The Changing Health Care Environment: Implications for Residency Training

Seth Frazier, MBA*; Daniel Hyman, MD*‡; and Steven Altschuler, MD*‡

ABSTRACT. Throughout the United States, the growth of managed care is forcing pediatric providers (physicians and hospitals) to reconstruct and integrate the health care delivery system with a focus away from the academic center and toward the community. Managed care also is forcing new financing approaches geared toward the assumption of economic risk for patient management and utilization of services. Radical changes in pediatric training programs will be necessary to accommodate the strategic and operational changes being pursued in response to these evolving market forces. These changes, while disruptive, will strengthen the breadth and diversity of graduate medical education and will better prepare trainees for the new delivery system in which they will practice. In this article, we examine how the evolution of managed care is redefining the basic financial and organizational framework for pediatric care and the implications of this redefinition for children’s hospitals and academic medical center-based pediatric programs. We draw on our experience in the greater Philadelphia market to illustrate the impact of these changes and discuss one pediatric system’s response. Finally, we review the educational opportunities provided by these changes. Pediatrics 1998;101:795–804; managed care, residency education, capitation, integrated delivery system, children’s hospital, utilization management, total quality management, health care financing.

ABBREVIATIONS. HMO, health maintenance organization; CHOP, Children’s Hospital of Philadelphia; PCP, primary care physician; TQM, total quality management.

MANAGED CARE GROWTH AND ITS IMPACT ON FINANCING AND ORGANIZATION

Managed care continues to grow rapidly. The Commonwealth of Pennsylvania, for example, has seen health maintenance organization (HMO) enrollment nearly triple between 1990 and 1995 to reach a nearly 30% share of the commercial population in 1995. Local analysts project HMO enrollment will continue to grow and cover two thirds of the population by 2002 (Fig 1). Children represent approximately one third of the HMO population in the Commonwealth. In Pennsylvania’s major urban markets, Philadelphia and Pittsburgh, HMO commercial penetration has exceeded 50%. In 1995 in the greater Philadelphia region, 75% of children covered by Medicaid were enrolled in HMOs (before 100% mandatory enrollment in 1997), and 62% of the commercially insured children were enrolled in HMOs.

Additional growth is anticipated, despite what appears to be a recent managed care backlash, through the expansion of more flexible HMO products. These products typically offer some, although reduced, coverage for out of network care and easier access to in-network specialists. These more flexible point of service products (as well as preferred provider organization plans) are accounting for much of the enrollment growth in many health care markets.

The increasing prevalence of all types of managed care influences provider market dynamics and compensation in well-described patterns (Fig 2). In the early stages of market evolution, independently practicing providers typically are paid on a discounted fee-for-service basis, whereas resource utilization and quality of care are monitored primarily through external review processes (eg, insurer audits). The health care delivery system typically is neither organizationally nor financially integrated. As the regional health care market matures, however, managed care becomes a more dominant part of the financing system, and providers must organize into integrated systems to compete effectively. These provider systems often contract with payers for either a global capitation rate or a percentage of the insurance premium and are thereby at financial risk for the covered population’s health care. During this phase, significant consolidation occurs among provider systems and health plans. After the consolidation is completed, leaving a handful of providers and heath insurers, a phase of managed competition ensues. Philadelphia has evolved considerably since the original market evolution research was conducted in the early 1990s and represents a market in the consolidation phase.

The market evolution toward greater provider integration is being driven by several factors. First, providers can create a stronger negotiating position by organizing to control a sufficient market share to become a must-have component of every payer’s provider network. In this situation, a health plan cannot afford to exclude the provider because too many members would be forced to switch out of their current plan to preserve physician–patient continuity, and this switching would reduce health plan enrollment. As a must-have component, payer’s will...
be forced to offer a price for services that will maintain the participation of the provider group.

Second, integrated provider groups providing care in an arrangement involving financial risk can achieve lower levels of resource utilization than can an unorganized network monitored by outside review agencies.4,5 As competitive market forces create intensified price competition, it is in the insurers’ interest to support the development of these integrated provider systems with whom the payer can then contract for services. Although these tendencies are not uniform, they are increasingly in evidence across the United States, including (in a dramatic manner) in the Philadelphia market. Third, and not least, there are general scale advantages for systems over free-standing providers.

The Philadelphia market has responded aggressively to these changes. Four regional health systems have emerged—University of Pennsylvania Health System, Allegheny Health, Education and Research Foundation, Jefferson Health System, and Temple University Health System—to establish broad-based delivery systems, acquire primary care physician (PCP) practices, and pursue risk contracts with payers. All four systems have an academic medical center component. Allegheny Health, Education and Research Foundation; Jefferson; and Temple each have an integrated children’s hospital. The University of Pennsylvania has an academic relationship with The Children’s Hospital of Philadelphia (CHOP), although the institutions remain independent. Both of the major HMOs—Aetna/US Healthcare and Keystone Health Plan East—in this market are pursuing full-risk arrangements with the local delivery systems. This environment provides an excellent laboratory for considering the impact of market evolution and one pediatric system’s response.

