The Child Neurology Workforce Study: Pediatrician Access and Satisfaction

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Objective To assess the opinions of pediatricians regarding the supply and utilization of child neurologists in the United States.

Study design A 32-item questionnaire was circulated by e-mail to a random sample of 5000 pediatricians with the assistance of the American Academy of Pediatrics.

Results After 2 mailings, 422 responses were received. Respondents ranged in age from 30 to 75 years (median 50 years), 60.4% were male, 96% were board certified in pediatrics, and 76% had a 2 or more–week rotation in child neurology during pediatric training. Approximately 79% indicated that there were few or too few child neurologists in their area, and 90% indicated that there were few or too few child neurologists in the United States. Sixty-one percent indicated that they always or almost always seek consultation from a child neurologist for a child with new onset seizures; 7% and 21% seek consultations for children with migraine or tics. The delay for child neurology consultation was 5 or more weeks in 63% and >12 weeks in 15%. Satisfaction with child neurologists was linked to the level of inter-physician communication. Neither satisfaction nor wait time influenced the frequency of consultations. Increasing level of patient complexity and parental expectations were cited as reasons for increasing numbers of consultations with child neurologists.

Conclusions Pediatricians perceive that a work force shortage exists in child neurology. Satisfaction with child neurology consultations is linked to communication with pediatricians. *(J Pediatr 2009;154:602-6)*

For at least the past decade, a workforce shortage has existed in child neurology in the United States. In 1998 an American Academy of Neurology (AAN) Task Force determined that there were 819 full-time equivalent child neurologists in the United States.[1] This number was at least 20% below the estimated demand for the clinical services of child neurology. Many believe that this survey underestimated the nation's need, because the AAN Task Force considered only clinical needs and not the expanding need for child neurologists as physician-educators and neuroscientists. In addition, the survey did not account for increased needs as a result of an improving life span for children with complex neurodevelopmental conditions.

In 2001-2002 the Child Neurology Society (CNS) conducted a survey of all child neurologists in the United States.[2-4] These data, consisting of responses from more than 600 child neurologists, provided a comprehensive summary of the status of child neurology in the United States. The survey respondents agreed that a work force crisis existed in child neurology. The mean age of child neurologists in the United States was 51 years at the time of the survey, indicating that the crisis would become even more severe as child neurologists continued to age and leave the work force.

This study, conducted in 2006, was designed to assess pediatrician needs regarding child neurology referrals in the United States. We were especially interested in the pediatrician access to child neurologists and their use of child neurology consultations.

METHODS

A randomly generated list of 5000 pediatricians in the United States was purchased from the American Academy of Pediatrics. Pediatricians included on the list were members of both the Academy and the American Medical Association. A 32-item questionnaire was designed by the authors to assess pediatrician opinions regarding their access to and utilization of child neurologists in the United States. Questions used a 5-point Likert scale or requested categorical yes/no responses. The questionnaire was sent

AAN	American Academy of Neurology	PCN	Professors of Child Neurology
CNS	Child Neurology Society		

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*List of additional members of the Executive Committee of the Child Neurology Society is available at www.jpeds.com (Appendix).

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by e-mail in 2 separate mailings in February and September 2006. Respondents were offered copies of AAN/CNS practice parameters for their participation.

Frequencies, percentages, and cross tabulations were calculated for all questionnaire items. Statistical comparisons for cross tabulations were done with Pearson χ^2. Analyses were conducted in Stata 9.2 MP (College Station, Texas).

RESULTS

Characteristics of the Respondents

After 2 mailings, 422 responses were received, for a response rate of 8.4%. Responding pediatricians ranged in age from 30 to 75 years (median of 50 years). Most of the respondents were male (60.4%). Nearly three quarters of respondents 50 years of age or older were male, whereas those younger than 50 years were more often female ($P <$ .0001). Nearly all (96%) were board certified in pediatrics. The regional distribution of responding pediatricians was: Northeast (Connecticut, Maine, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, Vermont) 116 (27.5%); Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, Wisconsin) 74 (17.5%); South (Alabama, Arkansas, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, Tennessee, Texas, Virginia, West Virginia) 145 (34.3%); and West (Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Oregon, Utah, Washington, Wyoming) 86 (20.4%) (1 respondent's region was not stated).

