde Report in the 1960s emphasized opportunities to prevent important diseases and enhance health in primary care.<sup>6</sup> A globally recognized definition of primary care and its foundations, however, was not launched until the World Health Organization (WHO) International Conference on Primary Healthcare, held in Alma-Ata in the former Soviet Union in 1978. The Declaration of Alma-Ata and its definition of "primary healthcare" were affirmed at the World Health Assembly's meeting in May of 1979:

Primary healthcare is essential healthcare based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and the country can afford....It forms an integral part of both the country's health system, of which it is the central function and main focus, and the overall social economic development of the community. It is the first level of contact of individuals, the family and the community with the national health system, bringing healthcare as close as possible to where people live and work and constitutes the first element of a continuing healthcare process.<sup>7</sup>

This definition fueled interest in primary care, had international impact, and sparked many attempts to clarify the principles of primary care.<sup>8</sup> For example, Barbara Starfield endeavored to reduce confusion over the intermingled functions of public health and personal health services by asserting that "primary care connotes conventional primary medical care striving to achieve the goals of primary healthcare."<sup>9</sup> Similarly, the WHO updated their call and their vision for primary care in the 2008 *World Health Report, Primary Healthcare Now More than Ever*,<sup>10</sup> with the following statements:

Primary care provides a place to which people can bring a wide range of health problems

Primary care is a hub from which patients are guided through the health system

Primary care facilitates ongoing relationships between patients and clinicians, within which patients participate in decision-making about their health and healthcare; it builds bridges between personal healthcare and patients' families and communities

Primary care opens opportunities for disease prevention and health promotion as well as early detection of disease

Primary care requires teams of health professionals: physicians, nurse practitioners, and assistants with specific and sophisticated biomedical and social skills

Primary care requires adequate resources and investment, and can then provide much better value for money than its alternatives.

The authors of the 2008 report also differentiate between conventional healthcare and people-centered primary care. These definitions from the WHO report are summarized in Table 1.

**Table 1.** *Conventional healthcare and people-centered primary care (From WHO 2008 World Health Report; with permission)*

Conventional ambulatory medical care in clinics or outpatient departments	Disease control programmes	People-centred primary care
Focus on illness and cure	Focus on priority diseases	Focus on health needs
Relationship limited to the moment of consultation	Relationship limited to programme implementation	Enduring personal relationship
Episodic curative care	Programme-defined disease control interventions	Comprehensive, continuous and person-centred care
Responsibility limited to effective and safe advice to the patient at the moment of consultation	Responsibility for disease-control targets among the target population	Responsibility for the health of all in the community along the life cycle; responsibility for tackling determinants of ill-health
Users are consumers of the care they purchase	Population groups are targets of disease-control interventions	People are partners in managing their own health and that of their community

Another key development in the evolution of thinking about primary care emerged through efforts to identify its fundamental attributes. In 1978,

the U.S. Institute of Medicine (IOM) framed the discussion, stating that primary care could be “distinguished from other levels of personal health services by the scope, character, and integration of the services provided.” The IOM further proposed that accessibility, comprehensiveness, coordination, continuity, and accountability were essential attributes of primary care.<sup>11</sup> The IOM’s characterization of primary care was consistent with the findings from prior studies that also emphasized first contact and longitudinality as key features.<sup>12-14</sup> To be complete, Barbara Starfield once suggested that the difference between continuity and longitudinality is important: “Continuity is a mechanism to achieve knowledge; longitudinality is the mechanism for achieving understanding.”<sup>15</sup> Affordability was added to the list of critical attributes to emphasize the need to reduce the ill effects of healthcare costs on families. Thus, the core attributes of primary care are often referred to as the three “A’s (accessibility, accountability, affordability) and the three “C’s” (comprehensiveness, continuity, coordination).

Interest in managed care and primary care in the 1990s led the IOM to revisit its definition of primary care.<sup>16</sup> The IOM’s study committee developed what became the operating definition for primary care at that time:

Primary care is the provision of integrated, accessible healthcare services by clinicians who are accountable for addressing a large majority of personal healthcare needs, developing a sustained partnership with patients, and practicing in the context of family and community.

This definition further establishes the notion of primary care as a function that is not fully captured by any single discipline or specialty. It is becoming increasingly apparent that the full realization of primary care requires a team with a spectrum of expertise sufficient to respond to the needs of the community it serves.

The IOM report refined the definition of primary care in the following manner:

1. Primary care is the logical foundation of an effective healthcare system because it can address the large majority of the health problems present in the population.



2. Primary care is essential to achieving the objectives that together constitute value in healthcare: high quality of care, including achievement of desired health outcomes; patient satisfaction; and efficient use of resources.
3. Personal interactions that include trust and partnership between patients and clinicians are central to primary care.
4. Primary care is an important instrument for achieving stronger emphasis on both ends of the spectrum of care: (a) health promotion and disease prevention and (b) care of the chronically ill, especially among the elderly with multiple problems.
5. The trend toward integrated healthcare systems in a managed care environment will continue and will provide both opportunities and challenges for primary care.

The IOM's extended definitions and explanations of each term are shown in Table 2.

**Table 2.** *Expanded healthcare definitions from the Institute of Medicine*

<p><i>Integrated</i> — comprehensive, coordinated and continuous services in a seamless process, combining events and information from disparate settings and levels of care.</p> <p><i>Accessible</i> — the ease with which an individual can initiate an interaction for any health problem with a clinician; access involves financial, geographic, cultural, language, and temporal considerations.</p> <p><i>Healthcare services</i> — care provided in all settings of care from home to hospital.</p> <p><i>Clinician</i> — an expert using a recognized body of scientific knowledge and having authority to direct the delivery of personal healthcare services.</p> <p><i>Accountable</i> — individual clinicians and systems both have responsibility for the quality of care, patient satisfaction, efficient use of resources, and ethical behavior.</p> <p><i>Majority of personal healthcare needs</i> — primary care clinicians receive whatever patients bring regardless of problem or organ system, including physical, emotional, mental, and social concerns.</p> <p style="text-align: right;"><i>Table continues on next page</i></p>
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**Table 2.** (Continued)

*Sustained partnership* — the relationship established between patients and their personal clinicians is recognized as being therapeutic and essential to building trust and understanding.

*Context of family and community* — the need to understand the patient's living conditions, family dynamics, and cultural background as well as the shared values, experiences, language, religion, and/or culture of their neighborhoods. The focus on community also implied responsibility to the entire population, whether they are patients or not.

## WHO IS PRIMARY CARE?

Primary care has many faces across global health systems, but the United States is unique for its low percentage and unusual array of primary care providers. In 2008, some 240,000 primary care physicians—uniquely American in their partition into general pediatrics, general internal medicine, and family medicine/general practice—represented 35 percent of the overall physician workforce operating in direct patient care. Notably, primary care's relatively small portion of the physician workforce appears to be shrinking, due to declines in medical student interest in primary care and production of primary care physicians from the graduate medical education pipeline.<sup>17,18</sup> Slightly more than one third (37 percent) of 80,000 U.S. physician assistants are believed to be practicing in primary care.<sup>19</sup> It is unclear how many nurse practitioners are active in primary care. Based on a survey conducted in 2004, about half of the practicing 120,000 to 140,000 nurse practitioners work in ambulatory care settings, but it is not clear how many of them are in primary care.<sup>20</sup> Primary care remains the largest platform of formal healthcare in the United States.<sup>21</sup> In 2006, 568 million visits were made to primary care physicians in physician offices and outpatient departments.<sup>22</sup> This number represented 57 percent of all patient visits.

## WHY PRIMARY CARE?

The United States provides a laboratory to assess primary care because its considerable variations in healthcare arrangements have resulted in a dispersion of outcomes within a single country. Multiple investigators

from various disciplines have assessed the effects of primary care, and this body of work supports the following conclusions:

1. When people have access to primary care, treatment occurs before evolution to more severe problems.<sup>23-26</sup>
2. Preventable emergency department visits and hospital admissions decrease when people have primary care.<sup>27-33</sup>
3. Primary care clinicians use fewer tests, spend less money, and protect people from overtreatment.<sup>34-40</sup>
4. Particularly for the poor, access to primary care is associated with improved outcomes, more complete immunization, better blood pressure control, enhanced dental status, reduced mortality, and improved quality of life.<sup>41-46</sup>
5. People with a regular source of primary care receive more preventive services.<sup>47-50</sup>
6. Higher levels of primary care in a geographic area are associated with lower mortality rates after controlling for important effects of urban-rural difference, poverty rates, education, and lifestyle factors.<sup>51-55</sup>
7. Having a primary care physician is associated with increased trust and treatment compliance.<sup>56</sup>

In summary, primary care is valued because of its capacity to provide people with access to appropriate services at reduced costs with satisfying results. Primary care enhances the performance of healthcare systems. It is not the solution to every health-related problem, but few, if any, health-related problems can be adequately addressed absent excellent primary care.

## EXEMPLARS OF PRIMARY CARE SYSTEMS IN OTHER COUNTRIES

In contrast to the situation of primary care in the United States, primary care in other countries is central to the functioning of health systems. Primary care performed in the countries described below is more consistent with the WHO's definitions.

## United Kingdom

The United Kingdom has had a primary care–based health system since the NHS was put in place following World War II. In the past decade the UK has introduced primary care groups (1999) that bring together doctors, nurses, and other health and social care professionals to plan and implement healthcare services, improve the health of local communities, and establish mechanisms of accountability.<sup>57</sup> The budgets for these primary care groups were protected from costs in other settings. Then, in 2005, the UK Quality and Outcomes Framework (QOF) offered primary care physicians up to 25 percent more practice revenue if they could demonstrate and report on specific quality and outcomes measures.<sup>58-60</sup> The improvements achieved under the QOF were preceded by previous investments in primary care and quality improvement capacities, including the computerization of medical records, which prepared UK primary care practices to respond to quality incentives at a much higher rate than was anticipated.

## Spain

Spain adopted a national health system in 1986, with the specific objective of re-engineering healthcare around primary care. Spain built its first Primary Care Health Center that year and by 2006 operated more than 13,000 such centers nationally.<sup>61</sup> Spain has a primary care-to-population ratio very similar to that of the United States but spends only 8.4 percent of its gross domestic product on healthcare. Also, Spain has a health information system that allows patients to call up their health data from any computer. Ten years into this reform, external evaluation showed related improvements in outcomes and equity.<sup>62</sup> In 2006, Spain's infant mortality rate was nearly half that of the United States.<sup>63</sup>

## Thailand

Thailand is a good example of a developing nation that has focused and invested heavily in primary healthcare. In the early 1970s, Thailand prioritized primary healthcare based on the following principles: 1) involvement of the community, bringing care close to families; 2) investment in building an effective district health system; 3) attention to protecting the poor from unaffordable health costs; and 4) increased

use of data for decision making in public health. Since 1990, Thailand has demonstrated the highest average yearly reduction in mortality for children aged younger than 5 years and substantially reduced its maternal mortality rate. Thailand achieved very high coverage of immunization and skilled birth attendance with low inequity. As in many developing countries, Thailand now faces the challenges of rapid epidemiological transition toward chronic disease. Researchers agree that the Asian economic boom of the 1980s contributed to Thailand's primary healthcare success, but they conclude that much of the foundation was laid through consistent progress toward an equitable primary healthcare system when the country still had a very low income per person.<sup>64</sup>

## Summary Definition for the Meeting

Primary care is the provision of accessible healthcare services by teams of professionals with clinical and social skills who are accountable for effectively addressing a large majority of personal healthcare needs, developing a sustained partnership with a defined panel of patients, guiding patients through their personal health decisions and the health system, practicing in the context of family and community, and monitoring the quality of their care as well as determinants of ill health in their community.

The core attributes of primary care are accessibility, accountability, affordability, comprehensiveness, longitudinality, coordination, and community orientation.

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# IS PRIMARY CARE WORTH SAVING?

## ACCESS TO PRIMARY CARE AND HEALTH SYSTEM PERFORMANCE

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Primary care within the United States faces an uncertain future. Pessimism abounds. In a recent publication, the American College of Physicians expressed concern about the impending collapse of primary care.<sup>1</sup> The incomes of primary care physicians have not kept pace with those of specialists, and physicians in practice express growing dissatisfaction with the shorter and shorter visits that are widely characterized as “hamster medicine.” Perhaps as a consequence of these trends, a declining proportion of U.S. medical graduates are entering primary care specialties.<sup>2</sup> The demand for care, however, is likely to grow. The population is aging, and the proportion of the population over age 85 is growing more rapidly than any other age group. The proportion of the population with chronic conditions is increasing. Also—if Congress succeeds in passing major healthcare reform—the number of insured Americans will increase dramatically. How best to bridge the gap between the increasing demand for medical care and the declining primary care workforce is thus an important question now confronting policymakers.

One approach to this problem would be to accept the status quo and allow primary care to continue its decline. The arguments that could be

made for this position include the growing use of online and social media. These outlets will increasingly enable consumers and patients to manage their conditions and refer themselves to specialists as needed. That practice, in turn, could lead to a medical profession that is dominated by specialists. From this skeptical perspective, advocacy for increased investment in primary care could be argued to represent no more than a lobbying effort on behalf of a currently threatened special interest.

The current paper thus addresses the question: Should primary care be saved? We conclude that it should, based on four major arguments: 1) patients value several core elements of primary care and having a primary care provider; 2) effective provision of the core elements of primary care is associated with better outcomes and lower costs; 3) health systems with a strong foundation of primary care achieve equal or better quality at substantially lower costs; and 4) high-performing U.S. health systems are already moving to strengthen primary care—with promising early results. However, the evidence does not suggest that expansion of the primary care workforce alone will result in improved health system performance. On the contrary, it appears that effective provision of the core attributes of primary care is more important than who provides the care or the absolute numbers of primary care providers available. Further discussion about how best to strengthen primary care within the United States is warranted.

## WHAT DO PATIENTS WANT? CONTINUITY AND “WHOLE-PERSON KNOWLEDGE”

A substantial body of literature reveals that the public values having a provider with whom they maintain an ongoing relationship. This provider would have comprehensive knowledge of them as individuals and of their health problems. In a national survey of Medicare enrollees carried out in 2004, over 70 percent of respondents reported believing that it was better to “have a general doctor who manages most of their problems” rather than to have “each problem cared for by a specialist” (Gallagher TC, personal communication). Several studies have examined what patients think about not only the specific performance of their primary care provider but also about the relative value of primary care and what aspects of primary care are particularly important. This body of work suggests that patients value their specific primary care physician for the longitudinal

relationship and comprehensive knowledge this individual provides and that this “whole person” perspective appears to be more strongly valued than competence.<sup>3</sup> Studies of why patients switch primary care doctors have shown that the continuity and quality of the relationship were the dominant factors that led to voluntary switching.<sup>4,5</sup> And inpatients cared for by hospitalists and also seen by their primary care doctor were pleased with the care they received from the hospitalist but felt the care would have been better if delivered by the primary care provider. The reasons the patients cite are that they had greater trust in their primary care physicians and believed that serious diagnoses or major discussions about choices should occur with their primary care doctor rather than a hospital-based physician.<sup>6</sup> Finally, continuity itself, whether with a primary care specialist or other provider, is very highly valued; 92 percent of all respondents in one survey rated continuity as very important or important.<sup>7</sup> And the importance of continuity in the physician-patient relationship may be even more vital for vulnerable populations.<sup>7-9</sup>

## EFFECTIVE PROVISION OF PRIMARY CARE MAKES A DIFFERENCE

Although many people have attempted to define primary care and its core attributes, the more technical elements are captured by Starfield’s four core dimensions: 1) providing first-contact access; 2) ensuring continuity of care that ensures whole-person knowledge; 3) providing effective care coordination; and 4) providing comprehensive care for a broad array of medical problems and conditions.

### Access

Having access to a regular source of first-contact care is associated with more effective provision of preventive services and better management of chronic disease. A regular place of care was the most important factor (compared to continuity, comprehensiveness, and communication) associated with receipt of preventive care services, after controlling for demographics, income, and health needs.<sup>10-15</sup> Having a primary care provider as the regular source of care was associated with better patient-reported access to care.<sup>10</sup> Lack of a regular primary care physician was also found to be a powerful predictor of severe uncontrolled hypertension.<sup>15</sup>

Nurse practitioners and physician assistants have been shown to play a particularly important role in improving access in rural areas and for disadvantaged populations.<sup>16-18</sup> And—as we discuss more fully in the following text health systems with greater absolute or relative availability of primary care physicians (an indirect measure of access to primary care) have lower rates of preventable hospitalizations and overall costs,<sup>19-25</sup> greater adherence with a broad array of evidence-based clinical practices,<sup>22</sup> and earlier-stage cancer diagnoses.<sup>24, 25</sup>

## Continuity

In observational studies and randomized trials, enhanced continuity of care is strongly related to better quality and lower costs. In observational studies, greater continuity is associated with lower emergency department and hospital use for children, Veteran's Administration (VA) patients, and for those at the end of life.<sup>26-28</sup> Longer ties between Medicare beneficiaries and their usual providers of care were associated with lower costs and less hospitalization in one study (but no better adherence to preventive care guidelines).<sup>29</sup> In another study, adults who were more closely connected to their provider were shown to be more likely to receive care that was consistent with current clinical guidelines.<sup>30</sup> Parents of children with better continuity reported better physician-patient interactional quality.<sup>31</sup> In addition, a randomized trial of continuity in care delivery within the VA found greater patient satisfaction, shorter hospitalizations, and fewer emergency hospital admissions.<sup>27</sup> Continuity may contribute to improved care by facilitating greater provider knowledge of the patient's medical problems and social context (whole-person knowledge), which we discuss in more detail in the following text.

## Coordination

Care coordination is widely considered to be a key attribute of primary care and a core function of the “patient-centered medical home.” Although interest has grown in identifying high-risk patients through predictive modeling (based on claims data) coupled with nurse outreach from health plans (usually by telephone), the evidence suggests that these approaches are ineffective.<sup>32</sup> Office-based care coordination in primary care has shown effectiveness for special needs children.<sup>33-35</sup> One of the mechanisms whereby greater continuity with primary care providers



achieves its impact may be through improved care coordination, but there is little direct evidence on whether care coordination by office-based adult care providers is effective. In contrast, there is strong evidence that well-designed programs to coordinate care for specific high-risk populations can be effective. Many clinical trials among high-risk elderly patients—each with a strong care coordination function—have shown reductions in hospitalizations and costs in this vulnerable population. Several models provide transitional care, bridging the gap between hospital discharge and return to the patient’s usual primary care provider.<sup>36-38</sup> These models rely on non-physicians, such as nurse practitioners or transition coaches, or most recently lay volunteers, to meet with at-risk patients, assist with discharge, and ensure timely follow-up and linkage back to an outpatient provider. Other models, largely associated with geriatric programs, provide enhanced home care or office-based strategies using nurses, social workers, and nurse practitioners to maintain high-risk elders in their homes and avoid hospitalization.<sup>39-42</sup>

## Comprehensiveness

“Comprehensiveness” as an attribute of primary care has two complementary meanings. It can refer to the capacity to address the majority of usual healthcare needs, or alternatively, the term may refer to a whole-person approach. Evidence exists to show that specialists traditionally labeled as providers of primary care (ie, those in family practice, general internal medicine, and general pediatrics) do provide more comprehensive care compared to their sub-specialty peers.<sup>43</sup> Furthermore, practitioners in some medical specialties are more likely to provide comprehensive care but nonetheless do not perform as well as primary care specialists in the provision of preventive care.<sup>44</sup> Whole-person knowledge is highly valued by patients<sup>4</sup> and—along with physician trust—it has been strongly associated with patients’ adherence with physicians’ advice and satisfaction with care.<sup>45</sup>

## STRONG PRIMARY CARE IS ASSOCIATED WITH BETTER HEALTH SYSTEM PERFORMANCE

Starfield and her collaborators have carried out extensive studies of the association between the primary care orientation of a local health system and the quality and outcomes of care. Cross-sectional studies focusing

on the supply of primary care physicians have shown that states and counties with a greater supply of primary care physicians have better health outcomes after controlling for potential confounders, such as demographics, income, education, and poverty levels.<sup>46</sup> These studies, however, were not able to control for individual patient attributes to ensure that the outcomes were being ascertained among those with the exposure to primary care. Results from cross-national studies that measured the degree to which key attributes of primary care were implemented also indicate that countries with stronger primary care systems generally had better health outcomes. However, because better primary care performance was also associated with a number of other important social policies, the effects of primary care were hard to disentangle from those of the other social policies.<sup>47,48</sup> Whether better primary care led to the better health outcomes observed in these studies thus remains uncertain.

Studies comparing the quality of care delivered by primary care physicians and specialists have reported inconsistent results. The Medical Outcome Study followed people with diabetes or hypertension for up to 7 years and found no evidence for systematically better process quality by specialists and no adjusted mortality difference,<sup>49</sup> whereas data from the Medical Expenditure Panel Survey suggest that having a primary care provider is associated with lower mortality.<sup>11</sup> Care during and after acute myocardial infarction slightly favored cardiologists, but the mechanism appeared to be fully explained by adherence to evidence-based guidelines (something that a well-designed care system could presumably help both cardiologists and generalists achieve).<sup>50</sup> Researchers in an Italian study of diabetes care found that specialty clinics achieved greater compliance with guidelines and better lipid control, but blood sugar control was no better and blood pressure control was worse than when care was provided by general practitioners.<sup>51,52</sup> Similarly, preventive care delivered by gynecologists was better for some gender-specific issues but no better for broader preventive health issues.<sup>53</sup> Because the populations treated by specialists and generalists are likely to differ and co-management is almost impossible to account for in these studies, firm conclusions on either quality or outcomes are likely to remain elusive.<sup>49,50,54-56</sup> Although these studies have compared primary care physicians with specialist physicians, studies comparing physician and non-physician primary care providers have been quite consistent: Advanced practice nurses and physician assistants can provide care of equal quality for many of the conditions treated in primary care settings.<sup>57-59</sup> The

evidence thus suggests that the system itself may be more important than the specific provider. As a recent review of chronic illness management concluded: “A rapidly growing body of health services research points to the design of the care system, not the specialty of the physician, as the primary determinant of chronic care quality.”<sup>60</sup>

National studies using Medicare data have consistently shown that regions with a greater proportion of primary care physicians delivered care of equal or better quality at lower per-capita costs than regions where specialists predominated—and the findings have been consistent whether the unit of analysis is the state,<sup>22</sup> the metropolitan statistical area,<sup>19</sup> or hospital referral region.<sup>23</sup> Several studies based on data from the mid-1990s compared U.S. regions classified according to the intensity of care provided to Medicare beneficiaries. Higher-intensity regions, when sorted into quintiles, had per-capita spending that was 60 percent higher than in the lowest intensity regions and had a physician workforce with a relatively greater proportion of primary care physicians—especially family practitioners. Studies of the quality and outcomes of care showed that technical quality of care was generally better in lower-spending regions<sup>22, 61</sup> and that health outcomes were equal or better.<sup>23, 61</sup> These early studies focused on the care of patients with acute myocardial infarction, hip fracture, and colon cancer and a representative sample of the Medicare population who were participants in the Medicare Current Beneficiary Study.<sup>23, 61</sup> Technical quality was equal or better in the regions with relatively stronger primary care workforce and utilization, and patient-reported access to care was also equal or better. Health outcomes, including mortality and functional status, were not better in the higher-intensity, more specialist-dominated health systems. Subsequent studies showed that physicians in the lower-intensity regions reported better communication with other physicians, greater continuity of care with their patients, and an overall greater capacity to provide high-quality care.<sup>62</sup> Also, Medicare beneficiaries overall reported that their quality of care was equal or better in low-spending regions.<sup>63</sup>

### Updating Regional Analyses—Primary Care Orientation, Quality, and Spending

To update these earlier analyses, we drew on data from the Dartmouth Atlas of Healthcare that focus directly on the primary care orientation of care systems within each region. We classified the regions according to the

degree to which the care for Medicare beneficiaries with chronic illness was delivered by primary care physicians or medical specialists. First, we briefly summarize the methods, and then we report the findings of the analysis.

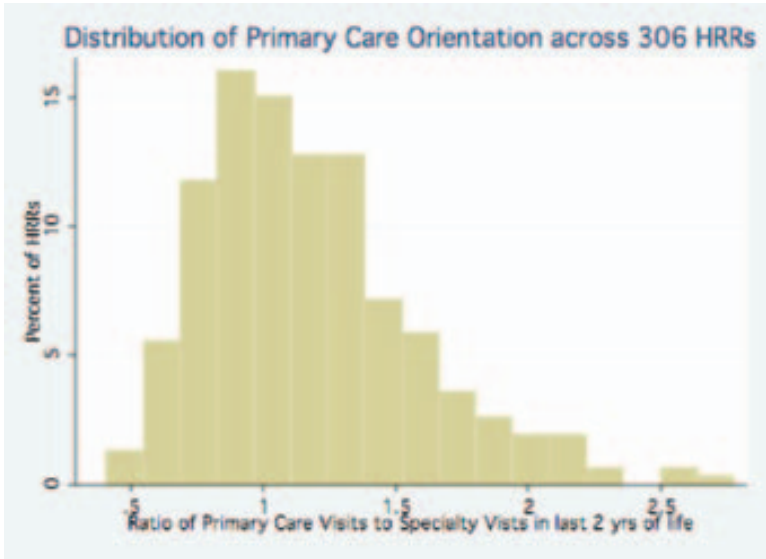
We compared health system performance across the 306 Hospital Referral Regions (HRR), which represent regional healthcare markets for tertiary medical care. Each of the 306 HRRs contained at least one hospital that performed major cardiovascular procedures and neurosurgery. The HRRs were defined based on travel patterns from all Medicare hospital discharges. The vast majority of the care for Medicare beneficiaries residing in an HRR was provided by the physicians and hospitals located within that HRR.

We measured the primary care orientation of each HRR by the ratio of visits by patients with serious chronic illness that were provided to primary care physicians (including general internists) as opposed to medical specialists. We identified all Medicare beneficiaries who died between 2001 and 2005 and had one or more of nine serious chronic illnesses, as defined in recent Dartmouth Atlas reports.<sup>64</sup> The rationale for focusing on this population was that it allowed comparisons in practice patterns at the regional level that would be highly unlikely to be caused by differences in underlying illness levels across regions. We ranked each HRR by the ratio of primary care to medical specialist visits in the last 2 years of life and grouped the HRRs into thirds: low, medium, and high primary care orientation.<sup>(i)</sup> The distribution of our measure of primary care orientation is shown in Figure 1.

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<sup>i</sup> We considered alternative measures of primary care orientation based on the composition of the physician workforce (proportion of physicians within the HRR who were primary care specialists) and the ratio of physician full time equivalents (FTEs) used by beneficiaries with serious chronic illness. These other measures were highly correlated with the measure based on visits and gave similar results to those presented here.

*Figure 1. Distribution of the Ratio of Primary Care to Medical Specialist Visits During the Last 2 Years of Life for Medicare Beneficiaries with Serious Chronic Illness*



*Table 1. Primary Care Orientation and the Quality of Care Provided to Medicare Beneficiaries, 2003 to 2005\**

	Primary care orientation, %			P-value
	High	Medium	Low	
Average percentage of female Medicare enrollees aged 65-69 having at least one mammogram over a 2-year period (2004-05)	66.5	63.4	63.2	P<.0001
Average annual percentage of diabetic Medicare enrollees aged 65-74 having hemoglobin A1c test (2003-05)	86.2	83.5	83.0	P<.0001
Percentage of Medicare beneficiaries whose predominant ambulatory provider was a primary care physician (2004)	83.2	79.3	73.4	P<.0001
Percentage of Medicare beneficiaries with a primary care physician (2004)	93.1	91.7	88.9	P<.0001
CMS Hospital Compare Composite technical process quality measures (all patients, 2005)	88.2	86.9	87.0	P=.008
Discharges for ambulatory care-sensitive conditions per 1,000 Medicare enrollees (2003-05)	76.2	82.1	75.4	P=.02

\*U.S. HRRs were grouped according to the ratio of primary care to specialist physician visits during the last 2 years of life for Medicare beneficiaries with a serious chronic illness. Regions were grouped into terciles. Measures of quality were either calculated from Medicare claims data or obtained from Medicare’s reports of hospital quality and aggregated to the HRRs within which they were located.

Table 1 compares the quality of care across these terciles of primary care orientation. Regions with a high primary care orientation had a somewhat higher proportion of women aged 65 to 69 years who received a mammogram, and a higher proportion of diabetics received an annual hemoglobin A1c test. A higher percentage of beneficiaries had a primary care physician (93.1 percent vs 88.9 percent), and a higher proportion of beneficiaries received the predominance of their care from primary care physicians (83.2 percent vs 73.4 percent). We found minimal differences in hospital quality measures or rates of hospitalization for ambulatory care-sensitive conditions.

*Table 2. Primary Care Orientation, Healthcare Spending, and Utilization\**

	Primary care orientation, %			Ratio High - Low
	High	Medium	Low	
<b>Total spending – All beneficiaries</b>				
Total age-sex-race adjusted per-capita spending	6922	7675	8346	0.83
<b>Spending—beneficiaries with serious illness</b>				
Total Medicare spending	38,364	43,641	49,628	0.77
Spending on physician services	6942	8302	10,229	0.68
<b>Hospital use—beneficiaries with serious illness</b>				
Hospital days per decedent, last 2 years of life	9.4	11.1	12.2	0.77
Percentage of deaths occurring in hospital	28.9	31.9	31.6	0.91
<b>Use of physician services</b>				
Physician visits per decedent in last 6 months of life	22.2	27.4	34.7	0.64
Medical specialist visits	8.0	12.1	18.3	0.44
Primary care physician visits	12.4	13.3	13.9	0.89
Percentage seeing 10 or more different physicians	20.6	26.9	34.2	0.60
Per-patient spending on procedures	1584	1774	2138	0.74
Per-patient spending on imaging	599	732	908	0.66
Per-patient spending on diagnostic tests	359	445	539	0.67
<p>*U.S. HRRs are grouped according to the ratio of primary care practitioner to specialist physician visits during the last 2 years of life for Medicare beneficiaries with a serious chronic illness. Regions were grouped into terciles. All differences are significant at the P&lt;.001 level, except for the difference in primary care physician visits, which differed at the P=.05 level of significance.</p>				

Table 2 compares spending and utilization patterns for Medicare beneficiaries stratified by the degree of primary care orientation. The differences across regions are much greater than the differences in quality described in the previous text. Total per-capita spending in the primary care-oriented regions was \$6,922, which is 17 percent lower than the \$8,346 per-capita spending found in the specialist-oriented regions. The differences were somewhat greater for beneficiaries with serious chronic illness: 23 percent lower in the primary care-oriented regions. The data shown in Table 2 also provide insight into the patterns of practice. Beneficiaries in primary care-oriented regions spend much less time in the hospital, are less likely to die in the hospital, have fewer physician visits overall, and make far fewer visits to medical specialists. Those in primary care-oriented regions are much less likely to have 10 or more different physicians involved in their care (20.6 percent vs 34.2 percent) and receive fewer procedures, imaging services, and diagnostic tests.

Several limitations of these updated analyses must be acknowledged. First, the quality measures available for the current study were limited to those that could be calculated from Medicare claims or that were available at the hospital level from the Medicare Compare database. We lacked measures of patient experiences of care and of health outcomes. Second, we have no data on the care of the population aged under 65 years—a limitation that extends to almost all of the earlier population-based studies as well. Also, our measure of primary care orientation did not allow us to evaluate the impact of the distinct functions of primary care on quality, costs, or whether the findings were in fact related to primary care itself or to some other unmeasured attribute of these regions. It remains possible, for example, that the better performance simply reflects a smaller specialist workforce and the better continuity that results from having fewer physicians involved in a given patient's care.

Concern has been raised that the differences in spending and practice observed across U.S. regions could be related to differences in poverty, underlying health status, the fact that many high spending regions are urban centers, or the relative concentration of academic medical centers. Although differences in illness are powerful determinants of healthcare utilization and spending, recent studies have shown that differences in health status explain only a small portion of regional variations in spending.<sup>65</sup> And, even among academic medical centers, studies have

shown a similar degree of variation in spending and intensity without any evidence that the higher-intensity hospitals were achieving better outcomes (after acute myocardial infarction, hip fracture, or an initial diagnosis of colon cancer).<sup>66</sup> Also, the lower-intensity hospitals, on average, have a stronger primary care orientation (Table 3). Examination of the specific academic medical centers within each quintile of intensity (Table 4) reveals that many hospitals are caring for disadvantaged populations in major urban centers in the lower two quintiles of intensity (eg, Grady, Parkland, and University Hospitals of Cleveland), suggesting that poverty is an insufficient explanation for differences in intensity.

*Table 3. Differences among Major U.S. Academic Medical Centers in Patterns of Care and Primary Care Orientation as Reflected in Care for Medicare Beneficiaries with Serious Chronic Illness in Their Last 6 Months of Life, Grouped into Quintiles of Relative Intensity (see Table 4 for list of hospitals in each quintile)*

	Spending per patient	Days in Hospital	Total Physician visits	Ratio Primary Care to Medical Specialists visits	Seen by 10 or more different
<b>Highest intensity</b>	48,849	22.3	55.2	0.53	55%
<b>High intensity</b>	41,026	16.6	37.1	0.84	49%
<b>Medium intensity</b>	34,604	15.1	30.2	0.86	44%
<b>Low intensity</b>	32,694	13.8	25.9	0.89	39%
<b>Lowest intensity</b>	29,645	11.7	23.1	0.92	35%

In sum, the evidence of the earlier studies and the updated analyses paints a relatively consistent picture: within the U.S. healthcare system, regions or academic medical centers that have a relatively strong emphasis on primary care are able to provide care of equal or better quality at substantially lower costs than regions that emphasize specialist care. Given the serious threat that rising healthcare costs pose to the affordability of care, the fiscal integrity of the U.S. government, and the impending inadequacy of the primary care physician workforce, efforts to consider how to strengthen primary care appear warranted. Recent evidence from high-performing U.S. healthcare systems seems to point in the same direction.