STRATEGIC AND OPERATIONAL IMPLICATIONS

Five major implications of these market dynamics exist for children’s hospital and academic medical center-based pediatric services, including 1) relentless downward pressure on facility and specialty utilization; 2) integrated delivery system development; 3) independence versus strategic alignment; 4) actuarial challenges; and 5) new model for quality management.

Decreasing Facility and Specialty Utilization

The foremost area of impact is clearly the tremendous pressure from government, employers, and insurance plans for the health care system to reduce both the rate of facility and specialty utilization and the cost of such services. Significant declines (10% to

---

**Fig 1.** Managed care penetration rates in the Commonwealth of Pennsylvania and the entire United States between the years 1990 and 2002. The rate of growth of managed care in Pennsylvania (dark line) and in the United States (light line) is compared between the years 1990 and 2002. The asterisk for years 1996, 1998 to 2000, and 2002 indicates the projected rate of managed care penetration.

**Fig 2.** Stages of the evolution of the health care market. As managed care becomes the more dominant part of the health care financing system, the health care market of insurers and providers of care evolves in a predictable manner through four stages (by permission of APM, Inc).
In the greater Philadelphia region, days in pediatric units have fallen by 15% from fiscal year 1991 to fiscal year 1996 based on data available from the local hospital council. Approximately two thirds of this decline was accounted for by reduced length of stay and the remaining third by reduced admissions. Interestingly, to date the aggregate census for the area’s children’s hospitals has remained constant because decreases in length of stay have been offset by increases in admissions. A recent Milliman and Robertson report forecasts that as markets evolve from “moderately managed” to “well managed,” commercial pediatric (age 0 to 18) non-neonatal intensive care unit inpatient use is expected to decline by more than 50%. This region has use rates consistent with “moderately managed” performance, thus, we anticipate significant additional declines.

Several factors contribute to this reduction in inpatient utilization. First, a significant proportion of pediatric inpatient days are for uncomplicated medical conditions such as asthma, respiratory infections, gastroenteritis, and dehydration that can be managed now with less hospitalization. Strategies to reduce inpatient utilization for these common conditions include improved ambulatory management, development and use of outpatient treatment centers and home care services, and improved efficiency in the inpatient setting. Second, for those conditions that still will require hospitalization, critical pathways and clinical care guidelines are emerging in many places as provider systems attempt to identify the most cost-effective strategies for managing common, predictable inpatient conditions (eg, surgical repair of uncomplicated atrial septal defects, appendectomy, asthma). Third, practitioners are increasingly comfortable discharging children at earlier phases in their recovery. In part, this is true because home care companies are simultaneously increasing their ability to manage many types of patients, including neonates, in a home setting.

The most important educational issue posed by inpatient declines is the decrease in general medical patients who provide an important component of the hands-on teaching opportunities for house staff. The house staff will need to be relocated to day treatment centers and integrated into home care programs to continue participating in the care of these patients.

A reduced need for specialists is expected in the future. The Council on Graduate Medical Education recently concluded that “reasonable projected specialist physician requirements range in the early 21st century. . . (from) ~85 to 105 specialist physicians per 100,000 population,” compared with a current supply of 140, a surplus of 25% to 40%. Lower specialist use rates are accomplished by reduced procedure frequencies, increased primary care management, and reduced access to specialists through financial and administrative mechanisms. Although several organizations are starting to challenge the common HMO PCP-as-gatekeeper paradigm, arguing that increased access to specialists can actually create more efficient treatment, there is little question that the overall demand for specialists will decline.

Future changes in the need for pediatric specialists are less predictable. The Milliman and Robertson report cited above forecasts that pediatric utilization of specialists will decline by 15% as the market evolves from “moderately managed” to “well managed.” In many markets, the overall reduced demand for specialty services has meant that previously adult care-oriented specialists now are looking to provide care to children who require specialty care. Once in control of aggregate health care spending through global risk contracts, many integrated systems owned and governed by adult-focused entities will be inclined to direct care toward in-network adult specialists rather than to non-network pediatric specialists. This pressure has resulted in disconcerting shifts in how specialty providers are chosen for children in many markets throughout the United States and is likely to continue to create competitive pressure between adult and pediatric specialists in the coming years. Although pediatric specialty expense is approximately half of specialty expense for adults, pediatric-focused systems also are identifying strategies to reduce specialty utilization through initiatives that reduce discretionary, possibly unnecessary, services and that enhance the role of the primary physician in a coordinated, comprehensive way. There are no data available publicly for pediatric specialty utilization in our market, although our own internal comparisons with mature market pediatric experience indicate that specialist utilization could fall by up to 35%. Not surprisingly, we have seen a dramatic shift in the career choices of pediatric residents graduating from CHOP. In the 1996 graduating class, 50% went into primary care pediatrics compared with 50% into additional specialty training. In 1990, 30% went into primary care and 70% to advanced specialty training.

