Gaps In Residency Training Should Be Addressed To Better Prepare Doctors For A Twenty-First-Century Delivery System

ABSTRACT Many observers have been concerned about a mismatch between the knowledge, skills, and professional values of newly trained physicians and the requirements of current and future medical practice. We surveyed and interviewed Kaiser Permanente’s clinical department chiefs for internal medicine, pediatrics, general surgery, and obstetrics/gynecology to ascertain their views of the perceived gaps in the readiness of newly trained physicians. Nearly half of those surveyed reported deficiencies among new physicians in managing routine conditions or performing simple procedures often encountered in office-based practice. A third of the chiefs noted deficiencies in coordinating care for patients. Filling these and other training gaps will require changes at many levels—from residency programs to Medicare reimbursement policies—to better prepare new physicians for the challenges of working in a health care system evolving to emphasize accountability, quality outcomes, cost control, and information technology.

With the enactment of the Affordable Care Act of 2010, the trajectory for the future of health care delivery has begun to shift toward greater accountability for the cost and quality of care and an increased focus on the need for innovation to achieve change. As policy makers and payers focus on delivery system reform, it is important not only to understand the changes needed in the organization and financing of health care services, but also to determine whether physicians who will work in the new system are adequately prepared to function in it.

Policy makers, academicians, health industry leaders, and advocates for delivery system improvement have identified many issues concerning the future physician workforce. The problems include an inadequate supply of primary care providers; the inappropriate distribution of physicians between rural and urban settings; the insufficient number of allied health professionals such as advanced practice nurses and physician assistants; and the need for new skills, such as facility in using an electronic health record system. There is a widespread belief that our nation’s system of medical education produces superbly skilled clinicians. Yet some analysts have raised the concern that physician education and training are not fully preparing new practitioners for the future requirements of medical practice.1–3

In addition, leaders in care delivery reform and medical education have identified some of the skills needed for the future. These are care coordination, systems-based practice, interdisciplinary teamwork, awareness of costs, ability to use information technology, and continuous quality improvement.4–8

To understand better the degree to which today’s medical residents are trained in these skills, we present some observations from Kaiser Permanente, a not-for-profit health plan serving 8.8 million members throughout the United...
States. These observations are based on informal surveys and interviews that point to potential gaps in new physician readiness.

Kaiser Permanente’s experience with newly trained physicians should have broad relevance because it includes many of the desired components of the care delivery environment of the future, such as care coordination across the continuum of primary, specialty, hospital, and post-hospital care; the use of an integrated inpatient and outpatient electronic health record; and physician group accountability for service and the cost and quality of care for a defined population.

At Kaiser Permanente, physicians are organized into clinical departments with management structures that facilitate the development of systematic information about clinical practice patterns—a feature that is central to the needs of future medical practice. Each clinical department is led by a chief of service, who is responsible for hiring and overseeing department physicians and for leading improvements in department performance. In addition, Kaiser Permanente has its own residency training programs and serves as a rotation site for nearby university training programs. This provides many department chiefs with important expertise in postgraduate medical education.

**Study Data And Methods**

In the summer of 2010 we conducted an informal e-mail survey of the 154 department chiefs in four clinical departments—internal medicine, pediatrics, general surgery, and obstetrics/gynecology—of the Permanente Medical Group (the physician component of Kaiser Permanente, in Northern California). We asked an open-ended question about the chiefs’ perceptions of the readiness of physicians who had recently completed their residency to practice in a highly organized care delivery system.

We used the three dimensions of knowledge, skills, and professionalism from the study of medical education at the Carnegie Foundation for the Advancement of Teaching described by Molly Cooke, David Irby, and Bridget O’Brien in *Educating Physicians*. The question we asked was: “If you had to name one characteristic missing in the average newly hired physician in your department in knowledge, skills, and professionalism (that is, values, attitudes, work habits), what would it be?”

We received 73 responses (a 47 percent response rate). To get a deeper qualitative understanding of the survey results, we conducted telephone interviews with the chiefs who had given us particularly thoughtful answers. During these interviews, we explored the chiefs’ thinking about the reasons for some of the gaps in preparedness and about how those gaps could be mitigated.

We grouped the survey responses into seven categories: office-based practice competencies, care coordination, continuity of care, familiarity with clinical information technology, leadership and management skills, systems thinking, and certain procedural skills. We present our observations below according to these categories, and we conclude with a discussion of key public and private policy issues raised by our findings.