**Table 4.** Teaching Hospitals Included in Each of the Intensity Groups  
*Shown in Table 3\**

<p><b>Highest intensity</b>            NYU Medical Center-University Hosp            Cedars-Sinai Medical Center            Robt Wood Johnson University Hosp            Mount Sinai Hospital            Thomas Jefferson University Hospital            Methodist Hospital-Houston            Hahnemann University Hospital            Rush-Presbyterian-St. Luke's Med Ctr            UCLA Medical Center            New York-Presbyterian Hospital            Jackson Memorial Hospital            Temple University Hospital            Howard University Hospital            Albany Medical Center            Tampa General Hospital</p>	<p><b>Medium intensity</b>            Barnes-Jewish Hospital            Nebraska Health System            Beth Israel Deaconess Medical Center            Emory University Hospital            Johns Hopkins Hospital            Saint Louis University Hospital            Oklahoma University Medical Center            Fairview University Medical Center            UAMS Medical Center            Yale-New Haven Hospital            Ohio State University Medical Center            University of Michigan Health System            Kaleida Health            Cleveland Clinic Foundation            Froedtert Memorial Lutheran Hospital            Boston Medical Center</p>	<p><b>Low intensity (cont)</b>            Univ. of Mississippi Medical Center            West Virginia University Hospitals            Grady Memorial Hospital            Duke University Hospital</p>
<p><b>High intensity</b>            Montefiore Medical Center            Massachusetts General Hospital            Harper University Hospital            UPMC Presbyterian Shadyside            Northwestern Memorial Hospital            Hospital of the Univ. of Pennsylvania            University Hospital-Stony Brook            Georgetown University Hospital            George Washington University Hosp            Brigham and Women's Hospital            Tufts-New England Medical Center            Memorial Hermann-Texas Med Center            University of Kansas Hospital            University of Maryland Medical Center            Shands Hospital at the Univ of Florida            Loyola University Medical Center            Loma Linda University Medical Center            Clarian Health Partners Inc.</p>	<p><b>Low intensity</b>            Rhode Island Hospital            Strong Memorial Hospital            U. of Texas Medical Branch-Galveston            UMass Memorial Med Ctr-U. Campus            SUNY Upstate Medical Center            Medical College of Ohio at Toledo            UC San Diego Medical Center            University of Iowa Hospital &amp; Clinic            Milton S. Hershey Medical Center            University of Chicago Hospitals            North Carolina Baptist Hospital            UCSF Medical Center            Vanderbilt University Hospital            John Dempsey Hospital            University of Alabama Hospital            Univ. of Washington Medical Center            Creighton U. Med Ctr-St Joseph Hosp</p>	<p><b>Lowest intensity</b>            St. Mary's Hospital-Rochester            Pitt County Memorial Hospital            University Medical Center, Tucson AZ            U.C. Davis Medical Center            University Hospitals of Cleveland            Medical Univ. Hospital, Charleston, SC            Medical College of Virginia Hospitals            Fletcher Allen Hospital of Vermont            Medical College of Georgia Hospital            University of North Carolina Hospital            University of Kentucky Hospital            Stanford Hospital            University of Virginia Medical Center            University of Missouri Hosp.&amp; Clinics            University of Colorado Hospital            University Hospital-Cincinnati            University of Wisconsin Hosp &amp; Clinics            Mary Hitchcock Memorial Hospital            OHSC Hospital and Clinics            Parkland Health and Hospital System            University of New Mexico Hospital            University of Utah Hospital            Scott &amp; White Memorial Hospital            St. Mary's Hospital-Rochester            Pitt County Memorial Hospital</p>
<p>*Hospitals were ranked according to the Hospital Care Intensity (HCI) Index, which is the simple average of the ratio to the U.S. average for each hospital of inpatient days and inpatient physician visits in the last 6 months of life for patients with serious chronic illness cared for by the hospital, adjusted for specific chronic illnesses.</p>		

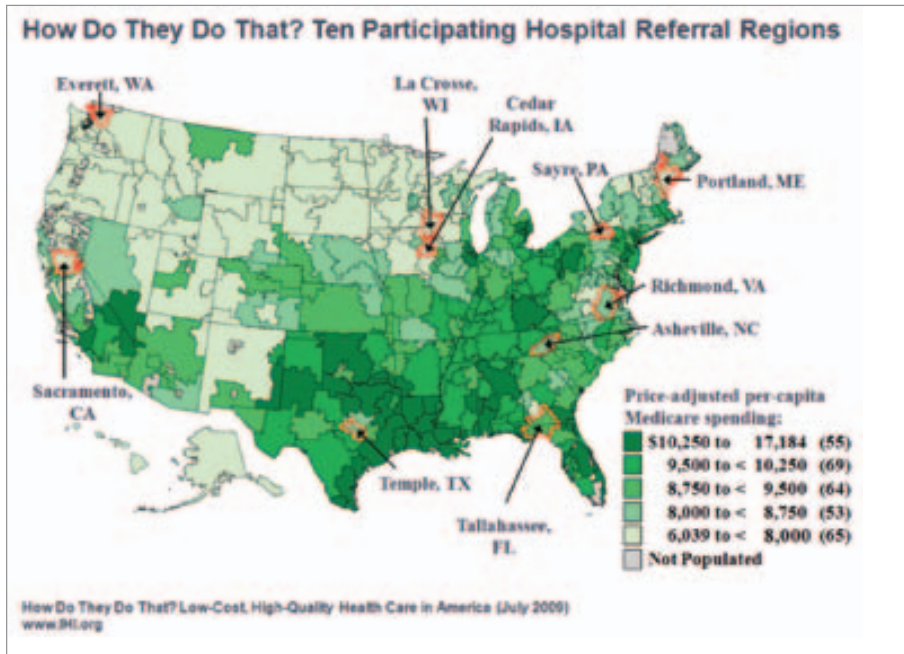
## INSIGHTS FROM HIGH-PERFORMING U.S. HEALTHCARE SYSTEMS

A fourth strand of evidence on the value of primary care emerges from recent case studies of high-performing U.S. regions and the experiences of integrated delivery systems that have participated in pilot payment reform projects or completed pilot studies of primary care reforms.

On July 21, 2009, leaders from health systems in 10 U.S. regions shared their experiences at a gathering in Washington, DC called “How Do They Do That? Low-Cost, High-Quality Healthcare in America.”<sup>67</sup> The goals for the meeting were to learn from high-performing regional health systems about how they have kept spending low or slowed spending growth while

delivering high-quality care and for participants to share their insights with other communities and with national stakeholders.<sup>68</sup> Using publicly available quality and cost data, more than 70 of the nation's 306 HRRs were identified as higher-performing, lower-cost regions. Representatives from 10 demographically and geographically diverse regions were invited to participate in the meeting (Figure 2).

*Figure 2. Regions Participating in the “How Do They Do That?” Conference*



Several themes that emerged from the discussion are relevant to primary care.<sup>69</sup> Representatives from many of the regions articulated a sense of accountability to their communities to provide high-quality and affordable care and of the need to ensure effectively coordinated care. Representatives from many of the regions also spoke specifically of the importance of a strong foundation of primary care. The data in Table 5 show that 8 out of the 10 regions have a relative predominance of primary care practitioners to specialists, with ratios of 1.23 or greater in the primary-care-to-specialist ratio used to rank regions for the updated regional analysis described in the prior section.

**Table 5.** Characteristics of the 10 Regions Participating in the “How Do They Do That?” Conference

HRR	HRR #	State	Cost Rank (#1 is lowest spending in U.S. out of 306 HRRs)		2006 Price-adjusted Medicare Spend per Enrollee	CMS Hospital Compare Composite quality score	Ratio of Primary Care FTE / Specialist FTE (National Average 1.06) <sup>†</sup>		Pop. Of Nominal City #	Pop. Growth 2000-2007	Ratio of Primary Care to MD Specialist Visits in last 2 yrs of life	% of All Beneficiaries whose Predominant Ambulatory Provider is a Primary Care Specialist
			1992	2006			Δ Rank (Cost)**	Pop. Of Nominal City #				
La Crosse	448	WI	8	4	\$6,473	97.0	2.18	90,719	-2.10%	2.56	81.7	
Temple	413	TX	54	76	\$8,594	94.5	1.60	58,330	7%	1.89	83.4	
Everett	437	WA	154	65	\$7,331	94.5	1.51	101,900	7.40%	1.61	81.6	
Sayre	359	PA	99	27	\$7,624	93.8	1.61	5,481	-5.70%	1.59	85.4	
Ashville	309	NC	70	24	\$8,086	94.6	1.56	73,875	7.20%	1.56	85.2	
Portland	222	ME	110	54	\$7,819	94.4	1.24	62,825	-2.20%	1.30	83.1	
Tallahassee	140	FL	201	95	\$8,764	91.4	1.27	168,979	12.10%	1.27	80.7	
Sacramento	77	CA	199	100	\$7,598	95.1	1.21	460,242	13.10%	1.23	81.0	
Richmond	431	VA	126	39	\$8,275	95.6	0.98	202,002	2.30%	0.91	77.9	
Cedar Rapids	190	IA	35	12	\$7,657	96.0	0.87	126,396	4.70%	0.82	79.4	

It is also worth noting that many integrated health systems are beginning to vote with their feet on the importance of primary care, with promising evidence in early pilot studies. Several of these initiatives began before the currently popular term “patient-centered medical home” was coined. Community Care of North Carolina established a program to support primary care physicians in their practices that reduced hospitalizations by 40 percent and improved the quality of care given to children with asthma.<sup>70</sup> Geisinger Health System in Pennsylvania began a program to support both their employed and their network primary care physicians with nurses and care managers that focuses on improving chronic disease care for complex patients. Their preliminary analyses showed improved quality of chronic disease care, a 14 percent reduction in hospitalizations, and a nine percent reduction in total costs.<sup>71</sup> Group Health Cooperative in Washington implemented its pilot medical home program in 2006. In their recently published evaluation of the first year they reported better patient satisfaction, less staff burnout, improved composite measures of quality, reduced emergency room visits and preventable hospitalizations, and a trend toward lower costs.<sup>72</sup> The second-year follow-up showed reduced total costs. Both Geisinger and Group Health have decided to implement their redesigned primary care practice models throughout their health systems. All of these interventions are best characterized as efforts to redesign primary care by defining and implementing the key features of successful primary care systems, including enhanced access (to acute and after-hours care), delivering planned care for patients with chronic disease (through the use of registries, electronic communication, group visits, and other

innovations), and coordinating care for patients with complex illness—often with advanced practice nurses integrated in the primary care practice.

## CONCLUSION

In sum, we know a fair bit about primary care. The public highly values having a provider with whom they have a longstanding relationship and who therefore knows them well and can help them with important decisions. And the evidence suggests that their instincts are correct: They get better care when they have timely access to a knowledgeable provider with whom they've had an ongoing relationship. U.S. health systems in which primary care has a stronger role achieve equal or better quality at substantially lower costs. And—perhaps most importantly—the U.S. health systems that are seriously and successfully improving care and reducing costs have decided that their future success depends upon a strong foundation of primary care. How best to build that strong foundation of primary care therefore deserves serious discussion.

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# DESIGNING NEW MODELS OF CARE FOR DIVERSE COMMUNITIES: WHY NEW MODELS OF CARE DELIVERY ARE NEEDED

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What would the U.S. healthcare system look like if we conceptualized it as a house? Would the architecture meet the needs of the individuals living inside of it? Would it live in harmony with the other structures surrounding it? Would its functions be sustainable—efficiently using resources in a cost effective way?

In his June 2009 *New Yorker* article, Atul Gawande conceptualized the healthcare system in this way:

Providing healthcare is like building a house. The task requires experts, expensive equipment and materials, and a huge amount of coordination. Imagine that, instead of paying a contractor to pull a team together and keep them on track, you paid an electrician for every outlet he recommends, a plumber for every faucet, and a carpenter for every cabinet. Would you be surprised if you got a house with a thousand outlets, faucets, and cabinets, at three times

the cost you expected, and the whole thing fell apart a couple of years later? Getting the country's best electrician on the job (he trained at Harvard, somebody tells you) isn't going to solve this problem. Nor will changing the person who writes him the check.<sup>1</sup>

Gawande warns that a crucial aspect missing from the health reform debate—which mostly centers on access and cost—is the question of design. Do we have a system that is designed for the people living in the house? Or is it a system designed for the contractors?

The U.S. healthcare system spends more as percent of gross domestic product and per capita than any other country on healthcare for outcomes such as rate of preventable deaths, infant mortality, and life expectancy that are not better and are sometimes worse than outcomes in most other developed countries.<sup>2-4</sup> But lackluster outcomes and skyrocketing costs are only part of the story. Research at Dartmouth for years has shown the wide geographic variation of spending and outcomes by region.<sup>5</sup> Even within the same communities we often find disparities in disease burden, outcomes, and standard practices.<sup>6-9</sup> Research indicates that increased spending on healthcare does not translate into improved population outcomes and, in fact, some outcomes are worse in regions of the country where healthcare spending is higher.<sup>7</sup> The question of why the United States, the country that spends the most on health, is not the healthiest nation in the world warrants a serious look at how our health system is organized, delivered, and financed.

Too often, patients with complex acute or chronic health conditions receive services from multiple health providers in multiple care settings that do not coordinate and communicate with each other. This is especially true for the vulnerable elderly and disabled populations. This lack of coordination and integration leads to a fragmented healthcare system in which patients experience questionable care with more errors, more waste and duplication, and little accountability for quality and cost efficiency. The reasons for these flawed practices are multi-faceted and include the following: the design of funding and delivery; the socioeconomic factors leading to disparities in outcomes and disease burden; and challenges to achieving adherence to multiple, complex, competing practice standards across healthcare providers caring for diverse patients with multiple risk factors and diseases living in communities with different resources and

values. The fragmented health system has perverse outcomes: a thicket of eligibility criteria and copays; population socioeconomic factors resulting in discontinuous care and unresolved disease burden; and uneven adherence or accountability to practice standards across healthcare providers. This state of affairs calls for a transformation of the current healthcare system into a system that invests more in round-the-clock access, teamwork, integration, continuity during transitions in care, patient and family engagement in their own healthcare management, information technology, and quality improvement.<sup>10, 11</sup> Research evidence shows that such systems are associated with lower costs of care, better health outcomes through access to more appropriate services, and reduction of inequities in the population's health.<sup>10-12</sup> Perhaps the main reason for our ill-designed system is our fundamental mindset.<sup>13</sup> To deliver high-quality, efficient healthcare that is accessible to everyone, we need to shift our thinking from traditional disease-based models that are centered around the payers and providers of care and move toward health-based models centered on the needs of individuals, families, and their communities.<sup>14-16</sup>

A dizzying array of conversations, campaigns and collaborations—all with different acronyms and intentions—is already in motion right now and seeking to address care redesign. Patient-centered medical homes (PCMH),<sup>17-22</sup> accountable care organizations (ACOs),<sup>23,24</sup> medical home neighborhoods,<sup>25</sup> and community health teams that are integrated with primary and specialty care services<sup>26</sup> are all concepts currently feeding into conversations at the national and state level if reform efforts come to fruition. But what too often gets lost in discussion of models is the importance of patient- and family- centered care.<sup>27</sup> In this paper we seek to deconstruct these and other models to identify common elements of success and develop a case for a process in which local solutions are built around the needs of populations—particularly for society's most vulnerable people (low-income, the uninsured and underserved, minority groups, young children, and the elderly).

As members of a multidisciplinary, geographically diverse team serving a variety of populations, we understand that reform at the national, state, and local level should not be a linear event, but is rather an iterative, dialectical process that both responds to change and proactively seeks continuous improvement. The literature supporting our ideas is broad and

scattered across multiple disciplines in public health, preventive medicine, and hospital administration. Published, evaluated attempts at redesign are often disconnected and not to scale. To that end, this paper will not capture every example of successful healthcare design. Rather, we seek to synthesize the common elements in an attempt to better inform and inspire leadership.

What we find, when we look across multiple theoretical constructs—both actualized and theoretical—is that the answer to our misshapen healthcare house, while seemingly complex, is actually quite simple: Let form follow function.<sup>28</sup>

## NOT BLUEPRINTS—BUILDING CODES

Just as in planning the building of a house, the planning of a health system requires advance thinking. Before building, an architect asks: Who is the house for and what are the needs of its future inhabitants? What materials and assets do I have available to build the house? How can my design support the needs of the homeowner?

Likewise, designers of health systems should ask three main questions:

- What are the needs of my local community?
- What strengths and resources does the community already possess?
- How can I help the community?

It may sound obvious to suggest asking “How can I help?,” but for too long in the world of healthcare perverse financial incentives have encouraged systems that revolve around the needs of providers and academic medical centers and not around the needs of the community. Provider-driven supply and demand, as opposed to population-driven need,<sup>7,8</sup> have created boundaries among prevention, care, and treatment, leaving patients and communities adrift in a sea of frustrated expectations, confusion, and poor health. Too often, patients and their family members are left alone to navigate a complex health system and assume responsibility for integrating care by themselves across the array of doctors, hospitals, and vendors they need. They are ill-equipped, ill-informed, and often physically ill when they are asked to assume these responsibilities.



In order to reshuffle the ways we organize, finance, and deliver care, we must follow a larger cultural shift in how we conceptualize the foundation of healthcare delivery. This shift in thinking needs to be guided by principles and to make explicit the values it is designed to promote (eg, comprehensiveness, continuity, coordination, compassion, cultural effectiveness, and patient and family centeredness). To design effective systems of care, we must re-imagine our options and explore alternative strategies. Every house design must include a plan for plumbing, heating, and cooling. Climate needs will of course vary between houses in Arizona and houses in New England, and the sophistication of a plumbing system will vary depending on the money available to pay for the house. Likewise, every healthcare system should take into account three main design elements common across all systems: 1) relationships (people); 2) data (information); and 3) teamwork (services). Relationships can and should exist among healthcare entities and public health departments, social service agencies, schools, churches, agricultural extension agents, and many other programs. Data can and should be gathered from diverse sources to evaluate both needs and assets. Teamwork skills must be supported so that care services match community need.

Again, the needs of a rural community with an aging population and strong community connections but few healthcare resources will differ from the needs of an urban neighborhood with high levels of chronic disease and weak community connections that still has access to many healthcare resources. The how, what, when, where, and why of people, information, and services will vary—but no system can truly be called a system without these three design elements.

Specific steps toward meeting these design elements include the following:

1) *Identify local disease burden, utilization patterns, practice pattern variation, costs, opportunities, and resources.* The first step, before any contemplated change or reform is designed, is to thoroughly understand the status quo. Architects for change often use broad population statistics to devise one-size-fits-all solutions. But the disease burden of a suburban population in the Southeast is not the same as that of a similar population in the Northeast, nor will it likely match that of an urban population in the West or a rural population in the upper Midwest. Even within a small city, geospatial mapping might show disparities in health status block by block. Needs are different and so should solutions be different.<sup>29</sup>

This is a fundamental shift away from a medical model that approaches problems assuming it already knows the solutions. This new design would encourage deeper thinking about customer- and community-focused solutions. Healthcare is different from other segments of the economy in that it too often fails to think deeply about customer preferences and instead orients services around service providers. Doing an appropriate needs assessment, in conjunction with local and state health departments, community partners, and other stakeholders, will inform more participatory, customized solutions.

For two decades, the Dartmouth Atlas project has documented Medicare utilization and payment information at the national, regional, and state level, finding tremendous variation.<sup>5</sup> This type of analysis needs to be conducted on other populations and to go deeper in scope so that we can identify the deeply embedded trends within local systems—already discovered for Medicare populations—that either promote or inhibit good outcomes. Large healthcare systems, especially those that receive Clinical and Translational Awards from the National Institutes of Health (NIH), may be particularly able to help, as they often have large service networks with electronic medical records feeding a local data repository and faculty skilled in data and registry analysis to identify local variations.

In the past year, the nation has been engaged in debate over how best to define the success of a healthcare system. Various segments of the population and policymakers have focused on cost, quality, or access. Synthesizing these concerns into metrics will help to shape system design over time.

2) *Identify or establish strong partnerships with public health, social services, housing, education, hospitals, and providers.* Many of the current federal health reform discussions have centered on the idea of ACOs, which link academic medical centers, community providers, and clinics together and make communities jointly accountable for outcomes. However, ACOs cannot function effectively without strong preexisting medical and community relationships and connections. Simply changing how medical care is structured is necessary but not sufficient to ensure a successful ACO. System design—especially if the ACO model moves forward—needs to draw on the strength of all stakeholders: academic medical centers; public health agencies; social services; healthcare providers; community

organizations and advocates; and patients and their families. These community-engaged partnerships require commitments that build equity, trust, and opportunities for co-learning over time for the mutual benefit of all involved.<sup>30,31</sup>

One example of how community engagement could be deepened is through formal linkage with community health teams. The “community health team” concept was designed to provide transitional care, coaching, patient support, and referrals for prevention services to vulnerable populations, and this system has been shown to add value to primary and specialty care health systems. Organized in teams of public health nurses; advanced practice nurses; social workers; health educators and promoters; and mental health providers, these teams monitor patients through comprehensive care plans that incorporate technology and home visits, creating links with primary and specialty care to coordinate care across systems.<sup>32</sup>

Integrating these community health teams with public health agencies would extend the resources for prevention, health promotion, and advocacy across communities and provide a full range of prevention services. The challenge, of course, is the limited funding for public health agencies. Plans for payment reform and system design should take into consideration the need for a stable public health infrastructure throughout all communities in order to achieve measurable population health outcomes.

3) *Configure a mix of professionals based on the needs of populations.* Some programs that use care managers to help patients navigate health systems and encourage compliance have found success in keeping patients healthy and/or managing their diseases at the least burdensome level.<sup>33-</sup>

<sup>35</sup> Others have incorporated medication use, education, and counseling for patients<sup>36,37</sup> and Web or phone-based decision support systems.<sup>38</sup>

Community needs and preferences will differ. School settings and “minute clinics”<sup>39</sup> are traditionally served by a single nurse practitioner or physician assistant, whereas workplace clinics, senior centers, and communities with high levels of chronic illness may require teams of physicians, nutritionists, medical language interpreters, health behavior specialists, and many others.

4) *Establish clinician teams that work at the top of their training and the edge of their license.* A keystone of teamwork is empowering team members to perform tasks according to their scope of practice, experience, and education.<sup>40</sup> Drawing again from our analogy of constructing a house, it would be inefficient to use the electrician to carry the lumber. It is likewise inefficient for a medical professional to work on tasks that require only a small amount of his or her training. This concept of course has come with no small amount of strife, as professional associations fight the expansion of scope-of-practice laws at the state and federal level. Clay Christianson writes that shifting professionals up to handle tasks at the edge of their licenses is a positive “disruptive innovation” that expands access and lowers costs for consumers. He advises that instead of fighting this trend, professionals should instead “disrupt those above them rather than fight a reactionary and ultimately futile battle with disrupters from below.”<sup>41</sup>

We need to envision teamwork as something more than including physician assistants, advanced practice nurse practitioners, pharmacists, nutritionists, physical therapists, registered nurses, social workers, medical interpreters, physicians, and other health team members. Patients, families, and communities should also be part of the team. Teams need to find ways to incorporate and coordinate the supports already existing outside of medical institutions, such as social service agencies, schools, and churches, which already have major roles in healthcare. With additional resources, these groups could do far more. When care responsibilities are shared by empowered team members, teams are able to target care strategies for complex patients who too often end up moving back and forth between office visits, emergency room visits, the hospital, and nursing homes.

Teamwork also requires a cultural shift away from thinking in terms of “low-level,” “mid-level,” and “higher-level” providers (terms that can be perceived as demeaning to nurse practitioners, physician assistants, and medical interpreters). To move away from subordinate roles within healthcare and closer to true teamwork, we need to identify the factors preserving hierarchy and recognize that all team members are integral. We should recognize and acknowledge that a shift toward team models has significant cost in terms of professional satisfaction. Working with healthy patients longitudinally builds trusting relationships. Professionals treating only the sickest patients do not get the chance to build relationships over

time and might experience less professional satisfaction than they did previously when they handled less complex tasks.

5) *Employ information technology that enables teamwork.* The existing healthcare system's relationship with information technology has been marked with inefficiency, duplication, waste, and medical errors as clinics, hospitals, providers, and vendors have employed multiple information technology systems with differing standards for quality. Medical information at the individual and collective level too often gets trapped in technology silos that lack the capability to coordinate and integrate. A system that captures patient information seamlessly across community-based health systems, hospitals, and provider settings would provide all patients with timely access, emphasize prevention and chronic care management, organize care around the patient's needs, coordinate care across settings, increase communication and patient safety, enable researchers to identify trends, and empower patients and their families with their own clinical information. Such a system would promote care that is appropriate, timely, equitable, coordinated, and focused on the patient's needs.<sup>42,43</sup> A common national database for health information that can be accessed by different electronic medical record interfaces would be ideal, but local data repositories for decision support can also be effective. Likewise, information technology can be used to empower patients through patient-facing technology, such as home monitoring and decision support systems.

The Office of National Coordinating for Health Information Technology (ONC) has been working at a rapid pace to develop and implement a national interoperable health information technology infrastructure. Since its beginnings in 2004, ONC has worked toward a goal of every American having an electronic medical record by 2014. Key to these efforts is diverse input at the regional and local level—including surveying patients to identify their preferences for privacy and accessibility. “Our goal, above all else, is to make care better for patients, and to make it patient-centered. Information policy and health IT policy should serve that goal,” says ONC director David Blumenthal.<sup>44</sup>

6) *Achieve seamless transitions.* Results from recent studies suggest that a lack of effective follow-up care and poor transitions between providers or levels of care harm the health of populations. Technology is one part of

the answer to this problem. But larger cultural shifts in delivery of services are necessary to ensure that coordination optimizes health, including stronger relationships between practitioners with different medical specialties and better attitudes toward medical specialties and disciplines other than one's own.<sup>34,45-47</sup>

Of particular interest to the Centers of Medicare Services (CMS) is the issue of Medicare “bounce backs.” A recent study revealed that unplanned rehospitalizations among Medicare beneficiaries are prevalent and expensive. In 1974 alone, rehospitalizations cost \$17.4 billion.<sup>48</sup> CMS is now looking at ways to restructure payment to encourage more coordination between hospitals and providers.

It is also important to think carefully about the overlap of care systems. For example, as the volume of people served by the Veteran's Administration (VA) rises with returning injured veterans, the VA's coordination needs with community providers will need to be refined. Likewise, a cancer patient undergoing treatment will interact primarily with oncology specialists but when in remission will need a careful transition to a family or internal medicine group.

7) *Collaboratively develop iterative cost/benefit assessment with appropriate economic and health metrics.* Completing the loop of this process, this step is similar to the first step. System design is not a one-time, linear process. Progress should be evaluated continually and used to guide improvement. However, too often our healthcare system measures costs and benefits in terms that are not meaningful to individuals, families, and communities, who may be more concerned with access, personal cost, and the burden of illness. Designers of new models need to work with the communities they serve to determine the mix of metrics that will define “success” for all stakeholders. This element of design is at the heart of health reform efforts.

As the recent controversy over increased investment in comparative effectiveness research has demonstrated, suspicion mounts when the public does not understand how and why cost/benefit information is being gathered.<sup>49</sup> Similarly, new breast and cervical cancer recommendations from the U.S. Preventive Sciences Taskforce have generated intense debate because the public lacks an understanding of the work of this agency and the agency has not engaged the target

groups in its deliberations.<sup>50</sup> Science needs to be broadly understood as a moving target that will and should evolve over time. It is incumbent upon designers of healthcare systems to link public engagement to quality improvement efforts.

## FRAMING THE OPTIONS

As we have argued previously, one overarching solution to problems in healthcare design does not exist. These design elements are not blueprints; rather, they are building codes: elements that should be included in every system but not necessarily implemented the same way every time.

These “building codes”—people and relationships, information and data, and teamwork and services—are elements that are already being implemented successfully in care models across the country in a variety of permutations. Examples at the macro and micro level abound.

### Federal Models for Local Systems

Every federal entity is currently focused on increased “collaboration.”<sup>51</sup> The Health Resources and Services Administration (HRSA) Health Disparities Collaborative is an integrated national effort to eliminate disparities and improve delivery systems of healthcare to all individuals living in the United States under the care of HRSA-service delivery organizations and partners. With its members working in teams, the Health Disparities Collaborative is transforming what is typically thought of as a healthcare system of last resort into a system with clinical outcomes that rival or exceed those from the private sector.<sup>52</sup>

Community-based delivery models that integrate healthcare research to establish evidence-based practice and services through collaborative processes and relationships reflect a desire to move care into improved outcomes. Although the Indian Health Service (IHS) serves communities facing some of the starkest health disparities in the country, it has nurtured and sustained relationships in which the IHS is a partner in meeting the needs of the tribal communities, assisting in assessing needs, and in implementing programs that meet those needs.<sup>53-55</sup>

The 3-year Medicaid-Medicare Advanced Primary Care (APC) Demonstration Initiative will allow Medicare beneficiaries to participate in state-based medical home systems including Medicaid and private payors. This demonstration will facilitate partnerships between Medicare and multi-payors medical home demonstrations and align compensation offered by all insurers to primary care physicians. States wishing to participate in the new demonstration must perform the following tasks:

- Establish effective APC models in all or parts of their states that include their Medicaid program as well as private payers
- Show that a majority of the primary care physicians in the demonstration areas would participate
- Have stringent requirements for designating APC providers, including independent accreditation and requirements for the use of health information technology
- Have integrated public health services to emphasize wellness and prevention
- Have secured the participation of a sufficient number of private payers.<sup>56</sup>

## Integrated Systems

Integrated delivery systems, such as the VA and staff-model HMOs, have long been finding ways to integrate services to serve the whole patient and have been backed with information technology that allows seamless links among research, dissemination, and practice. Group Health Cooperative, a large integrated health system in the Pacific Northwest, has established team-based care within a medical home model that is achieving very positive outcomes in quality and cost. In a pilot study conducted within Group Health, their medical-home patients had 29 percent fewer emergency room visits than patients in other clinics and 11 percent fewer preventable hospitalizations.<sup>57</sup>



## State, Regional, and Local Design: North Carolina

Perhaps the best example of system design that takes into account local disease burden and practice variation is the North Carolina Medicaid program. Conceived from the beginning as a series of regional networks that include primary care providers and other local agencies, the program has evolved into 14 separate networks, each focused on local residents and the providers and agencies who care for them. This system allows local experiments in care delivery within an overarching state framework.<sup>58</sup>

At the regional level, Community Care of North Carolina (CCNC) has improved outcomes for Medicaid enrollees and lowered unnecessary or avoidable emergency room visits in many counties by collectively identifying outcomes that matter. CCNC pooled the talent and expertise of networked providers from different specialties and disciplines and asked them to come up with the right measures to evaluate. Such measures, along with the incentives that accompany them, have made healthcare delivery more responsive to the specific regional needs of the community.

At the local level, the “Just for Us” program in Durham, North Carolina resulted from partnerships between Duke University Medical Center, the Durham Housing Authority, and other community entities. This program offers elderly and disabled residents living in public housing with accessible and highly coordinated care. Physician assistants provide home health visits for chronically ill elderly and disabled residents and use technology to share information and closely coordinate care among physician specialists, pharmacists, social workers, and other members of the care team.<sup>59</sup> Duke and Durham are in the process of drilling down even further through a pilot program that is creating “incubators” of university-community partnerships that address the specific disease burdens of the community and integrate research and healthcare delivery challenges in a way that centers on improvement of community outcomes.<sup>59</sup>

## Interdisciplinary Teamwork

The sheer number of nurses, physician assistants, and pharmacists graduating from their respective professional schools is rising, but many

models have long been incorporating these professionals into settings that best meet the needs of communities.<sup>60</sup> Now in its third decade of service, the Nurse-Family Partnership program incorporates home visits by highly skilled registered nurses, typically to young, new mothers living in poverty. The program operates in most states and has demonstrated numerous positive outcomes in the communities it serves, including lower rates of emergency room use, lower rates of child abuse and neglect, and lower rates of crime.<sup>61</sup> Another example of home visitation programs is the EverCare program operated through the United Health Group. Focused on chronic disease in the vulnerable elderly, this program enables teams of nurses and other healthcare professionals to develop and implement special needs plans for individuals in skilled nursing facilities and at home.<sup>62</sup>

Clinics and micro-clinics administered by nurse practitioners and physician assistants are controversial. But for many with and without insurance these clinics provide easy access to comprehensive care, including immunizations, school and work physical examinations, and the diagnosis and treatment of illness.<sup>39</sup> The clinics rely on empowered health professionals working at the top of their training. They use evidence-based practice guidelines embedded within the electronic medical record and transfer those records to the patient's primary care provider—often leading to good outcomes.<sup>39</sup> The clinics are oriented around the needs of the communities they serve and are often attached to retail businesses that are already planned for convenience.

## Using Data to Link Community Needs

One of many examples of how a community can harness the power of information technology is Columbia Basin Health Association (CBHA)—one of the first community health centers in the nation to fully transition to an electronic health record. CBHA has used its system to improve diabetes care community wide and to improve efficiency for providers and patients. After initiating their health information technology systems, CBHA roughly doubled their provider productivity (as measured by the number of patients seen per provider in a day), and they now rank above the 95th percentile nationally in total medical and dental team productivity, as reported in the Bureau of Primary Healthcare Uniform Data System. CBHA has used electronic health records to

enable improved continuity and coordination of care across healthcare institutions, resulting in continuity of care regardless of location.<sup>63,64</sup>

## Improving Transitions

Seamless transitions have been the aim of the “patient-centered medical home” concept, which encourages comprehensive care redesign. Initially created by a coalition of physician groups, businesses, and many patient advocacy organizations, this model seeks to link patients with a care team that better coordinates and integrates care needs and performs population management.<sup>18,19</sup>

Central to the concept of medical homes is the idea of co-located services. With this model, integrated groups of behavioral and mental health professionals, pharmacists, nutritionists, and social workers practice alongside physicians, physician assistants, and nurse practitioners, thus enhancing care and centering it on the whole patient. However, true integration and coordination are the keys to success with this design. Mere co-location is not enough.

In fact, mounting evidence supports integration and coordination of care. For example, recent research has shown that chronic physical conditions, including common chronic physical diseases (eg, diabetes, asthma, hypertension, and heart disease) and chronic pain conditions (eg, arthritis, back pain, and headaches) are often accompanied by common psychiatric disorders such as major depression, anxiety disorders, and substance abuse.<sup>65</sup> Primary healthcare is the setting in which common mental disorders are most likely to be recognized and treated. The fact that depressive and anxiety disorders often occur within the context of comorbid chronic physical conditions emphasizes the central role that providers of primary healthcare play in efforts to improve overall health outcomes of patients with physical and psychological disorders. These findings also provide a compelling case for health system redesign and may serve as a platform for consideration of broader and more cost-effective strategies to control chronic physical disease and psychological illness. Although better coordination and integration of care for mental and physical health are relevant to the overall redesign of healthcare systems, these efforts are especially important in vulnerable populations; including the poor and uninsured, children, the elderly, immigrants, and other disadvantaged individuals and families.<sup>66,67</sup>

## Framing the Evaluation

Just as an electrician might judge the quality of a house by its wiring, a plumber by the type of pipe materials used, and a carpenter by the type of wood, we can judge our current system of care subjectively by its individual parts. Systems change is a long-term iterative process that should be guided by goals set collaboratively with those living inside of the system. When one works with a community to create and evaluate care models, a series of considerations should be on the table, including the following:

- Which clinical and quality metrics matter most to which communities?
- Which clinical and quality metrics matter most to clinicians?
- How can we find more effective ways of delivering care, and learn from them?
- What are the barriers and natural supports to implementation?
- How can we navigate the tension of responsibility for health (ie, why are patients and providers under- or over-using services)?
- How can we empower patients, family members, communities, and healthcare professionals to move away from position-based hierarchies that obstruct communication and move toward service integration?
- How can we assure that isolated practitioners do not get lost in the cracks during redesign (ie, rural health and solo practitioners)?