The Table, based on an actuarial analysis from Bob Gold & Associates, Inc, compares the projected changes in pediatric and mixed populations by component of health care expenditure in a commercial population. The Table illustrates the significant decrease in all non-PCP areas of health care expenditures.

One area of possibly increased need for pediatric specialists is the inpatient physician, or hospitalist. Quality of care and resource utilization are both benefited by having inpatient care provided by physicians who can monitor more closely the patient’s progress and who have the experience to handle the increasing acuity of the typical hospital patient. As the hospital is used for fewer but relatively more complex patients, office-focused PCPs will find themselves referring their inpatients to such specialists more frequently, given the greater convenience for the PCP and the greater financial benefit to the system. CHOP has hired hospitalists to staff its inpatient community hospital affiliate program described below.

20%) in total inpatient facility utilization already have been noted throughout the country in major cities, and HMOs have long been recognized for their ability to reduce inpatient utilization by >30%. Pediatric utilization is expected to decline as well.

Several factors contribute to this reduction in inpatient utilization. First, a significant proportion of pediatric inpatient days are for uncomplicated medical conditions such as asthma, respiratory infections, gastroenteritis, and dehydration that can be managed now with less hospitalization. Strategies to reduce inpatient utilization for these common conditions include improved ambulatory management, development and use of outpatient treatment centers and home care services, and improved efficiency in the inpatient setting. Second, for those conditions that still will require hospitalization, critical pathways and clinical care guidelines are emerging in many places as provider systems attempt to identify the most cost-effective strategies for managing common, predictable inpatient conditions (eg, surgical repair of uncomplicated atrial septal defects, appendectomy, asthma). Third, practitioners are increasingly comfortable discharging children at earlier phases in their recovery. In part, this is true because home care companies are simultaneously increasing their ability to manage many types of patients, including neonates, in a home setting.

The most important educational issue posed by inpatient declines is the decrease in general medical patients who provide an important component of the hands-on teaching opportunities for house staff. The house staff will need to be relocated to day treatment centers and integrated into home care programs to continue participating in the care of these patients.

A reduced need for specialists is expected in the future. The Council on Graduate Medical Education recently concluded that “reasonable projected specialist physician requirements range in the early 21st century. . . (from) ~85 to 105 specialist physicians per 100,000 population,” compared with a current supply of 140, a surplus of 25% to 40%. Lower specialist use rates are accomplished by reduced procedure frequencies, increased primary care management, and reduced access to specialists through financial and administrative mechanisms. Although several organizations are starting to challenge the common HMO PCP-as-gatekeeper paradigm, arguing that increased access to specialists can actually create more efficient treatment, there is little question that the overall demand for specialists will decline.

Future changes in the need for pediatric specialists are less predictable. The Milliman and Robertson report cited above forecasts that pediatric utilization of specialists will decline by 15% as the market evolves from “moderately managed” to “well managed.” In many markets, the overall reduced demand for specialty services has meant that previously adult care-oriented specialists now are looking to provide care to children who require specialty care. Once in control of aggregate health care spending through global risk contracts, many integrated systems owned and governed by adult-focused entities will be inclined to direct care toward in-network adult specialists rather than to non-network pediatric specialists. This pressure has resulted in disconcerting shifts in how specialty providers are chosen for children in many markets throughout the United States and is likely to continue to create competitive pressure between adult and pediatric specialists in the coming years. Although pediatric specialty expense is approximately half of specialty expense for adults, pediatric-focused systems also are identifying strategies to reduce specialty utilization through initiatives that reduce discretionary, possibly unnecessary, services and that enhance the role of the primary physician in a coordinated, comprehensive way. There are no data available publicly for pediatric specialty utilization in our market, although our own internal comparisons with mature market pediatric experience indicate that specialist utilization could fall by up to 35%. Not surprisingly, we have seen a dramatic shift in the career choices of pediatric residents graduating from CHOP. In the 1996 graduating class, 50% went into primary care pediatrics compared with 50% into additional specialty training. In 1990, 30% went into primary care and 70% to advanced specialty training.

The Table, based on an actuarial analysis from Bob Gold & Associates, Inc, compares the projected changes in pediatric and mixed populations by component of health care expenditure in a commercial population. The Table illustrates the significant decrease in all non-PCP areas of health care expenditures.

One area of possibly increased need for pediatric specialists is the inpatient physician, or hospitalist. Quality of care and resource utilization are both benefited by having inpatient care provided by physicians who can monitor more closely the patient’s progress and who have the experience to handle the increasing acuity of the typical hospital patient. As the hospital is used for fewer but relatively more complex patients, office-focused PCPs will find themselves referring their inpatients to such specialists more frequently, given the greater convenience for the PCP and the greater financial benefit to the system. CHOP has hired hospitalists to staff its inpatient community hospital affiliate program described below.
Integrated Delivery System Development

A second area of impact is the development of integrated delivery systems. Under continuing pressure from these economic developments, children’s hospitals and other academic pediatric training programs have been forced to alter their strategies for delivering health care and educating residents in order to survive in a more competitive business environment. Although the exact strategies differ by region or local marketplace, a few unifying characteristics have emerged.

