

POST-GRADUATE EDUCATION FOR PEDIATRICIANS

Richard E. Behrman, MD

Thank you very much for inviting me to start off the discussions today on post-graduate medical education. Historically post-graduate education has always been grounded in the perception of the specific health care needs of patients. Therefore, I'm first going to address some of the more important health care needs of children, emphasizing the unmet needs which future pediatricians must be prepared to meet. Then I'd like to move on from these discrete problems to several very difficult fundamental challenges that cut across rotations and the residency years. There is a saying attributed to Mark Twain that might well have been directed to us as educators. "It is noble to teach oneself; it is still nobler to teach others-and a lot more trouble." These cross-cutting challenges are a lot of trouble to address.

But to begin, let's consider the health needs of children. Many groups of children deserve attention; however, 6 subsets, in particular, stand out. I'm going to comment briefly on each of these from the perspective of residency training.

1) First, there are those children and youth requiring hospitalization for high levels of care. The numbers of children and youth receiving tertiary and quaternary care have been relatively stable for several years. It is unlikely that the number of acute hospital days of care for these children will increase. The trend to diagnose and treat more and more of these children in ambulatory settings is likely to offset the introduction of new hospital based diagnostic and treatment modalities.

These patients are usually the recipients of the mainstream of direct services and research provided by the faculties of academic pediatric departments and, not surprisingly, academic departments across the country care for a large proportion of this total group. Participation in the care of these children also constitutes a major part of the education of pediatric residents.

Advances in biomedical science and technology are especially relevant to the management of these children, and the intellectual challenge they represent is what, in large part, makes the care of these children so compelling to many who choose academic careers. However, as fascinating and essential as the management of these children is, this care represents only a very small proportion of the total health care needs of children and youth.

But, for many of these children there are major unsolved problems in coordination of and deficiencies in medical, surgical and social services, particularly after they leave the

hospital and are treated in ambulatory, home, and community settings. There are major shortfalls in residency education in these domains.

Furthermore, the number of these children who are surviving very serious illness is increasing and, therefore, a related issue for post-graduate pediatric education is how to address the challenges of the long-term unmet needs of this group of children. Cumulatively a number of these children transition to become part of another growing group of children with chronic and disabling disorders. I will get to this other group in a moment.

2) Children who have had unintentional traumatic injuries form the second group. Nationally, unintentional injuries comprise a large proportion of current hospital admissions of children, although pediatric residents, in general, have limited involvement in their care. In addition, experience in pediatric rehabilitation ought to be a part of this residency training. Currently, most programs provide at best, a token experience in rehabilitation. Unintentional injuries are responsible for more child deaths each year than homicide, suicide, congenital anomalies, cancer, heart disease, respiratory illness, and HIV combined. In addition, more severely injured children and youth are surviving with significant morbidity, about 80,000 a year. The quality of life losses from disability during childhood were equivalent to 2.7 million years of life, a loss comparable to more than 92,000 child deaths.

A major issue for many of these injured children is the lack of availability in many communities of quality care by physicians knowledgeable about their appropriate medical and surgical management. The need for more educational emphasis during residency seems clear.

There is also an unmet need for more widespread implementation of a number of interventions that have been proven to reduce the incidence of various unintentional injuries, such as speed bumps, smoke detectors, use of bicycle helmets, protective playground surfaces, and fencing of swimming pools. The magnitude of this problem cries for leadership by the academic pediatric community. This should be a major target for advocacy experiences during residency training. I know that there is some question about whether advocacy for children should have a required role in residency training. It is one of the ways of reinforcing a basic value of our profession, altruism. I will return to this issue in a few minutes.

3) Children with disabilities and chronic diseases make up the third group. The percentage of children and youth having severe disabilities has doubled in the past two decades, with the greatest increase among poor children. Although children 17 years or younger represent only 7.8% of the millions of disabled persons in the United States,

disabilities with onset during childhood account for about one third of the total years of disability.

Children having disabilities include children from some of the groups previously noted but also include those with severe asthma and some children with significant cognitive and behavioral disorders. Low birthweight (LBW) graduates of NICU's make up only about 5% of children with severe disabilities. However, the disabilities group also includes many other children with mild to moderate disabilities that significantly compromise their quality of life and limit their opportunities. LBW infants with neurosensory, language and speech problems, and learning disabilities make up a far greater proportion of those with mild to moderate disabilities.

These growing numbers of children and youth with disabilities are heterogeneous in their unmet needs for medical, psychological, educational, and social services. Residents need to gain experience in coordinating these services. They also need to learn management strategies that actively develop the strengths of these children as well as address their handicaps since this approach is critical for these children to achieve their full potential. The management of these children presents a challenging opportunity to academic pediatrics that involves far more than establishing a new sub-board of neurodevelopmental disabilities. There should be a major emphasis on this group of children in pediatric post-graduate education. This needs to take place in a variety of community settings in addition to experience in specialty ambulatory care clinics.