## DISCUSSION

Form follows function. No one expects a three-story 1890's-style brick house to work for a family living in Albuquerque, New Mexico. Neither would a flat clay adobe dwelling be efficient in Harrisburg, Pennsylvania. Housing choices are determined by the materials that are available locally, the environment in which the house is being built, and the needs of the people who will live in the house. And yet the majority of houses in the United States have the same standard features, such as indoor plumbing and electricity.

Our care systems should be built or remodeled with the same principles in mind. What works will draw not only on the standardized approaches that we know work everywhere (ie, relationships, data, and teamwork) but also will be built around the needs, strengths, assets, the resources of the patient, and the requirements of his or her community.

Although this “form follows function” approach will result in models that are seemingly very different, the overall affect would still be felt: more timely access to quality services when care is needed, more coordinated care across providers and settings, more prevention of disease, better management of chronic disease and comorbid disorders, and, ultimately, lowered overall healthcare costs and better health outcomes. When healthcare providers are freed up by design to focus on the core of their training—caring for patients—job satisfaction will increase and the number and quality of professionals choosing the specialties most in need—pediatrics, family physicians, OB/GYNs—will rise.

All of these ideas may sound common sense and obvious, but too often perceived barriers stand in the way of change. Moreover, funding and information technology are not yet structured in a way that will allow these changes to happen.

But we can take steps now to remodel or rebuild the healthcare system. As we discuss in this paper, many models are already up and running. For those wishing to take the lead in redesigning local or regional systems, the first step is to design a planning process in which stakeholders share data, jointly discuss options and alternatives, jointly implement change, and jointly evaluate outcomes:

- Assess local needs, resources, and strengths—listen to the health department, community agencies, and groups as well as academic medical centers and provider practices.
- Gather as much information from as many entities as possible to paint an accurate picture of care and need now (eg, days lost from school or workplace, public health department community assessments, local health coalition priorities, inventory community assets).

- Identify the gaps in the system; hold meetings with communities, providers, and other stakeholders to identify the options for filling these gaps.
- Begin to educate all clinicians, patients, and their families about the role and responsibilities of a healthcare team.
- Incorporate design and improvement knowledge into training, including team training models that are suitable for different practice settings.

## CONCLUSION

We purposely avoided—as much as possible—using the phrase “primary care” in this paper to demonstrate the artificial distinctions people make in thinking about system design in terms of fragmented service sectors. To truly achieve success, we need to think in terms of a seamless circle where input from all stakeholders is included in planning, analyzed, actualized, and evaluated. It is important to offer an array of levels and types of healthcare based on population needs.

A slow shift is already taking place from physician-based delivery systems to a wider array of interventions based on local needs, resources, and strengths. This process needs to speed up and be diffused, disseminated, adopted, adapted, implemented, and institutionalized more widely.

This is not a one-size-fits all process! High-quality care can be developed in many ways and in many different settings and environments. The key to success is the use of evidence-based healthcare and evidence-based community and public health interventions. NIH’s Clinical Translational Science Awards program is working to assist the nation in this process.

Ongoing evaluation will also be central to building better care models that are responsive to the needs of diverse populations. Health reform at every level is never a one-time effort; it is an ongoing process. Any attempt to improve quality will require multiple cycles of development to find best practices and to adapt to the evolution of community needs of an increasingly diverse nation.

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# PHYSICIAN EDUCATION AND TRAINING IN PRIMARY CARE

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One of the most important challenges facing the healthcare system and medical educators today is the waning interest in primary care among graduates of U.S. allopathic and osteopathic medical schools. Numerous reasons exist for this decline; the two factors cited most frequently are the decreased compensation of primary care physicians relative to other medical specialties and the “uncontrollable lifestyle” associated with primary care.

An insufficient supply of primary care physicians not only has tremendous ramifications for the cost and quality of healthcare in the United States but also has important implications for the content of medical education. This paper examines variables related to undergraduate and graduate medical education that may contribute to the production of primary care physicians.

The predictors of entering and practicing primary care include a wide range of factors. Our investigation clearly shows that the overall medical school experience decreases student interest in primary care; too many of those who express intent to enter primary care at the beginning of training change their minds by the end. Numerous studies have

attempted to identify specific personal values that would accurately predict the students who ultimately choose a career in primary care. Other research has focused on the institutional characteristics of medical schools and residency programs, such as admissions policies, funding, departmental structure, and location, which are associated with a greater production of primary care physicians.

Many proposals have called for redesigning medical education across the continuum of the training process, from the beginning of admissions through the completion of residency. Innovative programs to discover better methods for outpatient training, as well as increased funding to support these efforts, provide the most promise for finding solutions.

Medical schools and residency programs need to address the increased demand for primary care physicians to meet the needs of an aging and chronically ill population by adjusting the curriculum. Students and residents are more likely to choose careers in primary care and family medicine if they are exposed to positive role models and quality experiences in the community. Traditional subjects must share space with the newer skills needed to lead multidisciplinary teams, provide comprehensive and coordinated care, focus on prevention and wellness, and engage patients in self management of chronic diseases. Future physicians need to learn competencies required for new models of care; education that incorporates the Joint Principles of the medical home model of care will serve as an important framework for all physicians' training.

We offer six recommendations to improve primary care training: 1) increased funding; 2) increased exposure to community health settings; 3) expansion of primary care residency training programs; 4) establishment of family medicine departments in all U.S. medical schools and development of associated area health education centers (AHEC); 5) medical education that focuses on “real world” competencies of the primary care physician; and 6) improvement of the practice environment for primary care physicians.



## BACKGROUND

The nomenclature and specialty training of physicians who provide primary care in the United States have evolved substantially over the past 50 years. As recently as the 1960s, many Americans received primary care from general practitioners for whom a rotating internship was their only training after medical school. However, two phenomena occurred in the 1960s and 1970s: 1) the specialty of family medicine was created, residencies were accredited, and Board Certification was established in this new primary care specialty; and 2) in many parts of the country, internal medicine physicians, previously viewed as specialists for those with serious “internal” illnesses, increasingly began to serve as primary care providers to adult patients.<sup>1,2</sup> When this evolution peaked, it became apparent that primary care physicians in both family medicine and general internal medicine were in practice all over the country.

Generally, family medicine physicians are more likely to be located in the South, Pacific West, Midwest, and less populated areas, whereas general internal medicine physicians are more likely to be in the Northeast and more heavily populated areas, especially the major urban areas in the United States. Concurrent with the shift of adult primary care from general practitioners to family physicians and general internists, primary care for children shifted from general practitioners to family physicians and pediatricians.<sup>1-3</sup>

Osteopathic physicians (D.O.s, doctors of osteopathic medicine) have played an important role in the delivery of primary care throughout this period. Although D.O.s are more concentrated among the physician workforce in certain areas of the country, their involvement in primary care services has been longstanding and a fundamental element and byproduct of the profession’s philosophy of holistic, patient-centered, preventive, and community-based education and care. This focus has continued during the expansion of the osteopathic medical education system from the five schools that existed in the 1960s to the 29 schools and branch campuses that exist today, with a curricular environment providing education and clinical training in osteopathic medical schools having primary care medical education in their mission statements, generally outside of large, research-focused venues of academic medical centers.<sup>4</sup> Based on prior agreement, discussion and analyses of primary

care providers in this document and related conference proceedings will be limited to the specialties of family medicine and internal medicine in both allopathic and osteopathic medicine.

Students must graduate from an accredited allopathic medical school (one which confers an M.D. degree) or osteopathic medical school (one which confers a D.O. degree) before beginning either a family medicine or internal medicine residency training program. Both family medicine and internal medicine residencies are 3 years in length and comprise a mix of inpatient and outpatient (ambulatory) rotations. These supervised rotations provide progressive levels of responsibility and complexity over the course of the residency. Family medicine residencies include rotations and curricula in adult medicine, pediatric medicine, obstetrics and gynecology, psychiatry, emergency medicine, and ambulatory surgery; about 50 percent of the training occurs in the ambulatory setting. Because internal medicine training focuses only on the care of adult patients, the training is limited to adult medicine, with small components of emergency medicine and neurology, and exposure to and collaboration with the surgical specialties. Generally, internal medicine residents spend about two thirds of their time on inpatient rotations and the balance on ambulatory training. Primary care internal medicine residencies, discussed in detail later in this paper, provide training in all of internal medicine; in addition, they include training time in fields that are outside of internal medicine but within the purview of adult primary care, such as dermatology, gynecology, psychiatry, and outpatient orthopedics. Physicians who obtain training in these primary care fields can be graduates of allopathic or osteopathic medical schools. Most residencies are accredited by the Accreditation Council on Graduate Medical Education (ACGME), the accrediting agency for residencies focused on training allopathic physicians, or the American Osteopathic Academy (AOA), the accrediting agency for residencies focused on training osteopathic physicians. All allopathic physicians train in ACGME accredited programs, whereas osteopathic physicians can train in either AOA or ACGME accredited programs (about 60 percent of osteopathic residents are training in ACGME programs).<sup>5</sup> Increasingly, residencies in both of these fields, but particularly in family medicine, are becoming dually accredited by these agencies. This dual accreditation has enabled family medicine residency programs increased flexibility in choosing and matching the medical students who are most interested in their program.

D.O. graduates, whether pursuing AOA or ACGME programs, are most likely to do so in family medicine. In past decades, primary care, especially family medicine, had been the traditional destination of D.O. graduates (41 percent of U.S. D.O.s are family/general practitioners and 10 percent are internists).<sup>6</sup> Consequently, D.O.s in family medicine have predominated within the population of osteopathic physicians throughout the country. Their proportional presence within the primary care delivery systems is a function of the total number of D.O.s and primary care M.D.s in a state or region.

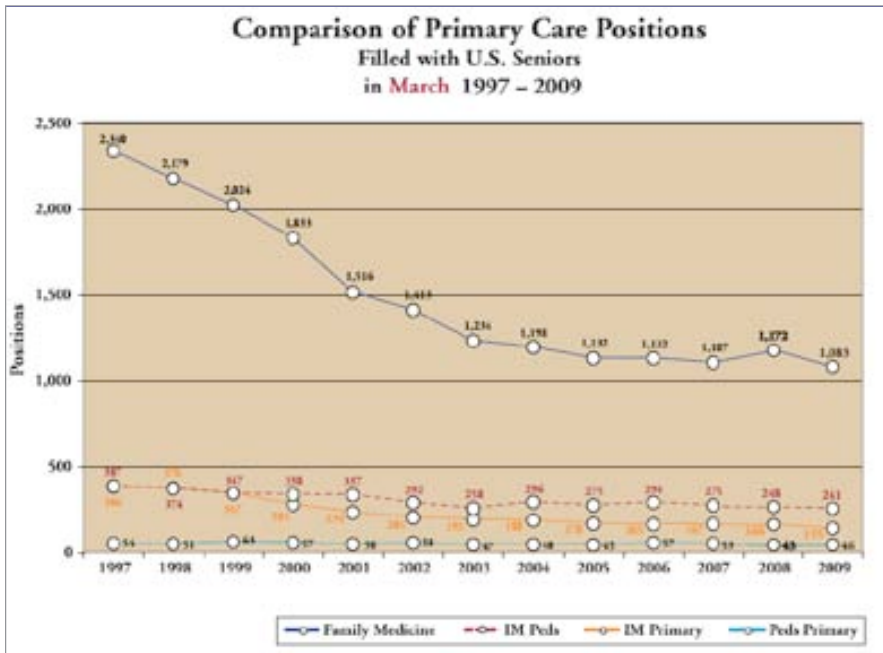
Nationally, seven percent of physicians providing patient care are D.O.s, whereas nine percent of physicians providing primary patient care are D.O.s. However, on a state by state basis, the presence of D.O. primary care physicians varies significantly. For example, in Oklahoma, 21 percent of physicians providing patient care are D.O.s and 26% of primary care physicians are D.O.s. However, in Maine (the second highest ranking state for active primary care physicians per capita), 21% of primary care physicians are D.O.s (with 14 percent of total active physicians being D.O.s), whereas in Vermont (the highest ranking state for active primary care physicians per capita) three percent of primary care physicians are D.O.s (with three percent of total active physicians being D.O.s).<sup>7</sup>

While the residency curriculum for family and internal medicine is similar for both M.D. and D.O. residency programs, the development of primary care specialty training within the osteopathic graduate medical education (OGME) system (ie, those programs accredited by the American Osteopathic Association [AOA]) followed a slightly different path from that of allopathic medicine. As in allopathic graduate medical education, osteopathic residency training programs in family and internal medicine were established in the 1960s.<sup>8</sup> However, until 2008 all OGME first-year trainees completed a 1-year rotation (usually a community hospital-based internship prior to admission to any specialty residency program), and subsequently, those wishing to pursue either family or internal medicine completed an additional 2-year residency program prior to AOA specialty board-eligibility in these areas.<sup>4</sup>

## Decreased Interest in Primary Care Among U.S. Medical Students

One of the most important challenges facing the healthcare system and medical educators today is the declining interest in primary care among U.S. allopathic medical school graduates. Although primary care physicians now comprise just over one third of the physician workforce, only slightly more than one fifth of current U.S. students are interested in primary care careers.<sup>9,10</sup> As Figure 1 demonstrates, the number of first-year ACGME accredited residency positions in primary care specialties filled by U.S. allopathic medical graduates has declined markedly and continuously since 2000. The number of first-year spots offered has been decreasing as well, primarily due to the shrinking size of residencies, in response to the lower demand over this same time period.

**Figure 1.** Comparison of Primary Care Positions

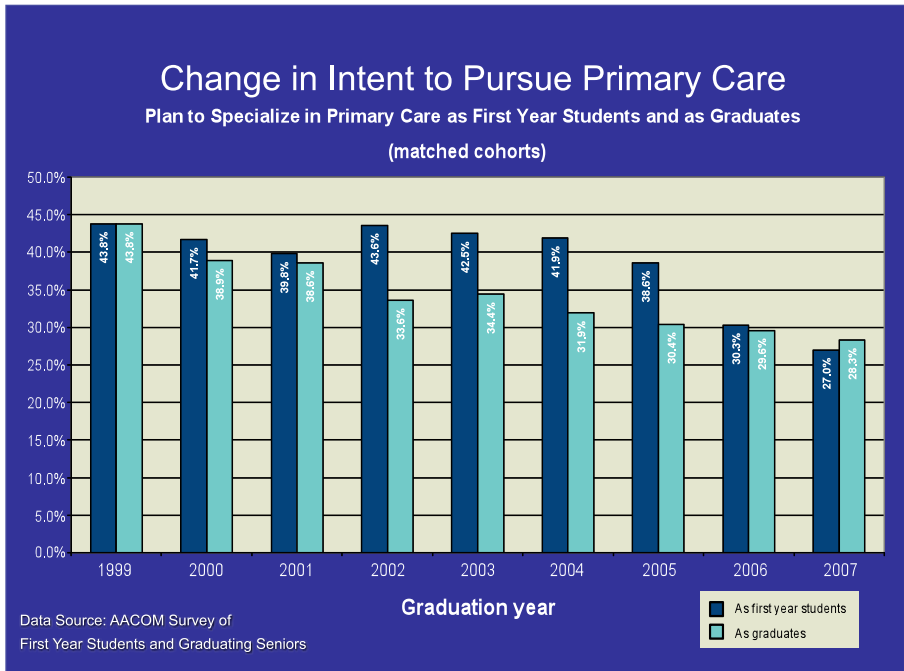


A similar trend is playing out among U.S. osteopathic medical school graduates. In the past decade, the proportion of osteopathic medical student graduates indicating an intention to pursue primary care training

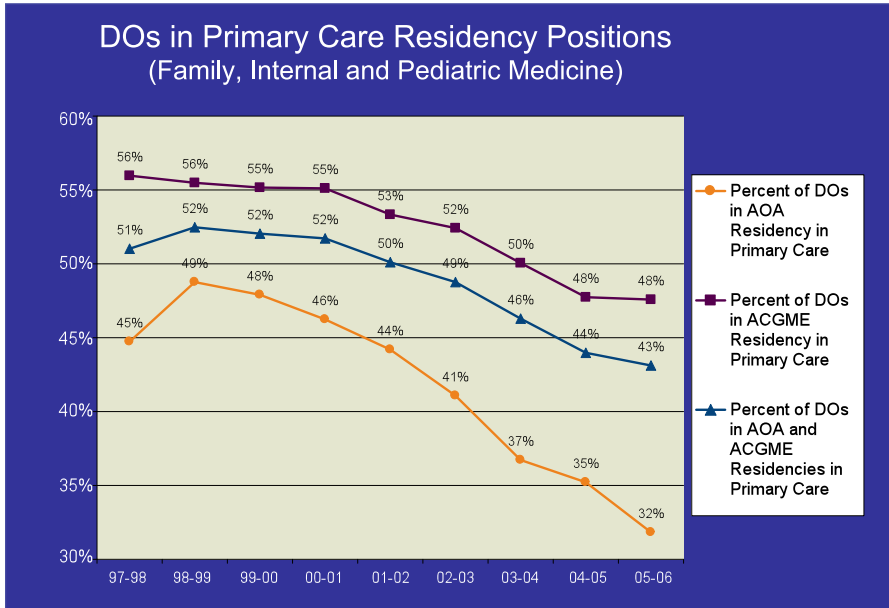
has dropped from 44 to 29 percent, and in 2006 less than half of all D.O.s in residency training were in primary care programs, as seen in Figures 2 and 3.<sup>11-14</sup>

The reason for the declining interest in primary care among U.S. medical students has been an issue of considerable debate and study in recent years. There are no doubt many reasons for this decline, but two factors are cited most frequently: the decreased compensation of primary care physicians relative to other medical specialties and the “uncontrollable lifestyle” of primary care.<sup>15-18</sup> In analyses that were 20 years apart, Ebell demonstrated a very tight correlation between specialty choice and compensation.<sup>19,20</sup> Phillips and colleagues at the Robert Graham Center examined in depth the relationship of compensation, particularly relative compensation, to medical student interest in primary care in their 2009 report.<sup>10</sup> In their analysis, the Graham Center authors found that growth in the annual income gap between primary care specialties and highly compensated specialists is associated with dramatic reductions in choice of primary care careers. The difference between primary care compensation and specialty

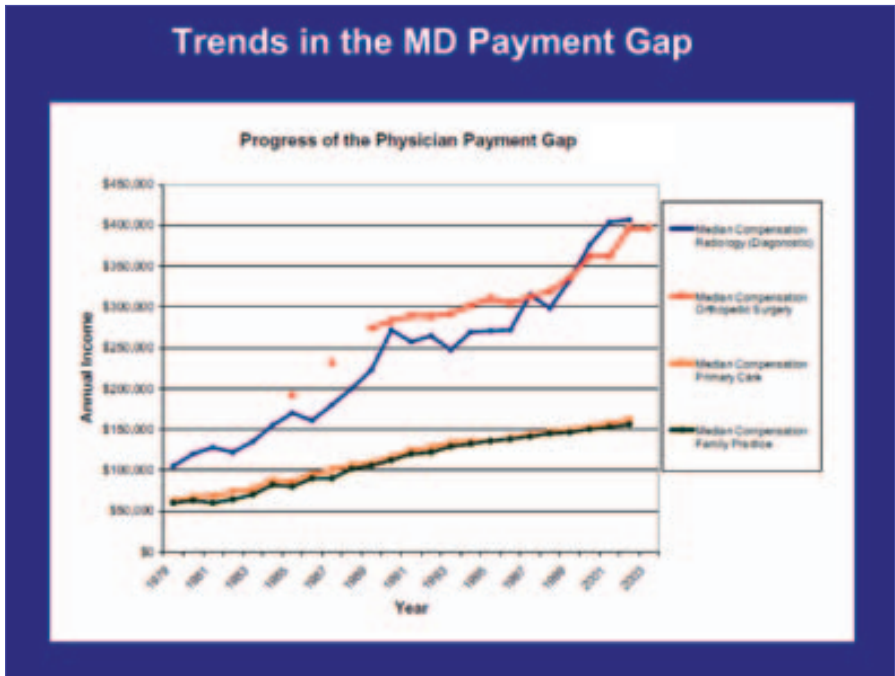
*Figure 2. Change in Intent to Pursue Primary Care*



*Figure 3. DOs in Primary Care Residency Positions*



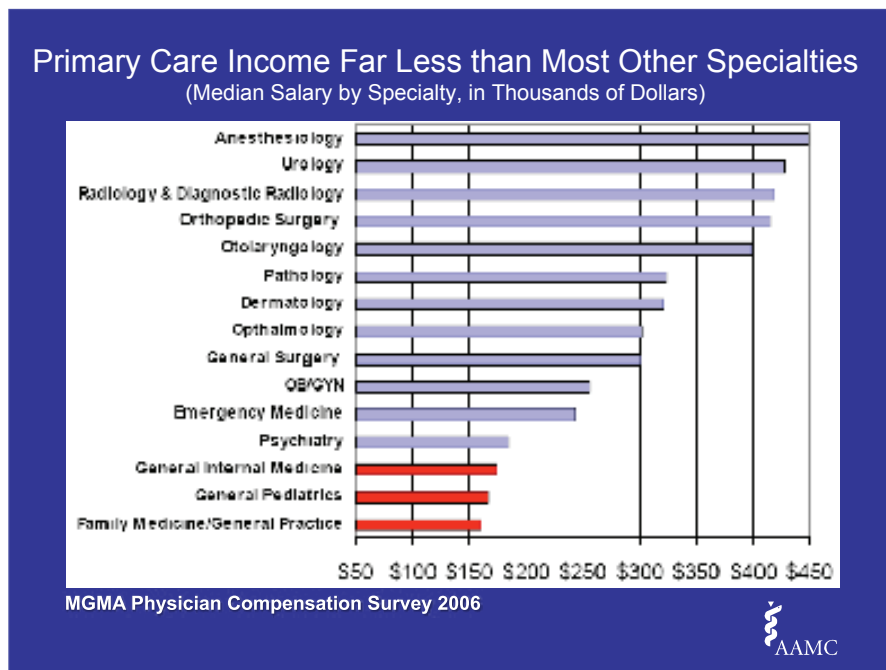
*Figure 4. Trends in the MD Payment Gap*



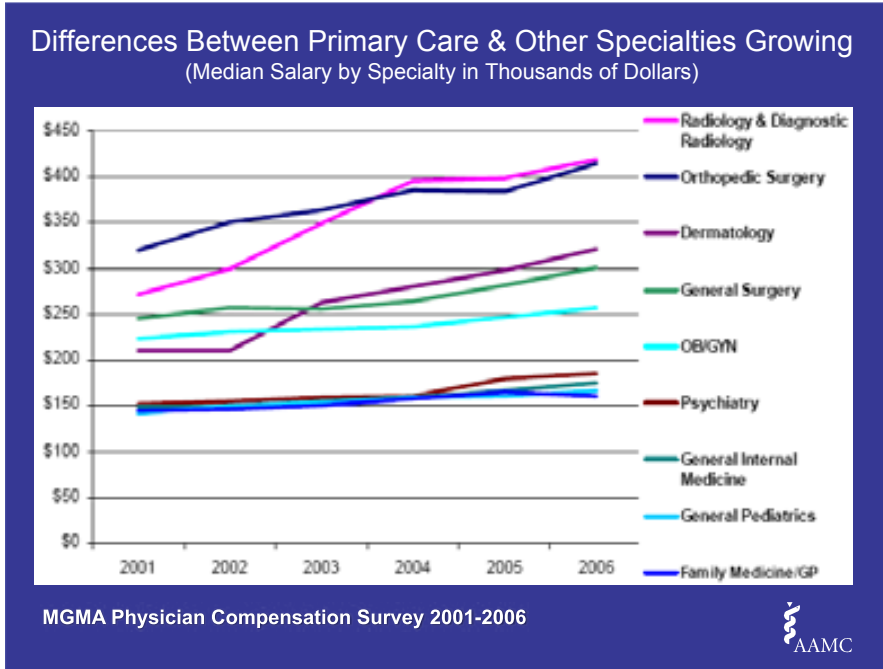
physician compensation has grown substantially over the past 30 years, and the growth in this “compensation gap” appears to be closely correlated with the decline in primary care career choice (Figure 4). Furthermore, in an elegant analysis of “return on investment,” they also found that students could expect a significantly poorer financial return on their educational investment by choosing a career in primary care than if they were to choose a procedure-based medical or surgical specialty or a career in business, law, or dentistry.<sup>11</sup> Thus, while the yearly compensation differential between primary care physicians and the most highly compensated physician specialties is substantial, approximately \$250,000, the net career differential is huge—more than \$3 million (Figures 5 and 6). This difference in return on education investment is likely apparent to students and responsible for heavily influencing their choices.<sup>10</sup>

The longstanding cultural lore of the primary care physician in the United States is that of a highly committed, energetic, and always available doctor, who is also present for community events, as well as every major occasion in the lives of the families for whom he provides care.<sup>3</sup> This romanticized version of the primary care physician may be the reason many young

**Figure 5. Primary Care Income Far Less than Most Other Specialties**



*Figure 6. Differences Between Primary Care and Other Specialties Growing*



people enter medical school in the United States. But apparently, as they begin to realize that this professional lifestyle is unpredictable and could encroach on their own personal and family life, the romance fades and reality sets in. This is the essence of the “uncontrollable lifestyle” issue, which, according to research from the past decade, is the other significant factor contributing to the decline in interest in primary care practice among U.S. medical students. Many authors assert that, compared to medical students of 20 to 30 years ago, students today are much more concerned about the quality of their personal lives and thus less likely to enter a medical field that they perceive to have long, unpredictable work hours.<sup>16,21-23</sup> One study of this issue found that controllable lifestyle explained 55 percent of the variability in specialty preference from 1996 to 2002, when controlling for income, work hours, and years of training required.<sup>21</sup>

Not surprisingly, students are also concerned about the nature of some of the “endless work” that they perceive is a burden to most primary care physicians. The professional time of primary care physicians is increasingly



used to fill out paperwork and deal with bureaucratic hassles, including prior authorizations and utilization review. These hassles and the resulting frustrations experienced by many primary care physicians are observed by the medical students who work with them and provide one more reason for the students to avoid primary care.<sup>3,16-18,24</sup>

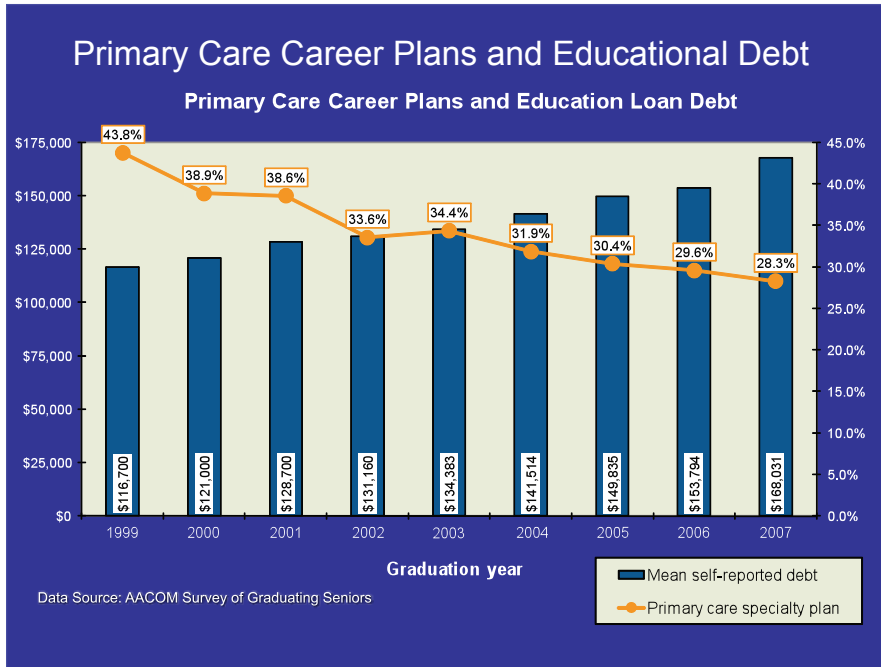
To compound the problem, the steady growth of effective therapies and the proliferation of guidelines have made it impossible for even the most committed primary care physician to provide the kind of comprehensive care required for his or her patients. Providing all the evidence-based care to a panel of 2,500 patients, along with the current level of acute care, would require almost 22 hours of clinical care per day—not to mention all the documentation and other administrative work.<sup>25</sup>

These issues for M.D. graduates are equally affecting D.O. graduates. Among the other factors that may contribute to the declining interest in primary care among osteopathic medical students are increased access to ACGME specialty training options and the rapid expansion of new osteopathic colleges in geographical areas without a substantial presence of D.O. clinical faculty, necessitating an increased presence of M.D. faculty in preclinical and clinical training. In addition, the near disappearance of osteopathic hospitals as a result of hospital consolidation into larger systems, and the subsequent loss of traditional community-based hospital training locations for D.O. students and residents, has meant that clinical training in hospitals includes both allopathic and osteopathic trainees.<sup>26,27</sup> Finally, a clear association is apparent between higher educational debt and lower likelihood of choosing a primary care career plan for D.O. graduates, as shown in Figure 7.

Clearly, an insufficient supply of primary care physicians has tremendous implications for the cost and quality of U.S. healthcare.<sup>3,15,17,28,29</sup> The insufficient supply of primary care physicians has important implications for the content of medical education and medical research as well. Although many factors that influence medical student specialty choice are beyond the control of medical educators, such as the secular trends described above, some factors in the educational environment and curriculum may increase the likelihood that a physician-in-training will

enter primary care. We devote the remainder of this paper to describing those factors, programs, and curricula. We conclude by detailing the competencies needed by future primary care physicians and the steps required to achieve those competencies.

*Figure 7. Primary Care Career Plans and Educational Debt*



# UNDERGRADUATE MEDICAL EDUCATION

## Medical Student Characteristics and Admission Criteria

Medical schools vary greatly by their number of graduates who enter primary care specialties. Numerous studies have documented that both the institutional characteristics of medical schools and the personal characteristics of medical students influence a student's choice to pursue a career in primary care. However, the nature of this research is largely observational, and its ability to define cause and effect is limited. A school with a strong reputation for primary care training may offer unique curricular experiences, but it may also attract students who have a baseline predilection for primary care careers. In addition, researchers from many studies report bivariate associations between factors and career choice without controlling for other confounding factors. Finally, the outcomes reported in these studies vary greatly; some use interest in primary care, some use selection of primary care residencies, and still others use actual entry into a primary care practice or choice of primary care career. When examining the outcome of primary care residencies, most studies focus on family medicine because internal medicine and pediatric residencies include large numbers of graduates who later become subspecialists. This section describes the current knowledge about the characteristics of medical schools and students that influence students to choose a primary care career.

Studies examining student characteristics have traditionally followed one of two approaches. In the first, characteristics of students applying to medical schools are examined for associations with expressed interest in primary care. In the second, characteristics of students graduating from medical schools and selecting primary care residencies are studied. The former method focuses on intention, not outcome, and may be hampered by a “desirable response” bias of students applying for entrance into medical school. The latter approach is limited because students interested in primary care but not admitted to medical school, or those dissuaded from a primary care career during medical school, are not included. Finally, most of the analyses of student characteristics focus on family medicine careers, with fewer data available regarding choice of general internal medicine careers. Despite these limitations, several general themes regarding student characteristics emerge.

Senf et al. examined factors related to the selection of a family medicine career in a systematic review of articles published from 1993 to 2003. In their review, results from three studies indicated that rural background was a consistent predictor; marital status was not a consistent predictor, according to one multivariate analysis; and based on evidence from conflicting studies, female gender and older age were classified as “weak predictors.”<sup>29,30</sup>

Few investigations have explored predictors of general internal medicine careers. In one of the few analyses, Hauer et al. examined student characteristics associated with choosing internal medicine. Male gender was associated with an increased likelihood of choosing internal medicine (odds ratio [OR] = 1.88), whereas membership in underrepresented minorities was correlated with a decreased likelihood of choosing an internal medicine career (OR = 0.52).<sup>9</sup> However, because only two percent of the sample chose general internal medicine (24 out of 1,177 students), these characteristics are more related to subspecialty internal medicine career choice than general internal medicine career choice, in particular.

The Robert Graham Center recently published a report from their comprehensive study examining factors that predicted not only choice of primary care careers but also choice of rural or underserved area practice location.<sup>10</sup> They obtained data on medical school experiences from the 1979-2004 Association of American Medical Colleges (AAMC) graduation surveys, and data on practice location from the 2001-2005 American Medical Association (AMA) Master files; osteopathic physicians and international medical graduates were excluded. The resulting database consisted of over 322,000 physicians. Factors positively associated with a primary care career included birth in a rural county (OR = 1.45), being married (OR = 1.22), and older age (OR = 1.01 per year). All variables were associated with higher ORs when the outcome was a career in family medicine. Male gender was associated with a decrease in the odds of practicing primary care (OR = 0.53), and students who expressed an intention to practice in underserved areas were more likely to enter primary care careers (OR = 1.54). The researchers also found important associations between financial factors and choice of primary care: Indebtedness had a complex association, and total compensation, a term they broadened to mean “return on investment,” was very predictive of specialty choice and increased the odds of not choosing primary care.