The physician workforce is shifting toward a primary care-oriented model. Simultaneously, integrated systems of providers are beginning to focus on providing cost-effective care to large populations of patients; this new focus requires a primary emphasis on, and commitment to, prevention and health maintenance. Care is being delivered increasingly by large provider organizations, many of which are affiliated with or centered around academic health systems. Together, these characteristics will have dramatic effects on the training of future pediatricians. In the past, when cost was less an issue than it is today, all levels and complexities of pediatric patient care were provided in children’s hospitals and other academic training programs, creating a ready environment for the training of residents. However, it is estimated that only 15% of pediatric inpatient admissions require pediatric specialist management in an academic medical center or children’s hospital setting. An increasingly cost-sensitive health care delivery system will no longer be able to ensure the continued accessibility of patients for resident training. This problem is especially acute for children’s hospitals, where the costs associated with care traditionally have been much higher than for community hospitals.

Therefore, if our traditional sites for training (ie, children’s hospitals and academic pediatric medical centers) are to continue, they must alter their form to ensure accessibility of patients for training. Children’s hospitals must undertake a strategy that allows for coordination of care and the cost-effective utilization of resources within an integrated delivery system. This approach requires that patients be cared for by the right provider, in the most appropriate setting, at the most appropriate time. Both additional sites for patient care and additional types of providers will be necessary. The establishment of subacute and community-based inpatient settings, outpatient day medicine settings, outpatient and community-oriented subspecialty offices, and day surgery units throughout the region is necessary to care optimally for the decentralized population of patients. The inclusion of care extenders, including pediatric nurse practitioners; clinical nurse specialists; and physicians’ assistants in primary care offices, specialty offices, and within hospitals, is another area of delivery system change that impacts on both patient care and resident education. Together, the combination of an extensive primary care network and this new infrastructure of care delivery sites and providers forms the backbone of a new, decentralized, but integrated, delivery and training system.

For example, CHOP traditionally has been a site of both residency and fellowship training in pediatrics. As an affiliate of the University of Pennsylvania Medical School, CHOP has provided an environment for residency training that has been quite traditional. Residents have obtained most of their training in an acute care inpatient setting. Exposure to outpatient sites of primary and specialty care has been more limited. With the movement to managed care as the predominant payment system, this approach is no longer feasible. It is expected that inpatient utilization of beds at CHOP will decline over the next 5 years. It also is anticipated that the types of patients hospitalized at an institution such as CHOP may become inappropriate for the training of general pediatricians. Children’s hospitals will focus their resources on caring for children with very complicated medical needs, including solid organ and bone marrow transplants, complex congenital heart disease, and fetal surgery. This increasingly tertiary environment will become less able to provide comprehensive training of residents alone.

With these concerns in mind, CHOP and its medical staff undertook the development of a new integrated delivery system that would meet the strategic needs of the hospital and its faculty and the academic needs of the hospital’s training programs (Fig 3). This strategy was designed to ensure continued accessibility to a broad range of patients in an environment in which patient access to the hospital and its specialists could diminish and to permit the development of appropriate sites for training residents. This strategy has involved four major components: development of a committed network of PCPs; establishment of community-based inpatient pediatric units; creation of community-based outpatient centers for specialty care; and a broadening of CHOP’s mission to include a comprehensive role in the preventive, acute, and chronic health care needs of the region’s children.

### Table: Comparison of Medical Costs Expressed as Per Member Per Month for Pediatric and Mixed Commercial Populations

<table>
<thead>
<tr>
<th>Age 0–16 Members</th>
<th>% Change</th>
<th>All Members</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Managed</td>
<td>High Managed</td>
<td>Low Managed</td>
<td>High Managed</td>
</tr>
<tr>
<td>PCP</td>
<td>$15</td>
<td>$16</td>
<td>$15</td>
</tr>
<tr>
<td>Specialty</td>
<td>$17</td>
<td>$12</td>
<td>$26</td>
</tr>
<tr>
<td>Inpatient</td>
<td>$18</td>
<td>$12</td>
<td>$21</td>
</tr>
<tr>
<td>Outpatient</td>
<td>$11</td>
<td>$7</td>
<td>$18</td>
</tr>
<tr>
<td>Other</td>
<td>$10</td>
<td>$8</td>
<td>$110</td>
</tr>
<tr>
<td>Total</td>
<td>$71</td>
<td>$55</td>
<td></td>
</tr>
</tbody>
</table>

*Other includes pharmacy, home care, dental, and durable medical equipment.*
Development of a primary care network is a vital but daunting challenge for pediatric systems. Relative to their adult counterparts, pediatric specialists and children’s hospitals require a far larger primary care network to support their services. We estimate that a specialty pediatric practice of 30 full-time physicians with a typical patient and specialty mix requires 70,000 to 100,000 pediatric lives to support it. A composite pediatric 25-bed inpatient unit requires 100,000 pediatric lives to achieve desirable utilization. Securing control of 100,000 lives would require garnering 100% of the referrals from 70 pediatricians (or 300 family practitioners with the typical proportion of pediatric patients). Adult systems require ~30% of the covered lives and PCPs to support comparably sized programs from commercial patients alone, and fewer if the Medicare population is included.

