

The Future of Pediatric Education II
A Project of the Pediatric Community

Summary of Survey Findings:
Pulmonology

Sponsoring Organizations:

American Academy of Pediatrics
American Board of Pediatrics Foundation
American Medical School Pediatric
Department Chairmen
Center for the Future of Children of The
David and Lucile Packard Foundation
Project #MCJ379381 from the Maternal
and Child Health Bureau

Introduction

The FUTURE OF PEDIATRIC EDUCATION II (FOPE II) Project is a 3 year, grant- funded initiative launched by the pediatric community in May 1996. As part of this project, key leaders in the pediatric community are addressing the future supply and training of pediatricians and the provision of pediatric care into the next millennium. They are continuing the work begun with a 1978 report entitled: "The Future of Pediatric Education."

The new report, scheduled for completion in 1999, will contain recommendations that will shape the lifelong learning process of pediatricians. Looking beyond the pediatric workforce and training of pediatricians, the recommendations encompassed in the 1999 report will also address the role and pediatric training of nonpediatricians, the financing of graduate medical education, and primary care and subspecialty issues.

The FOPE II Project consists of a 17-member Task Force that has ultimate responsibility for the development of the final report. Operating under the auspices of the Task Force are five, topic-specific workgroups:

- Pediatric Workforce Workgroup
- Pediatric Generalists of the Future Workgroup
- Pediatric Subspecialists of the Future Workgroup
- Financing GME Workgroup
- Education of the Pediatrician Workgroup

Each workgroup will provide an in-depth analysis of key issues under their purview. The workgroups are charged with generating a report that will, to the extent possible, include data-driven conclusions and recommendations for the optimal provision of pediatric care to all infants, children, adolescents, and young adults.

An important component of the FOPE II Project has been the gathering of insights, information, and data that will inform the deliberations of the workgroups and the Task Force. A number of venues are being used both to provide and solicit information. One opportunity is the Survey of the American Academy of Pediatrics (AAP) Medical and Surgical Subspecialty Sections. Seventeen AAP medical and surgical subspecialty sections have chosen to participate in this survey process. Several additional sections have provided the data and information that they acquired from independent survey initiatives.

The Survey of AAP Medical and Surgical Subspecialty Sections solicits information about career, education, and practice issues, as well as demographic information. The surveys have been sent to members of the AAP Section, as well as members of the appropriate subspecialty organizations, as identified by the Section. This report summarizes the findings from the surveys of physicians in pediatric pulmonology.

Methodology

This report is based on responses that were generated from two questionnaires, which were fielded simultaneously: a standard questionnaire (the *Workforce Survey for Child Health Care*) and a pediatric pulmonology questionnaire (the *Pediatric Pulmonology Survey*). (Copies of both surveys are included in an appendix to this report.)

The Workforce Survey for Child Health Care was developed by the FOPE II Task force and was designed to be applicable to most pediatric surgical and medical specialists. The Pediatric Pulmonology Survey was developed by two volunteers from the AAP Pediatric Pulmonology Section, Michelle Cloutier, MD, and Gregory Redding, MD, along with the Section's chairperson, Henry Dorkin, MD.

This questionnaire was mailed to pulmonologists along with the standard questionnaire, and included questions on such topics as: proportion of practice devoted to pediatric patients, salary support now and five years from now, size of practice, number of patients seen, time spent with patients, number and type of procedures performed, and diagnoses of pediatric pulmonology patients. This questionnaire, and the standard, was pre-tested by sending it out to a small group of pediatric pulmonologists, with the request that they fill out the questionnaire and inform us of any ambiguities. After reviewing the responses, the final questionnaire was completed.

Mailing lists were compiled of pulmonologists to whom the surveys would be mailed. Included in the sample were all 275 members of the AAP's Pediatric Pulmonology Section (Section); the 690 pulmonologists who belong to the pediatric assembly of the American Thoracic Society (ATS), and 517 pediatric pulmonologists sub-board certified by the American Board of Pediatrics (ABP).

