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Abstract

In the United States, child neurologists continue to value close, historical ties to adult neurology. However, the mandatory year of adult training for American Board of Psychiatry and Neurology certification in “Neurology with Special Qualification in Child Neurology” deprives residents of educational opportunities that would yield greater benefit for children afflicted with neurologic diseases. The need for modernization has been recognized in a Professors of Child Neurology survey in which a majority of program directors favored reducing adult neurology training and changing the certification to “Child Neurology.” This article reviews the rationale for an overdue transformation of Child Neurology training.

Keywords

medical education, child neurology, residency training

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Although the family had traveled several hours for an evaluation, their toddler’s anxiety trumped any sense of gratitude or duty. The child had no interest in helping me out, and even after a few classic tricks, the exam was unsatisfactory. Home video instructions ensued. Now, after video review and blood testing, I have a diagnosis to share with these young parents. Autosomal recessive, slow but inevitably progressive: to a wheelchair and total care. The parents will outlive the son. Mom emails before the visit—she is pregnant with their second child. I prepare to disclose the diagnosis and what it portends, wondering if there will ever be a disease-modifying treatment and if the second child will be affected.

No child neurology resident was with me in clinic for the initial evaluation or the subsequent disclosure of the diagnosis. During those clinics, one-third of all US child neurology residents were providing care for and receiving education from patients with a mean age of this toddler’s grandparents. Instead of learning neurologic localization in developing children with pediatric illnesses, these residents were learning localization while managing chronic obstructive pulmonary disease, type 2 diabetes, and adult cardiac conditions. Instead of treating developmental neurobehavioral disorders, they were practicing geriatric psychopharmacology. Instead of consulting on critically ill neonates, they were evaluating coma in electronic morgues. I wonder how all this fits with a “neuroscience-based approach” to training the next generation of child neurologists.¹

In 1968, when the American Board of Psychiatry and Neurology began certifying child neurologists as

“Neurologists with Special Qualification in Child Neurology,” adult neurologists were the most prevalent mentors available to teach then-current medical knowledge about all neurologic diseases. The 5-year residency, with 2 years of general pediatrics, 1 year of adult neurology, 1 year of child neurology, and 1 year of electives, came into being to allow residents to gain adequate training for both American Board of Pediatrics and American Board of Psychiatry and Neurology certification. A year of adult neurology training was also mandated because adult neurologists were the best available resource for training residents to incorporate detailed exam findings and comprehensive knowledge of nervous system anatomy into a diagnostic assessment. Adult neurologists utilized adult patients to demonstrate key principles of neuroanatomy and differential diagnoses. Whenever possible, hypotheses generated by astute adult neurologists were verified with pneumoencephalography, arteriography, and postmortem pathology.

In the early 1980s, as computed tomography and magnetic resonance imaging were coming into use, David A. Stumpf reviewed the history of pediatric neurology and pronounced child neurology to be “in its adolescence.”² In retrospect, we

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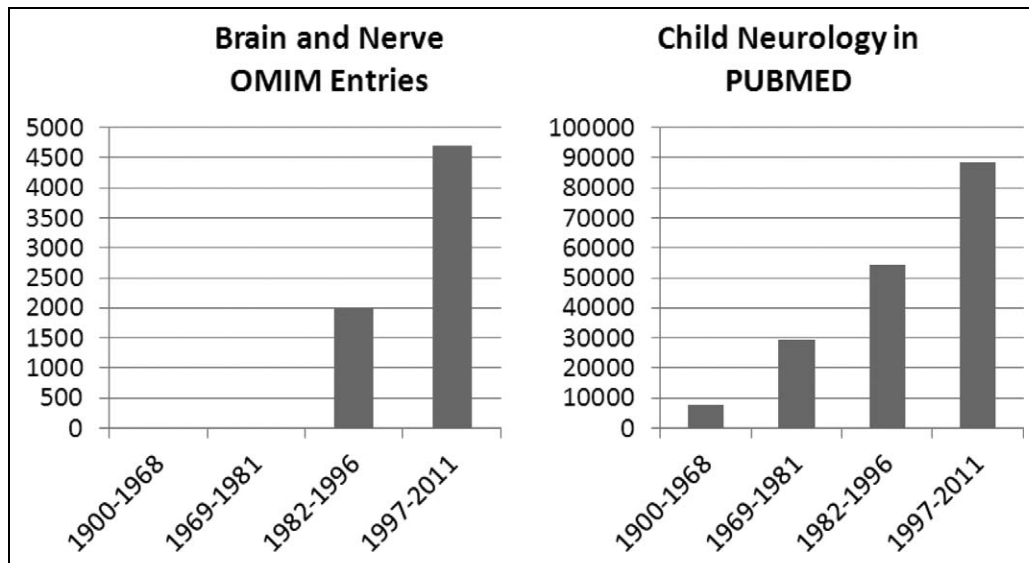


