Will current training programs prepare pediatricians to meet the health care needs of children in the 21st century? An opinion

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The discipline of pediatrics emerged as a separate and special branch of medicine in the middle of the 19th century through the founding of children’s hospitals and the training of physicians, nurses, and other professionals dedicated solely to the care of infants and children. During this relatively brief period, enormous progress has been made in the medical and surgical management of infants and children. For example, many of the illnesses that claimed the lives of children (eg, a number of infectious diseases, congenital anomalies, and cancer) or that had an impact on family and society have been controlled or even eliminated because of improvements in care and research that focused on specific pediatric problems. Recent advances in surgery and health care technology (eg, extracorporeal membrane oxygenation) together with the products of biomedical research during the last decades (eg, surfactant and conjugated vaccine for Haemophilus influenza) have improved survival of premature infants and reduced the morbidity and mortality associated with many childhood diseases.

As exciting and important as the past accomplishments have been, they will likely pale in comparison with what is likely to transpire during the decades ahead. The sequencing of the human genome and the research agenda it produces will transform pediatric and perinatal medicine, making it possible to determine the risk for congenital or acquired diseases of childhood before birth or in early life, as well as the risk for adult-onset disease. The revolutions in molecular biology and genetics will mandate that pediatric generalists and subspecialists possess a level of scientific knowledge perhaps greater than ever.

Pediatric medicine stands at a crossroads. Accordingly, it is reasonable to ask what pediatric medicine is likely to look like a decade from now and what knowledge and skills will be necessary to make a career in pediatrics successful. It is also important to assess what must be done to change our training programs to meet these new challenges and to decrease the impediments to success. Recently, the American Academy of Pediatrics produced a series of recommendations under the banner of The Future of Pediatric Education (FOPE II). We agree with a number of these recommendations, but we would like to focus on a few very specific suggestions. Although some readers will misinterpret our comments as an assault on conventional pediatric practice in the United States, our true intention is to raise important, albeit provocative, issues and make suggestions that we hope will stimulate a discourse about exciting career pathways for the future evolution of the specialty of pediatrics.

First, there is no question that the pediatrician has become an important part of our nation’s health care system for children. However, the practice of pediatrics in the United States differs from that in other industrialized nations where the pediatrician serves as a consultant rather than a primary care provider. Our view is that routine child care and some aspects of acute care management in otherwise healthy children should be increasingly delivered by the nurse clinician and family practitioner who are working in collaboration with the pediatric generalist. However, the care for children with complex acute and chronic medical disorders should be carried out by the pediatric generalist or subspecialist, who will also serve as a consultant to primary care providers (eg, family physicians) for more complex pediatric problems and for the interpretation of genetic or genomic test results that forecast certain childhood or adult disease risks.

Some generalist pediatricians should train to be “hospitalists,” recognizing that the overall acute-care needs of children who are hospitalized will continue to increase, requiring such individuals to have more intensive care training than heretofore. Indeed, children who are hospitalized are more likely to have more acute or more complex chronic medical disorders requiring multi-system management skills. Moreover, some pediatric generalists should be prepared to care for pediatric patients with chronic medical disorders (eg, cystic fibrosis, diabetes, and cancer) as they become adults. These may be physicians who have had dual training in medicine and pediatrics, but such competencies might also be achieved by having pediatric generalists spend a portion of their time training in an internal medicine environment. Pediatric generalists also require sound training in behavioral medicine; management of domestic, family, and societal violence; and treatment of substance abuse and childhood psychiatric disorders.

In addition to careers as clinically focused pediatric generalists or specialists, we strongly believe that more pediatric trainees should seek fellowship training and, in particular, careers in clinical and basic research. Ironically, during the past decade, just the opposite trend has occurred. At the beginning of the 1990s, 33% of the graduates of pediatric training programs pursued pediatric subspecialty fellowships and 10% non-pediatric specialties (eg, anesthesia), and of these, a smaller percentage commenced careers in research. During the past decade, this percentage has fallen steadily, so that by 1999, only approximately 20% of the graduates of US pediatric training programs were entering fellowship training in pediatric specialties and only 5% pursued non-pediatric specialty training. If this trend is not reversed, there will be an inadequate pediatric workforce capable and competent to ensure that specialized clinical care and related research advances will benefit infants and children in the 21st century.