Five mailings of the survey went out between August and December of 1997 to a total of 971 pulmonologists (there was some overlap on the mailing lists). Each mailing contained the standard questionnaire and the pediatric pulmonology questionnaire, a cover letter emphasizing the importance of the survey, and a return envelope.

We received some kind of response from 734 physicians, 75.6% of the sample. We received 201 responses that were excluded, either because the physicians indicated they were retired, deceased, were temporarily not practicing or were in training, were not practicing pediatric pulmonologists or we received knowledge that the address we had was not good and attempts at finding a better address failed. Altogether, of these 201, nine were not practicing or were in training, 39 were retired, 129 were not practicing pulmonologists, and two were deceased. These 179 were excluded from the sample size of 971, producing an effective sample size of 792. Our response rate is therefore 531 out of 792 or 67.0%.

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For purposes of statistical analysis the respondents were divided into two categories: the 395 who are sub-board certified in pediatric pulmonology (74%) and the 136 who are not (26%).

Acknowledgments

THE FUTURE OF PEDIATRIC EDUCATION II (FOPE II) Project acknowledges the participation of all who facilitated the development and implementation of the Pediatric Pulmonology Workforce Survey for Child Health Care and this report on the survey findings. The FOPE II Project Task Force and Workgroup members provided the overall framework for the surveys of pediatric medical and surgical subspecialists and those non-pediatrician physicians who provide pediatric care. The Project is grateful to the members and staff of the American Academy of Pediatrics (AAP). Of particular note are Michelle Cloutier, MD, and Gregory Redding, MD, volunteers from the AAP Pulmonology Section, and Henry Dorkin, MD, section chairperson, who wrote the questions for the pulmonology questionnaire. Sarah E. Brotherton, PhD, and Judy Karacic of the AAP Department of Research worked diligently on construction of the survey instrument, fielding the survey, and analysis of the results. Thomas M. Gorey, JD, of Policy Planning Associates, wrote the final report. Angela Lipinski, AAP Department of Education, handled all aspects of the production and distribution of this report. The FOPE II Project extends grateful thanks to the many individuals who took time from their busy schedules to complete and return the survey. The participation of these respondents has informed the deliberations of THE FUTURE OF PEDIATRIC EDUCATION II Project.

The Future of Pediatric Education II Project is made possible through the support of the following sponsoring organizations: American Academy of Pediatrics, American Board of Pediatrics Foundation, Association of Medical School Pediatric Department Chairmen, Center for the Future of Children of The David and Lucile Packard Foundation, and Project #MCJ379381 from the Maternal and Child Health Bureau.

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Workforce Survey for Child Health Care

Demographics of Respondents

On average, the respondents were 45 years of age and planned to fully retire from the practice of medicine at age 66. Board certified pediatric pulmonologists are younger than non-board certified pediatric pulmonologists, but as they plan to retire at a younger age, both groups plan on working another 21 years before they retire. Seventy two percent (72%) of the respondents were male and 28% were female. In terms of ethnicity, 81% were White/Non-Hispanic, 8% were Asian/Pacific Islanders, 7% were White/Hispanic, 1% were African American, and less than 1% classified themselves as Native Americans or Alaskan Natives.

Seventy nine percent (79%) of the respondents were graduates of U.S. medical schools, 2% were graduates of Canadian medical schools, and 19% were graduates of medical schools in other countries. The respondents' average year of graduation from medical school was 1978.

Approximately 88% of the respondents are affiliated with a medical school. Just over one third (35%) are in private practice.

Specialty, Residency Training, and Board Certification

The survey instrument asked respondents to list the specialties and subspecialties in which they have been trained, to specify the year they completed residency training, and to indicate for each specialty/subspecialty listed whether they were board certified. Respondents could list up to three specialties/subspecialties.