Development of the primary care network at CHOP has involved two major initiatives. First, primary care sites have been established in the hospital’s immediate neighborhood. These sites provide for a medically underserviced and less healthy indigent pediatric population and also provide convenient sites for trainees to learn and practice within a coordinated ambulatory setting. It is expected that the majority of these patients will receive care funded through state-run Medicaid managed care programs. Residents will be able to practice in an environment where the practice style and medical decision-making process are based, in part, on costs and utilization pressures that mimic those seen in the overall market.

Simultaneously, it has been necessary for the hospital to establish a network of PCPs that encompasses a large geographic area (Fig 3). Network development was accomplished through a variety of mechanisms, including the voluntary affiliation of community pediatricians, the hospital’s purchase of existing pediatric practices, and the creation of additional pediatric practices. Although there are practitioners in the Philadelphia region who presently remain in private practice, it is anticipated that within the next 5 years the vast majority of PCPs will be closely affiliated with or employed by large integrated systems. This particular example of an academic center establishing, through purchases or affiliations, a regional network has been and will continue to be replicated in evolving health care marketplaces throughout the country. These regional strategies, although primarily necessitated by patient care realities, also will create additional opportuni-

Fig 3. Schematic representation of the different components of the integrated delivery system associated with CHOP in the counties surrounding the hospital. Note the wide geographic distribution of primary care offices and the strategic location of outpatients specialty centers close to community-based inpatient units (as of mid-1997).
ties for resident education in settings infrequently used by current training programs.

It also was recognized that an adequate number of sites where less complex inpatient care can be provided had to be developed. When cost was not an issue, there was no reason not to admit patients to facilities such as CHOP. It is clear now that patients who do not require tertiary levels of care can and should be hospitalized in less costly settings. Therefore, CHOP has undertaken a program to develop joint ventures with hospitals in the community, where staff physicians from CHOP can manage appropriately placed patients within the community hospital’s inpatient pediatric unit. These sites have reduced the need for utilization of expensive beds within CHOP and have provided an enhanced level of convenient care appreciated by the community-based PCPs and their patients. These satellite units reduce the costs associated with the care of routine inpatient medical problems (thus beneficial in the managed care environment) and also provide additional sites to educate residents in more general aspects of inpatient pediatric care.

Another aspect of system integration development has been the creation of subspecialty sites that are, again, dispersed geographically and convenient to patients (Fig 3). As specialists begin to provide more care in the satellite units in the outpatient clinic setting, these sites will be increasingly utilized for their geographic convenience and relatively low cost. Over time, it is anticipated that these sites may provide a majority of subspecialty and therapeutic care.

With the development of a system dependent on the integration and coordination of care and the simultaneous decentralization of that care to multiple sites in a wide geographic region, communication between PCPs and specialty physicians becomes both more essential and more difficult. Solutions within the system at CHOP are evolving, but include the appointment of individual managed care liaisons within each specialty division. The information systems plan, in the process of being implemented, will place computer hardware, software, and e-mail capability in each site within which care is delivered, including the primary care offices throughout the region. A unified master patient index and computerized medical record will be available to all providers in the system. The use of new technologies including telephonic consultations and assessments also are likely to become increasingly important in the coming years. Providers throughout the delivery system, and the residents trained within that system, all will need to become increasingly familiar with and comfortable using each of these developing communications tools.

As this system evolves to deliver increasing proportions of patient care in outpatient and community-based settings, a hospital such as CHOP will be a site for only the most tertiary and quaternary care. The academic center is the most costly part of the provider system and should be used only for the most complex problems. Academic hospitals must redefine their role to become the core of a broadly structured system that assumes responsibility for all the health care needs of its covered population. The hospital no longer will be able to focus only on expensive, inpatient care; instead, it will be required to emphasize preventive measures designed to keep the population healthy. This expanded focus must be supported by structural and programmatic changes resulting in improved coordination and accessibility of services and enhanced cooperation with community PCPs. In this way, disease management programs can be implemented effectively to improve the quality and cost-effectiveness of care for sick patients. Examples at CHOP include diabetes and asthma disease management programs.

Independence Versus Strategic Alignment

A third implication of market dynamics is that children’s hospitals are confronted with the undesirable choice of either aligning with a single system and disrupting referral patterns from competing systems or maintaining an independent status and having no secure relationship with any system. Nationally, children’s hospitals have taken different approaches to network development and strategic alignment. Some institutions, such as La Bonheur Children’s Medical Center in Memphis, TN, or Children’s Memorial Hospital in Chicago, IL, have chosen alignment with adult-focused systems. Others, such as Children’s Hospital in Boston, MA, and CHOP to date have plotted an independent course.