4) A fourth group is those children and youth with mental health and behavioral disorders. These are the children with major psychiatric illnesses, behavioral and developmental disorders, and mental retardation. Children with neurologic disorders are particularly vulnerable to having mental health problems. A number of different systems, private and public, provide mental health services for children but their common features are that they are fragmented and woefully deficient in providing convenient, timely access and quality control, and in having sufficient human and financial resources. These children also have significant unmet needs for non-mental health medical care, including reproductive health care, as well as for social and legal services. The coordination of the vast array of services these children require is in itself a major challenge that needs attention. Future pediatricians must play a role in filling the vacuum of professionals available to care for these children and provide this coordination. Preparing residents to care for these children should be a major component of residency training since if future pediatricians don't provide a substantial amount of this care, it won't be provided. This preparation for caring for children with mental health problems and behavioral disorders is going to take at least as much time as is currently committed to neonatology. Learning how to manage a depressed

teenager ought to be as much a part of pediatric post-graduate education as managing an infant with presumptive sepsis.

5) Children and youth requiring primary care make up the fifth group. Although a substantial training experience in primary care is essential to pediatric post-graduate education, academic pediatric departments play a very small role in directly addressing the primary health care needs of most children in this country and Canada. Non-academic pediatricians and family physicians provide most of the primary care. The primary care that academic faculties and their house staffs do provide is skewed towards low income families. And even at that, the care provided by pediatric departments, although an important component, is only a modest part of the total primary care provided to these low income children. The unmet primary care needs of these children are large and continuing.

Unmet primary care needs occur at all socioeconomic levels but are disproportionately represented in low income families. The pattern of unmet needs varies somewhat among income groups. The unmet need for management of behavioral and mental health problems and for counseling about parenting, child development and prevention issues is omnipresent. Neglected prevention and care of dental disease tends to be most concentrated in low income families as is the need for timely access to quality care for common acute infectious and allergic problems. The place for dental education in pediatric residency training is limited but certainly deserves more attention than it currently receives. Unmet needs for appropriate screening measures and immunizations persist to different degrees at many socioeconomic levels.

The challenges for pediatric residency programs in regard to primary care include: How can the mainstream providers of primary care services be encouraged to meaningfully participate in the primary care education of residents? And, most importantly, how can quality educational experiences in primary care be achieved in settings where time and resources are limited?

6) Children and youth having sexually transmitted diseases and other sex-linked health problems make up the sixth group. Except for this group, the number of children with infectious disease has remained stable over the past decade, although the pattern of infectious problems has changed significantly within the hospital setting. The lack of access of adolescents to quality care and counseling for these disorders in their local communities is a major continuing problem, particularly since the morbidity for these youth and potentially for their progeny is significant. Residency experience with sexually transmitted diseases and other sex-linked problems in children should be at least as great as their experience caring for infected immune suppressed children. It rarely is. This issue also presents an important opportunity to foster collaborations between

educational and public health systems and to involve residents in such collaborations in anticipation of a future role in their local communities.

I know that all of you could elaborate further on the health needs of these and other groups of children and how they might be addressed during pediatric post-graduate education. However, more important than how we specifically address the educational implications of these 6 groups of children and youth or the needs of other children is the vision of what a complete pediatrician should be like. We want a pediatrician to be a knowledgeable and skillful scientific physician, not a physician scientist. We need pediatric physician scientists but that is a different issue. We want a pediatrician to be a caring, sensitive, effective care giver. We want a pediatrician to be able to marshal and help coordinate the variety of medical and social services a child may need to achieve optimal health. We want a pediatrician to be an effective advocate for children and youth.

Although it is important to address the various specific components of post-graduate pediatric education by changes in rotations and program content, all of these discrete parts of residency training added together will not result in the education of a complete pediatrician. A pediatric professional education is more than the sum of these parts. There are certain fundamentals on which a vision of a truly educated pediatrician must be built. Four issues seem particularly critical to me. In Mark Twain's terms, they are also the challenges to teaching others that are major "trouble".

They will require imagination and innovation in pediatric residency education. They are:

1. Addressing information overload.
2. Emphasizing systems pathophysiology and its integration with cellular and molecular biology.
3. Focusing on patient individuality and the nature of caring for ill children.
4. Reinforcing basic professional values.

First, the problem of smothering the learning experience with information is not new. Over 100 years ago Osier complained that, and I quote, "the phenomenal strides in every branch of scientific medicine have tended to overload it with detail." A century later winnowing the wheat from the chaff is still a problem of post-graduate and continuing education. As an editor of Nelson Textbook of Pediatrics for several dozen years, I have spent a good deal of time on the threshing room floor separating wheat

from chaff. The current and growing emphasis on evidence based medicine will help address this issue but it won't come close to solving the problem.

