ABSTRACT. Managed care involves the linkage of service delivery and financing. One of the outgrowths of the rapid expansion of managed care over the past decade has been an increasing consensus that the generalist of the future will need to manage more of the patients traditionally cared for by subspecialists. Subspecialty education for pediatric residents becomes increasingly important as the role of the pediatric generalist enlarges to include independent outpatient management of some less complex but traditional subspecialty patients as well as collaborative management of more complex patients. To prepare for this role, a balanced exposure to subspecialty problems in outpatient as well as inpatient settings is required. At the same time, however, the growth of managed care has led to certain barriers for providing this enhanced training. This article describes the effects of managed care on the role and scope of the pediatric subspecialist as well as on educational strategies for coping with these changes while reshaping the roles of both generalists and subspecialists for maximal effectiveness in meeting the health care needs of children. Pediatrics 1998;101:779–784; managed care; pediatric specialty care; graduate medical education; pediatrics; academic medical centers.

ABBREVIATION. MCO, managed care organization.

THE CURRENT ROLE AND SCOPE OF THE PEDIATRIC SUBSPECIALIST

The pediatric subspecialist’s role can be defined as accumulating knowledge about complex, chronic, or severe diseases of childhood to advance clinical care, frame research questions, and disseminate knowledge to other providers. Pediatric subspecialty practice, however, is different from adult subspeciality medicine primarily because of the unique features of pediatric disease demography. Adult health care is dominated by prevalent chronic disease with relatively simple pathophysiology and outcomes that often are quantifiable over short time intervals. The sheer numbers of subspecialty problems have made private subspecialty practice in adult medicine a viable option for many. Also, because of the ability to accumulate large cohorts of patients, significant differences in numbers of patients and in outcomes can be demonstrated in a timely enough manner to influence legislative and market strategies. In contrast, children have a much lower incidence of severe or chronic disease and, when present, disease tends to be more complex with multiple comorbidities. The accumulation of an appropriate number of patients for the subspecialist to maintain clinical competency; train students, residents, and fellows; and conduct clinical trials has been more of a challenge in pediatrics compared with adult medicine. Additionally, attempts to apply an experimental methodology to the study of best clinical management is complicated by the problem that many of the most significant pediatric outcomes are not identifiable for years or even decades.

Because of these characteristics of pediatric chronic illnesses, most pediatric subspecialists work in academic institutions, where they are generally responsible for the advancement of clinical care as well as for providing educational opportunities to a variety of learners. There also has been considerably less competition between pediatric subspecialists and generalists than that found in adult medicine, probably because of less overlap in the disciplines. Because pediatric subspecialists in teaching centers are primarily responsible for the education of residents and for continuing educational opportunities for generalist providers in their respective areas, any process that influences access to care to this group or induces financial instability will have a profound effect on residency programs. Therefore, it is vitally important to examine these issues with respect to the impact of managed care. Because managed care has stimulated some important improvements in health care delivery, the positives and negatives of the system should be looked on as a balance that can be influenced by appropriate monitoring, planning, and revision, when necessary.

PROBLEMS AND OPPORTUNITIES ASSOCIATED WITH MANAGED CARE

One positive impact of managed care has been a renewed emphasis on increasing responsibility by generalists for issues traditionally under the management of subspecialists and a heightened awareness of the deficiencies of residency training in the less acute/less complex end of subspecialty care. This has prompted educational programs to reexamine the curriculum for residency training. In the past, resident training has occurred primarily in the setting of ward rotations and subspeciality clinics that often stress the more acute or complex portion of the spectrum of diseases. Because of both acuity and funding mechanisms for residency training, the inpatient care
of complex patients traditionally has competed with outpatient opportunities involving such simpler issues as chronic constipation, heart murmurs, developmental delay, and diabetes control. The resultant subspecialty exposure has sometimes been inefficient and uneven.