Multiple studies have attempted to determine those personal values or personality characteristics that identify students who favor primary care careers. A systematic review of these studies published over ten years ago showed that personality differences explained very little of the variability in career choice.<sup>32</sup> Low expectations for income and increased interest in prevention, measured at matriculation, were correlated with family medicine career choice.<sup>33</sup> However, investigators from a recent study that examined value statements did not find a significant difference between students with a primary care interest and those with a specialty interest.<sup>34</sup>

Results from a large survey of graduating seniors (86 percent of all eligible students) from osteopathic medical schools showed that 30 percent of graduates were planning careers in a primary care specialty. Forty-two percent of women chose a primary care specialty, compared with 31 percent of men.<sup>27</sup> A similar distribution was seen for marital status (44 percent of married students chose a primary care specialty vs 30 percent of non-married students). In this same study, graduating osteopathic medical students from towns with populations of less than 100,000 were more likely to choose a primary care specialty than were those from towns of over 100,000 (OR = 1.5). This survey also showed that seniors graduating from the six osteopathic medical schools located in towns with populations of less than 100,000 were more likely to choose a primary care specialty than were those graduating from the 13 schools located in towns with larger populations (OR = 1.4).<sup>13</sup>

Although the evidence is not entirely consistent, the general conclusion to be drawn from these studies is that a few identifiable characteristics are predictive of primary care career choice. The strongest of these is rural background or upbringing; other factors include being married, older age, and female gender. Although the usefulness of these characteristics might be modest in terms of the size of the impact, altering medical school admission criteria to favor these student characteristics is one potentially useful strategy for increasing the percentage of students who choose primary care careers upon graduation.

Admissions policies at several schools explicitly favor applicants who state an interest in primary care specialties. For example, Mercer University School of Medicine admits only Georgia residents and gives preference to students “professing a desire to become primary care physicians.”<sup>35</sup>

Martini et al. identified characteristics of schools that produced a higher percentage of primary care physicians: 40 percent of the “high-producing” medical schools reported giving admission preference to students with generalist interests.<sup>36</sup> Although these admission policies may contribute to increasing interest in primary care, these schools also have curricula that heavily promote primary care and therefore attract students who are inclined in that direction.

The ability to influence choice of generalist careers through admissions criteria may be limited, as evidenced by a study of over 500 students from the University of Virginia.<sup>37</sup> Members of the admissions committee could not accurately predict generalist career choice (rank correlation = 0.14) based on data and student essays in the medical school admissions application. However, two variables on admission were significant predictors of a primary care career choice: female gender (OR = 1.8) and having a high level of community service (OR = 1.9).

## Medical School Characteristics

A number of medical school characteristics, such as funding, departmental structure, and location, have been associated with a greater production of primary care physicians. Whitcomb et al. highlighted the differences between medical schools that produce a high percentage of primary care physicians (39 to 56 percent) and those that produce a low percentage (22 to 29 percent).<sup>38</sup> They identified graduates who had completed residency using the AMA Physician Masterfile and characterized schools by type of ownership, location, research intensity, commitment to primary care education, and clinical teaching site. High-producing schools were more likely to be publicly funded and have smaller class sizes and less likely to be highly ranked in funding from the National Institutes of Health. All 25 of the high-producing schools had family medicine departments, compared with 36 percent of the low-producing schools. The majority of high-producing schools were affiliated with family medicine graduate medical education and sponsored an AHEC.

Martini et al. also studied medical school characteristics associated with the production of generalists by examining the number of students from both allopathic and osteopathic medical schools who entered internal medicine, pediatrics, and family medicine residencies.<sup>36</sup> When they

adjusted for internal medicine and pediatrics numbers for expected future subspecialization, they found that public ownership of allopathic, but not osteopathic, schools was correlated with an increased proportion of primary care graduates. Smaller classes, fewer research dollars, and an institutional mission to produce primary care physicians were additional factors. Their results confirmed that the presence of a family medicine department was a universal factor among the high-producing schools. In fact, having a family medicine department was the factor that explained most of the variation in generalist production (when added to a model containing public vs private funding, age of school, and class size). They observed no correlation with the presence of general internal medicine or general pediatrics divisions.

Researchers from the Graham Center found similar characteristics associated with an eventual career in primary care.<sup>10</sup> Public ownership (OR = 1.27) and rural location (OR = 1.38) were independent predictors. The presence of a family medicine department was not assessed in this study.

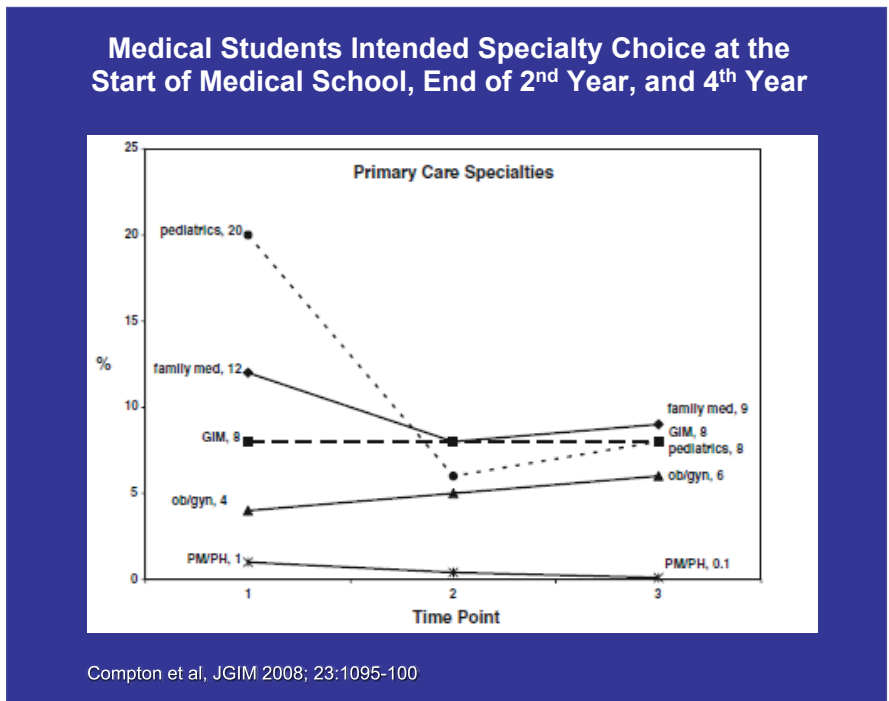
In summary, the strongest characteristic of allopathic medical schools that produce higher percentages of primary care physicians is public ownership. The presence of a strong family medicine department has also been consistently correlated with a higher proportion of students who enter family medicine residencies. In 2008, 11 U.S. medical schools remained without a department of family medicine, and accordingly, these schools produce a lower percentage of family medicine physicians.<sup>39</sup>

## Medical School Experiences

Experiences during medical school have clearly been shown to influence choice of primary care careers. In general, the overall medical school experience decreases student interest in primary care. In a comprehensive survey published 20 years ago, Babbott et al. used the Medical College Admission Test questionnaire and the AAMC Graduation Questionnaire to assess the preferences of over 11,000 medical students and the evolution of specialty choice.<sup>40</sup> They found that 41 percent of entering students preferred primary care, declining to 32 percent by the time of graduation. Most of the decline was related to interest in the specialty of family practice, and men showed a larger decrease in interest than women. Only 24 percent of students had stable preferences toward primary care specialties.

A more contemporary survey of approximately 1,000 students from 15 allopathic medical schools produced similar results.<sup>41</sup> These students were surveyed at freshman orientation, at entry to the clinical year, and during their senior year. Forty-four percent of the students were initially interested in pursuing a primary care career, declining to 32 percent by the senior year, as shown in Figure 8. The largest drop occurred in interest in pediatrics (from 20 to 8 percent), with smaller declines in family medicine (from 12 to 8 percent) and no change in general internal medicine (8 percent at both time points). Only 47 percent of students initially interested in

**Figure 8.** *Medical Students' Intended Specialty Choice at the Start of Medical School, End of 2nd Year, and 4th Year*



primary care remained interested, and only 15 percent of students initially interested in other specializations switched to primary care.

The annual survey of freshman and graduating senior osteopathic medical students offers a slightly different picture in this regard. The survey,



which compares matched class cohort responses as opposed to individual responses, reveals an overall trend of declining interest (16 percent, from 44 to 28 percent) in a primary care career (family medicine, internal medicine, or pediatrics) between graduating years 1999 and 2007. However, with the exceptions of the survey cohorts from 2002 to 2005, which revealed an eight to ten percent decrease in primary care career intent from freshman to senior years, there is little difference between the primary care career intent of the graduating seniors' cohort from that same cohort's intent as freshmen (Figure 2).<sup>11</sup>

The reasons for the declining interest in primary care among allopathic medical students may be related to curricular experiences, but they may also relate to a more subjective issue—perceived negative attitudes toward primary care in academic medical centers (“academia’s chilly climate”). Block et al. performed a telephone-based survey of 264 medical students at 59 allopathic medical schools.<sup>42</sup> The single predictor that was correlated with students’ reports of encouragement toward primary care was the schools’ historical production of primary care physicians, which the authors described as the “school’s mission.” Faculty perceptions, school size, school ownership, and research dollars were not predictive. In an analysis of student perceptions from the same survey, students reported generally negative attitudes about primary care physicians. These included the beliefs that “primary care tasks did not require high levels of expertise;” “generalists were not the best physicians to manage patients with serious illness;” and “the quality of primary care research was inferior to that in other fields.”<sup>43</sup> Students also reported negative attitudes toward primary care among faculty members. Although this study was completed almost 15 years ago, there is little reason to believe that attitudes toward primary care have improved in academic medical centers.

## Curricular Experiences

Several literature reviews have examined curricular experiences associated with students selecting primary care careers. Meurer reviewed the literature from 1982 to 1993 and identified 63 articles, of which they excluded 34 for poor quality.<sup>44</sup> The author found that the experiences that were most consistent in increasing generalist careers were family medicine clerkships and separate rural medicine tracks. These two curricular experiences are discussed in detail in the next two sections.

## *Family Medicine Clerkships*

A number of studies have demonstrated an association between the presence of a required family medicine clerkship and the proportion of students entering family medicine residencies.<sup>30</sup> Martini et al. found that a required family medicine clerkship was present in 36 percent of allopathic medical schools and was highly correlated with generalist output.<sup>36</sup> In a correlational study of all 123 U.S. allopathic medical schools, Campos-Outcalt et al., using multivariate analyses, demonstrated a relationship between the duration (in weeks) of required family medicine clerkships and the proportion of students choosing family medicine residencies.<sup>45</sup> Selection bias of admission policies or student characteristics could not be controlled in this study.

Another demonstration of a possible dose-response relationship is the Texas Statewide Family Practice Preceptorship Program, which included the state's seven allopathic and one osteopathic medical schools.<sup>46</sup> Students could volunteer for a 4-week preclinical ambulatory family practice rotation, an 8-week clinical ambulatory family practice rotation, or both. Odds of selecting a family medicine residency were 1.62, 2.31, and 4.98, respectively. However, because these students volunteered to participate, these results are unlikely to be generalizable to all medical students.

A few studies that have taken a more experimental approach to examining the relationship of family practice rotations and career outcomes. Harris et al. described the experience of a small family practice track, in which students were randomly selected from interested applicants.<sup>47</sup> Intervention students received a 4-week family practice clerkship and a 4-week preceptorship in a primary care office; 46 percent of those students chose family practice residencies versus 16 percent of the control subjects.

Finally, in an examination of 12 schools with increasing percentages of family medicine graduates (compared to 12 schools with declining percentages), the number of required clinical rotations in family medicine was a significant predictor in a multivariable model.<sup>48</sup> At the high-producing schools, a significant increase occurred in the number of students who spent part of the family medicine rotation at two or more sites. Therefore, both the quantity and quality of the exposure appear to correlate with increased production of family medicine physicians.

## *Rural Medicine Experiences*

Several medical schools have successfully produced large numbers of primary care graduates by offering focused programs in rural medicine. These programs grant a key service to local institutions by providing graduates who practice in rural areas, and later, the majority of these graduates have become family physicians. In a review of seven rural medicine programs, Rabinowitz identified the following common features: strong institutional mission; targeted selection of students with rural backgrounds; and focus on primary care, especially family practice.<sup>49</sup> Several representative programs and outcomes are described in the following paragraphs.

The WWAMI Program at the University of Washington, initiated in 1970, is one of the oldest programs focused on increasing generalist physicians in a predominantly rural region.<sup>50</sup> Students attend their home state universities for the first year of the program and attend the University of Washington School of Medicine (UWSOM) for the second year. The final 2 years take place in “community clinical units,” where experienced clinicians with close affiliation to UWSOM teach students in the community. Students can experience electives in rural community practices for up to 6 months in the clinical years. The program incorporates high school enrichment programs to recruit underrepresented minorities and students from rural backgrounds and also trains residents in internal medicine and family medicine. The report on the 1999 graduating class indicated that 55 percent of students were entering primary care training.

The Rural Medical Education (RMED) Program at the University of Illinois was started in 1993 to address the goal of reducing rural health disparities.<sup>51</sup> The curriculum includes instruction in rural healthcare, community-oriented primary care, and population health and is highlighted by a 16-week, fourth-year preceptorship with a family physician in a rural community. Each student is required to complete a community-oriented primary care project during the preceptorship. Of a total of 159 graduates, 85 (53 percent) entered primary care practice, and 69 (43 percent) practice in towns of 20,000 people or fewer.

The University of Minnesota-Duluth School of Medicine Rural Physician

Associate Program (RPAP) focuses on applicants who show a commitment to rural medicine and family practice.<sup>52</sup> This program offers a 9-month rural family practice experience that incorporates frequent contact with core faculty. Results reported in the school's most recent evaluation show that 82 percent of RPAP graduates chose primary care and that 68 percent entered family medicine.

Similar rural track programs exist in a number of osteopathic medical schools. For example, since 1996 the University of North Texas Health Science Center Texas College of Osteopathic Medicine has offered a Rural Family Medicine Track. Its special curriculum spans all 4 years, including course work focused on rural medicine, a rural clinical experience in all 4 years, and a total of 16 weeks of rural primary care clinical core training in years 3 and 4 and 8 weeks of rural surgery in year 3. According to the school, 54% of its graduates practice in primary care fields (45% in family medicine), with 29% practicing in towns of less than 10,000 population.<sup>53</sup>

### *Innovations in Primary Care Training*

From 1991 to 2001, the Robert Wood Johnson Foundation (RWJF) sponsored the Generalist Physician Initiative.<sup>54</sup> This program provided support to 13 medical schools to redesign the medical school curriculum and the admission process to favor generalism. Some common themes among schools included early primary care experiences, recruitment of community-based faculty, addition of family medicine experiences, and expansion of the primary care clerkship. Most schools adjusted their admission criteria to favor generalists. The RWJF initiative increased the proportion of graduates entering primary care fields from 26.4 percent in 1991 to 32.8 percent in 2000. However, when compared to schools that sought but did not receive funding for the project (to control for the confounder of interest in primary care), the performance observed at intervention schools was not better. The researchers felt that market forces, which increased interest in primary care in the late 1990s, were a major contributor to this effect.

In addition to giving preference to applicants interested in primary care, Mercer University School of Medicine's curriculum is heavily concentrated on primary care, with an 8-week required family medicine clerkship, a preclinical community office practice program, and a community science

program. The community science program runs through all 4 years and incorporates didactic seminars on disease prevention and health promotion along with visits to primary care offices in small towns. At the time of the last report, 32 percent of graduates had entered family practice residencies.<sup>35</sup> Thirty-six percent of practicing graduates reported working as family physicians, and an additional 21 percent reported working as general internists; the great majority of them remain in Georgia.

Several recent innovative programs targeting primary care have been developed in osteopathic medical colleges. At the Lake Erie College of Osteopathic Medicine, the Primary Care Scholars Pathway, now in its second year, enables students to complete a dual osteopathic medical degree and primary care residency in 6 years. Students enter the program early in their first year of medical school and begin an accelerated curriculum, which saves them 1 year's tuition and related expenses.<sup>55</sup> The program provides ongoing mentorship, early patient experiences in primary care settings, cohort development with other scholars, and a specialized track through a curriculum designed to prepare them for family medicine graduate medical education. The intent is to admit 12 scholars per year when the program is fully implemented in 2010.

At the A.T. Still University School of Osteopathic Medicine of Arizona, which opened in 2008, students spend their first year on campus and then disperse in small, established groups to complete their education at one of 10 large community health centers around the United States. The entire curriculum incorporates the Clinical Presentations Model developed at the University of Calgary, which combines basic science education with early patient experiences in community-based settings. When implemented, the third- and fourth-year clinical curriculum will center on rotations at hospitals affiliated with the students' base community health centers, using the Harvard/Cambridge Integrated Clerkship Model.<sup>56,57</sup>

### *Title VII Funding*

Title VII, section 747 programs are the centerpiece of the federal government's targeted efforts to improve the training of the primary care workforce.<sup>58</sup> The initial legislative purpose of this program, created and funded in 1963, was to increase the general supply of physicians. In subsequent reauthorizations, the focus of these funds shifted first to the

education and training of primary care providers and later to providing care to medically underserved populations. This funding mechanism has provided funds in the following areas: 1) predoctoral education in primary care in family medicine, internal medicine, and pediatrics; 2) residency training in primary care in family medicine, primary care internal medicine, and primary care pediatrics; 3) faculty development programs (eg, fellowships) in academic family medicine, general internal medicine, and general pediatrics; and 4) establishment and support of departments of family medicine.<sup>58</sup>

Title VII funding for predoctoral education has demonstrated consistent effects in increasing primary care career choice. Results reported by the Graham Center, which examined student and school characteristics, indicate that Title VII funding was positively associated with primary care career choice (OR = 1.11).<sup>10</sup> In an examination of Title VII grants from 1978 to 1993 by the same research group, funding was associated with an increase in students' choice in family medicine (15.8 vs 10.2 percent) and primary care (36.3 vs 30.9 percent).<sup>40</sup> Poltizer et al. demonstrated a correlation between Title VII funding and generalist production, but in this study, the effect was limited to private medical schools.<sup>59</sup> The authors hypothesized that the benefit of funding was mediated through the development of family medicine departments.

An important opinion which has surfaced over the years, with respect to Title VII and its impact, is that it is essentially a “drop in the bucket” in terms of funding for medical education, as stated by Rosenblatt and his coauthors in 1993: “It is important to note just how small the Title VII grants are in relation to other sources of medical school funding. Unless the objectives embodied in the Health Professions Education Act are reinforced by other direct and indirect actions of governmental agencies, academic medical centers, and third party payers—or the Title VII program is expanded greatly—relatively small grants awarded to primary care departments will not, of themselves, have much effect on the specialty mix of physicians emerging from the nation’s medical schools.”<sup>60</sup>

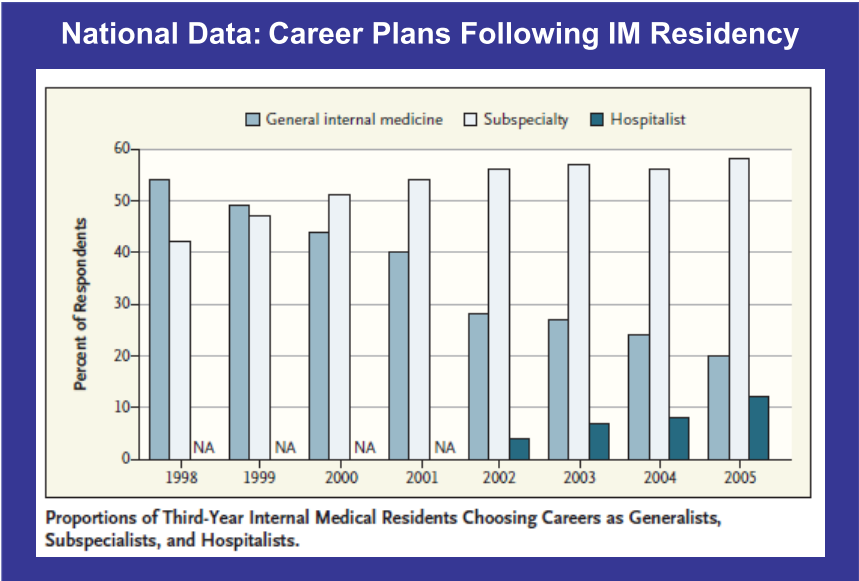
# GRADUATE MEDICAL EDUCATION

## Residency Program Characteristics and Curricula Predictive of Primary Care Career

### *Choice and Better Primary Care Skills and Practice*

When young physicians enter residency training in internal medicine or family medicine, myriad influences determine whether they will ultimately enter primary care practice or will choose another direction for their career. These other directions include a diverse range of possibilities from subspecialty internal medicine, focused practice in sports medicine or obstetrics in family medicine, a career in hospital medicine, or a non-practice-based position in industry or consulting. Unfortunately, not only is the percentage of all medical students who choose to enter residency training in one of the fields that may lead to primary care practice declining, but also once graduates complete their residencies, the proportion of graduates who enter primary care is lower than in the past. This trend can be attributed to the following two changes: 1) a slightly larger percentage of graduates are entering subspecialties; and 2) a growing proportion are choosing to enter and practice hospital medicine (to become hospitalists), as shown in Figure 9.<sup>10,15,61</sup>

**Figure 9.** National Data: Career Plans Following IM Residency



The predictors of entering and practicing primary care include the following factors: 1) demographic characteristics of the physician in training; 2) prior educational experiences of the physician in training; 3) stated early career goals of the physician in training; 4) educational debt of the physician in training; 5) residency program characteristics, including the educational environment; and 6) residency program curricula and training experiences. The next section describes the influences of residency program experiences, dedicated primary care programs (or “tracks”) within internal medicine, and innovative clinical experiences on primary care career choice.

### *Primary Care “Tracks” in Internal Medicine*

The 1970s marked the advent of primary care programs or “tracks” in internal medicine programs. These programs differ from categorical or “traditional” internal medicine residencies in that more training time is spent in the ambulatory setting, in continuity care of their own patients in specialties (eg, dermatology, orthopedics, gynecology) that are relevant to primary care practice, as well as in the medical subspecialties. Curricular time is often enhanced in a variety of areas, including women’s health, behavioral medicine, communication skills, geriatrics, HIV/AIDS, the care of special populations, public health, community medicine, and health policy.<sup>62,63</sup> Between 50 and 98 primary care internal medicine programs are in place and training residents; the number varies depending on whether only primary care programs with distinct National Resident Matching Program (NRMP) match numbers (n = 50) are included, or if all primary care programs listed on the Society of General Internal Medicine (SGIM) Primary Care Residency website (n = 98) are counted.<sup>64,65</sup>

The 50 programs with a separate NRMP match number enrolled a total of 247 interns in the 2009 NRMP match.<sup>66</sup> This number is down from 608 intern positions in the 1997 NRMP Match.<sup>66</sup> Many primary care programs have decreased the number of residents they recruit and train in response to the waning interest in primary care. For comparison, a total of 4,992 categorical internal medicine intern positions were represented in the 2009 NRMP match, a slight increase from the 4,810 in 2000.

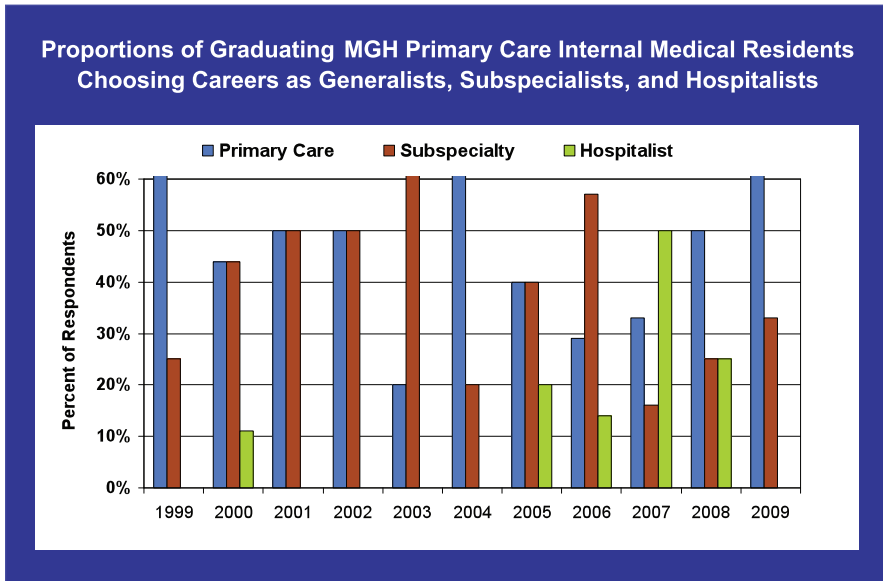


Most primary care internal medicine residency programs are located in large academic medical centers in large urban areas, primarily in the Northeast (New England and Mid-Atlantic states), and the Pacific Northwest and California.<sup>62,64,65</sup> Many of these academic medical centers are affiliated with medical schools that did not have a family medicine department when their primary care program was started, and some of these medical schools still lack a family medicine department.

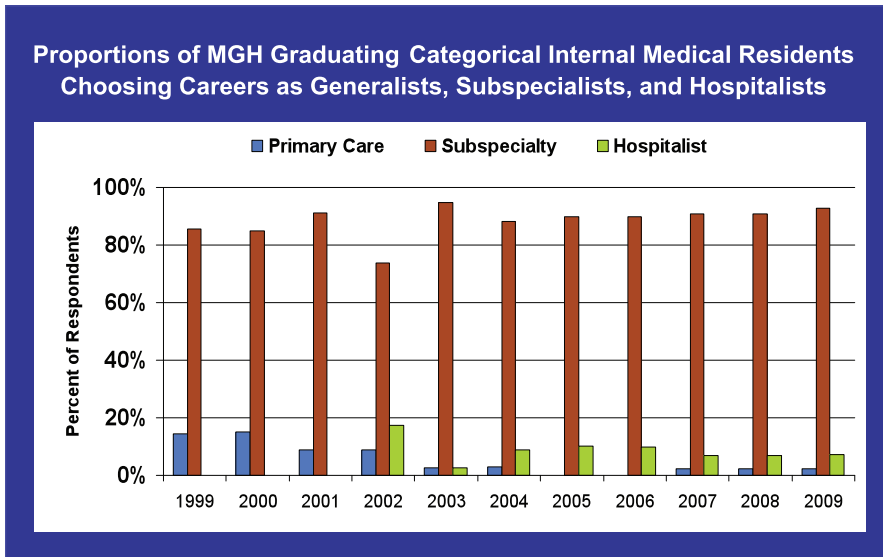
One national study compared the careers of primary care internal medicine program graduates to graduates of categorical internal medicine programs,<sup>63</sup> and several studies have looked at individual program career outcomes.<sup>63,66-68</sup> In their national analysis, Noble et al. found that graduates of primary care internal medicine residencies were significantly more likely to practice primary care after residency than were categorical internal medicine program graduates (72 vs 54 percent).<sup>63</sup> The individual program examinations for students who chose primary care show that graduates practice primary care upon graduation at higher rates than do graduates of categorical internal medicine programs (comparative numbers from categorical programs are provided if available): at the University of California at San Francisco, 89 percent of primary care graduates are practicing primary care;<sup>62</sup> at Brown University, 84.1 percent of primary care graduates versus 45.4 percent of graduates from the categorical program;<sup>67</sup> and Montefiore Social Residency Program, with 88 percent of primary care graduates, and these graduates are also more likely to practice primary care in underserved areas.<sup>68</sup>

With one exception, all of these analyses are more than 10 years old.<sup>68</sup> These findings may still hold true, but more recent data would certainly be helpful in clarifying current trends. To provide more current data, the rates of post-graduation entry into primary care, subspecialty, and hospitalist careers for internal medicine graduates nationally (both categorical and primary care) are provided in Figure 3.<sup>15</sup> In addition, data on the graduates of the Massachusetts General Hospital (MGH) primary care program and categorical internal medicine program over the past 10 years are provided in Figures 10 and 11, respectively (Bazari H and author, Personal Communication). As can be seen clearly from these data, for every one of the years from 1999 to 2009, the MGH primary care internal medicine program graduates were three to four times as likely to enter primary care as were the MGH categorical internal medicine program graduates. While

*Figure 10. Proportions of Graduating MGH Primary Care Internal Medical Residents Choosing Careers as Generalists, Subspecialists, and Hospitalists*



*Figure 11. Proportions of MGH Graduating Categorical Internal Medical Residents Choosing Careers as Generalists, Subspecialists, and Hospitalists*

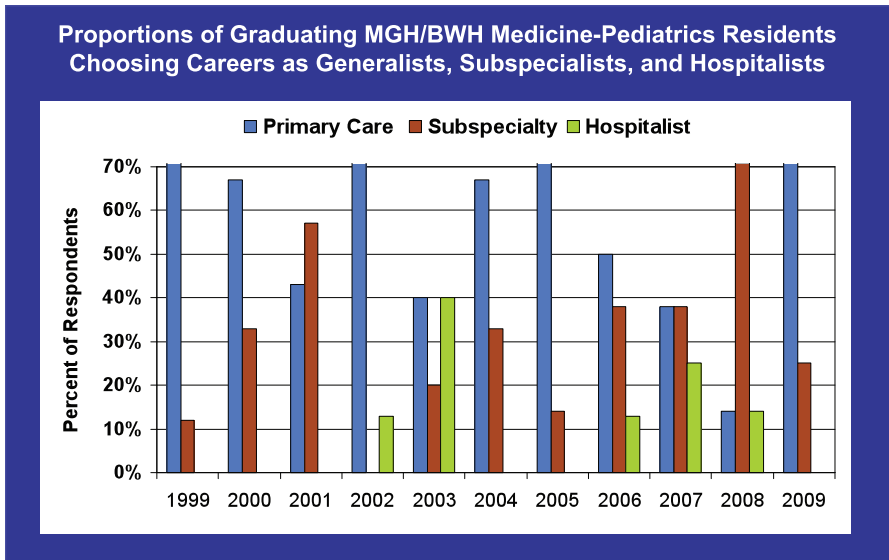


this apparent “success” in training and producing primary care physicians is laudable, two facts should be emphasized: 1) because not all of these graduates are entering primary care, the results are actually somewhat disappointing, and 2) because the physicians in training who choose to train in primary care programs are clearly predisposed to go into primary care, the primary care programs cannot claim to be the sole “cause” of their apparent superior outcomes. It would be helpful to know whether residents with a similar primary care “commitment” upon entry into residency are more likely to practice primary care upon graduation if they train in a primary care program as opposed to a categorical internal medicine residency program. Unfortunately, as far as we are aware, such data do not exist.

### *Medicine-Pediatrics Combined Training Programs*

In the late 1960s, young physicians began to express interest in being trained in both internal medicine and pediatrics as another pathway to primary care practice that would enable them to care for both adults and children. Although this mix of training became possible in the late 1960s, these programs did not become accredited until the 1980s. Like primary care internal medicine residency programs, these programs are also concentrated in large academic medical centers located primarily in large urban centers, and mostly in the eastern half of the United States. As of 2009, a total of 79 ACGME-accredited and two AOA-accredited combined medicine-pediatrics residency programs exist.<sup>64,69,70</sup> The 79 ACGME-accredited programs enrolled 354 interns this year, and this number is down from 464 intern positions in 1997.<sup>66,70</sup> The career plans of medicine-pediatrics residency graduates have been described in several analyses. Historically, a high proportion—approximately 67 to 78 percent of the graduates of these programs—enter primary care practice.<sup>71-75</sup> Published post-residency surveys of graduates show that most medicine-pediatrics trained physicians (80 to 82 percent) go on to care for both adults and children after residency.<sup>71-75</sup> While the percentage of medicine-pediatric residents entering primary care careers following residency remains high, the number entering primary care has been eroding in recent years, with the advent of hospital medicine as a career track. This trend can be seen from the MGH data presented in Figure 12.