One of the basic goals of post-graduate education as it relates to the core content of pediatrics is to enable residents to navigate the ocean of detail available from books, journals, the Internet, and the faculty. The resident should not be set adrift on this sea of knowledge without sails, back-up oars, and a compass. Nor should the faculty and chief residents pilot the house staff from island to island using ancient charts, even regularly updated ones, looking for buried treasure. The faculty must demonstrate by example how they continue to educate themselves and provide guidance to house officers as they practice exercising judgement in selecting information to know and use. Faculties need to indicate the current and wind directions at appropriate times, but the house officer has to set the sails and keep an eye on where the boat is going. This requires much more than journal clubs. I believe a continuing tutorial relationship may be needed during residency - a new kind of apprenticeship in managing information. It is not enough to find the latest meta-analysis on the Internet. There must be formal exercises in which residents evaluate the quality of a given meta-analysis and analyze the relevance of randomized control trials to the circumstances of particular patients. This is not the same as faculty simply relating their own judgements about the studies to the resident when a patient is discussed on the ward or in conference which is often the current mode of teaching about these issues.

The problem of navigating the sea of knowledge has been particularly exacerbated by the explosion of genetic information, which has only just begun, and by accelerating advances in other areas of science and technology. All of the physicians providing services for the groups of children whose health care needs I mentioned earlier are affected by this issue.

As important as the "gene's-eye" view of medicine is for understanding human biology and as it may become for diagnosing and treating human disease, it is contributing to several other problems in addition to the flood of information. The often evangelistic enthusiasm of some faculty for molecular genetics has unintentionally contributed to the second challenge for both undergraduate and postgraduate medical education. There is an evolving deemphasis on medical students and residents acquiring a working knowledge of systems physiology and pathophysiology.

Therefore, this second challenge is "how do we meet the need for a greater emphasis on system level pathophysiology and on the synthesis of pathophysiologic thinking from the molecular to the systemic level during pediatric residency?" This problem is not just a result of the exciting, competing pull of advances in molecular biology and genetics. The rapid rate of admission and discharge of hospitalized children, the managed-care

induced time constraints in ambulatory settings, and the significant academic and practice pressures on faculty are major contributors to a deficiency in this essential component of post-graduate education. Many PLI's start residency with less understanding of systems physiology than in previous years because of time pressures on the undergraduate curriculum and the shift of basic science faculty interests to the cellular and molecular level. The result is that, in general, residents are less prepared to transition into thinking in terms of systems pathophysiology that is so central to clinical care. This issue will require more explicit educational attention than residents currently receive by hit or miss exposure to such thinking during rotations in intensive care units or on specialty services as they currently are structured in most pediatric centers. It is much harder for residents to just pick-up the ability to think in terms of system pathophysiology than it was a decade ago. What I'm talking about is not just a matter of organizing clinical data on patients by systems. A clinician must develop the capacity to think in terms of systems pathophysiologic mechanisms, to integrate across physiologic systems, and selectively to synthesize cellular and molecular understanding into this thinking. Residency is the time when this way of thinking must become ingrained. It is an essential element in achieving a constantly evolving overall understanding of the way a healthy human organism responds to disease or injury. This process goes on throughout one's life of caring for patients, but the foundation is laid during medical school and particularly during residency training. I think a targeted clinical case-based problem solving curriculum extending across all years of residency training needs to be developed to address this issue.

The third challenge to pediatric post-graduate education is a need for a greater understanding and appreciation of patient individuality. Ironically, instead of an increased emphasis on human diversity at a clinical level, the genes-eye view of a patient is often preoccupied with molecular mechanisms and cellular processes when the genetic origins of a disease in a particular patient are discussed on the wards and in the clinics.

Rarely, does the diversity of phenotypic expression in various patients receive comparable emphasis. This deemphasis of differences among patients with the same disease may be unintentionally reinforced by a superficial presentation of clinical pathways and standardized treatment protocols, and even by stressing the importance of randomized control trials. It is intentionally reinforced by limitations on lengths of hospital stays, diagnostic procedures, and treatment options promulgated by managed care organizations. The result of all of this is to homogenize groups of patients. No two children in any of the groups of patients with important health care needs referred to earlier are the same. No two children with leukemia are the same. No two children with asthma are the same. Only through our appreciation of their differences can we provide

the best care. And it is in the appreciation of their differences that we continue to educate ourselves about human biology and about life itself.

Seeing each patient with the same disorder as something new is not only compassionate, intelligent medicine, but it is the best way to make each new patient a learning experience. It is the opportunity to add to and /or modify what the physician already knows about the condition. In being open to every small variation in a patient's presentation, we open ourselves to be always learning, always making new connections. This is true continuing education.