If generalists are going to take on less complex subspeciality illnesses, they must be exposed to more subspecialty patients in the outpatient setting. For residents to develop adequate competency in the diagnosis and treatment of these problems, residents will need exposure to accumulated groups of patients with similar disorders. The ability to aggregate patients with complex, severe or chronic diseases in pediatric subspecialty services, however, has been compromised by changes in the financing and delivery of health care under managed care in several key ways. First, adequate numbers of affected patients are not always available within a given HMO system. Second, selection of centers of excellence by managed care organizations (MCOs) sometimes is based on the reputations of affiliated adult care programs or on financial incentives, rather than on criteria of excellence in managing pediatric illness. Third, some MCOs frequently refer children to adult subspecialists.

There are special incentives for MCOs to refer children to adult subspecialists. First, adult subspecialists represent a fixed cost for staff model HMOs, whereas pediatric subspecialists represent a variable cost, because of an inadequate volume of patients to internally support a specifically trained provider, resulting in the need for outsourcing. Second, in fee-for-service contracts, adult subspecialists provide significant discounts for volume care and, as a result, are given the incentive to provide care for patients of widely ranging ages. The age at which children are being directed to adult subspecialists is variable by region, urgency of care, and payer type; however, even younger children and infants sometimes are diverted from the care of pediatric providers. Adult subspecialists usually see the less severe end of the spectrum of pediatric disease and rarely see complex cases or severely ill patients. This has a profound effect on the financial stability of pediatric subspecialists because reimbursement of simpler problems subsidizes the care of more seriously ill patients, the reimbursement of which falls far short of time and effort expended. Although many believe that this problem limits access to their programs, there is a paucity of information in the public domain relating to outpatient referrals, and it is unlikely that MCOs will be completely forthcoming about referral practices in this sensitive arena. Thus, competition with other less specialized providers reduces the number of patients available whose cases are ideal for the education of generalist providers, and competition for the better-reimbursed, healthier patients reduces financial resources to support education and research.

Added competition for patient care has resulted in progressively deeper discounting for subspecialty care by traditional and point-of-service contracts. Changes in valuation of practice expense may cause a significant decrease in subspecialty revenue. This drop in reimbursement affects pediatric subspecialty care disproportionately, because it is already poorly reimbursed for effort.

Early findings indicate that capitation may disadvantage children with chronic conditions and their providers. Reduced access to subspecialty care and decreased reimbursement affect all academic programs adversely, but are felt even more acutely by programs that manage rare and complex disorders. The number of chronically ill children under managed care should increase significantly with the spread of statewide Medicaid MCOs; thus, it is imperative to establish appropriate roles and support of their health care providers.

On a brighter note, the competitive changes in the health care field have stimulated the development of a new and improved framework for the team approach to patient care. This is an opportunity to define new roles and educational experiences for pediatric generalists and subspecialists as well as for advanced nurses and other health professionals. As the managed market continues to evolve, pediatric subspecialists and generalists can assume increasingly effective roles in the care of children if careful utilization and outcome data are acquired.

The seamless delivery of health care to children is an important goal that would be facilitated by an integrated system of providers that includes generalists, subspecialists, and allied health professionals. Targeted education of generalists, coupled with immediate and consistent access to a subspecialist through contract affiliations and advanced communication technology, would provide the most frugal and, therefore, the most sustainable delivery system. A deliberately structured curriculum should be created for the medical student, resident, and practicing generalist. Current activities of the Future of Pediatric Education II Taskforce should clarify roles and educational needs for generalists and specialists and, therefore, point the way to the most appropriate educational emphasis for all.

A system-wide elaboration of management strategies and quality assessment would promote the best outcome for a broad spectrum of disease states and simplify communication between providers. A well-integrated system with a balanced work force would require familiarity between providers through consistent interaction that would enhance the comfort level of all parties with the continual process of turning over complex care to the generalist. To sustain the necessary core of subspecialists to support a network of providers, there needs to be a means of supporting their time and effort that recognizes the value of the coordinating and planning function and does not require direct patient contact. These steps would ensure that the subspecialty work force remains a lean but functional model for sustaining education, research, and the translation of new knowledge to advances in patient care.