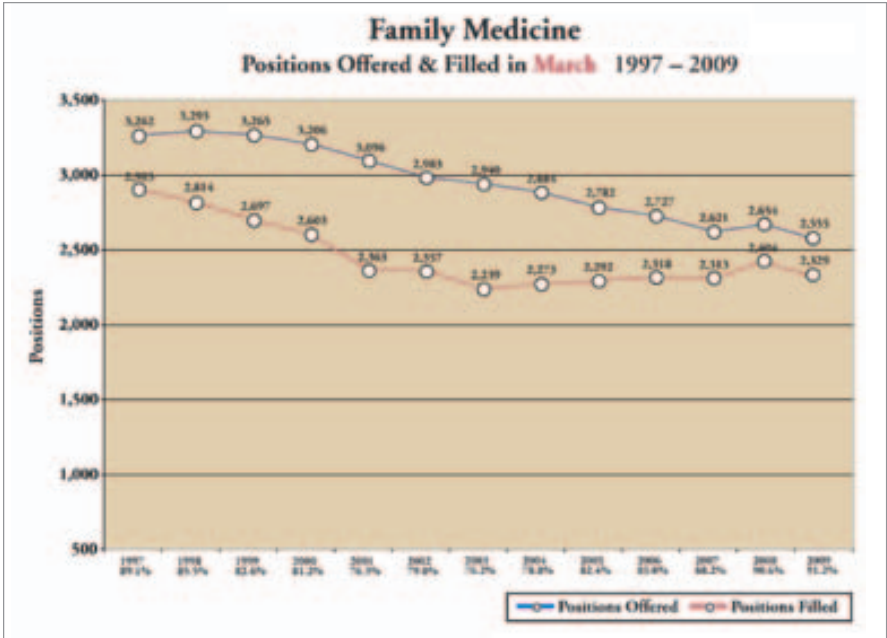
*Figure 12. Proportions of MGH/BWH Medicine-Pediatrics Residents Choosing Careers as Generalists, Subspecialists, and Hospitalists*



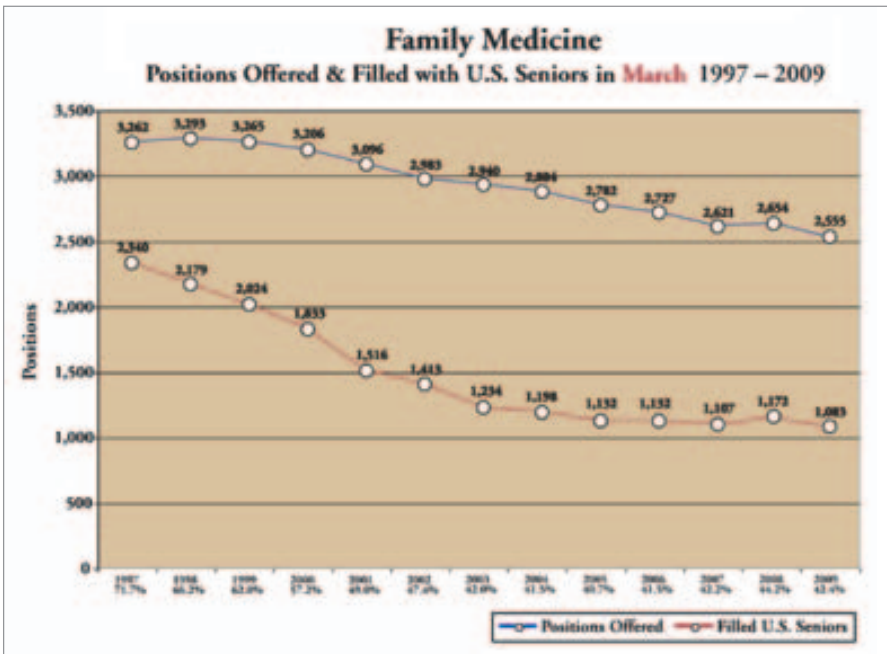
*Trends and Training Outcomes of Family Medicine Residency Programs*

Almost all physicians trained in family medicine will spend some of their time practicing primary care. Unfortunately, medical student interest in family medicine has experienced a decline parallel to the overall downward trend in interest in primary care. Figures 13 and 14 show that the total number of family medicine residency positions offered peaked in 1998, and the number filled by U.S. graduates peaked in 1997. In the 2009 NRMP match, a total of 2,555 family medicine, first-year, residency positions were offered, of which 2,329 were filled. Among those positions, 1,083 positions were filled by U.S. allopathic medical school graduates.<sup>66,70</sup> This is the sixth consecutive year that had an increase in the number of positions filled in family medicine through the NRMP match; this consistent increase is due primarily to increases in osteopathic medical students and international medical graduates. The increase in osteopathic graduates selecting allopathic family medicine programs was anticipated and is expected to continue, given the recent increase (26 in 2003 to 99 in 2009) of dually accredited residency programs.<sup>76</sup>

*Figure 13. Family Medicine Positions Offered & Filled in March 1997–2009*



*Figure 14. Family Medicine Positions Offered & Filled with U.S. Seniors in March 1997–2009*



The most recent workforce data show that family physician residency graduates continue to be unlikely to seek subspecialty training, with only 198 family physicians applying for additional training in 2008.<sup>77</sup> A far greater risk to the primary care workforce, particularly family physicians, may be early retirement. Primary care physicians tend to be less pleased than subspecialists with their career choices. An already depleted workforce could face massive shortages if the economy were to improve, and if some of the current, older practicing primary care physicians were to retire. This drain on the supply of practicing primary care physicians may be larger in magnitude than all the recent medical school expansion efforts, since the number of actively practicing U.S. physicians approaching retirement age will double over the next decade.<sup>77</sup>

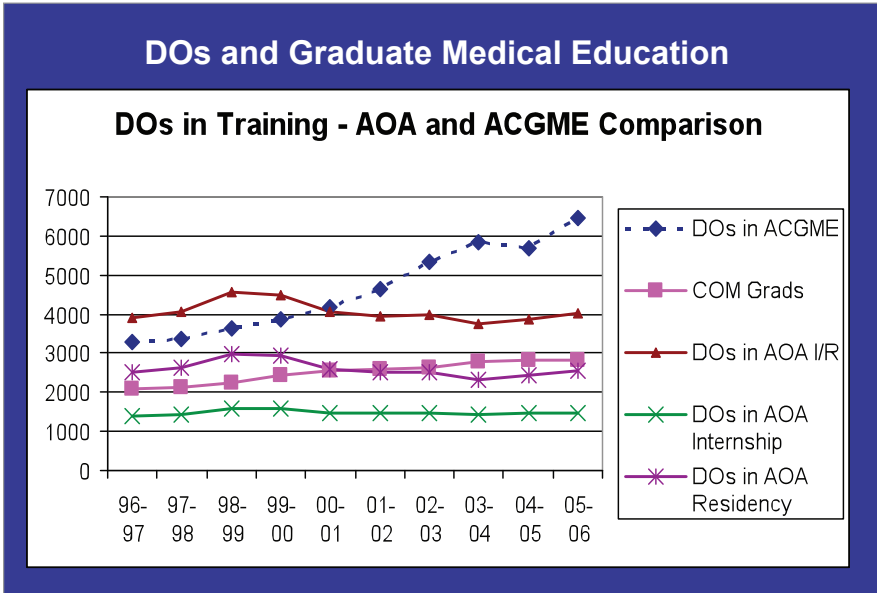
### *Residency Programs Accredited by the American Osteopathic Association*

Osteopathic medical school graduates can follow one of three pathways to obtain specialty training. After graduation, they can enter programs accredited by AOA or by ACGME, or they can enter one and complete training in the other. In most cases of the latter, graduating students complete an AOA internship year and then complete training in an ACGME program. Four states (Pennsylvania, Oklahoma, Florida, and Michigan) require 1 year of AOA-accredited graduate medical education training for licensure.

Until 2000, most D.O.s in residency training were in AOA programs. Since that time and due to the growing numbers of D.O. graduates, the increasing interest of graduates in specialties not available in AOA-residency programs, and the growing acceptance of D.O. graduates in ACGME programs, the number of D.O.s training in ACGME programs is on the rise. In 2000, there were 4,175 D.O.s (4.3 percent of positions) in ACGME programs and 4,231 DOs in AOA programs.<sup>77</sup> In 2008, those numbers rose to 7,237 (6.7 percent of positions) in ACGME and 4,934 in AOA programs (Figure 15).<sup>12,14</sup>

Historically, more osteopathic medical students have entered and remained in primary care practice because it was the main training path available to them. As accreditation patterns have changed, the proportion of osteopathic medical students entering primary care fields and, ultimately, primary care practice, has decreased. A recent national

Figure 15. DOs and Graduate Medical Education



survey of the post-graduation plans of osteopathic medical students found that only 30 percent planned to enter primary care practice after training (Figure 2).<sup>27</sup>

Nevertheless, data on D.O. graduate medical training continue to show a significant representation in primary care programs, particularly family medicine. The number of D.O.s in ACGME family medicine training programs has remained steady (1,389 in 2000; 1,374 in 2008); however, D.O.s represented 15 percent of family medicine residents in 2008. In 2008 there were 691 residents in AOA family medicine programs. Although this number is higher than that of residents in other AOA programs, it only represents 21 percent of all filled AOA resident positions. Overall, in 2007 and 2008 the largest number and percentage of D.O.s in graduate medical education programs were in family medicine (2020 of 10,073 residents [22 percent]) as opposed to any other specialty program.<sup>68,76</sup>

The picture for U.S. osteopath graduates in internal medicine is somewhat different than that for M.D. graduates. The number of D.O.s in ACGME internal medicine programs rose from 563 in 2000 to 1,296

in 2008. However, this number represents only six percent of internal medicine residents in ACGME programs, and their primary care practice plans are subject to many of the same forces as those experienced by other residents training in internal medicine. Numbers and positions for family medicine have traditionally been higher than those for internal medicine program and position numbers in the AOA graduate medical education system, and this trend continues. The number of AOA internal medicine residents in 2000 totaled 263; in 2008 it totaled 360, representing 11 percent of all filled AOA residency positions.<sup>5,13,68,75</sup> Recent trends of D.O. resident trainees are illustrated in Figure 3.

### *Title VII Funded Programs*

As mentioned earlier, Title VII, section 747 programs have focused on the education and training of primary care physicians, and grants have specifically helped to develop primary care residency programs in family medicine, internal medicine, and pediatrics. The recent Graham Center Report examined the impact of Title VII, Section 747 funds in medical schools and residency programs.<sup>11</sup> The researchers found that Title VII funding to medical schools increased the likelihood that students would enter primary care, but funding to residency programs decreased the likelihood that residents would choose a primary care career (OR = 0.94). This counterintuitive finding contrasts with the association of funded programs with significantly increased odds of future National Health Service Corps Career and practice in health manpower shortage areas. It is not clear how to interpret this finding; it may be that receipt of Title VII funding in the Graham Center analysis was associated with an important confounder associated with lower odds of entering primary care, such as training in a large academic medical center.

The Advisory Council on Training in Primary Care Medicine and Dentistry recently analyzed the impact of Title VII, section 747 funding in their 2005 report to Congress.<sup>79</sup> They concluded that Title VII programs present complex challenges to evaluators, but, in contrast to the Graham Center researchers, they found that Title VII funding for residency training increased the number and percentage of providers entering primary care practice.<sup>79</sup> A program-specific analysis from the New York University/Bellevue Hospital showed similar results.



A follow-up of graduates from this primary care internal medicine residency program, which has received Title VII funding for 20 years, indicated that 87 percent of graduates now practice primary care and that 90 percent work in underserved communities. Seventy percent of the graduate respondents reported that they felt strongly or very strongly that they enjoy their work, and only 15 percent reported burnout.<sup>80</sup> These are very encouraging results, but it is unclear how much the Title VII funding contributed to these outcomes. The authors argue strongly that the funding has enabled them to create an environment that conveys enthusiasm about primary care and that offers more robust educational programs.

### *Community-based Training and Rural Training*

Although reliable evidence has shown that community-based educational experiences in medical school can enhance and sustain students' interest in primary care, the data are not so clear for residency community training experiences. Many of the well-known urban internal medicine primary care internal medicine residency programs give residents the option of having their continuity practice at a community health center.<sup>66-68,80</sup> This option is popular among the residents and is associated with high levels of resident satisfaction. Similarly, many family medicine programs base some or all of the residents' clinics at community health centers.<sup>68,81</sup> No data were available indicating whether these longitudinal, community-based continuity experiences helped maintain residents' interest in and commitment to primary care or improved their outcomes or competencies as primary care providers. However, several analyses show that residents who have their continuity clinic in community health centers are more likely to practice in underserved areas following training.<sup>82-84</sup> Family medicine residency programs have required community medicine experiences since 1969. A meta-analysis of published evaluations of these experiences showed that most did not report any measurable outcomes.<sup>81</sup> However, several of the programs reported high percentages of graduates practicing primary care in underserved communities, and this was felt to be a byproduct of the community-based training experiences.

### *Specific Residency Curricular Elements*

A lot of attention has been paid to primary care residents' preparation in a number of key content areas, including women's health,<sup>85-87</sup> cross-cultural care,<sup>88,89</sup> geriatrics,<sup>90-92</sup> and preventive counseling,<sup>93</sup> including screening for alcohol and substance dependence.<sup>94</sup> Some of these studies have shown that primary care physicians in training are inadequately prepared in these key content areas. In most cases, the measured outcome is residents' perceived preparedness, which is not an objective measure, and therefore, we do not know whether they need more skills in these areas. Furthermore, we do not know whether having skills in these areas would truly improve their effectiveness as primary care providers. When primary care residency graduates were asked, after being out in primary care practice, what additional training they needed, common answers were alcoholism and substance abuse, counseling and psychosocial skills, sexuality issues, teaching skills, patient education, medical consultation, dermatology, psychiatry, geriatrics, orthopedics, and allergy/immunology.<sup>62,67,95</sup> Unfortunately, these studies were conducted more than 10 years ago. Many primary care residency programs now have well-developed curricula in most of these areas. It is likely that this expanded curriculum is, in part, a response to these surveys of program graduates.

### *An Innovative Approach to Ambulatory Training*

In 2005, the ACGME's Residency Review Committee for Internal Medicine (RRC-IM) announced a request for applications to be part of its Educational Innovation Program (EIP).<sup>96</sup> Its goal was to encourage innovation within internal medicine residency programs that have a history of excellent accreditation status. ACGME encouraged programs in this category to submit proposals for innovative residency training models. Twenty-one approved proposals comprised the RRC's EIP Program—17 programs in Phase 1 (2006) and four programs in Phase 2 (2007). At this time, interest in innovative models of ambulatory training was already growing.<sup>97,98</sup> Residency program leadership (and residents) were voicing a growing concern about the tension between inpatient and outpatient responsibilities that often causes residents to resent their ambulatory experience and contributes to their decreasing interest in primary care.<sup>97,98</sup> Not surprisingly, given this backdrop, many of the

EIP projects involved new and innovative ambulatory training models.<sup>99</sup> Fourteen of these new programs have had an ambulatory focus.<sup>96</sup> Most projects used new scheduling strategies to combine the ambulatory training time, including continuity practice, into very long blocks of time (in some cases, a full year). On the ambulatory side, this “immersion” approach enabled residents to experience the day-to-day work life of an ambulatory physician without needing to hurry back to the inpatient service. Other common themes in the ambulatory-focused innovations included shared-care and team-based care models that employed components of the patient-centered medical home, communications skill-building projects, and ambulatory quality improvement and practice improvement projects.<sup>100</sup> Only a few of these programs have published the results of these experiments to date.<sup>99</sup> One of these is the University of Cincinnati, whose leadership reports that both resident and patient satisfaction improved significantly. Overall, these projects represent the largest collection of new training ideas in internal medicine today. They may serve as the foundation for much-needed strategies to maintain residents’ interest in primary care, while strengthening their clinical skills.

## Recommendations for Generalist Training from Academic Medical Societies

In this time of crisis about the number of medical students entering primary care residency training, primary care physician groups have deliberated about how best to train future primary care physicians. Chief among the recommendations are the documents, “The Future of Family Medicine: A Collaborative Project of the Family Medicine Community,” and “Reforming Internal Medicine Residency Training: A Report from the Society of General Internal Medicine’s (SGIM) Task Force for Residency Reform.”<sup>101,102</sup>

The SGIM focused on the training of all internal medicine trainees, not just those going into primary care. Yet, their stated goal is for trainees to emerge from residency better prepared to provide primary care or ambulatory specialty care. Key among the recommendations were the following: 1) improving the training balance between ambulatory and inpatient medicine; 2) substantial redesign of clinical work and educational processes in teaching hospitals and clinics, with a focus on moving towards team-based care; 3) inclusion of health disparities and

teaching in the social sciences as part of residency programs; and  
4) improved clinical supervision of residents in both inpatient and ambulatory settings.

In contrast, the family medicine report emphasized training in community and population health, as well as key competencies. The key competencies were those that would prepare the trainee to practice patient-centered care most effectively in the “new model” practice (ie, patient-centered medical homes). Based on these two sets of recommendations, key competencies needed by primary care physicians upon completion of residency training are enumerated below.

### *Competencies for the Future Primary Care Physician*

All roads to curing the U.S. healthcare system lead back to primary care, where primary care physicians are the cornerstones of the system. Twenty-first-century doctors will need new skills to lead their practices successfully and to interact productively with twenty-first-century patients, families, and communities. Educational models that incorporate the Joint Principles of the medical home model of care will serve as an important framework for all physicians’ training, because most of these principles can be adapted to work well in primary care, specialty care, or in a research laboratory. The Joint Principles include the following components:<sup>100</sup>

- *Personal physician:* Each patient has an ongoing relationship with a personal physician trained to provide first contact, continuous, and comprehensive care.
- *Physician-directed medical practice:* The personal physician leads a team of individuals at the practice level who collectively take responsibility for the ongoing care of patients.
- *Whole-person orientation:* The personal physician is responsible for providing for all of a patient’s healthcare needs or taking responsibility for appropriately arranging care with other qualified professionals. This includes care for all stages of life—acute care, chronic care, preventive services, and end-of-life care.

- *Care is coordinated and/or integrated* across all elements of the complex healthcare system (eg, subspecialty care, hospitals, home health agencies, nursing homes) and the patient's community (eg, family, public, and private community-based services). Care is facilitated by registries, information technology, health information exchange, and other means to assure that patients get the indicated care when and where they need and want it in a culturally and linguistically appropriate manner.

Physicians will also benefit greatly from understanding the basics of the following principles:

- Leadership strategies, operations management, and quality improvement
- Teamwork
- Cultural competence and care of the medically underserved
- Prevention and health promotion
- Patient-centered shared decision making, chronic disease management, and self-management support.

Mastery of these skills will contribute to the success of future physicians as much as clinical diagnostic and treatment expertise, and will be more appropriate than the current underlying criteria for admission, which is often based on stamina and basic science proficiency during training.

### *Leadership Strategies, Operations Management, and Quality Improvement*

Individual performance is influenced strongly by the systems and cultures in which an individual works. Implementing this principle makes it imperative to engage the people who work in a practice or setting in its design. To accomplish this aim, physicians will need to understand leadership skills that focus on team building, system reengineering, and quality improvement. They will not need to perform all of the skills themselves, but they will need to be familiar with the relevant concepts and tools in order to choose the right staff for their practices and to be full partners in these efforts.

As leaders and members of the healthcare team, physicians will need more knowledge and experience with quality improvement techniques and “system architecture” competencies to continuously improve the function and design of practice systems.<sup>104, 105</sup> Rapidly changing technologies will most likely accelerate the pace of change, requiring physicians to be nimble, tolerant of ambiguity, and responsive to the service and clinical expectations of patients.<sup>104</sup>

### *Team Work*

In a recent workforce reform report, the American Academy of Family Physicians emphasized the importance of training physicians to provide care in collaborative clinical training practices that include nurses, mental health providers, social workers, and pharmacists, among others.<sup>105</sup> Team-based care will be essential as an innovative strategy on its own and to address workforce shortages across all primary care professions. Providers will be practicing in a care system that is less physician-centric and is less hierarchical than in current primary care practices, and one that will require effective team communication, collaboration, and role definition.

Educational programs that prepare physicians for practice settings where they will be autonomous, deferred to, and independent of other clinicians will do them a disservice. The complexity of primary care, wider use of hospitalists, and new practice models will require skills that foster high-functioning teams that are organized around the needs of the patient population, where everyone’s role is important to success. Primary care practice in the future may be more akin to an Amish barn-raising than care delivered by the fictional Marcus Welby.<sup>104</sup>

Programs that incorporate inter-professional education (IPE) will also be important. Several medical and nursing schools have made progress with IPE programs, and more must be encouraged to embrace this innovation. IPE programs offer students the opportunity to learn about independent and shared competencies and to build respect for one another in the early phases of their training. Program curricula generally focus on quality, patient safety, and the integrative power of health information technology as the basis of preparation.<sup>106</sup> Although they are challenging to design, these programs are beginning to generate evidence of their impact. In recent, in-person interviews, medical students involved in Yale University’s

student-run clinic, called Haven, described their ability to work with other health professional students in this clinic—including nurse practitioners, physician assistants, public health students, and pharmacists—as the most valuable component of their medical education experience at Yale Medical School.

### *Cultural Competence and Care of the Medically Underserved*

Primary care physicians will need expertise in caring for diverse patient populations and cultural competence to address the needs of all patients. A systematic review of cultural competency education programs shows that they improve provider attitudes, knowledge, and skills regarding cultural issues.<sup>107</sup> Few programs now combine teaching about cultural competence with a focus on reducing healthcare disparities. In a study exploring residents' perceptions of their preparedness to deliver quality care to diverse populations, Park et al. found that residents received mixed messages about cross-cultural care.<sup>108</sup> Although faculty deemed it important, few residents received formal training or had the time required to treat diverse patients in a culturally sensitive manner, and very little role modeling took place. These mixed educational messages highlight the need for significant improvement in cross-cultural education to help eliminate racial and ethnic disparities in healthcare.<sup>109</sup> Programs and training settings need to incorporate best practices to increase residents' preparedness to deliver high-quality, cross-cultural care.

A 2006 national survey of pediatric clerkship directors revealed that only 25 percent of programs taught cultural competence, but 81 percent expressed interest in a validated cultural competence curriculum.<sup>110</sup> In another assessment, the University of California, San Francisco found that only a minority of medical schools offered a defined curriculum for cultural competency and few of these programs addressed access, language, or health literacy.<sup>111</sup> The literature indicates that promoting cultural competence in teaching will require developing faculty, as well as developing and disseminating teaching materials and evaluation tools.

### *Prevention and Health Promotion*

Incorporating prevention and health promotion into their practices will require physicians to develop new skills. Although health promotion and

prevention may move into the province of other primary care clinicians, physicians will still need to be familiar with the basic tenets. Physicians will need to work effectively with other health professionals to ensure that patients receive the services and support they need to choose the right screening tests, genetic counseling, weight-loss strategies, and smoking cessation. Also, physicians will need training that enables them to counsel patients on healthy lifestyles, wellness and life balance, and self management for chronic disease. In addition to these skills, they will need much more robust training in methods that motivate and engage patients and families to fully participate in their own care.

### *Patient-centered Shared Decision Making, Chronic Disease Management, and Self-management Support*

Physicians of the future will require expertise in engaging patients effectively in decision making about all aspects of screening, diagnostic, and treatment options, as well as self management for chronic conditions. In a recent study, the Foundation for Informed Medical Decision Making on physician views about shared decision making and the use of patient decision aids found that 87 to 89 percent of primary care physicians supported involving patients in lifestyle changes and managing chronic conditions, and that 77 to 82 percent of the physicians favored involving patients in decisions about screening tests, medications, and surgery. However, teaching physicians how to incorporate these tools into clinical practice will require training throughout the medical school and residency experience (Personal communication, Fowler and Paget).

In contrast to episodic, reactive care, the chronic disease model upon which the medical home model is built incorporates planned visits and follow-up care that track patients on an ongoing basis. As a result, the practice is continually informed, is ready to address the patient's needs holistically whenever necessary, and follows up with patients after encounters, as appropriate. Physicians also assume responsibility for tracking and assisting patients as they move across care settings and for coordinating services with other providers, including those in behavioral health and social services. The practice team is responsible for educating patients and family members on primary preventive care and on self management of chronic illness (ie, secondary preventive care). Patient-centered primary care requires care planning, which is focused on patients' specific circumstances, wishes, and



needs; it also includes involving the patient in goal setting, problem solving, and follow-up. The competencies that enable a physician to thrive in these models of care are not routinely incorporated into medical education, and they will require physician knowledge of the models, the tools required to implement them, and comfort with reallocating some of these activities to other members of the healthcare team. Successful implementation will also require new competencies in patient engagement and coaching.

### *Summary*

Many proposals have been made to redesign medical education all along the continuum of training, beginning with the admissions process and ending with the completion of a residency in one of the primary care specialties. These recommendations are coming from the primary care specialties as well as from other organizations concerned that physicians be trained to provide high-quality, safe care, regardless of their specialty. Many of these recommendations are similar to the set of competencies described above. We are hopeful that this convergence of goals will influence medical education in the broadest sense, to help prepare physicians for the practices they will be expected to lead and design. The current educational model, which reinforces physician autonomy and isolated responsibility for the patient, is no longer effective.

## RECOMMENDATIONS FOR PRIMARY CARE TRAINING GOING FORWARD

To meet the needs of an aging and chronically ill population, and to develop a healthcare system focused on coordinated and comprehensive care, the role of primary care in this country will need to be elevated and enhanced, and the practice model will need to be substantially revised. Medical schools and residency programs will need to address the increased demand for primary care physicians and to train future physicians in the competencies required for new models of care. We recommend six key initiatives to improve primary care training: 1) increased funding; 2) increased exposure to community health settings; 3) expansion of primary care residency training programs; 4) establishment of family medicine departments in all U.S. medical schools and development of associated area health education centers; 5) medical education that focuses on “real world” competencies of the primary care physician; and 6) improvement of the practice environment for primary care physicians.<sup>3,18,28,29</sup>

The data presented in this paper show a clear benefit for directed funding to promote generalist training. Federal grants, such as Title VII funding, have had a large influence in strengthening family medicine departments and establishing primary care training tracks, especially in regions where primary care training would not traditionally thrive. Title VII funding was recently increased through the American Recovery and Reinvestment Act, but sustained funding needs to be maintained and new funding directed at efforts listed in the following text.

Students and residents are more likely to have positive primary care experiences, and therefore are more likely to choose a primary care career, if they are exposed to positive role models of primary care in community-based settings. In addition, increased exposure to family medicine appears to increase the number of students who choose that specialty. Requirements for graduate medical education have increased their emphasis on outpatient training, but quality experiences in the community should be required as well. Medical students need to be exposed to exciting, successful models of outpatient medicine in the specialties of family medicine and internal medicine throughout all 4 years of their education. Community-based faculty with close ties to the

academic center should be deployed; these individuals should receive remuneration for teaching and for regular faculty development. Special primary care tracks in medical school, with an emphasis on underserved populations and rural areas, should be replicated and improved to help select and train prospective students, who will be more likely to practice in these needed areas.

Primary care internal medicine residencies have demonstrated continued success at encouraging graduates to pursue primary care careers, but they still fall short. Residents in primary care programs need to be exposed to positive experiences in primary care and to be mentored by inspiring primary care faculty. Innovative programs that will help to discover better methods for outpatient training and increased funding to support these efforts should continue.

The undergraduate and graduate medical curriculum needs to reflect the realities of the practicing physician in the twenty-first century. Traditional subjects covering the basic and clinical sciences need to share space with the newer skills required to lead a multidisciplinary team that can provide comprehensive care. Chronic disease management, quality improvement, and population management should be explicitly taught and evaluated. Skills in the leadership of healthcare teams should also be included in the curriculum, and when possible, multidisciplinary training should be incorporated.

Finally, reform in medical education, improved exposure to community-based care, and increased funding for generalism will be inadequate to increase the number of students interested in primary care careers if the current primary care system remains broken. The goal of the medical home needs to be realized: This vision requires that primary care physicians lead multidisciplinary teams, provide comprehensive care with enhanced access, focus on prevention and wellness, engage patients in self management of chronic diseases, and be rewarded for improved coordination of care. Medical home demonstration projects should include incentives to trainees, and training programs should be designed to allow the trainees to participate fully in the outpatient practice environment.

Although issues of workforce requirements are beyond the scope of this paper, it is clear that undergraduate and graduate medical programs are

currently not rewarded for producing physicians who are best suited to address the healthcare needs of the communities where they reside. In order to achieve the recommendations described, changes in federal and state support for medical education, with explicit workforce goals, will need to be implemented.

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# NURSE PRACTITIONERS AS PRIMARY CARE PROVIDERS: HISTORY, CONTEXT, AND OPPORTUNITIES

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## INTRODUCTION

### Primary Care and Nurse Practitioners

Primary care is the foundation of most national healthcare systems; yet, the vision for primary care in the United States and who should provide it is less than clear. Nurse practitioners (NPs) have been providing primary care for over 45 years, and there is strong evidence that this care is cost effective, of high quality, and of great service in increasing access to care for vulnerable populations.<sup>1,2</sup> Nevertheless, despite the evidence, barriers to NP practice, along with “supervision” processes that increase the costs of primary care, continue. For the first time, in a recent policy monograph, the American College of Physicians (ACP) acknowledged that NPs and physicians had common goals related to high-quality, individual patient outcomes and enhanced population health.<sup>3</sup> The ACP acknowledged the shared concerns of medicine and nursing with respect to the decline in the primary care workforce and the need for appropriate reimbursement for services—especially those related to coordination of

care. The ACP also called for testing of new models, specifically related to multidisciplinary teams and the patient-centered medical home (PCMH) and addressed the question of who might lead and participate in primary care teams of the future. Amidst the significant obstacles to NP practice supported by physician organizations to date, this monograph provides hope for new dialogue regarding who will provide primary care and how these providers will be prepared. This paper is intended to support this dialogue by providing an overview of the history of NP education and practice, a description of the current workforce and how its members are prepared, and a presentation of visions for the future from the viewpoint of nurse practitioners.

When the first NP program started in the mid-1960s, it was a pediatric NP program response to a physician workforce shortage. Other specialties (family and adult NP) developed quickly. The original conception of this advanced practice role was that NPs would care for patients with routine, common, and stable problems with a focus on health promotion and disease prevention.<sup>4</sup> Although that focus continues, the reality was—and continues to be—that NPs in primary care are frequently asked to care for some of the most complex and challenging patients (eg, homeless, uninsured, chronically ill, and mentally ill). Nonetheless, NPs have managed these patients well, either collaboratively or at some level of independence. Over the past 40 years or more, hundreds of studies have documented the contributions NPs have made to primary care and the quality of that practice. In addition, over four decades, the scope of NP practice has been more clearly articulated, with professional regulatory mechanisms that support both education and practice.<sup>5</sup> About 150,000 NPs are now practicing in the United States, with a majority of those in primary care and 20 percent in rural or frontier settings.<sup>6</sup>

## History of Advanced Practice Nursing

NPs constitute one of four advanced practice nursing (APN) roles. The other three are certified registered nurse anesthetists (CRNA), clinical nurse specialists (CNS), and certified nurse midwives (CNM). CRNAs and CNMs have a long history dating back a century, while the NP and CNS roles were both initiated in the 1960s. The sociopolitical context for these newer roles was an era of questioning the status quo, including a political climate that supported changes in civil rights and women's rights.

The United States was in the midst of a controversial war. Within nursing, a move toward bachelor's and higher degree preparation was occurring. At the same time, there was a shortage of primary care physicians, especially pediatricians. During these years intensive care units were expanded, creating nursing positions that required a high level of skill and clinical decision-making. The CNS role had its roots in this expanded acute care function, whereas the NP's roots were in community-based primary care. Autonomy and independence based on licensure and certification were sought for each role. Almost 20 years ago, the National Council of State Boards of Nursing issued a statement on advanced practice nursing in which they asked that "each individual who practices nursing at an advanced level" should do so "with substantial autonomy and independence resulting in a high level of accountability."<sup>7</sup>

It is also notable that the NP role emerged during a time of increasing emphasis on specialization in medicine.<sup>8</sup> Throughout the history of healthcare, nursing has expanded into overlapping roles with medicine, especially in the area of community health and midwifery. Pioneers in these areas were Margaret Sanger (Planned Parenthood), Mary Breckenridge (midwifery) and Lillian Wald (community health), who had expanded and overlapping roles a century ago. These women provided the vision, expertise, and backbone that set the stage for a maturing profession within which the NP advanced practice role was formalized.<sup>9</sup>

## Certified Nurse Anesthetists

The first organized program in nurse anesthesia education was offered in 1909. More than 37,000 certified nurse anesthetists (CRNA) are now practicing, and 109 nurse anesthesia programs exist. CRNAs have been certified nationally by the American Association of Nurse Anesthetists (AANA) since 1945. A minimum of 7 calendar years of education and experience are required to prepare for practice as a CRNA. Between 1,300 and 1,700 student nurse anesthetists graduate each year. CRNAs must be recertified every 2 years, and CRNAs are the sole anesthesia providers in more than two thirds of all rural hospitals in the United States.<sup>10</sup>

## Clinical Nurse Specialists

The CNS role preceded the NP role, and some say it set the stage for the NP practice role, which has a greater overlap of scope with medicine.<sup>11</sup> Although the NP and CNS roles have at times been blurred, each group of practitioners has distinguishing aspects. The CNS performs more as a consultant-facilitator whereas the NP emphasizes direct patient care management. Also, the CNS generally practices in the secondary or tertiary care setting.<sup>12</sup> Unlike the NP role, which emerged out of primary care, the role of the CNS is based in acute and chronic illness, most often for hospitalized patients. Overall, about 1,000 individuals graduate from CNS programs each year (compared to 7,000 NP graduates).<sup>13</sup> An estimated 69,017 CNSs are now working in the field, and approximately 14,643 are qualified as both NPs and CNSs. There are 449 CNS programs across the country.<sup>13</sup>

## Certified Nurse Midwives

CNMs have been practicing in the United States since the 1920s. The role developed out of concerns about the lack of access to care and the poor quality of that care when it did exist in the form of midwifery (not nurse-related) and medical practice at the turn of the nineteenth to the twentieth century.<sup>14</sup> Today, CNMs are registered nurses who have graduated from nurse-midwifery education programs accredited by the Accreditation Commission for Midwifery Education (ACME). Currently there are 10,000 certified CNMs and certified midwives who are not nurses (CMs) nationally; 6,000 of those are members of the ACNM and only 100 of those 6,000 are CMs.

A CNM/CM provides a full range of primary healthcare services to women throughout the lifespan, including gynecologic care, family planning services, preconception care, prenatal care, postpartum care, childbirth, and care of the newborn. Nurse-midwives are recognized in all 50 states with licensure under the jurisdiction of one or more of the Boards of Nursing, Medicine, or Midwifery. Thirty-eight accredited programs exist in the United States, with 300 graduates in 2008. As of Fall 2010, preparation as a CNM or CM will require a minimum of a master's degree.

## Nurse Practitioners

The first NP program was started in 1965 at the University of Colorado under the direction of nurse leader Dr. Loretta Ford and her physician colleague Dr. Henry Silver.<sup>4,9</sup> The Colorado program emphasized pediatric care and was based on a model that focused on health promotion, growth, and development for children and the prevention of disease and disability.<sup>15,16</sup> Since the mid-1960s, the primary care NP focus has expanded markedly to include family NPs. Family NPs now comprise the largest group of NPs, with others in the profession categorized as adult NPs, women's health NPs, and gerontological NPs. As a result of a consensus process, APN stakeholders recently decided to merge the adult and gerontological NP into one focus.<sup>17</sup> Approximately 650 primary care NP programs now exist in the United States, enrolling approximately 32,000 students and with more than 7,500 graduates in the past year.<sup>13</sup> There are a total of approximately 150,000 NPs nationally, a majority of whom work in primary care.<sup>18</sup>

## Summary

Most of the early APN programs were certificate programs in which a registered nurse could qualify for admission. Over the years, the basic preparation for all APNs has moved to a master's degree. A majority of all graduates from NP programs have a master's degree from an accredited program. Recently, 92 schools have started doctoral programs in nursing practice (DNP). There were 361 DNP graduates in 2008 and over 3,000 enrollees. An increase in doctoral preparation is expected over the next decade.

In summary, of the four APRN roles, NPs represent the largest number of graduates each year (approximately 7,000), with a majority of those graduates (almost 6,000) having a primary care focus. About 1,700 CRNAs, 1,000 CNSs, and 300 midwives graduate each year. Clearly, the largest numbers of nursing primary care providers prepared each year are NPs.<sup>13</sup> The remainder of this paper will focus on the NP.

## FACTORS THAT INFLUENCE NP CAREER CHOICE

Since the 1980s, M.S.N. education has been the primary entry point to NP practice. The first issue in terms of recruitment into NP primary care provider positions is the adequacy of the pipeline of students who receive their initial preparation as nurses from college and university programs. Because nurses initially prepared at the associate degree or diploma level often complete a B.S.N. degree in order to go on for an M.S.N., students in R.N.-B.S.N. or R.N.-M.S.N. programs are one source of potential recruits to NP programs; however, only a small percentage (< 15%) of nurses prepared initially at associate degree or diploma levels seek an advanced degree.<sup>22</sup> In one state-wide study, Bevill and colleagues followed a cohort of 3,384 graduates licensed in 1984 and another cohort of 5,341 licensed in 1994 in North Carolina. They found that graduates who began their education with a B.S.N. degree (vs diploma or associate degree) were significantly more likely to pursue higher academic degrees.<sup>22</sup>

An innovative approach to address the overall nursing shortage that has also had an impact on NP workforce is the accelerated B.S.N. degree (A.B.S.N.) program for non-nursing graduates. Applicants with a bachelor's degree in another field are able to complete a bachelor's degree in nursing in 12-16 months (depending on the program). There are 218 A.B.S.N. programs in the United States.<sup>13</sup> An additional 57 accelerated second-degree programs offer a direct path to a master's degree, many of those in primary care. Although the intent of these programs is to address the nursing shortage at the bedside, these programs have brought unexpected consequences, namely as a pipeline for APN programs. Accelerated programs have tapped students who bring rich backgrounds in other fields, are motivated, and know what they want from a career. Bentley<sup>33</sup> and Brewer and colleagues<sup>34</sup> found that the accelerated program graduates, when compared to traditional nursing bachelor's degree graduates, were more likely to be male, nonwhite, and older; Brewer also found that the accelerated graduates often moved quickly into management positions.<sup>33,34</sup> Pass rates for the undergraduate board exams were also higher for accelerated program graduates.<sup>33</sup> Graduates from the accelerated programs frequently go on to master's programs in nursing, and many graduates choose primary care options.