Ten years ago, when there was a general cry for more primary care physicians and fewer specialists in the United States, pediatrics was recognized as one of the primary care specialties. This trend helped attract additional numbers of talented US medical students to consider and pursue training in pediatrics. Indeed, many pediatric training programs committed themselves to
training primary care pediatricians, and the accreditation committees began to insist on fewer hospital-based skills and more ambulatory and general pediatric training. We agree that a greater emphasis on ambulatory training is important. We also believe, however, that greater programmatic flexibility is essential to ensure that trainees can develop more creative training pathways for future success, especially given the enormous changes taking place in the biomedical sciences. For example, these might include tracks for the pediatric generalist, clinical specialist, investigator, or public health and policy specialist.

We are also cognizant that a number of factors have an impact on the choices of medical students and pediatric trainees. Among the most important is college and medical school tuition-loan indebtedness. Accordingly, lengthening the period of training is often viewed as a problem, and for a number of individuals, discourages pursuit of fellowship training. This is particularly true for individuals interested in research, because acquisition of the skills to become an independent investigator require an additional 2 to 3 years beyond the standard 3-year period as a fellow or junior faculty member, thus extending the overall training period to 8 to 9 years beyond graduation from medical school. To permit trainees to pursue career paths that require more time and incur more expense, institutions or the public sector should develop “loan forgiveness” programs to in which impediments indebtedness places on career choice.

It is also ironic that support for both basic and clinical research (including outcomes, epidemiology, and behavioral research) through the National Institutes of Health (NIH) has increased significantly in the last 2 to 3 years, a trend that is likely to continue until a doubling of the NIH budget has occurred. Thus at the very time when clinical revenues are declining, support for research and opportunities for major research breakthroughs are increasing. Unfortunately, fewer and fewer pediatricians are pursuing these opportunities in research, a trend that initially for having a qualified workforce to continue to improve the health of children in the next century. Accordingly, opportunities for research during residency training are important, although this is difficult without increased flexibility to permit the pursuit of new training pathways and opportunities. We believe that this can be achieved more economically and successfully if training programs are given greater latitude by the Accreditation Council for Graduate Medical Education and the American Board of Pediatrics to explore new career directions and training opportunities.

In addition, pediatricians may also achieve highly important contributions to child health through careers in public health and health care policy and advocacy. As with the more traditional roles described previously, these career paths are likely to benefit from new educational alignments with schools of public health, education, government, business, law, health policy, and arts and sciences. These cannot be just another addition to traditional training, because the time and resource commitments may be prohibitive for both the trainee and the training program or university. Thus creative planning that develops new training pathways important if we are to develop a pediatric workforce able to address the challenges of the century ahead.

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Mentors and career development advisors are essential for guiding future physicians. They should be an integral and essential part of a training program and should provide regular guidance and feedback to each trainee. For example, informal seminars should allow small groups of trainees to gather with faculty to discuss career areas and opportunities in basic and clinical research (including translational health outcomes, epidemiology, and behavioral research), clinical care, public health, and public policy/advocacy. Such groups should permit trainees to interact with faculty in a flexible manner so that they can develop creative career options.

Achieving any of these new career pathways requires a willingness to face one additional challenge, which permeates all of medicine, but which is heightened in pediatrics. This is the struggle of young professionals to achieve work and family balance, given the demands of a prolonged training period, long work hours, high stress, poor compensation, and high levels of indebtedness. Despite some of the accomplishments in achieving gender balance, the burden on women is often greater than that on men, especially when childbirth is considered. The fact that approximately half of our nation’s entering medical students are women is an important achievement. Of note, nearly 70% of incoming pediatric trainees are women, many of whom are beginning their families. The challenges of their personal lives add an additional stress to the choice of career and make a long pathway of additional training, especially toward research, seem insurmountable. Ironically, such a career path may actually have greater opportunities for job and time flexibility, although the role models who might champion this are frequently absent. The number of women entering pediatrics makes this especially relevant to the structure and flexibility of our training programs and to the opportunities that are created.

Medicine is changing rapidly. We need to make the necessary adaptations so that we can ensure a successful future for our pediatric trainees and workforce. This will not occur unless we are innovative, creative, and open-minded. Reproducing the past is not likely to be the best remedy for the future. We do not believe our current training programs, or the constituencies that support them, are poised for the dramatic changes that are necessary. For the sake of future generations, we have raised fundamental questions about the future of pediatrics. It is time for a constructive dialogue among pediatric specialists, primary care providers, and scientists to consider carefully the health care needs of children during the next decades and the ways to reshape our training programs and institutions to secure the most successful future for the next generation of children and pediatricians.

**REFERENCES**

8. 2000 Annual Report of the American Board of Pediatrics to the Association of Medical School Pediatric Department Chairs.