PHYSICIAN EDUCATION: RECOMMENDATIONS FOR CHANGE

The new emphasis on increasing responsibility by generalists for common, lower acuity traditional sub-
specialty issues necessitates changes in the resident educational process. The scope of experience to be acquired includes detection, diagnosis and routine management of a wide range of complex or severe organ system abnormalities, understanding indications for referral, coordinating multisystem management, directing the financial and medical resources, using telemedicine and other technical advances, and monitoring the effectiveness of care strategies. Although the three years of pediatric residency training is quite full, there are many reasons to avoid prolonging training or drastically reducing other content areas. This puts great importance on creating new models and efficiencies for residency subspecialty experiences and incorporating the latest advances in computer aided education as described below.

First, as the residency curriculum is adjusted to the present realities of patient management, the training location of traditional subspecialty rotations must be rethought. Because general pediatricians may be the only local resources available for the stabilization and initial management of severely ill children, care must be taken to maintain substantial exposure to acutely ill patients through the use of emergency, transport, and critical care settings. However, in recent years, several authors have called attention to the diminishing educational value of inpatients. Greater emphasis on ambulatory care diagnostic evaluations and management has decreased the exposure to many conditions in the inpatient setting. Many patients are admitted with prepackaged diagnostic or management instructions so that residents become caretakers rather than decision-makers. Clearly, there are important experiences to be gained in the ambulatory setting of a referral center, outreach subspecialty clinic, and inpatient setting. The training location for each subspecialty subject should be selected deliberately to enhance the curriculum, rather than assuming that inpatient blocks automatically provide a balance of experience.

Second, the traditional structure of the subspecialty rotation also needs to be rethought. As length of stay for all patient groups is continually shortened in response to competition for managed care contracts, the opportunity to observe the progression of disease states and the response to management will be compromised unless the transition between inpatient and outpatient management is incorporated into residency training. This suggests that subspecialty rotations be redesigned according to disease or problem groups rather than strictly to inpatient or outpatient experiences. Blending of inpatient and outpatient subspecialty rotations could provide continuity of experiences, counteract the fragmentation caused by shortening length of stay, and provide learners with exposure to a broad spectrum of subspecialty issues; however, the number of available patients still may not be ample enough to fill a month-long rotation in a single subspecialty. Several methods of augmenting the subspecialty outpatient experience are possible. Some outpatient experiences could be grouped into a single rotation to prevent underutilized time and allow complementary disciplines to reinforce one another (eg, rheumatology, orthopedics, and rehabilitation). Also, many subspecialty groups maintain outreach clinics in remote locations. These clinics often offer the resident exposure to the milder end of the subspecialty patient spectrum and the largest number of previously undiagnosed patients and, therefore, are especially instructive.

Third, the content of the subspecialty experience must be formalized and not serendipitous. Subspecialty rotations will need to be required, not elective. Subspecialty groups also will need to develop and disseminate specific teaching curricula for the generalist that provide appropriate exposure to patients with a wide range of severity and complexity states and a degree of continuity. Target numbers for specific procedures to be performed by the trainee under supervision and types of patients to see either in person or by simulated computer technology must be developed and monitored. Patient care scenarios could be developed, computerized, and accessed during unscheduled clinical times during a rotation.

Fourth, because there are increasing time demands on academic subspecialists, it will be advantageous to utilize advanced instructional technology and telemedicine for maximum effectiveness and efficiency. Computer software programs for resident teaching and CME currently are under development. Repetitive lectures should be reduced by interactive software that would increase the efficiency of subspecialists in teaching institutions. Use of advanced educational designs also could enhance the learning of key features over an increasingly broad required informational base. For many disease states, computer-based instructional multimedia cases are extremely useful teaching tools. This learning format allows the presentation of visual images, sounds, and a wide array of clinical information, enabling the learner to engage in interaction and self-testing, which improve retention and interest. Typical and atypical visual findings of a disease state can be displayed in a comprehensive manner usually not available in the hit-or-miss outpatient environment. Thus, a certain exposure to informational content is ensured, freeing the resident-faculty experience for emphasis on other aspects of patient care. Exposure to telemedicine also should be incorporated into the subspecialty experience. The speed and efficiency of communication among educators, trainees, and different levels of care providers also will facilitate the educational process modeling generalist–subspecialist interactions that will become important to pediatric trainees when they transition from resident to community practitioner. This modality will become increasingly vital to support generalists in office- or hospital-based practices as they take on more complex roles in care delivery.