Once a student is admitted to an NP program, other factors affect that student's career choice, namely, exposure to primary care settings that engage them in the full NP scope of practice. Moving the educational preparation of NPs into universities and graduate master's programs has facilitated faculty practice in academic nurse-managed centers (ANMCs), also called nurse managed health centers. These centers, often established in local communities, served the healthcare needs of vulnerable populations, particularly the medically underserved. NP students are exposed to these populations with NP faculty as preceptors. Students who had these kinds of experiences were more likely than those who did not to choose to continue working in primary care with the underserved.

Of 62 ANMCs included in a study by Barkauskas et al.,<sup>23</sup> 73 percent provided primary care management of health problems, including health maintenance and management of minor acute and common chronic illnesses. ANMCs served as safety-net providers for underserved and other vulnerable populations but were not specifically named in the Institute of Medicine's report<sup>24</sup> along with public hospitals, federal, state, and locally supported community health centers.<sup>1</sup> This fact kept ANMCs invisible to insurers and potential funding sources, making sustainability a challenge. ANMCs, however, were ideal settings to train future NPs who might be interested in entering primary care.

Rural areas are particularly affected by shortages of primary care providers. In these areas, such providers care for a higher percentage of elderly and uninsured individuals, as the young move to urban areas.<sup>25</sup> In a study by Lindeke and Jukkala,<sup>25</sup> NPs working in rural areas noted high patient satisfaction with the care they received. However, the NPs identified barriers to practice and job satisfaction, including resistance from physicians, lack of knowledge of the NP role, lower salaries, lack of a peer network, and limitations of space and facilities. The NPs desired higher salaries, more support staff to assist with office tasks, more onsite NP colleagues and mental health staff, pocket computers, and telemedicine for consultation. Zeier<sup>26</sup> recommended that NP-managed rural clinics seek designation as either rural health clinics (RHC) or as Federally Qualified Health Centers to increase and stabilize financial assistance from public insurance. Community involvement from residents in deciding what services the clinic would offer and involvement of the health center staff in the local community were thought to be critical for success. Like

physicians practicing in rural settings, NPs were faced with providing some of the most comprehensive primary care services with the fewest resources.

Both the positive and challenging aspects of primary care in rural areas have impacts on student career choice. Cumulative data from four surveys of NPs over a 5-year period (from 2004 to 2009) led to estimates that 66 percent of NPs practice in at least one primary care site and 20 percent practice in rural or frontier settings.<sup>18</sup> The primary specialty preparations were family (49 percent), adult (18 percent), and pediatric (9 percent) NPs.<sup>18</sup> Data from the 2006 survey showed that NPs were working in private physician practices (32 percent), community and public health (10 percent), hospital outpatient clinics (10 percent), and in hospitals (9 percent).

As the NP role expanded and the healthcare climate changed, other influences in addition to physician resistance had an impact on the ability of NPs to serve as primary care providers.<sup>27,28</sup> Legislation and regulation regarding scope of practice, professional competition, managed care, access of patients to NPs as primary care providers, reimbursement, and patient choice all affected NP practice. States vary in requiring physician involvement in NP practice from none to collaboration to supervision.<sup>6,29</sup> Lack of designation for third-party reimbursement has also created challenges to the NPs' ability to practice in primary care. The frequently used practice of billing "incident-to" the physician realized higher revenues for physician-run practices, but no matter what the setting, the NP data were embedded in physician data, making the NP data invisible.<sup>28</sup>

As the healthcare delivery system shifted to managed care in some markets, nursing leaders called for the integration of NPs and all APNs into the organized delivery system by including them as providers in capitated plans or by contracting for their services for the care of special groups of patients.<sup>30</sup> Yet today, NPs in primary care still struggle for parity with recognition and reimbursement for services provided.<sup>31,32</sup> The key to sustainability for nurse-managed health centers is the capacity to participate fully in the system of reimbursement from third-party payors. Nonetheless, the support of other groups has helped NPs continue their efforts to provide primary care to the public. Private foundations and public organizations have funded innovative nursing demonstration projects and models of care that helped to improve access to care and the



quality and delivery of care. Many organizations targeted underserved and vulnerable populations. For instance, the W. K. Kellogg Foundation, created in 1930, supports children, families, and communities in efforts to help vulnerable children achieve success as individuals and in the larger society. The Robert Wood Johnson Foundation, founded in 1936, seeks to improve health and healthcare for all Americans, with an emphasis on how it is delivered, how it is paid for, and how well it does for patients and their families. The Josiah Macy, Jr. Foundation, founded in 1930, shifted emphasis from providing resources solely for physician education to addressing health education strategies that would enhance primary care in the U.S. healthcare system. These three private foundations have contributed either directly or indirectly to sustaining nurse-managed centers or to improving NP education and practice.

Through a variety of mechanisms, the Health and Human Services Administration (HRSA) Bureau of Health Professions has promoted the choice of primary care by graduate students in nursing. Started in 1967, Bureau, after name and organizational changes, was eventually housed in HRSA in 1982. Title VII and VIII programs are the only federal programs with a mandate to increase the supply, improve the distribution of health professionals, and generate a supply of providers to work in medically underserved communities. Title VIII (Nurse Education Act) focuses on nursing and particularly training for advanced practice nurses. HRSA supports program grants for advanced education nursing and traineeship grants for student scholarships.

Created in 1972 within HRSA, the National Health Service Corps (NHSC) administers two programs to encourage primary care career choices—scholarship and loan repayment programs for advanced practice providers, including NPs. Nearly 80 percent of the NHSC scholars remain in the underserved area after fulfilling their NHSC service commitment, and more than 50 percent make a career of caring for underserved populations. Although 3,800 clinicians are now in service (including NPs, in 2009), more than 7,000 job vacancies remain for NHSC primary care. These vacancies are for medical, dental, and mental health clinicians. State funding issues and providers not choosing primary care have been cited as reasons for these vacancies. Unfortunately, the NHSC does not break down vacancies by discipline. State-level primary care offices also assist NPs and other health professionals to find or develop jobs in individual

state-designated health professional shortage areas, in medically underserved areas, and with medically underserved populations.

Under the American Recovery and Reinvestment Act of 2009, health professions programs allocated additional financial resources for the NHSC programs, Student/Resident Experiences and Rotations in Community Health, among other nursing initiatives. The potential for impact on primary care is real, and many educational institutions hurried to take advantage of this new opportunity to receive funding to enhance current programs, to expand programs in areas of technology (such as distance learning to reach rural NPs and to implement electronic health records for practicing clinicians).

In summary, public support for NP primary care education and practice has been varied and plentiful. Obstacles to practice that create negative effects on advanced practice nursing career choices have been derived primarily from the private interests of other professional groups who seek to limit NP scope of practice. We expect that the new public policies aimed at efficiency, teamwork, and use of all health professionals to their full scopes of practice will make primary care, which is intrinsically attractive to people with nursing backgrounds, increasingly extrinsically attractive as well.

## NURSE PRACTITIONERS IN PRIMARY CARE

NPs practice in diverse settings including physician-led private practices, community health centers, prisons, nurse-managed health centers, retail clinics, school-based health centers, faith-based health centers, and other settings. Over the years, NPs created new models of practice that increased access to care for diverse populations. As Fairman<sup>35</sup> stated:

Nurse practitioners negotiated and experimented with their physician colleagues....They also showed typical entrepreneurial spirit long associated with the nursing profession by seeking out practice areas without the constraint of institutional oversight.... nurse practitioners demonstrated that they could provide a different type of care and much needed continuity, advocacy, and education to patients long ago abandoned by much of mainstream medicine for the more complex, and highly acute case. In this way, nurse practitioners became essential to a system of care fragmented by medical specialization.

Some of the more unusual models and settings in which NPs practice are described below.

### Nurse-managed Health Centers

Nurse-managed health centers (NMHC) are accessible service sites that deliver family and community-oriented primary care. The majority of care is provided by NPs in collaboration with other nursing and healthcare providers, such as physicians, dentists, and social workers. NMHCs are often associated with academic institutions, providing educational settings for undergraduates and graduate students across disciplines. They have been rooted historically in the communities they serve, and many use the word “community” in their names.<sup>36-38</sup> The centers represent a model that is similar to the that of the Community Health Centers funded by the U.S. Bureau of Primary Healthcare and in many cases increase access to care for vulnerable populations.

NMHCs aim to be patient centered and embrace many of the qualities of the patient-centered medical home. The facilities emphasize health promotion, disease prevention, and early detection as well as diagnosing

and managing common acute problems and chronic diseases such as diabetes, hypertension, depression, and asthma. Patient satisfaction in NMHCs tends to be exceptionally high, and the centers are successful in managing chronic illnesses based on national benchmarks.<sup>39-41</sup> However, reimbursement and regulation issues make their sustainability a major challenge.

## School-based Centers

School-based health centers (SBHCs) bring healthcare to schools, allowing students to avoid health-related absences and get support to succeed in the classroom. SBHCs are often directed and staffed by NPs, who provide a majority of the care.<sup>42</sup> They are located in schools or on school grounds and provide a comprehensive range of services that meet the specific physical and behavioral health needs of the young people in the community. Generally, SBHCs employ a multidisciplinary team of providers, including NPs, registered nurses, physician assistants, social workers, physicians, alcohol and drug counselors, and other health professionals. They often have advisory boards consisting of community representatives, parents, youth, and family organizations that provide planning and oversight.

Some SBHCs provide primary care to students and their families, while others supplement the care provided by other providers in the community. SBHCs reduce absenteeism due to illness, improve management of chronic illnesses such as asthma, and provide important preventive interventions for both physical and mental health issues related to adolescence. Students followed in SBHCs, when compared to those followed in community clinics, were less likely to use the emergency room, more likely to receive health maintenance visits and flu and tetanus vaccines, less likely to be insured, and made more primary care visits.<sup>43</sup>

Approximately 1,709 SBHCs exist in the United States.<sup>42</sup> Funding for these centers is derived mainly from local, state, and federal grants.<sup>44</sup> Both NMHCs and SBHCs are challenging to sustain, as they serve as safety net providers, are dependent on grants, and lack effective reimbursement policies for NPs and midwives.

## Retail Clinics

Retail clinics provide a model of more urgent care than primary care and are located in pharmacies and grocery chains. Approximately 1,000 retail clinics exist in the United States.<sup>45</sup> These clinics do not require appointments, and the care they provide is somewhat limited to common acute diagnoses, such as pharyngitis, otitis, and urinary tract infections using fairly strict protocols. NPs generally provide the care, although the clinics are not owned or managed by NPs. Retail clinics report short waiting times and appeal to clientele without insurance or those for whom immediate access is needed and not available.<sup>46</sup> The American Medical Association and American Academy of Pediatrics have expressed concern about the quality of care, potential incentive to overprescribe, and lack of interaction with primary care providers in retail clinics. Despite those concerns, data indicate that care provided at retail clinics is cost efficient for limited diagnoses and that quality is good.<sup>47</sup>

## Veterans Administration

The U.S. Department of Veterans Affairs (VA) employs 3,344 NPs, the largest number of NPs in the country.<sup>48</sup> NPs in the VA system work in collaborative interdisciplinary teams, and a variety of nurse practitioner roles have evolved in the VA over the past 36 years.<sup>48</sup> For example, gerontology NPs in the VA have a major role in leading interdisciplinary healthcare teams that collaboratively manage veterans' care.<sup>48,49</sup> In addition to primary care roles, VAs have been innovative in their use of models linking practice and management roles, for which the VA is recruiting DNPs.

## Independent Practice

First, it must be acknowledged that the term “independent” has different meanings for physicians and NPs. Physicians with independent practices tend to view themselves as “hanging out their shingle” and engaging in solo practice. In contrast, the vast majority of NPs view independent practice from a licensing perspective—that is, practicing under one's own license with oversight dictated by the Board of Nursing. Within this context, independent practice takes place in a myriad of settings, many or most of which include collaborating physicians.

In most states, NPs practice collaboratively with physician colleagues. In 15 states, NPs practice with no requirement for any physician involvement.<sup>6</sup> Regardless of state, NPs often have high levels of autonomy based on competence, decision making, and accountability even when the levels of empowerment conferred by legal status and practice privileges are more restrictive.<sup>50</sup>

## Collaborative Practice

Collaborative practice is overwhelmingly the reality and the preference of NP providers. The fiscal realities of practicing solo, in addition to the restrictions on NP practice imposed by state regulations, make a team approach the best choice for physicians and nurses in primary care. A majority of NPs practice in settings with physicians who are either in private practice or in publicly funded practices, such as community health centers, the VA, or other government practices, including local health departments. Issues of collaboration will be discussed in more depth in another section of the paper.

## Summary of Research on Quality and Effectiveness of Nurse Practitioner Care

Hundreds of studies on quality of care of NPs have been conducted over the past 40 years. The studies reported here will be those that represent the largest meta-analyses and classic works using randomized controlled studies over the years. The first randomized study, out of Canada, reported its results in 1974 based on more than 21,000 patient visits.<sup>51</sup> The researchers found no difference in patient management and prescribing between NPs and physicians, and NPs managed two thirds of the episodes without consultation. Reported patient satisfaction was high. Although these programs were reported to be cost effective, they were not financially profitable to physicians because of restrictions on reimbursement for NP services.<sup>51</sup>

In 1985, the Office of Technology Assistance reported the results of a study that provided the impetus for Medicaid reimbursement for NPs and CNMs.<sup>52</sup> This study was a meta-analysis of sorts, with findings that indicated that NPs and certified nurse midwives provided care that was equivalent in quality to care provided by physicians, the comparison

measure used in this review. Patient satisfaction was high, and malpractice cases were extremely rare; certified nurse midwives were found to manage normal pregnancies safely and as well as, if not better than physicians. Results from 14 of the studies in the analysis revealed a difference in the quality of care provided by NPs and physicians, and in 12 of these instances the quality of care given by NPs was found to be better than the care provided by physicians.

Brown and Grimes reviewed more than 900 articles and documents over 30 years of practice and based on just those studies that had been randomized, reported that 1) patients followed by NPs were more likely to be compliant with taking medications, keeping appointments and following recommended behavioral changes than patients followed by physicians; 2) NPs ordered slightly more lab tests than did physicians; 3) patient satisfaction was higher for NPs than physicians; and 5) NPs scored higher on resolution of pathological conditions such as diastolic BP, blood sugar control, and otitis media. NPs and physicians were equivalent on outcome measures such as overall quality of care, prescription of drugs, functional status, number of visits, and use of the emergency room. In all studies, including those that were not randomized, NPs spent more time with patients, addressed health promotion more frequently, and made more referrals than physicians. Their patients also had fewer hospitalizations.<sup>53</sup>

Munding and colleagues found that NP outcomes for management of some chronic diseases were comparable to or better than those for physicians in a randomly controlled study in which patients were assigned to NP or physician providers.<sup>2</sup> NP hypertension care outcomes were superior to physician outcomes in comparable Medicaid-insured patients. The researchers found no differences in asthma outcomes between NPs and physicians. In another study, Lenz and colleagues compared NP and physician care in 104 randomly assigned diabetic patients.<sup>54</sup> They found no significant differences in overall outcomes 6 months after care initiation.

More recently, a systematic review of randomized controlled trials and prospective observational studies using Cochrane review methods compared NPs and physicians providing care at first point of contact for patients with undifferentiated health problems in primary care.<sup>55</sup>

Eleven trials and 23 observational studies met all inclusion criteria. Findings indicated that patients were more satisfied with care by a NP. No differences in health status were found, but NPs had longer and more frequent patient visits than did physicians. No differences were found in prescriptions, return visits, or referrals. Quality of care was in some instances better for NP visits.

In a meta-analysis based on 4,253 screened articles, of which 25 articles relating to 16 studies met inclusion criteria, Laurent and colleagues found no appreciable differences between physicians and nurses in health outcomes for patients, process of care, resource utilization, or cost.<sup>56</sup> In five studies, the nurse assumed responsibility for first contact care for patients wanting urgent consultations during office hours or outside of office hours. Patient health outcomes were similar for nurses and physicians, but patient satisfaction was higher with nurse-led care. Nurses tended to provide longer visits, give more information to patients, and recall patients more frequently than did physicians. The impact on physician workload and direct cost of care was variable.

In a study using HEDIS (Health Employer Data Information System) national benchmarks, Barkauskas and colleagues<sup>40</sup> found that NPs in six nurse-managed health centers met and often exceeded national benchmarks for treatment of chronic diseases such as hypertension, diabetes, and asthma.<sup>40</sup> Interestingly, mammograms fell below the national standards. When the researchers explored this situation further, they found that institutional policies only permitted results to be sent to physicians, even when NPs had ordered the mammogram. In a follow-up study with nine NMHCs across eight states, four performance measures were reviewed (breast and cervical cancer screening, diabetes care, and hypertension). Results indicated the sites met and in most cases exceeded the fiftieth percentile (with some exceeding the ninetieth percentile) when compared to national HEDIS benchmarks for 2009.<sup>41</sup>

## Summary

NPs have practiced in a variety of models, and the outcomes of their practices have been studied for more than 40 years. Repeatedly, when quality of care has been assessed in studies that are highly rated on strength of evidence, NP providers have been found to provide equivalent,



and in some cases, superior care. Because of the supervision requirements and payment models that have funded physicians as heads of practices, evidence about relative costs of care using various primary care provider-mixed teams has been difficult to obtain. Such studies are needed prior to implementation of any public policy that would reimburse primary care at significantly higher costs.

## SCOPE OF PRACTICE AND REGULATORY CHALLENGES

In this section of the paper, we describe the complex regulatory issues that often represent barriers to practice for NPs.

Safety is the basis for the regulation of the health professions. Medicine was the first discipline to be regulated and to have recognition and protection of its practice authority. By the beginning of the twentieth century, every state had enacted an act defining medical practice. Nursing regulation followed, and scope of practice was carved out of the broad medical authority. In many states the scope of practice for advanced practice nurses continues to be a delegated medical act. As the NP role evolved, many states revised their nurse practice acts to recognize the more autonomous role of advanced practice nurses. However, the scope and autonomy of advanced practice nursing, and specifically NPs continues to vary from state to state, resulting in widely differentiated abilities to provide primary care, to prescribe medications and order tests, to be reimbursed, and to be primary care providers of record.<sup>6,32</sup>

The route to licensure for NPs, certified nurse midwives, and other advanced practice nurses (ie, CNMs, CNSs, and CRNAs) is similar across states in spite of the variation in recognition of practice authority. All states require graduate nursing education, and most require certification by nationally accredited certification bodies. NPs have several proprietary certification bodies related to specific specialty areas, which include the American Nurses Credentialing Center, the American Academy of Nurse Practitioners Certification Program, the National Certification Corporation (women's health nurse practitioners), and the Pediatric Nursing Certification Board. Individual states use certification as a mechanism to verify competence for licensure.

One additional development emerged recently from collaboration between the National Board of Medical Examiners and the Council for the Advancement of Comprehensive Care. Together, these groups have created and administered a certification examination for doctorally prepared NP graduates. This examination assesses the knowledge and cognitive skills necessary to support comprehensive care provided DNP graduates.<sup>57</sup> This test provides a secondary credential that is not required for NP licensure.

## Impact of Scope of Practice Limitations for Nurse Practitioners

Across the 50 states, regulation of NPs varies widely. In 28 states and the District of Columbia, NPs are regulated solely by Boards of Nursing. In 22 states, Boards of Medicine and/or Pharmacy share this authority with the Board of Nursing. The variation between states generates significant barriers to NP mobility state to state.<sup>6,32,58</sup> States with sole Board of Nursing regulation have been found to be less restrictive, while having another professional board involved in NP regulation was correlated with more restrictions on consumer access and less than full implementation of NPs into the healthcare provider workforce of the state.<sup>17,59</sup> Lugo and colleagues concluded that the regulations in place for NPs across the country seem to be arbitrary in nature and unrelated to any evidence about associations between restrictions to NP practice and patient safety.<sup>32</sup> These regulatory limitations affect access to care and promote underuse of the full skill sets of the less costly primary care providers, creating barriers to achievement of the nation's goals for efficient, cost-effective primary care to all citizens.<sup>32,60</sup>

Variations in scope of practice and regulatory policies affect the primary care workforce differently in different states. Results from recent studies indicate that more restrictive states lose potential NPs to states that have more supportive practice acts and regulations that govern NP practice.<sup>32,61,62</sup>

Financing and reimbursement modalities are also affected by the level of accountability for practice. Malpractice insurance for collaborative physicians is sometimes higher if the physicians are expected by law to be accountable for an NP provider's practice—also leading to fewer NP providers.<sup>62</sup> Lugo et al. ranked states on the basis of access to patient choice of provider related to the level of restrictiveness of regulation of NP practice. Favorable practice/regulatory environments were associated with greater supplies of (and thus greater access to) non-physician providers.<sup>32,63</sup>

It is important to reiterate that the goals/benefits of less restrictive regulatory environments are related to access, efficiency, quality, and cost of care. The ability for NPs to practice in full collaboration with

physicians is the optimal goal for patients, for NPs, and for physicians as well. Primary healthcare needs, needs related to management of chronic illness, and the numbers of patients and families with potential access to primary care are expected to expand greatly over the next decade.<sup>3,64</sup> A recent policy brief from Rand Health addressed the rising costs of healthcare in Massachusetts after the state approved its near universal health plan.<sup>65</sup> They made multiple recommendations, including one to “expand scope of practice and change payment policies for NPs and physician assistants.” The authors went on to say that NPs and physician assistants are underutilized despite being qualified to provide primary care at a lower cost than that of other providers. The literature verifies that a team approach to care is best and is strengthened by real or virtual collaborative practice between physicians and their NP and physician assistant colleagues.<sup>3,61,66,67</sup> In fact, the possibilities for collaboration and mutual support between physicians and NPs have been enhanced in recent years by information technologies that support virtual collaboration.

Anecdotally, at the grass roots level, NPs and many physicians report that collegial relationships are alive and well. The divisiveness occurs at the state and national level, where professional organizations representing physicians continue to block regulations that would allow NPs to take full accountability for their practices.

The final issue related to practice/regulatory environments is the negative effect of this variation on our collective abilities to envision model primary care roles that could address the question of how primary care providers should be trained. Under current conditions, that question would need to be answered differently from state to state. In states that require supervision with reference to written specific protocols (something generally impossible to maintain in actual practice), physicians and NPs might be expected to learn how to enact good practice, given the regulations. Instead, throughout the United States, each health professional who is being trained for primary care is trained for the role envisioned by their respective professions, regardless of the regulations and the roles for which other primary care providers are being trained. Physicians, osteopaths, NPs, and physician assistants are prepared, certified, and licensed to provide competent healthcare to patients presenting with primary care problems. Regulations developed 20 and 30 years ago are outdated and no longer useful. It is time to envision

the desired roles for each provider at a national level and to bring the training into alignment with these desired roles for each member of the healthcare team.

Several positive developments are on the horizon. The numbers of advanced practice nurses and physicians sitting jointly on standards-of-practice and standards-of-care committees are increasing, and advanced practice nursing and physician faculty are cross-teaching students from both disciplines more frequently. Another heartening development is the collaborative work of six healthcare regulatory organizations (Medicine, Nursing, Social Work, Pharmacy, Physical Therapy, and Occupational Health) to guide regulatory decision making with regard to scopes of practice for healthcare professions. The premise for this collaboration is that the only factors relevant to scope of practice are those designed to ensure that all licensed practitioners are capable of providing competent care to patients. It is hoped that the guidelines developed by this group will assist legislators and regulatory agencies in making sound policy decisions.<sup>58</sup>

## Overview of a New Advanced Practice Registered Nurse Model of Regulation

The regulation of advanced practice nurses, and most specifically NPs, is a complex phenomenon, made more difficult by the multiple roles and specialties involved. APRN (advanced practice registered nurse) regulation encompasses four primary elements:

- *Licensure*—granting the authority to practice which is enacted by state nurse practice acts and rules and regulations;
- *Accreditation*—providing formal review and approval of academic education and certification entities;
- *National certification*—recognizing the achievement of standards recognized by the profession; and
- *Graduate or postgraduate education*—formally preparing APRNs for practice.

The new regulatory model for advanced practice nursing is the outcome of several years of negotiation among more than 25 key stakeholders. Through consensus building, groups came together to produce a model that would integrate the regulation of NPs through an entity called by the acronym LACE (licensure, accreditation, certification, education). It is expected that the new model will strengthen regulation for APRNs across the board, bring the states into alignment over time and make it possible for individuals representing the myriad of advanced practice specialties to work collaboratively toward a strong nursing regulatory base.<sup>17</sup>

The process of developing a new regulatory model was a breakthrough for APN organizations, which have struggled with unity for many years. Advanced practice nursing is young compared to other established healthcare professions and, through the new model for regulation, it is coalescing into a cohesive whole. The outcomes of this work, not yet completely implemented, are described in the following text.

APRN is the title used for licensure. This title clarifies that nurses holding themselves out as APRNs and aspiring to APRN scope of practice have completed the requisite graduate didactic and clinical education, have successfully passed an accredited national advanced nursing certification examination, and have been duly licensed by their state.

In this APRN model of regulation, there are four roles as described in the first section of the paper (CRNA, CNM, CNS, and CNP).<sup>17</sup> Individuals who have the appropriate education will sit for a certification examination to assess nationally established competencies of the APRN core and at least one of six population-focused areas of practice (adult/gerontology, family, pediatrics, women's health, neonatal, psych/mental health) for regulatory purposes. APRN certification programs will be accredited by a national certification accrediting body and require a continued competency mechanism.

The new model moves APRN education into a broader population focus with a more generalist base. Specialty preparation (oncology, cardiology, palliative care) is optional and builds on the population focused, generalist base. This change strengthens basic skills, allowing NPs an opportunity to enhance their pivotal role in primary care. Clinical and didactic coursework must be comprehensive and sufficient to prepare the graduate

to obtain certification for licensure to practice in the APRN role and population focus.

In the new regulatory model, NP educational programs will need to be granted pre-approval and pre-accreditation prior to student enrollment, as is the case for nurse midwifery and nurse anesthesia at present.<sup>17</sup> This pre-approval assures that programs will meet standards for graduate nursing education and that students will be eligible for certification and licensure.

In terms of national certification, the new regulatory model enhances the interface between licensing bodies, accreditors, educators, and certification bodies. It calls for better reporting mechanisms, provides tighter control of test psychometrics, ensures competence and maintenance of recertification, and provides fluid communication among the entities that comprise LACE.

Nursing regulators will have sole responsibility for licensing APRNs and will only license individuals when graduate education and certification are congruent. The Pew Health Commission and others have long held that regulation needs to be evidence based and related to quality rather than promoting professional divisiveness.<sup>68</sup> The new NP regulatory model is a significant move toward this direction. We recognize that current regulation of APRNs does not reflect all of the components described in the model and will evolve incrementally over time. Further, the goal of the new model is to bring states into alignment with a scope of practice, enhance independent/collaborative relationships with professional colleagues, and provide practitioners with prescriptive authority.<sup>17</sup> NPs perceive the new regulatory model as a collaborative process with the potential to change as healthcare evolves and new needs become apparent. This new model will allow NPs in primary care practice to function to their greatest potential as healthcare providers.

# EDUCATIONAL PROGRAMS

## Numbers of Programs and Students

For 28 years, the American Association of Colleges of Nursing (AACN) has conducted an annual survey of institutions that offer baccalaureate and higher-degree nursing programs. In the latest survey, 663 out of a potential 762 individuals returned completed surveys, for a response rate of 87 percent.<sup>13</sup> The 2009 report includes data about numbers of students enrolled (Fall 2008) and graduating (August 1, 2007 through July 31, 2008) from graduate programs in the nation's nursing schools.

The number of master's programs grew from 330 in 2005 to 475 in 2008.<sup>13,69</sup> NPs accounted for 47 percent of all students enrolled in master's degree programs and 51 percent of all master's graduates. Master's enrollment changes increased in all geographical regions across the United States. Based on the national NP certification for which a program prepares graduates, graduates from master's level programs represented the largest group in the following primary care specialties: family NP (57), adult NP (15), and pediatric NP (6). Of the post-master's NP students, graduates specialized in family NP (53), adult NP (8), and pediatric NP (4).<sup>13</sup> Seventy percent of the dual degree graduates were adult/gerontological NPs (131 of 187 graduates).<sup>13</sup>

During a 6-year period, Doctor of Nursing Practice (DNP) programs have grown from an estimated four programs in 2003<sup>70</sup> to an estimated 98 in 2009.<sup>71</sup> DNP programs prepare both nurse administrators and NPs. The number of post-master's DNP enrolled students (1,158) was much greater than that of post-baccalaureate DNP students (324) because many programs have not implemented the post-baccalaureate option.<sup>13</sup>

## Curricula and Programs of Study

NP education is guided by standards and criteria developed by nursing professional organizations. These include AACN, the National Organization of Nurse Practitioner Faculties (NONPF), the Commission on Collegiate Nursing Education (CCNE), and the National League for Nursing Accrediting Commission (NLNAC). The National Task Force on Quality Nurse Practitioner Education (NTF), a collaborative



effort of several nursing professional organizations, developed criteria for evaluating NP programs.<sup>5</sup> Curricula for NP master's education consist of graduate core content, advanced practice nursing core, nurse practitioner competencies,<sup>72</sup> and specialty (or population-focused) master's competencies. The APN core includes advanced health/physical assessment, advanced physiology and pathophysiology, and advanced pharmacology.

Despite accepted NP competencies,<sup>73,72</sup> curriculum guidelines, and requirements<sup>5,74</sup> NP programs vary in the titles of their educational programs, the number of credits they offer, and the clinical hours required for successful completion. No central database exists from which this information can be readily accessed. Scheibmeir compiled data from schools of nursing with master's level NP educational programs in a four-phase research study incorporating information from websites of 328 schools of nursing, collecting survey data from these institutions, and conducting focus groups with nursing faculty.<sup>75</sup> The results of this study provide a major impetus for implementation of the Consensus Model for APRN regulation described above. A total of 1,037 program titles were found. Of these, 24.5 percent were for family NPs, 39.9 percent were for other commonly recognized program titles, and 35.6 percent were for self-described single or combination programs.

The new APRN Consensus Model will strengthen curricula across the United States by creating agreed-upon program designations based on a population focus (ie, family, adult/gerontology, pediatric). The goal is also to promote consistency and preparation across programs. In the Scheibmeir<sup>75</sup> report, 84 percent of survey respondents indicated that master's level NP graduates with broad preparation were more marketable than were narrowly focused NPs. The master's level graduates had greater employment flexibility and could take additional subspecialty preparation later if they desired. Also, rural communities preferred to employ graduate NPs who could address healthcare needs across the lifespan (eg, family NPs). Of all respondents, 56.2 percent felt that subspecialty preparation did not enhance marketability, whereas 42.7 percent felt it did, citing that NP graduates with a subspecialty could market themselves in a specific area in which they wanted to practice and that some employers actively seek NP graduates with specific expertise.

All graduate NP nursing students have completed basic educational preparation to qualify for licensure and practice as registered nurses. This basic preparation includes extensive clinical hours and related experiences. For APN training, the nurse must complete 2 to 3 years (depending on degree level) of full-time equivalent coursework. As part of this training, the NTF recommends a minimum of 500 supervised clinical hours in master's level NP programs to meet evaluation criteria.<sup>5</sup> NONPF<sup>76</sup> issued a statement indicating that specialty organizations are best equipped to determine the number of clinical hours required beyond the master's degree for a DNP graduate. Guidelines from the AACN<sup>77</sup> recommend that 1,000 clinical hours beyond the basic baccalaureate preparation should be required for completion of a DNP degree.<sup>77</sup> Determining the number of clinical hours required for completion of a DNP program and to qualify for initial certification remains inconsistent. Recent discussions regarding clinical hours have included a stronger focus on competencies versus actual hours; however, to date there has not been agreement on how to transition from clinical hours to solely competency-based requirements.

Clinical hours are often embedded within the courses for many programs and are consequently difficult to extract with precision. In Scheibmer's study, the components of clinical hours included direct care, simulation, skills laboratory, and other experiences.<sup>75</sup> Of the 295 schools who provided self-reported data, 149 (51 percent) used clinical simulation in their educational programs for NPs and another third were planning to enhance their programs with this teaching method. Of the 149 schools, 39 (26 percent) counted simulation as direct care hours and almost two thirds (192) expressed the opinion that these hours should be included in direct care hours in the future. One hundred ninety schools (35 percent) counted direct care hours only, whereas 11 schools made no distinction between skills laboratory, simulation, and clinical (direct care) hours. The range for total clinical clock hours was 540 to 960. No studies have been done to demonstrate the number of hours needed to achieve competency. As nursing moves forward to implement the Consensus Model for APRN Regulation, we expect to achieve greater standardization in educational programming with respect to course content and clinical hours, accompanied by greater standardization in the regulation of practice and role delineation for primary care.

## Challenges to Increasing the Numbers of Nurse Practitioner Graduates

Although primary care providers are in short supply, all qualified applicants were not accepted into NP educational programs in 2008. Because 169 of 308 schools with master's NP programs had enrollment limitations, 2,734 qualified applicants were denied admission.<sup>13</sup> For the DNP programs, 748 qualified applicants could not be accepted. The three most common reasons given for not admitting all qualified applicants from master's program schools were (with schools able to indicate more than one reason), insufficient number of faculty (52 percent), insufficient number of clinical sites (45 percent), insufficient number of clinical preceptors (36 percent), and overall budget cuts/insufficient budget (17 percent). For DNP programs, insufficient number of faculty (42 percent) was the number one reason, followed by other (not specified, 24 percent) and insufficient number of clinical sites (15 percent). The top three reasons for insufficient number of faculty for both master's and DNP programs were the same: inability to recruit faculty due to competition for jobs with other marketplaces (47 percent and 64 percent, respectively), insufficient funds to hire new faculty (20 percent and 64 percent, respectively), and qualified applicants unavailable in the geographic area (30 percent and 21 percent, respectively). The most important reason for not accepting all qualified applicants across all programs was insufficient number of faculty,<sup>13</sup> and the faculty shortage is projected to worsen as aging current faculty members reach retirement.