Table 1 below presents a summary of the specialty, board certification, and residency training information on those who responded to the survey. Nearly nine out of ten of the respondents listed pediatric pulmonology as one of their specialties and over eight out of ten listed general pediatrics. Of those who listed pediatric pulmonology as one of their specialties, 85% indicated they were board certified in that specialty. Of those who listed general pediatrics as one of their specialties, nearly 100% indicated they were board certified in that specialty.

Table 1. Residency Training and Board Certification of Survey Respondents

| Specialty | Number | Percent of Total | Percent Board Certified (%) | Residency Completion Year (%) |
|--------------------------|--------|------------------|-----------------------------|-------------------------------|
| | (Mean) | | | |
| Pediatric pulmonology | 470 | 88.5 | 84.5 | 1990 |
| General Pediatrics | 434 | 81.7 | 99.8 | 1984 |
| Allergy | 49 | 9.2 | 85.7 | 1982 |
| Critical Care | 39 | 7.3 | 82.0 | 1990 |
| Neonatology/perinatology | 35 | 6.6 | 94.3 | 1981 |
| Other | 20 | 3.8 | 90.0 | N/A |

Among those board certified in pediatric pulmonology, 82% listed general pediatrics and 100% listed pediatric pulmonology as one of their specialties. Among the respondents not board certified in pediatric pulmonology, 80% listed general pediatrics and 55% listed pediatric pulmonology as one of their specialties.

Main Practice Site

Respondents were asked to specify their main employment site; that is, the setting in which they spend the most time. Table 2 provides a breakdown of responses for this question. For the respondents overall, nearly six out of ten indicated their main practice setting was a medical school.

Table 2. Main

| Practice Site | % of Respondents (%) |
|----------------------------------|----------------------|
| Main Site | |
| Medical school | 58.0 |
| Specialty group | 10.9 |
| Solo practice | 8.0 |
| Community hospital | 6.2 |
| Multispecialty group | 6.4 |
| Pediatric group | 4.3 |
| HMO | 1.9 |
| Uniformed health services clinic | 1.2 |
| Other | 2.7 |

When asked to describe the area in which their primary practice site is located, 47% indicated that it is an urban--not inner city--area; 36%, urban--inner city; 14%, suburban; and 3%, rural.

Those board certified in pediatric pulmonology were more likely to indicate that their main practice setting was in an urban--not inner city--area, while those not board certified in this subspecialty were more likely to say that their main practice setting was in a suburban area, rural, or urban--inner city--area.

Time Spent in Professional Activities

Table 3 depicts the average percentage of time spent by pulmonologists in various professional activities. On average, 60% of the total time spent by pulmonologists in professional activities is devoted to direct patient care.

On average, the respondents said they typically work 59 hours per week. Those board certified in pediatric pulmonology reported working an average of 60 hours per week, while those not board certified in this subspecialty reported working an average of 57 hours per week.

Table 3. Average Percent of Time per Week in Professional Activities

| Professional Activity | Percentage of Time (%) |
|--------------------------------|-------------------------------|
| Direct patient care | 59.7 |
| Administration | 11.0 |
| Teaching | 10.9 |
| Clinical research | 7.5 |
| Basic science research | 6.5 |
| Health services research | 0.4 |
| Other, non-direct patient care | 3.7 |

Thirty percent (30%) of the respondents indicated that they spend *some* of their direct patient care time in primary care pediatrics; 96% said they spend some time in a pediatric medical subspecialty (for most, pediatric pulmonology); 2% said they spend some time in a pediatric surgical subspecialty; and 13% said they spend some time in another specialty (*eg*, allergy). On average, the respondents reported spending 86% of their time in a pediatric medical subspecialty (primarily pediatric pulmonology), 10% of their time in primary care pediatrics, and 4% of their time in another specialty (*eg*, allergy). Among respondents who reported spending some time in pediatric pulmonology, those who are board certified in that subspecialty spent an average of 90% of their direct patient care time in pediatric pulmonology compared to 76% for those not board certified.