Fifth, new emphases will need to be added to the subspecialty experience. Rotations will need to place greater emphasis on health promotion and disease prevention as well as on evidence-based practice as medical training prepares pediatricians for a managed care culture with shifts in emphasis from cure of the acutely hospitalized patient to care of the
allow the teaching center to continue as the source of educational funds provided through government, in-teaching function should be supported by explicit sources necessary to support clinical effort. The will provide important information about the re-cognition care given by other providers. An accounting of these resources are shrinking, whereas subspecialty care, research funds, teaching, and other sources. All subsidized by revenues from low-acuity subspecialty care, research funds, teaching, and other sources. All subsidized by revenues from low-acuity subspecialty care, research funds, teaching, and other sources.

Sixth, who participates in teaching during a subspecialty rotation will need to be addressed. For a blended organizational scheme of care and training to be effective, teams of subspecialists, generalists, nurses, and social workers must provide continuous care for unstable patients, direct the aggressive management of inpatients, and coordinate the management of outpatients. Use of such a model not only provides an optimum standard of patient care and educates the resident in treatment beyond the bedside of the hospitalized patient, it offers an instructive example of an interdisciplinary team. Alternatively, blended programs with subspecialists working together with generalists to provide service to traditional subspecialty patients could offer another glimpse into an organizational structure of care delivery for the future. Still another approach would be the use of the academic consultative generalist to provide the resident with critical role models by leading the evaluation of problems such as asymptomatic murmurs, chronic constipation, and developmental delay.

Seventh, the continued aggregation of patients with uncommon or severe diseases or conditions in teaching centers is important both for quality delivery of care to children and for the education of trainees. Issues of reimbursement and referral patterns in a managed care setting must be addressed aggressively. In the past, the care of chronically ill children and advancements in subspecialty medicine were palliated. Since the establishment of subspecialty rotations also will need to incorporate teaching about maximizing a child's care by accessing community services, public sector systems, and parent–child support groups. This has always been part of the subspecialist’s role in the provision of child health care, but has been modeled for the trainee less often.

Finally, it is imperative to expose the pediatric resident to the range of subspecialties to link trainees with possible career paths. Because there is a favorable balance between pediatric generalists and subspecialists, there is no reason to adjust the type of learning experiences to manipulate the work force distribution. In fact, certain pediatric subspecialties must attract trainees to maintain and advance these fields. In the past, 30% of pediatric residents entered subspecialty training, and only half of these completed their certification in pediatric subspecialties. This percentage is dropping to 21% during the current academic year according to exit interviews by first-time candidates for certification in general pediatrics. Only 11 198 subspecialists have been certified by the American Board of Pediatrics since the establishment of individual subboards (personal communication, ABP, 1996; Workforce Data). The actual number of active subspecialists is likely to be somewhat lower because some of the long-standing subboards such as pediatric cardiology, which was established in 1961, include a substantial number of diplomats who have left the field in the intervening years. As trainees are exposed to role models of generalists involved in more complex patient care, decisions to pursue subspecialty careers are likely to be driven primarily by procedural or research interests.

**SUMMARY**

The effect of managed care on academic health centers has been to create increased competition for patients and to drive down fiscal resources. This has had an even more unfavorable effect on pediatric subspecialties because of the relative rarity and complexity of disease states in children compared with adults. Competition for pediatric patients comes from a variety of areas, including from the more plentiful adult subspecialists, and impedes the ability to aggregate groups of patients with a broad range of disease severity to provide the best care for chronically ill children as well as the best learning environment for residents. On the other hand, managed care has stimulated the development of a mechanism for enhanced interaction within a team of providers and offers new roles for generalists and subspecialists. Currently, there is considerably less competition between pediatric subspecialists and generalists than that found in adult medicine, and it is hoped that this characteristic will remain as financial incentives are realigned. The best outcome for everyone will be achieved if academic medical centers take the lead in developing successful systems of care delivery, utilizing partnerships between generalists and subspecialists, academic and community based physicians in a creative manner.