The challenges faced by NP programs are not unique. Securing adequate numbers of clinical placement sites for students, finding competent preceptors, establishing policies and procedures for clinical experiences that meet regulatory and legislative rules, and negotiating mutually beneficial arrangements for student learning are common challenges in medical education. Medical schools, physician assistant programs, and other health professionals programs compete for the same sites. As the number of NP programs grew and the number of students from other disciplines needing clinical placements increased, especially in primary care, clinical sites for NP programs became more difficult to secure. Offering incentives to preceptors is one way of retaining them, yet the majority of NP programs do not have the resources to compensate sites or preceptors.

CMS billing practices and reimbursement for medical services also present challenges for clinical sites, preceptors, and students.<sup>78</sup> When deciding where to place a student, a faculty member must consider the scope of practice for NPs within the state, requirements for collaborative agreements (mandatory for Medicare even if the state does not require it), the credentials of the preceptor, the type of facility, the services provided at the practice, billing and reimbursement for the preceptor and facility, and documentation procedures. CMS regulations are onerous for all students in the health discipline and dictate that licensed providers must conduct the examination, do the clinical decision making, and establish the treatment plan and management. These regulations create environments of anxiety and high alert for NPs and physicians who act as preceptors.<sup>79</sup> Deciding how to meet the CMS rules for evaluation and management services and billing creates a challenge and often leads to potential preceptors refusing to work with a student. The elements of evaluation and management—history taking, physical examination, medical decision making, counseling, and coordination of care—are all areas in which students need to gain experience.

In summary, schools of nursing develop NP educational programs based on established guidelines and recommendations from leading nursing organizations and accrediting bodies. Students receive learning and clinical experiences that will help them meet expected competencies for graduate NPs. The APRN Consensus Model should provide greater consistency across programs, reduce variability, and facilitate regulatory change. The challenges of a faculty shortage, competition for adequate and appropriate primary care clinical sites and preceptors with other health professional programs, and funding for students and schools of nursing remain. But while current master's programs prepare highly qualified NPs for clinical practice, the need for NPs with additional skill sets has prompted further development of clinical doctoral programs for NPs.

## Doctoral Nursing Programs and Workforce Requirements

The increasing complexity of healthcare; the increasing content, duration, and credit requirements of existing master's degree programs; and the demand for formal practice-centered education and scholarship opportunities are major forces propelling the development of the

professional doctoral degree for the nursing profession.<sup>80</sup> This is the highest academic degree for nurses committed to clinical and administrative practice. The DNP curriculum for advanced practice nurses includes basic graduate and advanced nursing practice cores plus specific essential areas identified by AACN.<sup>77</sup> The additional advanced content areas for the doctoral program are intended to improve leadership skills and include such topics as organizational systems leadership for quality improvement, information systems and patient care technology, healthcare policy for advocacy in healthcare, interprofessional collaboration, and clinical prevention for improving patient and population health. The doctoral program culminates with a scholarly clinical capstone project. The intent is to prepare DNP graduates who are capable of providing evidence-based care for individual patients and also capable of leading interprofessional practice initiatives that focus on patient safety, quality of care, and performance improvement. Instead of traditional research-focused scholarship, the scholarship of DNP graduates should exemplify Boyer's broader definition of the "scholarship of practice."<sup>81</sup>

The DNP is envisioned as a terminal *practice* doctorate for nursing. Recognizing the need for a new type of doctorally prepared faculty member to support DNP programs, the first goal of many programs has been to increase the pool of faculty prepared to train future NPs.<sup>82</sup> The first DNP graduates were committed to employment in a variety of positions: faculty in a school/college of nursing (110 [31 percent]), ambulatory (non-hospital) clinical facility (48 [13 percent]), hospital clinical setting (33 [9 percent]), or hospital administrative or executive position (15; [4 percent]). Eleven percent of the graduates had other plans, and 32 percent were not sure of their plans.<sup>71</sup>

To date, almost all of the DNP programs are for students who already have a master's degree. DNP students add competencies that build on the specialty practice education they received in their master's programs and, in most cases, their experience in practice, administrative, or faculty roles. Yet, one influential professional association, AACN, which represents deans and directors of baccalaureate and higher-degree nursing education programs, has called for the DNP to be required for entry into practice as a NP by 2015.<sup>71</sup> No licensure or certification requirements mandate this change to date, and some APN organizations (such as those representing nurse midwives and clinical nurse specialists) oppose the entry-level DNP. Others

have expressed concerns that a transition to a DNP for entry into NP practice could reduce the production of NPs at a time when the country may experience a dramatic increase in need. The number of graduates from master's and post-master's NP primary care programs increased from 2004 to 2008, but only a small number of schools had made the decision to phase out entry master's level programs during this period. Increasing or even maintaining the current annual graduation numbers (about 7,500) of primary care NPs would require funds from students and schools to pay for additional study for each graduate, a sufficient number of faculty members who are qualified to cover the additional year's program content as well as supervision of individual scholarship projects, and more preceptors for the additional hours of supervised clinical time. These are not insignificant challenges during a period of economic downturn that has reduced budgets for many schools of nursing.

Proponents of retaining the current system of M.S.N. specialty preparation and optional post-master's DNP programs argue that this approach would ensure that DNP graduates actually acquire advanced, system-level competencies because they will have previously learned, and mastered in practice, the knowledge and skills associated with the care of individual patients. As described above, more than sufficient evidence exists to show that M.S.N.-prepared NPs serve patients and communities well. Rather than mandating the increased costs to students, faculty, and schools of nursing that would be required to convert to entry DNP programs now, many argue that the pressure for DNP entry programs should be removed, allowing the market (societal needs, school budgets, student demand, and employer demand) to settle the issue over time and, at a minimum, assuring a transitional period with a production capacity equal to the potential needs that may result from national healthcare reform proposals.

All the other health professions (eg, pharmacy, physical therapy) have converted their master's programs to practice doctorates. Currently, with the length of most M.S.N. programs, nursing students with practice specialty preparation earn academic credits and supervised practice hours equivalent to those earned by students in doctoral programs in pharmacy or physical therapy, yet the nursing students lack the equivalent credential. A transition of master's to DNP entry programs would rectify this inequity and ensure that all future NPs would be prepared according to a single, and higher, educational standard. At this point, therefore, the "how they will be trained?" for NPs is in flux.

## PRIMARY CARE TEAMS, TEAMWORK, AND COLLABORATION

The terms “team” and “collaboration,” often used synonymously, are given lip service by NPs and physicians in primary care in both education and practice settings. There is little argument that it does take a “team” and “collaboration” to provide the full range of primary care services, especially healthcare services included in the models being proposed for patient-centered medical homes. The IOM and the ACP identify collaboration between providers as an essential component of good primary care.<sup>3,67</sup> Yet, in reality, little attention is paid in the training of primary care professionals to development of the knowledge, skills, and attitudes related to teamwork and collaboration.<sup>83</sup> Gardner and others have reminded us that collaboration requires an emphasis on the process of developing respect, trust, and a sharing of power.<sup>84-86</sup> Tradition, professional socialization, and hierarchical relationships have impeded that process. If collaboration works and is important to the efficiency and quality of primary care, what is the problem?

First, physicians and NPs may view the concepts of teamwork or collaboration differently. Although O’Brien and colleagues found numerous areas of agreement, physicians in their study expected nurses to be seekers of collaboration, not the reverse.<sup>87</sup> These authors noted that “physicians believed that communication would improve if what they said was heard and heeded,” whereas NPs “believed they were not heard” at times by physicians.

For NPs, one of the thorniest issues is the way the term “collaboration” has been interpreted in national and state regulations. Too frequently, collaboration is defined in regulatory language that affects NPs. For example, Medicaid and Medicare reimbursement for NPs requires a “collaborative agreement” with a physician. Likewise, in many states, collaboration is a component in regulatory language for NP scope of practice. Unfortunately, the term “collaboration” has been interpreted to mean “supervision.” This interpretation has hindered the advancement of true collaborative relationships between physicians and NPs and impeded access to NP primary care.

A related issue is the profession-based disagreement about who is capable of leading primary care teams. In the many NP primary care models we reviewed in this paper, all provide for strong collaborative relationships between healthcare providers, even though some teams are managed by nurses. NPs, and many physicians, believe that the level of communication and teamwork among providers is the fundamental characteristic that determines the quality of primary care practices, rather than the type of provider that is the accountable leader of a particular practice.

Other concerns include the complexity of the phenomenon itself and the significant interpersonal commitment involved in building collaborative relationships.<sup>85,86</sup> The educational preparation of primary care providers occurs in isolation and rarely includes a focus on interprofessional collaboration.<sup>67,68</sup> Students are not expected to develop collaborative relationships with members of other disciplines, do not learn about conflict management skills, and are rarely exposed to faculty from other disciplines. The American College of Graduate Medical Education, the American Association of Colleges of Nursing, the NONPF DNP competencies and the learning objectives outlined in work recently reported by the Robert Wood Johnson Foundation-funded project, *Quality and Safety Education for Nurses*,<sup>83</sup> have all included teamwork and collaboration as essential competencies for practice.<sup>73,77,83,88</sup>

Two examples of interdisciplinary education are reported here. One was funded by the Robert Wood Johnson Foundation Partnerships for Training initiative in the late 1990s.<sup>89</sup> This project brought together NPs, physician assistants, and CNMs along with university partners to teach core primary care content. Unfortunately, the programs did not include medicine, and many started with funding that was not sustained once funding ended.

Another federally funded example of interdisciplinary education is the area health education centers (AHECs) funded by the Bureau of Health Professions. This funding, in existence for over 30 years, addresses healthcare workforce issues by exposing students to healthcare career opportunities that they otherwise would not have encountered, establishing community-based training sites for students in service learning and primary care disciplines, and providing continuing education programs for healthcare professionals across disciplines. Although the criteria for AHEC funding emphasizes interdisciplinary education, requirements



established more than 30 years ago are out of date and need to reflect the current situation, in which NPs, CNMs, and physician assistants serve as significant primary care providers. The only requirement currently with AHEC funding pertains to medical students; it is silent on other provider students, such as NPs, CNMs, and physician assistants. AHECs exist in all but three or four states and provide important clinical experiences for primary care students.

Although academic silos and accreditation requirements have precluded interdisciplinary education in the past, there is reason to hope that new information technologies and healthcare reforms will lead to greater integration of the education of primary care provider students from different disciplines. And, whether as disciplinary or interdisciplinary objectives, we hope that teamwork and collaboration will be included in the curricula to prepare all primary care providers.

These issues are significant, but the underlying problem that is the biggest barrier to achieving a world with effective, efficient primary care teams is our collective lack of vision for primary care roles that will serve us into the future. Currently, each discipline (ie, physician assistant programs, NP programs, and medical schools) prepares providers for essentially the *same* role—or for roles with significantly overlapping scopes of practice. Role ambiguity and duplication of costs and efforts are the natural result. Primary care physicians are pushing both for higher incomes and for the “lead” roles in coordination of care. Yet our society desperately needs to *reduce* the costs of care. Team training emphasizes the need for a “common mental model” of what is to be accomplished by each team member, yet our disparate views about primary care roles play out in education, regulation, reimbursement for services, and our ability to provide patient-centered care.

The proposed patient-centered medical home (PCMH) concept is a model of healthcare that embodies the full spectrum of primary care based on clearly defined provider-patient relationships, and primary care standards of accessibility, continuity, comprehensiveness, integrated care, and interdisciplinary care.<sup>90,91</sup> The overall goal of the medical home concept is a full spectrum of care—preventive and curative, longitudinal, and coordinated.<sup>90</sup> However, most of the language to date around the PCMH concept is physician-centric and presents the physician as the sole

leader of the team despite two critical trends: 1) the looming shortage of primary care physicians; and 2) the evidence that other, probably lower cost, primary care providers and models of care are equipped and willing to provide a PCMH—and have been doing so—to diverse populations.<sup>38,92,93</sup> NMHCs have embodied many of the characteristics of the PCMH concept for years,<sup>93</sup> yet have been often limited by federal, state, and insurance reimbursement and practice policies that limit the full scope of practice. The ACP monograph<sup>3</sup> supports testing new models of the PCMH, including those that are nurse led. With support from other physician, osteopath, physician assistant, and NP groups, perhaps we can map out cost-effective primary care models that can accomplish the PCMH aims. If we redefine the roles for primary care physicians, NPs, and physician assistants, and if we standardize the relationships in regulation across states, then (and only then) will it be possible to envision curricular strategies that prepare new graduates with the competencies they need to perform in these roles.

## Summary

Collaboration and interdisciplinary education and practice have been discussed as integral components to any model of care for the future. Based on IOM recommendations, expected educational competencies related to interdisciplinary collaboration from both nursing and medicine, trends in practice models, and perhaps most important, the needs of the nation for primary care providers, now is the time to address what it will take to prepare all providers for collaboration and interdisciplinary primary care practice.<sup>67</sup>

## SUMMARY AND RECOMMENDATIONS

In this paper, we have presented the broad range of issues relevant to NPs in primary care. NPs have made significant strides in clarifying their role for patients, physician colleagues, policymakers and third-party payors. With these thoughts in mind, we recommend the following issues as foci of discussion.

### Regulation Changes

The role of NPs as primary care providers has evolved over 45 years. Patients have had highly satisfactory experience with NPs in multiple settings, a majority of which are physician-led practices. The diversity of state regulations has been a major barrier to fully utilizing NPs and providing increased access to primary care. Until regulation issues related to scope of practice and prescriptive authority are standardized at the most flexible level, it is impossible to design effective primary care roles involving NPs or to redesign the primary care physician role into one that is commensurate with the legitimate increased income expectations that may be required to attract sufficient numbers of primary care physicians.

### *Recommendations*

- Nursing should continue implementing the new Consensus Model for APRN Regulation, which would provide a broader basic preparation for all NPs and greater standardization of the nursing professional regulatory process.
- State and national policies should be changed to clarify the scope of practice of NPs as independent (albeit collaborative in the true sense) primary care providers. Subsequently, insurers' policies, including Medicare and Medicaid, should be revised to link reimbursement to practice.
- Laws that prohibit provider discrimination should be enforced so that patients have access to the primary care provider of their choice.

## Creating a Vision for Primary Care Provider Roles and Team Training

In 2003, *Health Professions Education: A Bridge to Quality* offered a new vision for health professions education: “All health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches and informatics.”<sup>67</sup> Educational programs must lay the foundation for strong, meaningful, collaborative primary care practice. In order to develop effective strategies for developing these competencies, members of all disciplines need to be committed, creative, and willing to think outside of their professional silos.

### *Recommendations*

- Fund models that develop and evaluate interdisciplinary and intradisciplinary strategies that develop competency in teamwork and collaboration in primary care provider education programs.
- Build on the work of the ACP to define new primary care roles for physicians, NPs, and physician assistants and align curricular content, strategies, preceptorship, and faculty mentoring with this vision.
- Eliminate barriers to education and precepting of primary care providers by faculty from disciplines other than their own.

## Other Educational Changes

### *Recommendations*

- Expand federal funding of such programs as AHECs to include minimum requirements in high need areas for all primary care students; at this time only medical students are required to have a minimum of clinical experiences in high-need areas. These settings would lend themselves to interprofessional experiences and service.
- Expand tuition reimbursement programs for all providers who choose primary care and practice for at least 5 years in primary care (in addition to funding those who provide primary care in rural and underserved areas).

- Move practitioners into the workforce as rapidly as possible, including incentives for full-time study for NP students (who currently opt for part-time study so they can remain employed), similar to the traineeships of the 1970s and 1980s.
- Support the DNP program as a post-master's program and discourage the development of entry-level programs until the need for NPs in the primary care workforce is met (but offer tuition incentives for students to complete DNP programs after a period of practice in a primary care provider role).

## Models of Care

### *Recommendations*

- Expand and fund the PCMH and other innovative models, using interprofessional teams in newly defined roles, and use these sites for training all types of primary care providers.
- Evaluate outcomes of all types of primary care practices, using common databases that support benchmarking and continuous quality improvement.

If indeed primary care is the foundation of the future healthcare system in this country, and if access to primary care for all is to be assured while containing or reducing costs of care, NPs will play a crucial role in achieving these aims. In many countries, much of the primary care for women and children is provided by nurse midwives, nurses, and community health workers, with outcomes superior to those in the United States.<sup>94</sup> Surely we are capable of designing the best possible primary care teams of the future. Primary care in today's world cannot be fully provided by any one person or any one profession. Collaboration among providers is essential, and all providers must be able to practice to their fullest capacity and educational preparation without onerous and unnecessary regulations that are not evidence based. We look forward to discussing these recommendations and building positive momentum for assuring a well-educated primary care workforce for the future.

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# WHO AND HOW: PHYSICIAN ASSISTANT EDUCATIONAL ISSUES IN PRIMARY CARE

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## CONTEXT AND HISTORY

In the 1960s the U.S. health delivery system and the healthcare workforce changed dramatically due to civil rights legislation, new funding opportunities in Great Society programs, new technology, and the return of healthcare personnel from the Vietnam War. Although we now have a 40-year history of training and deployment for primary care physicians, physician assistants (PAs), and nurse practitioners (NPs), the United States still suffers from shortages and maldistribution of these providers. The country also suffers from poorly defined policies for potential primary care workers at other levels, including emergency medicine personnel, community health workers, and other allied healthcare personnel.

For PAs, federal funding of early programs initially emphasized the training of returning military medics and corpsmen, and then focused on the recruitment and retention of a diverse group of students, including individuals from specific medically underserved communities. Federal funds were also directed toward programs with required clinical rotations in rural and urban underserved settings, such as community and migrant health centers. Research and training dollars emphasized strong relationships with primary care physicians and issues of cultural sensitivity and competence. Clinical coordinators worked in partnership with primary care clinics to develop job opportunities and appropriate strategies for using PAs in these settings.

As federal training dollars diminished and the number of PA training programs grew (from 49 in 1987 to 148 in 2009),<sup>1,2</sup> federal funding decreased, and healthcare educational programs relied less on the federal funding that *did* exist. Newer PA programs—many lacking the strong partnerships with academic medical centers that had been enjoyed by the initial programs—had more generic mission statements with less emphasis on primary care. Without connections to the robust infrastructure of family medicine departments, as AHECs, and other similar agencies, personnel from these new programs often found it easier to arrange for lecturers and clinical preceptors from specialty “cultures” that had weak relationships—if any—with primary care. The move toward master’s degrees in the past 15 years has also changed the national PA applicant pool to include fewer men, fewer military medics and corpsmen, and fewer individuals from rural areas. In the past, people from these groups were more interested and more recruitable for careers in primary care.

A national census conducted by the American Academy of Physician Assistants showed a decline in primary care employment from 53 percent in 1998<sup>3</sup> to 37 percent in 2008.<sup>4</sup> However, these numbers reflect a variation of the traditional definition of primary care, which includes family medicine, general internal medicine, general pediatrics, and obstetrics/gynecology. Also, these findings do not account for the increasing numbers of PAs working in emergency and urgent care settings (9.5 percent in 1998 and 10.5 percent in 2008).<sup>3,4</sup> A large number of PAs who work in emergency medicine and urgent care are essentially the primary care providers for uninsured patients, who use these facilities as their only source of care.

The number of PA graduates working in primary settings varies widely, with major regional differences mirroring primary care deployment patterns of young physicians. Programs with high rates of primary care placement use a variety of methods to influence graduate specialty selection, including specific recruitment and selection strategies, use of primary care providers as principle lecturers, and a clinical year design emphasizing primary care experiences. The one external issue that has been difficult to control is the availability of primary care jobs in settings that welcome new graduates.

## CHOOSING THE RIGHT STUDENTS FOR PRIMARY CARE

The PA profession shares many recruitment, selection, and retention issues and controversies with other health professions. In the past, when most PA students were individuals with prior employment in healthcare, it was probably easier to determine which students would select primary care jobs based on their previous employment and hometown. Questions being addressed among current PA programs with a goal of turning out primary care PAs include the following:

1. *Should schools and programs focus on traditional applicants, or should they recruit from specific populations in order to increase diversity and deployment?*

Federal funding for PA programs and for the interdisciplinary Healthcareer Opportunity Program included support for targeted recruitment activities. These programs were successful in increasing the number of disadvantaged students in PA programs. Unfortunately, this funding is no longer available, and PA programs are significantly less diverse.

2. *Are primary care providers “a different breed” who can be identified—and then selected—in the admissions process?*

The PA profession was originally successful in identifying future primary care providers because applicants were second-career individuals with prior employment in healthcare, often in primary care. With less current emphasis on this more-experienced applicant pool, it is more important for programs to be clear about their mission (primary care specifically as compared with more generic outcomes), and to seek out and select students who understand and can articulate the values of primary care.

3. *Would personality testing—such as the Myers-Briggs process—provide clues about who would, could, or should choose to specialize in primary care?*

Although personality testing is not appropriate for use in the admissions process, the Myers-Briggs test can be used to structure groups, to assist with appropriate clinical placements, and to expand students' views of what is available and possible in the medical environment—especially in primary care, which requires a broad, “big-picture” view and strong problem-solving skills.

4. *Do future or potential primary care providers have a more “altruistic” history than students choosing other specialties?*

Students with a history of community service, including time spent in the Peace Corps or the military, seem better able to relate to the primary care environment. Admissions criteria that acknowledge and value these types of experiences are more likely to lead to the selection of students with a high potential for primary care employment.

5. *Are there specific interview formats that would help to identify and select individuals with potential as primary care clinicians?*

PA programs have served as laboratories for unique and innovative admissions activities. Interviewing applicants in groups, for example, provides different perspectives on each potential student than do interviews of a single applicant by a group or succession of interviewers. An interview day that includes observed group activities and interactions provides additional information that is useful to admissions committees. Scenarios and vignettes focusing on primary care topics can be used in the admissions process to deliver a message about the importance of primary care in the curriculum.

6. *Who should serve as screeners and interviewers for the admissions process if the goal is to maximize the numbers of students choosing primary care?*

To identify and choose students with primary care potential, primary care providers must be an integral part of the admissions team.

## PRINCIPLES OF THE PA EDUCATIONAL EXPERIENCE

Typically, PA programs are 2 to 2 and a half years in duration, with approximately 1 year spent in didactic settings and 1 year in full-time clinical experiences. PA programs focus on generalist training with the idea that employer-physicians may ultimately “customize” the PA to their practice—either in primary care or in a specialty field. Increasingly, PA programs have moved to the master’s degree level in the past 15 years, although some programs have retained the bachelor’s degree as a strategy for training individuals from military, rural, and disadvantaged backgrounds. Tuition ranges from \$11,362 to \$101,324,<sup>2</sup> depending on the type of institution and availability of state funds to support resident education. Entry-level salaries ranged from approximately \$63,000 to \$100,000 or more in 2008 (the most recent year for which data are reported).<sup>2,4</sup>

PA program faculty manage educational programs in the didactic year, determining student competencies, designing coursework, developing specific course objectives, hiring lecturers, and writing and evaluating examinations. This competency-based model, which also integrates content across multiple courses, is effective and efficient and assures the delivery of appropriate content. Frequent assessments provide feedback to faculty and students on academic progress and professional development.

Compared to students in most medical schools, who learn basic sciences before they approach patients, PA students learn screening and begin participating in physical exams early in their training. This practice helps to make clinical assignments more than shadowing experiences. Most programs include clinical exposure in the first year, ideally in primary care settings with primary care role models.

In addition to traditional medical content, PA didactic course work often includes small-group experiences designed to build interdisciplinary skills through work in teams. Accreditation standards require instruction in medical ethics, cultural competency, and appropriate professional roles within the healthcare system. Students are encouraged to be involved in community service, including volunteer experiences in community settings that focus on healthcare access for the underserved.

PA programs vary in how they design their clinical year, in accord with regional differences in healthcare delivery and differing mission statements among programs. Programs with primary care missions typically spend more time on primary care (up to 4 months), whereas programs with less emphasis on primary care have more specialty rotations. Overall, students are encouraged to choose clinical experiences that take them out of their “comfort zone” and expose them to new areas of interest. A typical clinical year for a PA student would include rotations in primary care or family medicine, emergency medicine, general surgery, maternal and child health, psychiatry or behavioral medicine, inpatient internal medicine, geriatrics, and a wide range of specialty electives. Some programs also require that all students complete rotations in clinics providing care to the medically underserved.

In comparison with medical schools, which pay hospitals or physicians for clinical rotations and underwrite student travel and housing expenses, PA programs do not generally have funding to subsidize clinical rotations. Instead, they must rely on volunteer preceptors whose incentives include the potential to recruit and employ new graduates who are good matches for their practices. Deciding not to fund clinical rotations has—until now—been a gentleman’s agreement among PA programs. Recently a few PA programs have decided to pay for clinical sites (nine programs reported payments in 2008).<sup>2</sup> This development has led to a major concern that the only way to pay clinical sites is to pass these costs directly on to students, a situation that would create barriers to education and increase indebtedness for new graduates.

After graduation, PAs take a generalist national certifying examination offered by the National Commission on Certification of Physician Assistants (NCCPA). This test is required for practice in all states. Individual states regulate PA practice, including prescriptive authority. PAs are required to document their continuing medical education and to pass a recertification examination from NCCPA every 6 years. No recognized specialty examinations or credentials exist for PAs, but in 2009 the NCCPA announced plans to develop voluntary specialty credentialing exams for PAs in five specialties: orthopedic surgery, cardiovascular surgery, emergency medicine, nephrology, and psychiatry.<sup>5</sup>

## THE SPECIALTY ISSUE AND PRIMARY CARE

Although a number of small, institutionally funded residency programs exist for PAs, no national funding source, such as Medicare, exists for PA residency programs. However, the NCCPA may be developing specialty exams, and if this is the case the exams could be used to initiate a number of structured post-graduate training opportunities. These opportunities may include short fellowships, online learning opportunities, and more formal mentoring programs with documentation of patient encounters and competency in specific procedures. Overall, people in the profession have shown concern that the creation of PA specialty certification will divert PAs away from primary care and decrease overall flexibility in a profession that values the ability to move between specialties as one of its major strengths.

### PA-Specific Issues

The formal legal relationship between physicians and PAs (PAs may practice *only* with physician supervision) makes it reasonable to expect that PAs will follow physician patterns of specialization regardless of PA programs' mission statements and messages about the importance of primary care. Aggressive recruiting and head-hunting—especially by recruiters from procedurally based specialties—now begins early in PA training, when students are most likely to feel the pressure of their academic debt. Although PA specialty salaries do not differ as dramatically from primary care salaries as do salaries for specialty versus primary care physicians, specialty practices often provide incentives and benefits to PAs that are seldom seen in primary care employment.

Even new PAs with a commitment to primary care report difficulty in finding and negotiating jobs in primary care settings. Recruitment is not well organized, burnt-out physicians seem less enthusiastic about their jobs, and physicians (especially younger ones) lack understanding about how to work with PAs or NPs. This situation contrasts sharply with that of specialty physicians, who often seem more aware of how PAs will improve patient care, decrease waiting times, increase physicians' job satisfaction and, of course, increase the bottom line!

PAs are most attracted to primary care practices that would fully integrate them into all phases of patient care, including acute care, continuity visits, case management, electronic communications with patients, and participation in quality processes. The “medical home model” will be successful only if *all* providers are involved in the design, implementation, and evolution of demonstrations and practice models.

## RECOMMENDATIONS: WHAT MIGHT WORK

1. Develop and implement reimbursement strategies for providers to create incentives for PAs and NPs to work in primary care settings (eg, Australia’s new medical specialty designation for “Rural and Remote Practice”).
2. Develop “best practices” projects supported by foundations to review, document, and publicize successful practice and role models. Consider the creation of a series of “primary care commercials” (such as the Group Health series) that are broadly distributed as public service announcements and provide appropriate messages and images of primary care and primary care providers.
3. Consider primary care in the broadest sense to include mental health and general oral health. Review strategies that have helped other new health professions (eg, dental therapists and behavioral health workers) to function productively as members of the primary care team.
4. Require that new “medical home” reimbursement strategies include incentives for student placements.
5. Incorporate didactic and clinical primary care requirements into accreditation standards for all health professions.
6. Incorporate curriculum content about the training and utilization of other health professions as an accreditation requirement for all health professions.



7. Make PA or NP employment a required part of the curriculum for all residents in primary care (family medicine, general internal medicine, and general pediatrics) as a strategy for demonstrating and standardizing the concept of team practice.
8. Reestablish federal funding for PA programs that will emphasize primary care projects, including focused recruiting from military veteran and educationally disadvantaged populations, development of primary care content, funded placement of students in primary care settings, and training of primary care preceptors and clinical administrators in supervision and utilization of PAs.
9. Support the training of PAs and NPs in all community health centers and related federally designated sites by including funding preferences and training stipends in grant programs.
10. Review successful health worker programs, such as Alaska's Community Health Aide Program, and consider the potential of similar systems for PAs and NPs as supervisors and trainers. Optimal health worker utilization could include disease prevention and health promotion activities, monitoring and support of patients with chronic illnesses, and community health education functions.
11. Use training and reimbursement strategies to better incorporate a "culture of clinical teaching" into primary care practices at all levels.

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*The conclusions and recommendations from a Macy conference represent a consensus of the group and do not imply unanimity on every point. All conference members participated in the process, reviewed the final product and provided input before publication. Participants are invited for their individual perspectives and broad experience and not to represent the views of any organization.*

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**Ruth Ballweg, M.P.A., P.A.-C.**, is a physician assistant and Associate Professor in the School of Medicine at the University of Washington, where she directs the MEDEX Northwest Physician Assistant Division. She is actively involved in healthcare workforce issues in Washington, Alaska, Montana, Idaho, Oregon, and Nevada. Ms Ballweg is the editor and a contributor to the first American textbook written on training for physician assistants, which is now in its fourth edition. She has also written on women's professional roles in healthcare, on the training of community health workers as physician assistants, and on the composition of the primary care workforce. She is currently working on the international development of the physician assistant profession in Canada, Queensland, and South Africa.

**Richard J. Baron, M.D., FACP**, is the founding physician of Greenhouse Internists, PC, a five-physician, community-based independent practice of internal medicine located in Philadelphia. With grant support from the Robert Wood Johnson Foundation and the Center for Healthcare Strategies, he set up and ran Healthier Babies, Healthier Futures, a regional collaborative of Medicaid health plans focused on improving birth outcomes by standardizing collection of prenatal risk data and making it available to HMO case managers. He is the recipient of the Richard and Hinda Rosenthal Award from the American College of Physicians for innovative contributions to internal medicine and currently serves as Board Director for the National Quality Forum. He is immediate past Chair at the American Board of Internal Medicine.

**Michael S. Barr, M.D., M.B.A., FACP**, is the Vice President for Practice Advocacy and Improvement for the American College of Physicians. Dr. Barr's focus is on public policy relating to the patient-centered medical home, quality improvement, practice redesign, and health information technology. Prior to joining the staff at ACP, Dr. Barr served as the Chief Medical Officer for Baltimore Medical System, Inc., a Joint

Commission–accredited, multisite federally qualified community health center. Dr. Barr has served on the faculty in the Division of General Internal Medicine at Vanderbilt University. He currently holds faculty appointments at Johns Hopkins and George Washington Universities.

**Bobbie Berkowitz, Ph.D., R.N., CNAA, FAAN** is the Alumni Endowed Professor of Nursing at the University of Washington School of Nursing and Adjunct Professor in the School of Public Health and Community Medicine. In addition she is a consulting professor with Duke University School of Nursing and the University of California at Davis. She serves on the editorial boards of several scholarly journals, including *Public Health Nursing*, *Journal of Public Health Management and Practice*, and the *American Journal of Public Health*, as Senior Associate Editor of *Policy, Politics, and Nursing Practice*, and as Associate Editor of *Nursing Outlook*. She is active in numerous professional organizations, serving as Board President for Qualis Health and the Group Health Cooperative, as a board member of the American Academy of Nursing and the Washington Center on Nursing, and as President-elect of the Washington State Academy of Sciences. Dr. Berkowitz is a Fellow in the American Academy of Nursing and a member of the Institute of Medicine.

**JudyAnn Bigby, M.D.**, is the Secretary of Health and Human Services for the Commonwealth of Massachusetts, for which she oversees 16 state agencies and serves in the Cabinet of Governor Deval Patrick. She has a broad range of experience as a primary care physician, professor, researcher, and health policy expert. Since her appointment, Secretary Bigby has successfully implemented many aspects of Massachusetts' highly successful healthcare reform law. Dr. Bigby has also served as the Director of Community Health Programs at Brigham & Women's Hospital and as Associate Professor of Medicine at Harvard Medical School and Director of Harvard's Center of Excellence in Women's Health. She also served on the Minority Women's Health Panel of Experts for the U.S. Department of Health and Human Services.

**Robert H. Brook, M.D, Sc. D., FACP**, is the Vice President, Corporate Fellow, and Director of the Health Program for the RAND Corporation. In addition, he serves on the faculty of UCLA, where he directs the Robert Wood Johnson Clinical Scholars Program. He is also a Professor of Medicine at the David Geffen School of Medicine and Professor of Health Services at the School of Public Health. Dr. Brook led the Health and Quality Group on the \$80M Health Insurance Experiment and was

co-principal investigator on the Health Services Utilization Study. He was the co-principal investigator on the only national study that has investigated the impact of DRGs on quality and outcome of acute hospital care. He was also the co-principal investigator on a joint activity of 12 academic medical centers, the American Medical Association, and RAND, the purpose of which was to develop appropriateness criteria and parameters for the use of procedures.

**Darwin Brown, M.PH., P.A.-C.** is the Clinical Coordinator of the University of Nebraska Medical Center's Physician Assistant Program, for which he also serves on the faculty. He has been in clinical practice in general internal medicine for 23 years. He is an active member of the American Academy of Physician Assistants, the Nebraska Academy of Physician Assistants, the Accreditation Review Commission on Education for the Physician Assistant, the American Public Health Association, the Nebraska Coalition for Patient Safety, and the Physician Assistant Education Association. In 2002 he earned a fellowship for Primary Healthcare Policy with the Department of Health and Human Services.