Referrals

Ninety eight percent (98%) of the respondents reported that they receive referrals for pediatric patients. Table 4 displays the source of these referrals, by specialty. The three biggest sources of referrals of pediatric patients to pulmonologists are pediatric generalists, family physicians, and pediatric medical/surgical subspecialists. Among respondents who said they receive referrals for pediatric patients, nearly 90% or more said they receive referrals from each of these sources. Pediatric nurse practitioners represent another significant sources of referrals, with over one half of the respondents saying they receive pediatric referrals from these health care providers.

Table 4. Source of Referrals of Pediatric Patients to Pulmonologists

| Source of Referrals | Percentage* |
|---|--------------------|
| Pediatric generalists | 99.0 |
| Family physicians | 89.4 |
| Pediatric medical/surgical subspecialists | 86.5 |
| Pediatric nurse practitioners | 59.4 |
| Physician assistants | 38.8 |
| Adult medicine subspecialists | 34.9 |
| General internists | 29.4 |
| Obstetricians/gynecologists | 11.8 |
| Others | 9.8 |

* Percentage of respondents who receive pediatric referrals.

Those board certified in pediatric pulmonology were slightly more likely than those not board certified in this subspecialty to report that they receive referrals from pediatric generalists, family physicians, pediatric medical/surgical subspecialists, and pediatric nurse practitioners, while those not board certified in pediatric pulmonology were more likely to report that they receive referrals from obstetricians/gynecologists.

Pulmonologists also were asked to report whether they receive referrals from urgent care centers, community agencies, and school districts. Fifty seven percent (57%) of the respondents reported that they receive referrals from urgent care centers, 53% said they receive referrals from community agencies, and 31% indicated that they receive referrals from schools. Only 11% of the respondents said that their pediatric referrals come only from within their own practice or managed care network.

Just under one third (31%) of the respondents said that neither the volume nor the complexity of the pediatric referrals they have received in the last twelve months has

changed compared to previously, while 69% said that either the volume, the complexity, or both have changed. Those board certified in pediatric pulmonology were more likely than those not board certified in this subspecialty (73% versus 53%) to say that they have experienced a change.

Among those pulmonologists who have experienced a change in the volume *or* complexity of pediatric referrals, 62% indicated that they have seen an increase in the volume of referrals, 20% said there has been a decrease in the volume of referrals, and 62% said there has been an increase in the complexity of referrals. Eighteen percent (18%) said they have experienced no change in the volume of referrals and 36% said they have experienced no change in the complexity of the cases referred to them.

Pulmonologists who indicated that they have experienced a change in the volume or complexity of pediatric referrals in the last twelve months were asked to describe the factors to which this change could be attributed. Fifty nine percent (59%) of the respondents said that an increased likelihood of general pediatricians and other generalists to treat less complex subspecialty patients has caused a change in the volume or complexity of pediatric referrals, while 36% cited an increase in the incidence or severity of illness in their community and 34% pointed to increased competition from other pediatric subspecialists. Pulmonologists were divided as to whether a change in the likelihood of generalists to treat more complex subspecialty patients was a factor in the change in volume or complexity in referrals; 31% said generalists were more likely to treat more complex subspecialty patients, 34% said there was a decrease in this likelihood, and 35% reported no change.

Need for Additional Training

Despite whatever changes are taking place in health care, the respondents to this survey generally did not feel that the changes have resulted in a need for additional training on their part, particularly with respect to primary care. Sixty nine percent (69%) of the respondents indicated that the changes in health care have not necessitated additional training in primary care, and 74% said that the changes have not necessitated additional training in their subspecialty. A significant minority of respondents indicated a need for a “little” additional training in primary care (28%) and in their subspecialty (24%). One third of those not sub-board certified in pediatric pulmonology indicated they required a “little” more training in that subspecialty. Only 3% of the respondents indicated a need for “much more” training in primary care and only 2% indicated a need for “much more” training in their subspecialty.