Preventing or conquering serious disease remains an elusive ambition. In the rush to redress serious deficiencies in disease prevention created by the fee-for-service system, it is important to remain conscious of the ongoing needs of the sick as well as the...
Training Pediatricians for the Evolving Generalist–Specialist Interface in the Managed Care Era, by Williams et al

EDUCATING THE GENERALIST ABOUT SUBSPECIALTY ISSUES: A PROACTIVE APPROACH

Predicting the future and its needs is always hazardous. Where does one begin? Should one examine the present reality and try to determine where this will lead, or should one create a vision and try to influence the turn of events? This dilemma is confounded further by trying to defy reality. More and more, we use statistics to predict market forces, particularly those that appear to govern decisions in the managed care arena. Determining the future role of the subspecialist and, hence, the interface between subspecialist and generalist can be reduced too easily to a numbers crunching event, looking at generalist to subspecialist ratios, population bases, and reimbursement strategies. In reducing the analyses to numbers-gathering, the full role of the subspecialist as educator, researcher, and consultant is ignored. Thus, rather than using the changing economics of health care as the driving force for change, let us create a vision of how generalists of the future should be involved in the care of patients with chronic and complex disease, how their training should be structured, and how obstacles to education and care can be addressed.

THE SUBSPECIALIST AS THE PROVERBIAL ELEPHANT

The subspecialist is rather like the elephant being examined by blind men, one feeling the trunk, one the tail, and so on. Managed care has focused on the role of the subspecialist as clinician and maintained that health care provided by a subspecialist is more costly than that provided by the generalist—hence, the impetus to involve generalists in the care of these patients. Although Williams et al maintain that most pediatric subspecialists work in academic institutions, there is evidence that this may not be so, even in pediatrics. Figures from the American Board of Medical Subspecialties report that there are 45 board-certified pediatric cardiologists in Los Angeles, yet it is apparent that not all of these individuals are located in the seven academic training programs in the area. Although clinicians in the community serve a role in caring for children with chronic and complex conditions, the role of the subspecialist goes beyond patient care. Williams and colleagues define the subspecialist role “as accumulating knowledge about complex, chronic, or severe diseases of childhood to advance...”
clinical care, frame research questions, and disseminate knowledge to other providers,” another feature of the elephant. The importance of the subspecialist as educator, researcher, role model, and child advocate cannot be ignored. Although these roles may seem lofty, in the numbers crunch arena they represent an essential component of the game plan in defining the future. The correct number of subspecialists needed to educate or carry on critical research has not been addressed, and probably should not be.

The clinical role of the academic subspecialist, as well as of the community-based subspecialist, needs to be examined. One approach is to separate referral from consultation. With referral, the care of the patient is being transferred to another physician; with consultation, the advice of the consultant is sought, but the generalist retains care of the patient. It is critical, then, that the resident knows when to consult and how to follow the direction of the consultant.

RESTRUCTURING RESIDENT EDUCATION

Although Williams et al use the changing role of the subspecialist as defined by managed care as the impetus for restructuring resident education, the very changes that they suggest already have been implemented through the revised Program Requirements for Residency Education in Pediatrics. For years, resident education has been too inpatient-focused, failing to address critical issues such as health maintenance, adolescent medicine, and behavioral issues. As early as 1994, the Residency Review Committee (RRC) for Pediatrics queried pediatric organizations about the needed changes in residency education. Key issues were identified, foremost of which was the need to move from an inpatient to an outpatient emphasis. As a result of these recommendations, the mandate that 50% of pediatric training be ambulatory was created. One strategy to achieve this mandate is to move the focus during subspecialty rotations from inpatient organ system-specific services to outpatient sites that focus on health maintenance and long-term management of chronically ill children.