**Study Results**

**OFFICE-BASED PRACTICE COMPETENCIES** Nearly half of the chiefs who responded to our survey mentioned that new physicians had one or more deficiencies in the management of routine conditions or simple procedures in office-based practice. Proficiency gaps that many chiefs noted included lack of experience in the management of minor depression and anxiety, minor chronic pain, transitory musculoskeletal problems, basic dermatological conditions, and headaches and in the provision of immunizations and preventive health counseling.

This finding is neither new nor surprising. In the past few years both the Medicare Payment Advisory Commission and the Accreditation Council for Graduate Medical Education have noted the disparity between the skills emphasized in training venues and those needed for contemporary office-based practice. In most training programs, residents spend much less time in office-based practice settings than in hospital-based care settings. As a consequence, newly trained physicians are often insufficiently experienced in caring for prevalent, transitory conditions, which can make up a large portion of their later office-based practice.

Most chiefs noted in the survey that these gaps can be mitigated by additional experience in the group practice medical office through the use of one-on-one mentoring with more-experienced physicians; training by specialists in the group practice for the management of uncomplicated dermatological, orthopedic, behavioral health, and other conditions; and education in the appropriate use of referrals to specialists. The mitigation process can take six to twelve months, with some reduction of practice efficiency and patient satisfaction with care during that time.

**CARE COORDINATION** About one-third of the survey respondents noted skill deficiencies in the area of care coordination. These included issues of coordination across specialties, among provider types, across settings, and over time. As
was true for the more general category of office-based practice skills, the majority of these responses came from chiefs of internal medicine and pediatrics.

These chiefs observed that newly trained physicians were often unprepared for the professional interactions involved in multispecialty practice. This was commonly manifested as a physician’s inability to judge which situations or conditions should be managed directly and which should be referred to a specialist or subspecialist. The default is generally in favor of referral, creating the potential for unnecessary duplication of care, inconvenience to patients, and added costs. Similarly, many newly trained physicians were unfamiliar with a variety of team-based care models, such as the patient-centered medical home, that involve coordination with and among nonphysician caregivers.10

Another commonly noted deficiency in newly trained physicians was a lack of familiarity and comfort with managing chronic health care conditions in office-based practice. Diabetes, congestive heart failure, asthma, learning disabilities, and psychosomatic illness generally have no quick fixes. They often require consistent care, regular monitoring and interventions, and a good deal of patience. In addition, many newly trained physicians lacked familiarity with what are called the electronic patient panel management tools: technology such as patient registries that supports the automated tracking of the health status of patients with such chronic conditions and that is critical to their optimal management.

In Kaiser Permanente’s experience, the lack of care coordination skills is also remediable over time, with mentoring, collegial support, and practice monitoring. That said, an increasing number of the organization’s new internal medicine physicians are choosing careers as hospitalists—physicians responsible for managing a patient’s care while he or she is in the hospital—instead of adapting to the requirements inherent in office-based care coordination.

CONTINUITY OF CARE More than two-thirds of the survey respondents expressed concerns about attitudes and practices among newly trained physicians that affected the continuity of patient care. These points were noted by chiefs in all four departments.

One common concern was the result of a policy change in recent years for residents in training: Residents must stop working when they reach the limit of their allowable work hours—even if this is before a patient’s immediate problems have been adequately addressed. The survey respondents worried that some newly trained physicians enter the profession with the idea that their job is one with fixed hours. The chiefs’ comments included the following: “To new physicians, being a physician is only a job.” “Residency work hour restrictions seem to make it ‘OK’ not to have continuity of care for patients.” “Lifestyle is definitely a primary focus, and some view work as shift work with less of an interest in their patient as a whole.”

Some chiefs felt that this “shift work” attitude led directly to more care “handoffs”—that is, transfers of care from one physician to another—than had been customary. The chiefs felt that more handoffs were likely to mean less-consistent care. In general, however, they felt that this problem was remediable by appropriate schedule management and the modeling of professionalism by leaders and older physicians. But to the extent that these issues stem from generational changes in views about work-life balance—a problem also common today in fields outside medicine—rather than recent changes in residency work-hour rules, they will be more difficult to address.

Many chiefs appear to believe that there has been a secular shift in some aspects of traditional physician professionalism. They also believe that there is no going back and that part of their job now is to exercise leadership and use managerial skills to continue to reinforce the importance of care continuity for patients’ well-being.

FAMILIARITY WITH CLINICAL INFORMATION TECHNOLOGY Only a handful of respondents identified a gap in familiarity with clinical information technology. At first, this finding seemed inconsistent with the relatively new adoption of electronic health records in health care. We found, however, that a substantial majority of newly trained physicians have used a hospital electronic health record system.