There are several advantages to joining a network. First, the network can provide secure participation in managed care contracts available only to broad, geographically accessible integrated systems. In some markets, payers are not willing to carve out pediatrics for risk-contracting purposes; thus, the risk for pediatrics is passed to adult-oriented systems that seek to provide the care internally or to subcontract with pediatric-focused providers. In either case, the adult-focused system now has control over the pediatric dollar without a role in governance for the pediatric provider. By joining with the adult system, the pediatric provider can access such contracts directly and participate in their management through its role in the integrated delivery system governance. Larger integrated systems also can provide improved access to capital. Capital is especially important now because of the cost of establishing a primary care network and upgrading information systems capability to support the new financial and market environment.

However, there are multiple disadvantages. As part of a broader system, a children’s hospital would lose referrals from pediatricians affiliated with directly competing systems. Second, there is a significant potential for dilution of mission as institutional strategic decisions become focused on the needs of the system as a whole rather than on the unique needs of children. CHOP has its academic relationship with the University of Pennsylvania while also enjoying clinical affiliations with strong community hospitals. CHOP is looking to build on these relationships while maintaining its independence.
Pricing and Actuarial Challenges

The advent of risk-contracting poses major financial risks for children’s hospitals because pediatric institutions are magnets for patients whose utilization of resources far exceeds the average. Typically, managed care plans contract for globally capitated care at average rates for the region. Because children’s hospital-based practices can have per member per month expenditures of two to four times the regional average, pediatric hospital-oriented systems confront tremendous challenges when trying to compete economically with systems containing more mixed populations. Unfortunately, there are no industry-accepted risk-adjustment methodologies that could be used to modify payments, a gap that forces managed care plans and pediatric health care providers to struggle continually over how to define a fair payment. A recent study found that the existing severity models would only pay 24% to 82% of the actual cost for a child with at least one chronic condition.11

The most equitable method for establishing fair capitation rates in the context of an unusual population requires that the contract be based on historical costs. However, for new plans or markets in which there has been limited managed care penetration to date, historical cost data are not available. Alternatively, provider systems may want to explore carve-outs of unusual patient populations or high-risk services for which the traditional capitated reimbursement mechanisms would be inadequate, even if the delivery system were only moderately unlucky (or adversely selected). Children’s Health Net, the risk-contracting entity affiliated with CHOP, has pursued both the historical cost and the carve-out methodologies depending on payer interest.

If the historical cost method is not available because of managed care plan resistance or not applicable because of the immaturity of the plan, pediatric systems are confronted with a dilemma. They can either not participate in risk contracts or carve-out unusual patient populations from their risk contracts. If such patients are carved out, then the pediatric provider will not be accessible comparably through managed care contracts, and trainees will lose the opportunity for learning the management of complex patients. Complex patients could also lose access to the local delivery system best able to meet their needs. Alternatively, such patients can be accepted at a loss, reducing the aggregate resource availability in the provider system to care for the population as a whole.

Total Quality Management Approach to Quality

Concurrent with, and in part motivated by, these market dynamics has been the dissemination of an alternative model of quality management adopted from industry, referred to as total quality management (TQM). The previous quality model for health care was primarily a mixture of a carefully monitored system for reviewing new treatments through a research methodology and a more ad hoc system for reviewing routine patient care. In this environment, the care process for most patients was only subject to systematic quality review in the event of a catastrophic outcome. Likewise, the teaching model that was developed and maintained provided a loosely supervised resident with significant discretion and with little systematic scrutiny except in the event of a catastrophic outcome.

TQM, drawing on tools successfully applied in industry, redefines the evaluation of quality in health care by advocating systematic improvement of the routine care process in addition to addressing catastrophic events. The focus within TQM is on eliminating variability within the routine care process that does not contribute to improved outcomes. Explicit in this model is the ability to 1) analyze the care process, a historically difficult process before the automation of clinical information; 2) define standards of care; and 3) measure outcomes. By its very nature, the TQM model will reduce the amount of discretion available to practitioners (for common case types) in the interest of more standardized practice that generates improved outcomes more consistently. The TQM model has applied an approach previously reserved only for clinical trials to routine care processes.

This approach to care management has significant implications for teaching. The routine care processes no longer will allow trainee discretion, but rather will be increasingly determined by protocols designed to improve patient outcomes while conserving resources. Progressive educators must find opportunities within this transition to enhance the learning process.

Another outgrowth of TQM will be an explosion of outcomes measurement. Although established quality measures are limited, employers acting as purchasers of health care are increasingly demanding objective measures for choosing among competing provider systems. The impact on pediatrics has been modest to date, because the most common quality measurement tool (HEDIS 2.0) has only three clinical pediatrics measures (immunizations, low birth weight, and asthma). Recently, HEDIS 3.0 has added pediatric measures with a focus on middle ear disease. Academic pediatric centers are in a position to benefit from this trend. Progressive centers will be innovators in defining the measures important in defining quality care for children objectively, and will be the first to implement systems for monitoring and improving performance in these areas. However, academic centers also will confront the burden of competing in these measurable areas while providing care for their traditionally more indigent and sicker patient population. It will be important to develop accurate severity adjustment tools so that urban academic centers and community-based, non-teaching hospitals can be compared appropriately.