Competition

Seventy six percent (76%) of respondents said they face competition for pediatric subspecialty services in their geographical area. The major source of competition, which was mentioned by 84% of respondents, was other pediatric subspecialists. Other

significant sources of competition that were mentioned included general pediatricians (cited by 46% of respondents) and other physicians trained in adult medicine in the same subspecialty (cited by 41% of respondents). (See Table 5.) Respondents not board certified in pediatric pulmonology were more likely than board certified pediatric pulmonologists (31% versus 20%) to say they face competition from family physicians.

In response to a similar, but more specific question on the Pediatric Pulmonology Survey, 43% of respondents said they face competition from allergists and 40% said they face competition from other pediatric pulmonologists.

Table 5. Perceived Source of Competition for Pediatric Subspecialty Services

| Source of Competition | Percentage of Pulmonologists* (%) |
|---|--|
| Other pediatric subspecialists | 83.8 |
| General pediatricians | 45.9 |
| Physicians trained in adult medicine in my subspecialty | 40.5 |
| Family physicians | 22.4 |
| Urgent care centers | 9.0 |
| Non-physician medical personnel (<i>eg</i> , advanced practice nurses, chiropractors) | 6.7 |
| Related health professionals (<i>eg</i> , psychologists, nutritionists) | 2.6 |
| Other | 2.8 |

* Percent of respondents who said they face competition from any source.

Although three fourths of the respondents indicated that they face competition for pediatric subspecialty services in their geographical area, only half of these respondents have modified their practice as a result of competition.

For those pulmonologists who have modified their practices, over one half have increased office hours, while over one fourth have increased the number and/or responsibilities of their support staff, increased the number of physicians in their practice, and decreased their research/administrative activities (see Table 6).

Respondents board certified in pediatric pulmonology were more likely than those not board certified in this subspecialty to say that they have increased office hours (58% versus 35%) and decreased their research and administrative activities (29% versus 13%) as a result of competition.

When asked whether, during the last twelve months, their practice had been sold to or merged with another practice or health care organization, only 8% responded affirmatively.

Table 6. Practice Modifications as a Result of Competition

| Change (%) | Increased | Decreased (%) | No Change (%) |
|--|------------------------------------|------------------|------------------|
| | Office hours | 52.4 | 1.1 |
| | 46.5 | | |
| | Fees | 5.9 | 10.2 |
| | 84.0 | | |
| Number/responsibilities of support staff | 26.7 | 12.3 | 61.0 |
| | Number of advanced practice nurses | | |
| | 16.0 | 6.4 | 77.5 |
| | Number of physicians for practice | | |
| | 27.3 | 4.8 | 67.9 |
| | Amount of research/administrative | | |
| activities | 19.8 | 25.1 | 55.1 |

Workforce

Sixty one percent (61%) of the respondents said they did not anticipate that their communities would need additional pediatric subspecialists in the next 3-5 years, 70% indicated there would not be a need for more pediatric subspecialists in their discipline, and 81% felt there would not be a need for more pediatric subspecialists in other pediatric subspecialties.

When asked whether they or their employer would be hiring additional, non-replacement pediatric subspecialists in their field in the next 3-5 years, the responses were almost evenly divided: 36% of the respondents said “no,” 32% said “yes,” and 32% said they were unsure.

Income

Pulmonologists rely on a variety of payment sources for their income, but salaried arrangements are the most common. As Table 7 illustrates, over one half of pulmonologists receive some income from straight salaries, while approximately one third or more receive some income from salaries with performance incentives and fee-for-service arrangements.

Table 7. Sources of Income for Pulmonologists

| Source of Income | Percentage With Income from Each Source (%) |
|-----------------------------------|---|
| Salary | 52.5 |
| Salary with performance incentive | 32.6 |
| Traditional fee for service | 38.2 |
| Discounted fee for service | 36.8 |
| Prepaid, capitated, nonsalaried | 24.4 |
| Prepaid, capitated, salaried | 19.0 |

Table 8 provides information on the percentage of pulmonologists' income that comes from various sources. For those pulmonologists who indicated that they receive some income from salaries--or salaries with performance-based incentives--nearly two thirds said such sources account for a substantial portion (67-100%) of their total income.