In addition, those whose training included a rotation at a Veterans Affairs facility have had experience with a comprehensive inpatient and outpatient information technology system. And, as expected, those new physicians who had training experience at Kaiser Permanente could
Few newly trained physicians fully understand the social context of disease processes.

immediately use our comprehensive inpatient and outpatient electronic health record. We found that most others adapt to it quickly.

**Leadership and Management Skills** A few respondents indicated concerns about leadership and management skills. During the follow-up interviews, chiefs provided more detail about new physicians’ general leadership and management skills.

Physician leadership and management capabilities are essential for effective physician organizations and physician-hospital partnerships. The country appears to be moving toward delivery system integration and payment reform that may require previously disparate organizations and physician-hospital partnerships. The country appears to be moving toward delivery system integration and payment reform that may require previously disparate providers—such as primary care providers and a wide array of specialists—to be jointly responsible for the quality and cost of care for a population of patients. Physician leadership will play a key role in ensuring the success of these integrated organizations.

The necessary management skills include systematic project management and problem solving; persuasive public speaking; effectively organizing and running a meeting; hiring people, fostering employees’ development, and evaluating their performance; influencing people; and undertaking basic budget management. There was a general sense among the respondents to our survey that residency programs do not provide training in these skills. It is open to question whether such training can or should be a part of graduate medical education, or whether it must take place in organized care systems later.

**Systems Thinking** Although the chiefs in our survey did not use the term *systems thinking*, they mentioned a range of concerns related to new physicians’ abilities that generally fall in this category. Examples included providing cost-effective care, knowledge of preventive care and community health, and skills in quality improvement.

We found, not surprisingly, that residency training does little to expose young physicians to the actual costs of care delivery, methods of avoiding duplication and waste, or the impact of health care costs on the relative affordability of health care coverage. As noted in the New Millennium Physician Charter, physicians will increasingly need to understand the full societal context in which they practice, especially the implications of practice patterns on the overall cost and affordability of health care services for a population.

Of particular concern, however, is the lack of familiarity with systematic quality of care improvements. We found that newly trained physicians have some experience in quality improvement, given the recent requirements of the Accreditation Council for Graduate Medical Education. Physicians who have used a comprehensive inpatient and outpatient electronic health record in their training seem to be better acquainted with the latest so-called rapid-cycle quality improvement methods, which require timely data about how changes in care pathways affect patient outcomes.

We also found that few newly trained physicians fully understand the social context of disease processes, such as the relationship between low socioeconomic status and risk of heart disease. Many lack awareness of the need to repeatedly stress to patients the importance of making healthy lifestyle choices, the need to closely monitor preventive and early detection interventions, and the desirability of coordinating care with community and social services.

**Procedural Skills** By far the most common concern expressed in the survey and interviews was one that we had not anticipated at the start of the project. This was that newly trained physicians, especially those in pediatrics and obstetrics/gynecology, lacked certain technical skills that all physicians had if they had completed their residency ten or more years ago. In pediatrics, these missing skills included performing circumcisions and lumbar punctures, and the placement of difficult intravenous access lines. In obstetrics/gynecology, they included competence in and comfort with certain complex surgical procedures, such as complex vaginal surgery.

Some chiefs believed that the deficiencies stemmed from reduced residency work hours and the resulting lower volume of procedures that new physicians had performed in training. Other chiefs pointed to changes in technology. For example, many routine procedures that were once conducted by making large surgical incisions and, in effect, “opening up” the patient have now been replaced with laparoscopic procedures, in which only small incisions are made and a laparoscope is inserted to conduct
the surgery or other intervention. As a result, there has been a reduction in the number of “open” procedures that residents could practice during training.

Still other chiefs noted that as university hospitals have instituted “lumbar puncture teams” and “intravenous access teams” to reduce institutional liability and increase patient comfort, there has been a corresponding diminution in these skills among newly trained physicians. Many chiefs have had to institute an expanded period of monitoring or proctoring until new physicians have mastered such procedural skills.

Considerations For Policy Makers

PRIVATE POLICY During our interviews, the chiefs of internal medicine, pediatrics, general surgery, and obstetrics/gynecology expressed opinions about the causes of these gaps and possible ways to mitigate them. As a practical matter, most chiefs said that many of the gaps could be filled or largely mitigated in an organized system of care environment. But could or should some of these gaps be closed during the education and training process instead?

Some issues are clearly less amenable to mitigation in the practice environment. An example is the trend toward reduced residency duty hours and its potential impact on the attitudes and behavior of new physicians. Some chiefs believe that these changes merely reflect societywide shifts in the attitudes of younger Americans toward work-life balance.