CHOP has addressed this new approach to quality from three directions. CHOP has instituted a quality improvement program to develop Practice Inpatient Pathways and improve key operational processes. At the same time, the Center for Outcomes Research has been created to contribute to the development of pediatric outcome measures, conduct outcome studies in high-impact areas, and serve as a local resource for faculty and staff investigators interested in incorporating outcomes research as part of their investi-
gations. Finally, Children’s Health Net will track the pediatrics-relevant HEDIS 3.0 outcomes measures for its managed care risk contracts.

REDESIGN OF RESIDENT TRAINING PROGRAMS

The multitude of changes described will impact on residency training traditionally provided within the academic children’s hospital or in the pediatric units of a university hospital. Under economic pressures, inpatient care is shifted from the costly academic center to the less expensive community setting. For strategic reasons, pediatric specialists must practice where the patients live, rather than depend on patients to travel to their academic hospital offices. In the interest of quality, which must be measured and reported objectively, and to achieve the most efficient levels of resource utilization, clinical decision-making will be dictated in many instances by care pathways and practice guidelines that standardize the care most patients receive. Residents no longer will be trained adequately simply by managing in a loosely supervised manner whatever patients are admitted to the pediatric hospital. Instead, several revisions become necessary to train residents in these settings and to prepare these future pediatricians adequately.

First, with the movement of inpatient care to the satellite hospital units, residents must begin to spend some of their rotations in these units. Although this requires additional travel and will be inconvenient for the residents, it will afford them the opportunity to see how inpatients can be cared for in a way that is very different from what they observe in the academic center. It also will give them the opportunity to work with and benefit from the experience of community-based pediatricians, whose relationships with current training programs frequently are quite limited.

Second, the shift in care from inpatient settings to nonhospital locations (home, outpatient clinics, etc) will encourage developers of training programs to look for opportunities to educate residents in such settings. Residents will be able to help coordinate home-based care and participate in home assessment and follow-up visits, while having exposure to the types of problems being cared for in these settings. In each of these examples, pediatric problems that currently are cared for in the traditional inpatient setting where residents now practice can continue to be used as training examples, although the setting of care is different. The resident can continue to gain experience through involvement and provide beneficial service, albeit in a somewhat different manner.

Third, the creation of multispecialty clinics in community locations also provides a new setting for resident education. Pediatric programs traditionally have struggled to achieve a balance between too little and too much subspecialty experience in their residency curricula. Although the increasing orientation to primary care may result in fewer specialists, it also requires that the future generalist have broad experience in evaluating and following children with chronic medical problems. Multispecialty clinics will provide a convenient location for residents to spend blocks of time to gain exposure to these problems under the supervision of specialty physicians.

Fourth, the expanding role of care pathways and clinical guidelines will reduce the residents’ opportunity to learn simply by making their own decisions and then following the patient’s course given those decisions. Financial realities and ongoing outcomes measurement will result in attending physicians having much greater accountability both for the tests and procedures they order and for the number of days their patients remain in the hospital. Certainly, residents will need to follow adopted guidelines in caring for patients. However, they also must learn the circumstances under which other decisions should be considered. New models for education, including computer models that can simulate the care process, should be considered potentially valuable tools for training residents in this new era. Residents also will be exposed to opportunities provided by the rapid changes in information technology in medicine, many of which we cannot yet predict. Opportunities also will exist for residents to be involved in the process of evaluating the effectiveness of implemented guidelines, reviewing cases in which care deviated from the guidelines, and monitoring utilization and quality-management reports. Experience in this new arena will be crucial if our residents are to be prepared for the world of managed care into which they will emerge when they complete their training years.

Finally, the strategically necessary affiliations of primary care practices with the academic hospital provide another new opportunity for the education of house staff. There are very few examples of successful programs that have placed pediatric residents in private practice settings for ongoing education while providing direct patient care. This topic has been discussed extensively in a recent Pediatrics supplement Pediatric Resident Education in Community Settings. It is likely that future training program requirements will make such office-based experience an increasingly necessary component of pediatric residency curricula. The obstacles to the success of such programs (eg, lack of office space, time constraints in private offices, variability in supervisory ability, patient acceptance, and reduced physician productivity) all will need to be addressed. However, the increasing need for residents to spend time in office settings can be met through structured programs in affiliated private practices. Programs should strongly consider making education of house staff within offices a contractual responsibility of interested PCPs who are employed by or affiliated with teaching hospitals. Additional resources will be required to teach practitioners effective techniques in supervising residents and to provide time and space for resident education in these settings. Still, we see this development as a positive one in considering the overall experience residents will have in future pediatric training programs.