It is reassuring that nearly all of the recommendations proposed by Williams et al already have been incorporated into the revised pediatric program requirements. The first recommendation that “more attention be paid to outpatient contacts with subspecialty patients. . .” is met by the RRC requirement that “Outpatient experiences should be integrated into all subspecialty rotations to provide an opportunity for residents to develop skills needed to manage patients with complex illnesses in the primary care setting” (Pediatric Program Requirements V.C.). Blending inpatient and outpatient experiences, as is recommended, also is the intent of the RRC: “it is required that all residents be exposed to the specialized knowledge and methods of the major pediatric subspecialties through longitudinal experiences on the general inpatient and intensive care services and in outpatient settings” (Pediatric Program Requirements, V, section C). The need for a structured curriculum, recommendation three, is another RRC requirement: each component must include “a structured educational experience. . .” with “written goals and objectives.” The need to include “new emphases” is already mandated by the RRC, as is the requirement for using a broader base of individuals to teach the residents. For instance, Pediatric Program Requirement V.B.1d states that residents must have the opportunity to “develop skills in working with an organized inpatient health care team, including nursing, child life therapy, social services, physical therapy, occupational therapy, and discharge planning.”

It is the expectation that the changed emphasis during subspecialty rotations will better enable the primary care physician to care for children with chronic problems, and approach their care from a health maintenance–disease prevention perspective. It would be important also to teach the residents about the difference in the role of consultation versus that of referral. The primary care physician must become familiar with common problems to be able to differentiate these from problems requiring consultation or referral.

EDUCATIONAL CHALLENGES

Given the current and future directives for increased generalist involvement in the care of children with organ system-specific diseases, the gauntlet has been dropped challenging the academic subspecialist to model resident education to meet the needs of the generalist. The focus should be away from diagnostic dilemmas and the esoteric to the recognition of common conditions and their management. Curriculum development presents not just an RRC obligation, but also an opportunity to structure and sculpt the knowledge of the individuals who will be caring for children. Some bastions of the past may have to fall; for instance, organ system-specific inpatient services may need to be replaced by general inpatient services where children are cared for by generalists, using subspecialists as consultants.

The challenge of adequate patient numbers remains uncertain. How many patients does it take to educate a physician about a given disease entity? It is difficult for any group to reach consensus on this. The RRC has been criticized frequently for trying to dictate a number without a proven frame of reference.

Our job is to define for managed care the appropriate role of the subspecialist in the care of children. Our obligation is to train pediatric residents both to care for children with common chronic illnesses and to know when to consult with subspecialists. The role of the subspecialist as educator and researcher must not be subsumed by the numbers game of managed care. By creating the future, we will ensure that the care of children is not compromised by the economic incentives of some.
Training Pediatricians for the Evolving Generalist–Specialist Interface in the Managed Care Era

Roberta G. Williams, Leonard D. Stein and Laurel K. Leslie

*Pediatrics* 1998;101;779

Updated Information & Services

including high resolution figures, can be found at:
/content/101/Supplement_3/779.full.html

References

This article cites 14 articles, 2 of which can be accessed free at:
/content/101/Supplement_3/779.full.html#ref-list-1

Citations

This article has been cited by 1 HighWire-hosted articles:
/content/101/Supplement_3/779.full.html#related-urls

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):

Medical Education
/cgi/collection/medical_education_sub

Teaching/Curriculum Development
/cgi/collection/teaching_curriculum_dev_sub

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
/site/misc/Permissions.xhtml

Reprints

Information about ordering reprints can be found online:
/site/misc/reprints.xhtml

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PÉDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 1998 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.
Training Pediatricians for the Evolving Generalist–Specialist Interface in the Managed Care Era
Roberta G. Williams, Leonard D. Stein and Laurel K. Leslie

*Pediatrics* 1998;101;779

The online version of this article, along with updated information and services, is located on the World Wide Web at:
/content/101/Supplement_3/779.full.html