For those pulmonologists who said they receive some income from traditional fee-for-service payment arrangements, nearly two thirds indicated that these payment arrangements account for only 33% or less of their total income. Similarly, among those pulmonologists who said they receive some income from prepaid, capitated arrangements--salaried or nonsalaried--the most common response was that these payment arrangements account for 33% or less of their total income.

Table 8. Percent of Income by Source

| Income Source | 0-33% | 34-66% | 67-100% | Don't Know |
|-----------------------------------|-------|--------|---------|------------|
| Salary | 16.2 | 6.1 | 65.9 | 11.7 |
| Salary with performance incentive | 17.0 | 7.3 | 63.0 | 12.7 |
| Traditional fee for service | 63.4 | 16.2 | 4.7 | 15.7 |
| Discounted fee for service | 42.2 | 26.7 | 11.2 | 19.8 |
| Prepaid, capitated nonsalaried | 62.0 | 7.4 | 2.5 | 28.1 |
| Prepaid, capitated salaried | 51.6 | 5.3 | 11.6 | 31.6 |

Finally, when asked whether they have used telemedicine, fax machines or other forms of information technology as part of a consultation with another practitioner because of lack of ready access to appropriate subspecialists (*eg*, in a rural area), two thirds of respondents answered affirmatively.

Pediatric Pulmonology Survey

Practice Characteristics

On average, the respondents reported spending 66% of their total work hours in pediatric pulmonology; 9% in general pediatrics; 4% in adult pulmonology; 14% in non-patient-care-related activities; and the remaining time in other specialties or subspecialties (*eg.*, critical care, allergy, and neonatal care). Respondents board certified in pediatric pulmonology on average reported spending 72% of their time in pediatric pulmonology compared to 51% for those not board certified in this subspecialty. On the other hand, those not board certified in pediatric pulmonology on average reported spending 18% of their time in general pediatrics compared to just 6% for those board certified in the subspecialty.

Table 9 presents data on the average percent of time *in the area of pediatric pulmonology* that is spent in various professional activities. Direct patient care accounts for almost two-thirds (63%) of the time respondents spend in pediatric pulmonology.

Table 9. Average Percent of Time in Pediatric Pulmonology Devoted to Various Professional Activities

| Professional Activity | Percentage of Time (%) |
|-------------------------------------|-------------------------------|
| Direct patient care | 63.2 |
| Research | 14.7 |
| Teaching medical students/residents | 11.5 |
| Administration and other activities | 9.5 |

Respondents were asked to estimate the percentage of salary support they currently receive from various sources and to estimate what they believe their salary sources will be five years from now (see Table 10). Respondents estimated that direct patient care revenues currently are the largest single source of their income, accounting for just over one-third of their total income, and they projected that this will continue to be the case five years from now. The most significant projected change is that in five years the respondents expect salaries plus incentives to become a more important source of income and for hospital salaries to become a less significant source of income overall for pediatric pulmonologists.

**Table 10. Estimated Sources of Pulmonologists' Income:
Currently and in Five Years***

| Source | Currently (%) | In Five Years (%) |
|------------------------------|---------------|-------------------|
| Research grant-basic science | 5.8 | 6.3 |
| Research grant-clinical | 4.8 | 6.1 |
| Direct patient care | 34.0 | 33.6 |
| Hospital salary | 28.1 | 21.0 |
| Salary plus incentive | 22.5 | 28.0 |
| Other sources | 5.2 | 5.3 |

* Estimated, average

percentage of total income from listed sources for all respondents.