CONCLUSION

We have reviewed the current trends influencing pediatric training programs and pediatric hospitals existing in medical marketplaces increasingly dominated
by managed care arrangements among insurance companies, employers, and medical providers. The implications in the areas of cost control, resource utilization management, quality management, physician work force needs, educational programs, and strategic affiliations among parts of the health care delivery system are extensive and, in many ways, threatening. We remain optimistic, however, that innovative and aggressive institutions can prosper in this new environment through a structured approach to the creation of an integrated system. The system of the future will facilitate the delivery of comprehensive cost- and quality-competitive patient care and allow for the survival and advancement of the educational programs that remain a core part of the missions of these institutions.

REFERENCES

3. Council on Graduate Medical Education. Managed Health Care. Implications for the Physician Workforce and Medical Education. Rockville, MD: US Dept of Health and Human Services; 1995
8. Turner JP. Pediatric Managed Care: Capitation, Risk Sharing and Provider Incentives. San Francisco, CA: Milliman & Robertson, Inc; 1996

COMMENTARY

The Changing Health Care Environment: Implications for Residency Training, by Frazier et al

Frazier et al 1 have thoughtfully reviewed the recent changes in managed care with emphasis on pediatrics. Although no health care environment is truly typical, the Philadelphia environment bears lessons for many. Our pediatric environment in St Louis, MO, now nearly 90% managed care, went through a period of rapid evolution in late 1995 when Missouri Medicaid became managed. Unlike Philadelphia, however, St Louis has evolved into three regional health care systems, one of which is unaligned with an academic center. Our own Barnes-Jewish Children’s (BJC) Health System is a fully integrated consortium comprising academic hospitals (Barnes-Jewish Hospital and St Louis Children’s Hospital, the teaching hospitals of Washington University School of Medicine), several community hospitals, and community-based primary care providers. St Louis Children’s Hospital, the pediatric flagship of the BJC Health System, and the Washington University pediatric physicians have established a regional network for pediatric care embodying many of the concepts that Frazier and colleagues 1 discuss under strategic and operational implications.

On reflection, three key concepts were omitted from analysis: 1) the integral role of obstetrics in pediatric strategic initiatives; 2) the local relationship between community-based pediatric providers and the children’s hospital with its full-time faculty; and 3) the disproportionate share of primary and secondary indigent care provided to the local community that surrounds most academic centers/children’s hospitals.

First, integrated obstetric/pediatric planning has a profound implication for prevention of illness and timely intervention in the many serious or chronic problems first recognized during pregnancy or on the first days of life. The parent–physician partnership, which grows from the care and counseling at this early point, has a powerful influence on lifelong patterns of preventive and health care.

Second, the strength of the interaction between the community pediatricians and the academic faculty at the children’s hospital is critical to the success of a system-wide program. Fortunately, but in contrast to colleagues in several other specialties, the barriers that come from long-standing competition are much lower, with most academic physicians pursuing careers as subspecialists and most community pediatricians as generalists. The time is ripe for strengthening this fundamentally healthy relationship.

Third, many and perhaps most children’s hospitals and academic centers provide a substantive amount of care to the underserved and, traditionally, the under- or uninsured. This places pediatric academic centers on high moral ground but threatens their survival as reimbursement is ratcheted down faster than sources of alternative care appear.
Each of these issues has enormous implications for residency training. The concept that many pediatric centers will evolve into caring only for the most tertiary and quaternary cases may be flawed. Who should and will provide secondary (and perhaps primary) care to the immediate community? The current CHOP four-component strategy is not dissimilar from that of many other children’s hospitals, including our own. Yet CHOP’s strategy is tailored to its local environment, as well it should be.

The affiliation with community-based practitioners has been the hallmark of several recent ventures in primary care pediatric education at the University of Utah, the University of Massachusetts, and with our Washington University/St Louis Children’s Hospital COPE program. The COPE program is a well-structured education pathway involving >65 community-based pediatricians as mentors. A defined curriculum with educational goals for our resident trainees and mentors has evolved over the past 6 years. Thus, along with Frazier and coworkers, we “remain optimistic that the innovative and aggressive institutions can prosper in this new environment.”

How will these present and future changes affect residency training? Frazier et al underscore that inpatient care will continue to shift from costly academic centers to lower cost community sites and that pediatric specialists will practice closer to where their patients are located. These transitions will foster movement of pediatric residents to the community setting with the attendant increase in interactions with community-based pediatricians.

Alan Schwartz, PhD, MD
Department of Pediatrics
Washington University School of Medicine
St Louis, MO

James P. Keating, MD
Department of Pediatrics, Washington University School of Medicine
St Louis Children’s Hospital
St Louis, MO

REFERENCES
2. Roberts KB, Starr S, DeWitt TG. The University of Massachusetts Medical Center office-based continuity experience. Are we preparing pediatric residents for primary care practice? *Pediatrics.* 1997;100(4). URL: http://www.pediatrics.org/cgi/content/full/100/4/e2
The Changing Health Care Environment: Implications for Residency Training
Seth Frazier, Daniel Hyman and Steven Altschuler

Pediatrics 1998;101;795

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://pediatrics.aappublications.org/content/101/Supplement_3/795