Figure 1. Child Neurology in PubMed and OMIM. Prior to ABPN Child Neurology Certification in 1968, child neurology publications were few. At the time of its supposed adolescence in 1981 (see text), relatively little had changed. In subsequent years, there has been dynamic expansion of child neurology knowledge (PubMed) as well as genetic discoveries in diseases in brain and nerve (OMIM). The neuroscience of child neurology infancy (1968) and adolescence (1981) should no longer dictate its training. OMIM indicates Online Mendelian Inheritance in Man; ABPN, American Board of Psychiatry and Neurology.

can see that this was not the case. In 1981, although the neurologist's cherished tools of patient care were well established in children, in medical knowledge, our field was really in kindergarten (see Figure 1).

How can we achieve child neurology competence today?

One option would be to increase the number of years of training. This solution is impractical and uneconomical given medical student debt burdens and the overlap for many trainees of residency and childbearing. Accepting that 3 years of neurology training is a fixed maximum, we have a classic economic situation of optimizing utilization of a limited resource (time). This limit means that curriculum decisions involve opportunity costs. That is, in measuring the value of the current 12 months of adult neurology rotations, we must simultaneously calculate child neurology opportunities missed.

How does the 12 months of adult neurology training prepare the child neurology resident to care for children with the common conditions (epilepsy, migraine, Tourette syndrome, autism, cerebral palsy)? Primarily, it provides an understanding of long-term outcomes. For this, 3 months of general adult neurology training suffices. The rest of the time generates opportunities missed.

How does the 12 months of adult training prepare the child neurology resident to care for children with rare conditions? Our current American Board of Psychiatry and Neurology 12-adult neurology month model primarily creates missed opportunities to learn to diagnose and manage rare conditions through direct patient care and expert mentoring. Selectively, not globally, 1 to 3 months of optional adult subspecialty electives could provide a valuable concentrated experience for

some child neurology subspecialty areas. A current proposal to move adult neurology training to PGY4/5 or to allow program directors to count adult electroencephalography or neuropathology months as part of adult neurology training³ will not provide optimal training. More pediatric neurology months are needed to give residents early exposure to many more subspecialty cases. Such early exposure would inspire more trainees to become expert clinicians and researchers.

To evaluate the role and determine the optimal length of adult training today, we have to choose between these 2 educational objectives:

1. After completing the adult neurology rotations, each child neurology trainee should be able to recognize and treat most basic neurologic disorders of adults.
2. After completing the adult neurology rotations, each child neurology trainee should be better prepared for the practice of child neurology.

Goal 1 is consistent with the ideal embodied in the current American Board of Psychiatry and Neurology training model for certification in "Neurology with Special Qualification in Child Neurology": the superlative clinical neurologist with a common skill set to be applied to children or adults. Although some advocate this approach based on neuroscience and neurologic disease across the life spectrum,¹ it is difficult to see how this approach would universally help pediatric patient care or neuroscience. While laudable for some programs, for 59% of other training programs, this goal is considered outdated.^{3,4}

In contrast, goal 2 is consistent with a practical, modern training model where adult neurology training subserves the

clinical or academic training for the child neurologist. This objective could be accomplished readily with 3 core plus 3 optional adult elective months.⁴

If you are currently involved in residency education, ask your graduating residents to list up to 10 cases that taught them the most. I recently did this with our 3 fellowship-bound (1 epilepsy, 1 stroke, 1 multiple sclerosis) graduates. Their replies were 27 complex cases, often spanning several neurology subspecialties: epilepsy (10), rare hereditary/metabolic (8), critical care (7), vascular (6), movement disorders (6), neoplasms (2), inflammatory (2), headache (2), and neuromuscular (1). Despite their interests in neuroscience and adult neurology, only 3 of 27 cases were adults, and none was geriatric.

We have an opportunity and an obligation to make the future better for our pediatric patients. Children with neurologic diseases no longer need “Neurologists with special qualification in Child Neurology” (any more than children with congenital heart disease need “Cardiologists with special qualification in Child Cardiology”—who, sensibly, do not exist). They need doctors, basic and clinical researchers, and educators with “Excellence in Child Neurology.” Child neurology should control its destiny and not subordinate education to the workforce needs of our colleagues and collaborators in adult neurology. Three months of mandatory adult training is adequate. Let’s transform these other 9 months

now, to create a new, more knowledgeable and capable generation of child neurologists.

This transformation will better prepare our trainees to care for this toddler as well as . . . his younger sister.

Declaration of Conflicting Interests

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