One hundred six respondents (25%) indicated that they had additional training in 1 or more subspecialties. The most common subspecialties were as follow: Developmental/Behavioral Pediatrics (18 respondents); Neonatology (10 respondents); Adolescent Medicine (9 respondents); Infectious Diseases or General/Community Pediatrics (8 respondents, each), and Genetics or Emergency Medicine (5 respondents, each). Sixty-two respondents (15%) indicated that they held board certifications in addition to general pediatrics. Most respondents (76%) had a 2 or more–week rotation on child neurology during their pediatric residencies.

Pediatrician Opinions Regarding the Supply of Child Neurologists

The vast majority (90%) of responding pediatricians believed that the number of child neurologists in the United States is insufficient (Figure 1). Although respondents with other board certifications were less likely to report an undersupply of child neurologists in the United States ($P = .04$), a substantial proportion of this subgroup [28/62 (45%)] indicated that there were "too few" child neurologists.

Somewhat more respondents, 20% overall, indicated that there were sufficient child neurologists in their referral area (Figure 1). There were substantial regional variations in this opinion. Nearly 25% of responding pediatricians from the South indicated that there are sufficient numbers of child neurologists in their region versus only 10% of responding pediatricians living in the West ($P < .05$; Figure 2). Respondents with other board certifications held similar opinions; 77% indicated that there were "few" or "too few" child neurologists in their area.

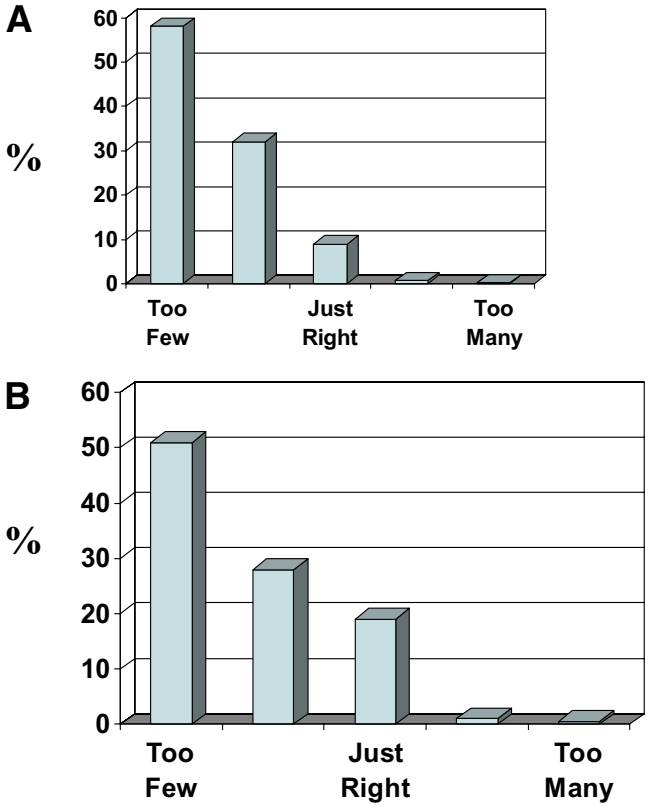

Figure 1. Summary of pediatrician opinions regarding **A**, the number of child neurologists in the United States and **B**, the supply of child neurologists in their area.

Pediatrician Access to Child Neurologists

To understand if geographic distance between the pediatrician and the child neurologist influenced opinions regarding the supply and use of child neurologists, the proximity of the child neurologists was ascertained. Nearly 50% of all respondents were within 10 miles of the child neurologist to whom the pediatricians referred their patients. Only 15% were 50 or more miles from the child neurologist. There were regional variations; 93% of pediatrician respondents in the Northeast were 50 or fewer miles from their child neurologist versus 88% of respondents in the Midwest ($P = .3$), 83% of the respondents in the South ($P = .02$), and 76% of the respondents in the West ($P = .0005$).

Child neurologist availability was assessed by asking "What is the average time that patient from your practice must wait for a new patient visit to the child neurologist?" Sixty-three percent (265/421) of respondents indicated that the wait was 5 or more weeks; 15% indicated that the wait was more than 12 weeks (Figure 3). Slightly more respondents in the West (67%) indicated that the wait was