Workforce Issues

The respondents reported on average that they have 3.5 pediatric pulmonologists in their Division or practice. When asked whether they currently are recruiting or planning in the next three years to recruit a new, non-replacement pediatric pulmonology faculty member or practice partner, nearly one half of the respondents (46%) said “no,” while just over one fourth (28%) said “yes” and just over one fourth (27%) said they were unsure.

Next, respondents were asked to specify the number of full time equivalent (FTE) non-physician professionals who work in their pediatric pulmonology subspecialty practice. On average, the respondents said that their practice has 1.7 FTE nurse coordinators, 1.5 FTE nurse practitioners/physician assistants, 0.9 FTE social workers, 0.8 FTE dietitians, and 0.9 FTEs in other disciplines.

Patient Encounter Data

The respondents indicated that on average they *and their physician associates* provided care for 1,768 pediatric pulmonary patients during the past year. *Individually*, on average, the respondents reported the following pulmonary pediatric patient encounters in the last 12 months: outpatients-850; inpatients (general floor)-272; inpatient consultations-125; inpatient consultations in the pediatric intensive care unit (ICU) or neonatal ICU-61; and inpatient (non-consultative) encounters in the pediatric or neonatal ICU-49.

Compared to those not board certified in pediatric pulmonology, those respondents who are board certified in this subspecialty on average reported more outpatient encounters (918 versus 663); more inpatient (general floor) encounters (302 versus 190); more inpatient

consults (147 versus 66); and more inpatient consults in the pediatric or neonatal ICU (72 versus 30).

When asked to project whether they anticipated seeing more pediatric pulmonary inpatients, outpatients, or consults per week in the next 12 months compared to currently, 72% of the respondents said they expected to see more outpatients and 42% projected that they will have more consults. Only 23% said they expected to see more pediatric pulmonary inpatients. Compared to those not board certified in pediatric pulmonology, those respondents who are board certified in this subspecialty were more likely to project more outpatient encounters (76% versus 60%) and more consults (44% versus 34%) in the next 12 months.

On average, the respondents reported that they, individually, conduct 3.7 half day pediatric pulmonology clinics per week (an average of 4.2 half day clinics for those board certified in pediatric pulmonology and 2.3 for those not board certified in this subspecialty).

The respondents reported scheduling an average of 48 minutes to see new pediatric pulmonology patients and 23 minutes to see follow-up patients. On average, the respondents reported providing patient care (consultation, clinic, etc.) outside of their primary hospital or clinic setting 1.9 times per week.

Table 11 displays the primary diagnoses for the respondents' pediatric pulmonary patients and the respondents' assessments as to whether each of these diagnoses has increased, decreased, or not changed over the past two years. Overall, asthma was the most common diagnosis, accounting for just under one half (46%) of the pediatric pulmonary problems treated by respondents. Cystic fibrosis, which was the second most common diagnosis, accounted for 18% of the respondents' pediatric patients.

Respondents board certified in pediatric pulmonology were more likely to report chronic aspiration syndromes, neuromuscular disease, and high technology dependent care as primary diagnoses. Those not board certified in this subspecialty were more likely to report apnea as a primary diagnosis. Also, those board certified in pediatric pulmonology were more than twice as likely as those not board certified to say that neuromuscular disease has increased as a primary diagnosis over the past two years.

Table 11. Diagnostic Categories as a Percent of Pediatric Patient Problems

| <u>Diagnosis</u> | <u>Percentage</u> % | <u>Change over the Past 2 Years</u> | | |
|--------------------------------|------------------------|-------------------------------------|-----------|-----------|
| | | Increased | Decreased | No Change |
| Apnea | 7.0 | 19.7 | 18.2 | 62.1 |
| Chronic aspiration syndromes | 5.1 | 19.9 | 2.9 | 77.2 |
| Asthma | 46.1 | 45.5 | 5.7 | 48.8 |
| Bronchopulmonary dysplasia | 9.3 | 12.7 | 33.9 | 53.4 |
| Cystic fibrosis | 17.6 | 23.4 | 7.4 | 69.2 |
| Neuromuscular disease | 3.9 | 21.5 | 4.7 | 73.8 |
| High technology dependent care | 4.9 | 29.2 | 8.1 | 62.8 |
| AIDS/Immunocompromised | 2.5 | 18.3 | 9.6 | 72.1 |
| Other | 3.8 | 16.9 | 3.7 | 79.4 |