Chiefs who viewed these changes positively believed that although there may be training gaps in some areas, younger physicians bring new strengths and capabilities to practice—such as a greater ability to work in teams and to gather information from many sources, including the Internet and nonphysicians—which outweigh these changes in attitude. Other chiefs felt that the shifts in attitude were diminishing physician professionalism.

Our observations, assuming they are generalizable, raise the question of where in the education, training, and early work life of new physicians these gaps are best addressed. Some of them may be most appropriately addressed during medical school or even in premedical education. Others will need to be dealt with in residency and fellowship training. But organized systems of care, such as Kaiser Permanente and the emerging accountable care organizations, will need to consider and prepare for those gaps in training that they are best able to address.

The Association of American Medical Colleges and some of its member institutions are proposing to lead the way in creating the best environ-

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ment in which to train physicians for a reformed delivery system. They are developing the concept of regional alliances called “health care innovation zones.” Darrell Kirch, president and chief executive officer of the association, describes the concept as follows: “In a [health care innovation zone], academic medical centers—with their aligned hospitals and physicians—would sit at the nexus of an integrated delivery network that provides the full spectrum of inpatient and outpatient care.... [The zones] would explore and test new business models of delivery and other innovations.”

Kirch notes that academic medical centers can play a pivotal role as conveners in achieving care coordination across the community, using educational resources to improve the balance of primary and specialty care, and leveraging research resources to measure and monitor the impact of innovations. Training physicians in such settings will help build the physician workforce that will be needed in the future. Vanderbilt University Medical Center is an example of an academic medical center that has organized its physicians into group practices and has created a paired governance and management structure for its medical school, hospitals, and physicians.13

PUBLIC POLICY Some of the changes needed to prepare physicians will be beyond the scope of what residency programs and organized systems of care can reasonably do. Filling these gaps may require changes at a higher level. For example, Congress could make changes in Medicare payment policies such as those recommended by the Medicare Payment Advisory Commission. The Department of Health and Human Services could address the gaps in developing the regulations for implementing the Affordable Care Act. Accrediting bodies such as the Accreditation Council for Graduate Medical Education could further promote the core competencies and provide guidance for residency programs about how to best achieve them. To achieve their full effect, such changes will need to be coordinated.

Some policy changes are already under way.
Although most of us realize that the physician practice environment will continue to evolve, we cannot know today what changes in medicine, science, technology, health policy, and society will have large effects on the course of that evolution. Therefore, residency training—as with training for every field of endeavor—must prepare students to be adaptable, thoughtful, and cognizant of the fact that changes—in this case, in care delivery—will be shaped by committed and forward-looking leaders.

Conclusion

American physicians are widely considered to be among the best trained in the world. In this paper we have chosen to focus only on gaps in training, especially those related to a changing practice environment.

Clearly, more research needs to be done, and more discussion needs to take place before we have a thorough understanding of what needs to change in residency training and how best to make those changes. However, it is also clear that educators, accrediting bodies, policy makers, organized care delivery systems, and other stakeholders will need to confer to clarify the gaps, prioritize them, and determine which can be best addressed in medical school, residency, fellowship, or clinical practice.

The authors orally described their preliminary findings at the annual American Board of Internal Medicine Foundation Forum, Vancouver, British Columbia, August 1, 2010.

NOTES

3 Milstein A. Trailing winds and personal risk tolerance: transforming medical education and training to meet the needs of patients and society. Paper presented at: American Board of Internal Medicine Foundation Forum; 2010 Aug 1–4; Vancouver, BC.
In this month’s Health Affairs, Jay Crosson and coauthors report on the results of their survey of Kaiser Permanente’s clinical department chiefs about perceived gaps in the readiness of newly trained physicians. In particular, the department chiefs reported deficiencies among new physicians in managing routine conditions, performing simple procedures often encountered in office-based practice, and coordinating care for patients. The authors write that filling the training gaps to stay abreast of changes in health care will require modifications in residency programs, among other changes.

Crosson did a fellowship in infectious diseases at the Johns Hopkins University Medical School. In addition, he graduated from the Kaiser Permanente Executive Program at Stanford Business School.

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Murray Ross is vice president of the Kaiser Foundation Health Plan and leads the Kaiser Permanente Institute for Health Policy. The institute aims to leverage experience from the nation’s largest private integrated health care delivery system to shape policy and practice. Ross’s work focuses on how the US health system can make more effective use of new drugs, devices, and medical procedures and how to encourage greater integration of care delivery to improve quality. His doctorate in economics is from the University of Maryland, College Park.