**Jordan J. Cohen, M.D.** President Emeritus of the American Association of Medical Colleges (AAMC) and Trustee Emeritus of the Josiah Macy, Jr. Foundation, is currently Professor of Medicine and Public Health at the George Washington University School of Medicine. As AAMC President, Dr. Cohen strengthened services for medical students, residents and constituents; advanced communications, advocacy, and data gathering; and launched initiatives to improve medical education, research, and patient care. He has held faculty positions at Harvard, Brown, and Tufts Universities and the University of Chicago, and served as dean of SUNY Stony Brook School of Medicine. Current board positions include the Morehouse School of Medicine, the National Library of Medicine, and the Qatar Foundation for Education, Science and Community Development.

**Linda Cronenwett, Ph.D., R.N.**, is Dean Emerita and Professor of the School of Nursing, University of North Carolina at Chapel Hill. A member of the board of directors of the Institute for Healthcare Improvement, the North Carolina Institute of Medicine, and the North Carolina Center for Hospital Quality and Patient Safety, she is also principal investigator for the Quality and Safety Education for Nurses initiative and program director for the Executive Nurse Fellows Program, both of which are funded by the Robert Wood Johnson Foundation. She has served on numerous editorial advisory boards, and her recent publications have focused on preventing medication errors and safety and quality education for nurses.

**Gerald Cross, M.D.**, served as Acting Under Secretary for Health for the Veterans Health Administration (VHA) until February 2010. In his career with VHA, which he began as the National Director of Primary Care in 2004, Dr. Cross has led numerous initiatives to expand primary care and mental healthcare for veterans. These initiatives have included development of a program for screening and treatment of traumatic brain injury and of a highly successful suicide prevention hotline for veterans. During his career with the U.S. Army, Dr. Cross held many leadership positions, including teaching chief, Department Chair, Chief of the Medical Staff, Consultant to The Army Surgeon General, and faculty member at the Uniformed Services University of the Health Sciences. He commanded four Army medical facilities, ranging from a small overseas clinic to the hospital at Fort Hood. His military decorations include the Legion of Merit with four oak leaf clusters, the Air Assault Badge, the “A” Proficiency Designator, and the Order of Military Medical Merit.

**Susan Dentzer** is the Editor-in-Chief of *Health Affairs*, the nation’s leading journal of health policy, and is an on-air analyst on health issues with the PBS NewsHour. She previously led the NewsHour’s health unit, reporting extensively on-air about healthcare reform debates. She is a member of the Institute of Medicine and the Council on Foreign Relations, and chairs the Board of Directors of the Global Health Council. She is also on the board of Research!America. Ms. Dentzer graduated from Dartmouth, is a trustee emerita of the college, and chaired the Dartmouth Board of Trustees from 2001 to 2004. She currently serves as a member of the Board of Overseers of Dartmouth Medical School and is an Overseer of the International Rescue Committee, a leading humanitarian organization.

**F. Daniel Duffy, M.D.** is Dean and Professor of Medicine of the University of Oklahoma School of Community Medicine. He formerly served as Executive Vice President and then Senior Advisor to the President of the American Board of Internal Medicine (ABIM) where he introduced the maintenance of certification process based on evaluation of practice performance. He served on the Board of Directors of the American Board of Medical Specialties and is currently Chair of the ABMS Maintenance of Certification Committee. Dr. Duffy has served as a member of the Ambulatory Measures Steering Committee of the National Quality Forum and the Performance Measurement Committee of the National Committee for Quality Assurance. He is a leader in communication and interpersonal skills, a consultant in healthcare organizational design, and a contributor to

the literature on physician education, medical professionalism, and quality assessment and improvement.

**Victor J. Dzau, M.D.** is the Chancellor for Health Affairs at Duke University, the President and CEO of Duke University Health System, and James B. Duke Professor of Medicine at Duke. Previously, he held faculty leadership appointments at Stanford University and the Harvard Medical School. Dr. Dzau is a pioneering researcher in targeting renin angiotensin for cardiovascular therapy. He believes that academic institutions can become an important force in developing solutions for global medicine through private-public partnerships bridging innovation, research, training, service, and care delivery. Among his honors are the Gustav Nylin Medal from the Swedish Royal College of Medicine, the Max Delbrück Medal from Humboldt University, Charite and Max Planck Institute, the Commemorative Gold Medal from Ludwig Maximilian University of Munich and Frey-Werle Foundation, the Polzer Prize from the European Society of Sciences and Arts, the Ellis Island Medal of Honor of USA, the Novartis Award for Hypertension Research, and the Distinguished Scientist Award of the American Heart Association. Dr. Dzau was the founding Editor-in-Chief for *Physiological Genomics* and has also served as Editor-in-Chief of the *Journal of Vascular Medicine and Biology*.

**Susan Edgman-Levitan, P.A.**, is Executive Director of the John D. Stoeckle Center for Primary Care Innovation at Massachusetts General Hospital. She is a Lecturer in the Department of Medicine, Massachusetts General Hospital and an Associate in Health Policy, Harvard Medical School. She is known for her advocacy of understanding the patient's perspective on healthcare. From 1995 to the present, Ms. Edgman-Levitan has been the co-principal investigator on the Harvard Consumer Assessment of Health Plans Study (CAHPS). She is an editor of *Through the Patient's Eyes*, a book on creating and sustaining patient-centered care, and *The CAHPS Improvement Guide*, and coauthor of the Institute of Medicine 2006 report, *The Future of Drug Safety: Promoting and Protecting the Health of the Public*. Ms. Edgman-Levitan serves on several boards and national advisory committees, including the Foundation for Informed Medical Decision Making, the National Patient Safety Foundation, the Lucian Leape Institute, the National Health Service Corps Advisory Council, and the Patient-Centered Primary Care Collaborative.

**Harvey V. Fineberg, M.D., Ph.D.**, is the President of the Institute of Medicine. He previously served as Provost at Harvard University and as the Dean of the School of Public Health. He also has served as President of the Society for Medical Decision Making and consultant to the World Health Organization. His research has included assessment of medical technology, evaluation of vaccines, and dissemination of medical innovations. He is the author or coauthor of numerous books and articles on subjects ranging from AIDS prevention to medical education.

**Elliott S. Fisher, M.D., M.P.H.** is Professor of Medicine and Community and Family Medicine at Dartmouth Medical School and the Director for Population Health and Policy and Director of the Center for Population Health at the Dartmouth Institute for Healthcare Policy and Clinical Practice. He recently replaced John Wennberg as Director of the Dartmouth Atlas of Healthcare. Dr. Fisher's research explores the causes of the twofold differences in spending observed across U.S. regions and healthcare systems and the consequences of these variations for health and healthcare. His work demonstrating that higher spending regions and health systems do not achieve better outcomes or quality has had a major impact on current thinking about healthcare and healthcare reform. He has served on the National Advisory Council of the Agency for Healthcare Research and Quality and now chairs a committee of the National Quality Forum charged with the development and implementation of a new measurement framework intended to improve health outcomes and the value of healthcare services. He is a member of the Institute of Medicine.

**John P. Fogarty, M.D.**, assumed the role of Dean of the Florida State University (FSU) College of Medicine in 2008. Before that, he served as Senior Associate Dean for Operations and Associate Dean for Primary Care at of the University of Vermont College of Medicine. In his earlier career, Dr. Fogarty was an Army physician and academic leader who rose to the rank of colonel and served the last 5 years of his military career as Chair of Family Medicine at the Uniformed Services University School of Health Sciences in Bethesda, Maryland. Dr. Fogarty's honors have included being named by the Vermont Academy of Family Physicians as Vermont Family Physician of the Year. He also received the Distinguished Service Award from the Vermont Medical Society. Dr. Fogarty is a strong advocate for family medicine and the author of multiple articles and book chapters related to family medicine and medical education. He also served as a Residency Assistance Program Consultant for the American Academy of Family Physicians for 12 years.

**David R. Garr, M.D.**, is a Professor of Family Medicine at the Medical University of South Carolina (MUSC). He has been on the faculty at MUSC since 1985 and has served as the Associate Dean for Community Medicine during the past eight years. In 2003, he became Executive Director of the South Carolina Area Health Education Consortium. He has been the principal investigator on a number of federal and foundation grants and has published articles focusing on prevention and population health. Throughout his career, he has been an advocate for interprofessional education and practice and has been involved in teaching health professions students and clinicians about preventive medicine, community-responsive healthcare, and primary care. He has served as the President of the Association for Prevention Teaching and Research and was the recipient of the F. Marian Bishop Outstanding Educator Award in 2008.

**Catherine L. Gilliss, D.N.Sc., R.N., FAAN**, is the Dean and Helene Fuld Health Trust Professor of Nursing, and Vice Chancellor for Nursing Affairs at the Duke University School of Nursing. She also serves as Director of the Duke Translational Nursing Institute, a core entity of the Duke Clinical and Translational Science Award. Prepared as an adult nurse practitioner, she directed adult and family nurse practitioner programs for nearly 20 years, including the UCSF Primary Care program, and was the recipient of the Pew Charitable Trust's Excellence in Primary Care Education Award. Her scientific focus is the family and chronic illness, and her work has been recognized by the International Society for Family Nursing with their Lifetime Achievement Award for Research. Dr. Gilliss is the President of the American Academy of Nursing and a member of the North Carolina Institute of Medicine.

**Marthe R. Gold M.D., M.P.H.**, is the Logan Professor and Chair of the Department of Community Health and Social Medicine at the Sophie Davis School of Biomedical Education (SBE) at City College, New York. The SBE's mission is to prepare students from minority and economically less advantaged families for primary care careers in underserved urban communities. Dr. Gold's clinical career has been in rural and urban underserved settings. In her earlier position at the University of Rochester School of Medicine, she developed and directed a required course on community medicine for family medicine residents. After completing a degree in public health at Columbia School of Public Health she served as Senior Policy Advisor in the Office of the Assistant Secretary for Health in the U.S. Department of Health and Human Services. Her work there was on

financing of clinical preventive services, cost-effectiveness analysis methods in medicine and public health, and healthcare reform. Her current scholarly work focuses on interventions to increase levels of patient activation and engagement in populations served by community-based health centers, and on public views on resource allocation priorities in healthcare. A member of the Institute of Medicine since 2006, Dr. Gold serves on the Communications Collaborative of the Evidence-based Round Table and Chairs the IOM Committee on Public Health Strategies to Improve Health.

**Kevin Grumbach, M.D.**, is Professor and Chair of the Department of Family and Community Medicine at the University of California, San Francisco and Chief of Family and Community Medicine at San Francisco General Hospital. His research focus is on primary care physician supply, access to care, innovations in the delivery of primary care, and racial and ethnic diversity in the health professions. His articles have been published widely in such journals as the *New England Journal of Medicine* and *JAMA*. With Tom Bodenheimer, he coauthored two books: the textbook *Understanding Health Policy—A Clinical Approach*, and *Improving Primary Care—Strategies and Tools for a Better Practice*. His honors and awards have included a Generalist Physician Faculty Scholar award from the Robert Wood Johnson Foundation, the Health Resources and Services Administration Award for Health Workforce Research on Diversity, and the Richard E. Cone Award for Excellence and Leadership in Cultivating Community Partnerships in Higher Education.

**Paul H. Grundy, M.D., M.P.H., FACOEM, FACPM**, is IBM Corporation's Global Director for Healthcare Transformation. His work is directed towards shifting healthcare delivery around the world toward consumer-focused, primary care-based systems through the adoption of new philosophies, primary care pilot programs, new incentives systems, and the information technology required to implement such change. Dr. Grundy also serves as the President of the Patient Centered Primary Care Collaborative and is an Adjunct Professor at the University of Utah in the Department of Family and Preventive Medicine. His work has been reported widely in such publications as the *New York Times*, *Business Week*, *The Economist*, and the *New England Journal of Medicine*. Dr. Grundy's numerous awards include the U.S. Department of State Superior Honor Award. Prior to joining IBM in 2000, Dr. Grundy worked as a senior diplomat in the U.S. State Department supporting the intersection of health and diplomacy. He was also the Medical Director for the International SOS and for Adventist Health Systems. He has worked extensively on



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**Marc B. Hahn, D.O.**, is the Senior Vice President for Health Affairs at the University of New England in Biddeford, Maine and Dean of the College of Osteopathic Medicine. Prior to this appointment, Dr. Hahn had served for more than 7 years in similar positions for the University of North Texas Health Science Center. He was a Robert Wood Johnson Health Policy Fellow. His contributions to the field of pain management while at the Pennsylvania State University College of Medicine led the College's Department of Anesthesia to establish the Dr. Marc B. Hahn Fellowship Award. The Association of American Publishers named his textbook, *Regional Anesthesia: An Atlas of Anatomy and Technique*, as the best new medical textbook of the year.

**Gwen Wagstrom Halaas, M.D., M.B.A.**, is Associate Dean for Academic and Faculty Affairs at the University of North Dakota School of Medicine and Health Sciences (UND SMHS) and Associate Professor in the Department of Family and Community Medicine. UND SMHS is ranked first in the United States for percentage of graduates going into family medicine and leads the nation in rural health. Dr. Halaas was named the Minnesota Academy of Family Physicians Teacher of the Year in 2008. She has also served as Director of the Rural Physician Associate Program, University of Minnesota Medical School and Associate Director for the Minnesota Area Health Education Center. Dr. Halaas practiced full spectrum family medicine for many years in St. Paul, Minnesota, delivering babies and caring for the physical and psychosocial health of patients of all ages. Dr. Halaas has written two books, *The Right Road: Life Choices for Clergy and Clergy, Retirement and Wholeness: Looking Forward to the Third Age* in 2004. She was profiled for her administrative leadership in Fitzhugh Mullan's book, *Big Doctoring in America: Profiles in Primary Care*.

**Jennie Chin Hansen, R.N., M.S.N., FAAN**, is the President of AARP and a member of the AARP Board of Directors. In her current role at AARP, she is the chief volunteer spokesperson on such topics as healthcare access and quality, long-term services and supports, economic security, and liveable communities for the 50+ population. Prior to her work at AARP, Ms. Hansen transitioned from On Lok Senior Health Services after nearly 25 years of service and executive leadership with the prototype of PACE (Program of All Inclusive Care to the Elderly). Her other leadership roles

include serving as the Comptroller General of the Federal Commissioner to the Medicare Payment Advisory Commission, as board officer of the National Academy of Social Insurance, and on the Robert Wood Johnson Initiative on the Future of Nursing at the Institute of Medicine Committee. Ms. Hansen's awards have included a 2005 CMS Administrator's Award of Achievement, the Gerontological Society of America's Maxwell Pollack Award for Productive Living, and the Grantmakers in Aging John Feather Diversity Award. She was named by the League of Women Voters of San Francisco for their "Women Who Could Be President" in 1997. She will assume the role of Chief Executive Officer of the American Geriatrics Society in April 2010.

**Susan B. Hassmiller, Ph.D., R.N., FAAN**, is the Robert Wood Johnson Foundation (RWJF) Senior Advisor for Nursing and the Director of the RWJF Initiative on the Future of Nursing at the Institute of Medicine. Dr. Hassmiller recently served a 6-year term as a member of the National Board of Governors for the American Red Cross and was the immediate past chair of the organization's national 9/11 Recovery Program. Previously, Hassmiller was with the Health Resources and Services Administration, where she was the Executive Director of the U.S. Public Health Service Primary Care Policy Fellowship. Dr. Hassmiller is a Fellow in the American Academy of Nursing and a member of The Joint Commission Nursing Advisory Council and the New York Academy of Medicine. Her honors have included the 2008 John P. McGovern Award from the American Association of Colleges of Nursing, the 2009 Florida Association of Community Colleges Lifetime Achievement Award, and the 2009 Community Service Award from George Washington University. She is also the 2009 recipient of the Florence Nightingale Medal, the highest international honor given to a nurse by the International Committee of the Red Cross.

**Douglas G. Kelling, Jr., M.D.**, is an internist who has been practicing inpatient and outpatient medicine at Carolinas Medical Center NorthEast in Concord, North Carolina for 33 years. Dr. Kelling is on the faculty at the Duke University School of Medicine in the Division of Pulmonary, Allergy and Critical Care at Duke. Over the past 14 years he has developed community-wide chronic disease management programs for oral anticoagulation, diabetes, asthma/COPD, hypertension, dyslipidemia, congestive heart failure, and osteoporosis. Currently, over 8,000 patients are enrolled in these programs.

**Kathleen Klink, M.D.**, is the Director of the Center for Family and Community Medicine at Columbia University. Dr. Klink completed service in the office of Senator Hillary Rodham Clinton as a Robert Wood Johnson Health Policy Fellow in December 2008, where she worked with senior health staff in evaluating and formulating legislation for the U.S. Public Health Service Act, Title VII reauthorization, and worked with constituent groups, government, and others regarding health policy issues. Earlier in her career, as medical director of the Coney Island Community Health Center she spearheaded community initiatives, including one to decrease teen pregnancy, and initiated an innovative quality assurance program at the Center. Her interests are in primary care workforce development and health systems quality improvement based on best evidence. She co-chairs the patient-centered medical home committee for the Columbia University Medical Center's Washington Heights/Inwood Health Initiative, an institution-wide effort to improve health outcomes for community residents.

**Richard D. Krugman, M.D.**, is the first Vice Chancellor for Health Affairs for the University of Colorado, Denver. Earlier in his career, as a professor of pediatrics, he served as Director of the C. Henry Kempe National Center for the Prevention and Treatment of Child Abuse and Neglect and has gained international prominence in the field of child abuse. He has held appointments with the Public Health Service at the National Institutes of Health and the U.S. Food and Drug Administration as well as serving as a Robert Wood Johnson Health Policy Fellow and as a legislative assistant in the office of U.S. Senator Dave Durenberger of Minnesota. He is a past Chair of both the Association of American Medical Colleges (AAMC) and the Council of Deans of the AAMC. Dr. Krugman is a member of the Institute of Medicine and is currently on the boards of University of Colorado Hospital and The Children's Hospital of Denver. He has published over 100 original papers, book chapters, and editorials and four books. He recently stepped down after 15 years as Editor-in-Chief of *Child Abuse and Neglect: The International Journal*.

**Joseph B. Martin, M.D., Ph.D.**, is the Edward R. and Anne G. Lefler Professor of Neurobiology at Harvard Medical School. Previously, Dr. Martin served as Dean of the Faculty of Medicine at Harvard University from 1997 to 2007. At Harvard, he helped to establish the Dana-Farber/Harvard Cancer Center. He also led the formation of the Harvard NeuroDiscovery Center, a virtual center of researchers working together on understanding

the prevention, causes, and treatment of neurodegenerative diseases like Alzheimer's Disease and Parkinson's Disease. The Center seeks to cultivate scientific collaboration between the basic and clinical sciences. Earlier, Dr. Martin served as Dean of the School of Medicine at University of California, San Francisco, where he was also appointed as Chancellor.

**David Meyers, M.D.**, has served as the Director of the Center for Primary Care, Prevention, and Clinical Partnerships at the Agency for Healthcare Research and Quality since February 2008. Prior to this appointment he helped to direct the Center's Practice-Based Research Network initiatives, served as a medical officer with the U.S. Preventive Services Task Force, was a Project Officer for the Agency's Health IT portfolio, and served as the Center's Acting Director. Earlier in his career, Dr. Meyers practiced family medicine, including maternity care, in a community health center in southeast Washington, DC and directed the Georgetown University Department of Family Medicine's practice-based research network, CAPRICORN.

**J. Lloyd Michener, M.D.**, is Professor and Chairman of the Department of Community and Family Medicine at Duke University, Director of the Duke Center for Community Research, and Clinical Professor in the Duke University School of Nursing. Dr. Michener also serves as the President of the Association for Prevention Teaching and Research. Among his other appointments, Dr. Michener has chaired the Council of Academic Societies and served as co-chair of the National Institutes of Health (NIH) Community Engagement Steering Committee for the Clinical and Translational Science Awards (CTSA). Dr. Michener has a long-standing interest in community health, prevention, informatics, and training of faculty. With the award of the NIH-funded CTSA to Duke in 2006, he became the director of a new Center in Community Research that spans the Health System. He also oversees the Masters Program in Clinical Leadership, a joint program of the Schools of Medicine, Nursing, Business, Law, and the Institute of Public Policy. Within North Carolina, Dr. Michener has managed the statewide networks of chronic disease prevention programs of the Kate B. Reynolds Charitable Trust and the North Carolina Health and Wellness Trust Fund.

**Fitzhugh Mullan, M.D.**, is the Murdock Head Professor of Medicine and Health Policy at the George Washington University School of Public Health and Professor of Pediatrics at the George Washington University

School of Medicine. As an officer in the Public Health Service he served as Director of the National Health Service Corps and of the Bureau of Health Professions in the Health Resources and Services Administration. He is a contributing editor to the journal *Health Affairs* and has written widely on health and medical topics for both professional and general audiences.

**Mary D. Naylor, Ph.D., R.N.**, is the Marian S. Ware Professor in Gerontology and Director of the NewCourtland Center for Transitions and Health at the University of Pennsylvania School of Nursing. Since 1990, Dr. Naylor has led a multidisciplinary program of research designed to improve the quality of care, decrease unnecessary hospitalizations, and reduce healthcare costs for vulnerable, community-based elders. Her research team partnered with a major insurance organization and healthcare plan to translate this model into the “real world” and promote its widespread adoption. Dr. Naylor is the National Program Director for the Robert Wood Johnson Foundation sponsored Interdisciplinary Nursing Quality Research Initiative. She was elected to the Institute of Medicine (IOM), National Academy of Science in 2005 and currently serves on the IOM’s Roundtable on Value and Science Driven Healthcare and Board on Healthcare Services. She is also a member of the RAND Health Board and the National Quality Forum Board of Directors. Dr. Naylor was recently appointed as Chair of the Board of the Long-Term Quality Alliance.

**Marc A. Nivet, Ed.D.**, is the Chief Operating Officer and Treasurer of the Josiah Macy, Jr. Foundation. He also serves as Special Assistant to the Senior Vice President of Health at New York University and on the faculty of NYU’s Robert F. Wagner Graduate School of Public Service. Prior to joining the Foundation, Dr. Nivet was Associate Executive Director of the Associated Medical Schools of New York and Director of Minority Affairs for the New York College of Osteopathic Medicine. His research interests include faculty development, medical student career choice, and medical student debt burden. Dr. Nivet is known for creating innovative collaborations that have been recognized nationally as models of success and for writing and lecturing about diversity as a driver of educational excellence. Dr. Nivet is a Fellow of the New York Academy of Medicine and past president of the National Association of Medical Minority Educators, Inc., which presented him with its Outstanding Service Award in 2006.

**Luis Padilla, M.D.**, is a board-certified family physician and the Medical Director of Unity Healthcare’s Upper Cardozo Health Center in Columbia Heights, Washington, DC. The Center has 22,000 enrolled patients,

accounting for 83,000 visits in 2008. Upper Cardozo is a popular and major site of outpatient medical training to the area's medical schools and residency programs. He earned his medical degree from Wake Forest School of Medicine in 2001 and completed his family medicine residency at Brown University in 2004. He was appointed to the National Advisory Council of the National Health Service Corps, which reports to the U.S. Secretary of Health and Human Services and, by designation, the Administrator of the Health Resources and Services Administration and will complete that service in May 2010.

**Herbert Pardes, M.D.**, is President and CEO of New York-Presbyterian Hospital and New York-Presbyterian Healthcare System. Dr. Pardes is an ardent advocate of support for academic medical centers, humanistic care, and the power of technology and innovation to transform twenty-first century medicine. A noted psychiatrist, Dr. Pardes served as director of the National Institute of Mental Health and as U.S. Assistant Surgeon General during the Carter and Reagan administrations. He was also president of the American Psychiatric Association. Dr. Pardes has been appointed to serve on commissions related to health policy by Presidents George W. Bush and Bill Clinton, including the Presidential Advisory Commission on Consumer Protection and Quality in the Healthcare Industry and the Commission on Systemic Interoperability. Dr. Pardes has written more than 130 articles and book chapters on mental health and academic medicine and conducted international collaborations with a variety of countries including India, China, and the former Soviet Union. His awards include election to the Institute of Medicine of the National Academy of Sciences and the American Academy of Arts and Sciences, the Sarnat International Prize in Mental Health, and the U.S. Army Commendation Medal.

**Robert L. Phillips, Jr., M.D., M.S.P.H.**, is the Director of the Robert Graham Center. He also serves on the faculties of the Department of Family Medicine at Virginia Commonwealth University, Georgetown University, and George Washington University and practices medicine at Fairfax Family Practice Center. He has served on the American Medical Association's Council on Medical Education and as the President of the National Residency Matching Program and currently serves as Vice-Chair of the Council on Graduate Medical Education. His research interests include physician-health system interactions and their effects on quality of care, geographic information systems, and collaborative care processes.

**Joanne M. Pohl, Ph.D., A.N.P.-B.C., FAAN**, is Professor at The University of Michigan School of Nursing. She has more than 30 years experience as an Advanced Practice Nurse/Nurse Practitioner working primarily in nurse-managed health centers with underserved populations. At the University of Michigan she has directed the Adult Nurse Practitioner Program and served as Associate Dean for Community Partnerships. Her research has focused over the past decade on the outcomes of care and cost of care in nurse-managed health centers, student experiences in these centers, and community responses to the centers. Dr. Pohl was awarded an Agency for Healthcare Research and Quality Health Information Technology grant and received funding from Blue Cross and Blue Shield of Michigan for a health literacy study in primary care. She has published extensively and presented at numerous national and international conferences. Dr. Pohl recently served as the President of the National Organization of Nurse Practitioner Faculties.

**David Satcher, M.D., Ph.D.** is the Director of The Satcher Health Leadership Institute, which was established in 2006 at the Morehouse School of Medicine in Atlanta, Georgia. The Institute's programs reflect Dr. Satcher's experience in improving public health policy and his commitment to eliminating health disparities for underserved groups, such as minorities and the poor and shedding light on neglected issues, such as mental and sexual health. Dr. Satcher was sworn in as the sixteenth Surgeon General of the United States in 1998. As Surgeon General Dr. Satcher led the department's effort to eliminate racial and ethnic disparities in health, an initiative that was incorporated as one of the two major goals of Healthy People 2010. Dr. Satcher has received over 40 honorary degrees and numerous distinguished honors including top awards from the National Medical Association, the American Medical Association, the American Academy of Family Physicians, and the Symbol of H.O.P.E. Award for health promotion and disease prevention. In 2005, he was appointed to serve on the World Health Organization Commission on Social Determinants of Health.

**Stephen C. Schoenbaum, M.D., M.P.H.**, is Executive Vice President for Programs at The Commonwealth Fund and Executive Director of its Commission on a High Performance Health System. Prior to his current position, Dr. Schoenbaum was Medical Director and then President of Harvard Pilgrim Healthcare of New England, a mixed model HMO delivery system in Providence, Rhode Island. Nationally, Dr. Schoenbaum

played a significant role in the development of HEDIS (the Healthcare Effectiveness Data and Information Set). He is a lecturer at Harvard Medical School in the Department of Population Medicine, a department he helped to found, and is the author of over 150 medical publications. Other professional activities include his service as Vice Chairman of the Board of the Picker Institute and as the Chair of the International Advisory Committee to the Joyce and Irving Goldman Medical School of Ben Gurion University, of which he is also a longstanding member. In addition, he is an honorary member of the British Association of Medical Managers and an honorary Fellow of the Royal College of Physicians.

**Stephen C. Shannon, D.O., M.P.H.**, is President of the American Association of Colleges of Osteopathic Medicine (AACOM). In this role, he represents the nation's 26 colleges of osteopathic medicine, explaining their priorities and positions and influencing medical education policies. Prior to assuming this position, he served as Vice President for Health Services and Dean of the College of Osteopathic Medicine in the University of New England. He also served as chair of the AACOM Board of Deans. His interests include public health and preventive medicine, clinical outcomes, and occupational and environmental health.

**Joan L. Shaver, Ph.D., R.N., FAAN**, is Professor and Dean of the College of Nursing at the University of Arizona. She came to this position from the University of Illinois at Chicago College of Nursing, where she was a faculty member and served as the dean from 1996 to 2009. Dr. Shaver has conducted funded research in women's health and sleep science, publishing her scientific work in nursing, medical, and interdisciplinary journals. In Chicago, Dr. Shaver served on the Board of Directors for Advocate HealthCare, an 11-hospital integrated, faith-based healthcare system. She has also served on the Scientific Advisory Committee for the Alberta Heritage Foundation for Medical Research in Canada. She is past President of the American Academy of Nursing, has served on the National Institutes of Health Advisory Council for the National Institute of Nursing Research, and was a member of panel for the Institute of Medicine Health Professions Education Summit. Dr. Shaver has an enduring interest in developing nursing and healthcare leaders with the transformational competence to reshape our health system so as to provide coordinated care.

**Kurt C. Stange, M.D., Ph.D.**, is a practicing family physician and epidemiologist. At Case Western Reserve University in Cleveland he is



the Gertrude Donnelly Hess, M.D. Professor of Oncology Research and Professor of Family Medicine, Epidemiology and Biostatistics, Oncology, and Sociology. He serves as editor for the *Annals of Family Medicine* and directs the multisite Center for Research in Family Practice and Primary Care, one of three research centers funded by the American Academy of Family Physicians. Dr. Stange is actively engaged in ongoing basic and applied research that aims to strengthen our understanding of the core structures and processes of primary care practice and their effect on preventive service delivery and patient outcomes and to discover new methods of enhancing the comprehensive, integrative, and relationship-centered generalist approach to patient care. He is a Past President of the North American Primary Care Research Group and is a member of the Institute of Medicine of the National Academy of Sciences.

**Barbara Starfield, M.D., M.P.H.**, is University Distinguished Service Professor with appointments in the Departments of Health Policy and Management and Pediatrics at the Johns Hopkins University Schools of Public Health and Medicine. She also directs the Johns Hopkins University Primary Care Policy Center. Dr. Starfield's overriding concerns are understanding the impact of health services on health, especially with regard to the relative contributions of primary care and specialty care on reducing inequities in health. Her research focuses on clinical care, services to populations, and the relationships between the two. Trained in pediatrics and epidemiology, she devotes her energies to health services research and its translation into health policy at the national, state, and local levels. Dr. Starfield's awards and honors have included the first Pew Primary Care Research Award, the Distinguished Investigator Award of the Association for Health Services Research, the American Public Health Association's Martha May Eliot Award, the Ambulatory Pediatric Association's Lifetime Achievement Award, and the Baxter International Foundation Prize for Health Services Research. Her publications include two books from Oxford University Press: *Primary Care: Concept, Evaluation, and Policy* and *Primary Care: Balancing Health Needs, Services, and Technology*.

**Valerie E. Stone, M.D., M.P.H.**, is an Associate Professor of Medicine at Harvard Medical School, Director of the Primary Care Internal Medicine Residency Program at Massachusetts General Hospital (MGH), and Associate Chief of the General Medicine Unit at MGH. She is also a Senior Scientist at the Stoeckle Center for Primary Care Innovation, where her scholarly focus is on disparities in HIV care by race, ethnicity, and gender; adherence to medications; and the patient-doctor relationship in

HIV/AIDS. Dr. Stone is the author of numerous scientific abstracts and publications regarding the care of persons with HIV/AIDS and primary care. She is also the first author of a new book entitled *HIV/AIDS in U.S. Communities of Color* (Springer, 2009). Dr. Stone is a member of the Infectious Diseases Society of America Guidelines Panel on Primary Care of HIV/AIDS Patients and has served on the National Institutes of Health's Office of AIDS Research Advisory Council and as the Council's Chairperson. In addition, Dr. Stone was a member of the U.S. Department of Health and Human Services Advisory Committee on Training in Primary Care Medicine and Dentistry and of the Residency Review Committee for Internal Medicine of the Accreditation Council for Graduate Medical Education, for which she recently completed a 6-year term. Dr. Stone also recently completed a 3-year term as National Secretary of the Society of General Internal Medicine.

**George E. Thibault, M.D.**, became the seventh president of the Josiah Macy, Jr. Foundation in January 2008. Immediately prior to that he had been Vice President of Clinical Affairs at Partners Healthcare System in Boston and Director of the Academy at Harvard Medical School. He was the first Daniel D. Federman Professor of Medicine and Medical Education at Harvard Medical School and is now the Federman Professor, Emeritus. For nearly four decades at Harvard Medical School Dr. Thibault played leadership roles in many aspects of undergraduate and graduate medical education, including the New Pathway Curriculum and the new Integrated Curriculum reform. His research has focused on the evaluation of practices and outcomes of medical intensive care and variations in the use of cardiac technologies. Dr. Thibault serves on the President's White House Fellows Commission and he chairs the Special Medical Advisory Group for the Department of Veteran's Affairs. He has been a visiting scholar both at the Institute of Medicine and at Harvard's Kennedy School of Government and at many medical schools in the United States and abroad.

**Reed V. Tuckson, M.D., FACP**, is the Executive Vice President and Chief of Medical Affairs at UnitedHealth Group. Dr. Tuckson's previous appointments included serving as Senior Vice President, Professional Standards, for the American Medical Association and as President of the Charles R. Drew University of Medicine and Science in Los Angeles. He has also served as Senior Vice President for Programs of the March of Dimes Birth Defects Foundation and is a former Commissioner of Public Health for the District of Columbia. Dr. Tuckson is an active member of

the Institute of Medicine of the National Academy of Sciences, for which has served as the Chairperson of its Quality Chasm Summit Committee and as a member on their Committee on the Consequences of the Uninsured. He is immediate past Chair of the Secretary of Health and Human Services' Advisory Committee on Genetics, Health and Society. Most recently, Dr. Tuckson was named one of Modern Healthcare's "50 Most Powerful Physician Executives" for 2010 and 2009 and "Top 25 Minority Executives" in Healthcare for 2010 and 2008, and to *Ebony* magazine's "2008 Power 150: The Most Influential Blacks in America" list. Dr. Tuckson will be honored by Project Sunshine in New York in May, 2010, for his support of children's issues, volunteerism and social responsibility.

**Kenneth J. Veit, D.O., M.B.A.**, is the Senior Vice President for Academic Affairs and Dean at Philadelphia College of Osteopathic Medicine (PCOM). Prior to this position, he served the College in various leadership capacities, directed five community healthcare centers, and was a member of the department of family medicine. He continues to teach and see patients as a Professor of Family Medicine at PCOM. Dr. Veit's academic interest includes all aspects of medical education. He has published and participated in multiple national and regional studies regarding best medical education practices. He has been a member of the American Osteopathic Association Council of Pre-Doctoral Education and is now a member of the Commission on Osteopathic College Accreditation, the accrediting body for all colleges of osteopathic medicine.















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The Josiah Macy, Jr. Foundation is a private philanthropy dedicated to improving the health of individuals and the public. Since its establishment in 1930, the Foundation has focused its support principally on projects and conferences designed to enhance the education of health professionals, especially physicians.