Again, to quote Osier "Variability is the law of life. As no two faces are the same, so no two bodies are alike, and no two individuals behave alike in the abnormal conditions we know as disease. This is...fundamental [to] the education of the physician....."

An appreciation of this variability is part of the basis for the distinction between disease and illness, between what Barondess has described as "biologic phenomena in disarray [versus] ailing humans in disarray." To repeat, disease can be thought of as biologic phenomena in disarray whereas illness family, the child, and the physician involves feelings, attitudes, values, traditions, and beliefs. This interaction is intertwined with medical science and technology but, in fact, dominates the process of caring for a sick child. The skill with which a pediatrician conducts this illness, as opposed to disease, related transaction often determines whether the potential benefits of biomedical knowledge will be realized. It is important that the illness-related functions of the physician not be pushed aside by the science and technology we apply to disease and disability. Residents need to learn how to integrate the illness-related functions, the sick child and family in disarray, and the disease-related functions, the biologic systems in disarray, in order to provide the highest quality care. This requires that post-graduate pediatric education specifically incorporate into training programs the opportunity for residents to acquire and practice the interpersonal skills that are needed to care for healthy and ill children under constructive critical oversight. This includes not just communication skills but behavior that demonstrates sensitivity to and understanding of psychologic and sociologic issues. And programs need to assure that each house officer really does incorporate this learning into his or her behavior. In a changing health care system in which resources are likely to become more limited, this critical aspect of post- graduate training is particularly vulnerable because it requires a large amount of house staff and faculty time. However, no aspect of pediatric post-graduate education is more important. A high-school educated technician can be trained to run a ventilator. The communication skills, the sensitivity and understanding about people under stress, and the appropriate behavior of a care giver requires real education.

A fourth issue that needs to be explicitly addressed during residency education is the core public service commitment of our profession; the commitment of physicians to selflessness; the commitment not to be motivated by personal gain in deciding how best to serve patients. This principle of the Hippocratic oath needs to be reinforced during residency training. Residents need to understand that the administration of the oath is not just a formality for medical school graduation ceremonies but a central part of their professional lives. This understanding doesn't just happen. It is a consequence of listening to and observing professional role models on the faculty who understand and can articulate the altruistic foundation of the profession.

There is a difference between the value system of the business community focused on maximizing profit and that of the medical profession focused on service to the public. This difference is why pediatric post-graduate education must continually keep focused on the important health care needs of children, such as those I reviewed at the start of this talk, rather than on which services receive the highest reimbursement. The confusion of these values in the minds of many is implicit in the term "health care industry" and references to medical services as "product lines." Medical commercialism is the antithesis of the core value of the profession and this has to be understood and incorporated into the education of our profession during post-graduate training. The changes in our society demand that we put a renewed special emphasis on this issue during residency.

Please do not misunderstand my remarks. Self-interest and profit are appropriate core goals of business and should govern business behavior within reasonable limits. It is assumed with some justification that society, in general, will ultimately benefit from the relatively free pursuit of personal gain tempered by a sense of fairness in competition. And this model is the backbone of material prosperity in our country. Similarly, doctors need to earn a living and medical care should be provided in a cost-effective and efficient fashion.

However, practicing medicine in a business-like manner, should not be equated with running a business because the value system and goals are fundamentally different. Medical commercialism is the antithesis of the Hippocratic oath and the profession's tradition of selflessness must be specifically addressed during post-graduate training. As pediatric physician educators, we must find innovative ways to integrate this most basic professional value into training experiences. Programs providing an opportunity for advocacy for children in the community are an important part, but only a part, of what is required to address this important issue. One of the major goals of residency education should be to imbue in these future pediatricians an understanding that the profession's primary legitimacy is the interest of its child and adolescent patients. Placing the patient's interest and needs above our own or anyone else's interests or

needs, altruism, is the essence of our calling. Patient need, not supply and demand economics, is the central issue. Our future as a profession, our status in society, and our pride in our special pediatric calling are all derived from this basic principle.

In conclusion, someone once remarked that it is comparatively easy to get educated; it is very hard to stay educated. Residency training is the beginning of staying educated. This will involve learning how to critically evaluate the expanding universe of information. It will require continually having the ability to think in terms systems pathophysiology synthesizing from the molecular to the whole body level. Staying clinically educated will demand incorporating one's appreciation of human variability into sensitive application of the communication skills required to care for ill children and their families. And most importantly staying educated as a physician will entail a constant reinforcement of a selfless commitment to the needs of children. These are the basic components of the bedrock on which residents can build their future education and remain educated.

The purpose of life is to matter; to count; to stand for something, to have it make some difference that we lived at all. Post-graduate pediatric education built on such a foundation will lead not just to residents being better physicians but to their being better human beings and having a satisfying worthwhile life.