Compared to two years ago, 46% of respondents said they have more patients with asthma; 29%, more patients requiring high technology dependent care; 23%, more patients with cystic fibrosis; and 20%, more patients with chronic aspiration syndromes. Approximately equal numbers of respondents said that apnea has increased and decreased as a primary diagnosis over the past two years. The diagnosis with the most significant decrease in frequency is bronchopulmonary dysplasia; over one-third of respondents said that this condition accounts for a smaller percentage of their patients now than two years ago. (Only 13% said it has increased as a primary diagnosis.)

Among the procedures and tests that are most common for pediatric patients, respondents reported that pulmonary function tests are done most frequently (see Table 12). On average, respondents indicated that they perform approximately 15 such tests per week. Next most common are telephone consultations, which average 10 per week for pediatric pulmonologists.

Table 12. Number of Pediatric Patient Procedures per Week

| Procedure | Number per Week |
|--|------------------------|
| Sleep studies | 2.1 |
| Pulmonary function tests | 14.5 |
| Flexible bronchoscopies | 1.3 |
| Bronchoprovocation | 0.7 |
| Skin tests | 1.9 |
| Exercise stress tests | 0.9 |
| Home care consultations (without charge) | 2.4 |
| Telephone consultations | 9.7 |
| Home visits | 0.1 |

Compared to those not board certified in pediatric pulmonology, those respondents board certified in this subspecialty on average reported that they perform more pulmonary function tests, flexible bronchoscopies, and bronchoprovocations, and that they provide more home care and telephone consultations.

Summary

On average, 60% of the total time spent by pulmonologists in professional activities is devoted to direct patient care, with teaching, administration, and clinical research accounting for most of the remaining time. Almost one third of pulmonologists spend some time in primary care pediatrics.

The three biggest sources of referrals of pediatric patients to pulmonologists are pediatric generalists, family physicians, and pediatric medical/surgical subspecialists. Among those pulmonologists who receive referrals for pediatric patients, nearly 90% or more receive referrals from each of these sources.

Among pulmonologists who have experienced a change in the volume or complexity of pediatric referrals, a majority have seen an increase in the volume of referrals and an increase in the complexity of cases referred to them by general pediatricians and others. A major factor to which pulmonologists attribute these changes is an increased likelihood of general pediatricians and other generalists to treat less complex subspecialty patients.

Despite whatever changes are taking place in health care, pulmonologists generally do not feel that the changes have resulted in a need for additional training on their part, particularly with respect to primary care.

Over three fourths of pulmonologists feel they face competition for pediatric subspecialty services in their geographical area, with the major perceived source of competition being other pediatric subspecialists. Only one half of pulmonologists have modified their practice as a result of competition, with the most common change being increased office hours.

Seven out of ten pulmonologists believe that there will not be a need in their community for more pediatric pulmonologists in the next 3-5 years.

Pulmonologists rely on a variety of payment sources for their income, but salaried arrangements are the most common, with over one half of pulmonologists receiving some income from straight salaries and one third receiving some income from salaries with performance incentives.

Direct patient care revenues currently are the largest single source of pulmonologists' income, accounting for just over one-third of their total income, and pulmonologists project that this will continue to be the case in the future.

Asthma is the most common diagnosis among the pediatric pulmonary problems treated by pulmonologists, accounting for just under one half of their pediatric cases, followed by cystic fibrosis, which accounts for 18% of pulmonologists' pediatric patients.

Almost one half of pulmonologists say they have more patients with asthma, compared to two years ago.