

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

Summary of Survey Findings:
Critical Care Medicine

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
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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 critical care medicine.

Methodology

This report is based on responses that were generated from two questionnaires: a standard questionnaire (the Workforce Survey for Child Health Care) and a critical care medicine questionnaire (the Pediatric Critical Care Survey). 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 Critical Care Survey was developed by two volunteers from the AAP Critical Care Section (David S. Jardine, MD, and Curt M. Steinhart, MD), along with the Section's chairperson, Timothy S. Yeh, MD. This questionnaire (after being pretested with a small group of pediatric intensivists) was mailed to critical care physicians along with the standard questionnaire, and included questions concerning attrition from pediatric critical care medicine, consultation practices, percent of time spent treating children, number of trainees in critical care medicine, workforce requirements, and career satisfaction.

Mailing lists were compiled of pediatric intensivists to whom the surveys would be sent. Included in the sample were the 485 members of the AAP's Critical Care Section, the 533 pediatricians who have passed the pediatric critical care subspecialty board through the American Board of Pediatrics, and the 1,394 pediatrician members of the Society for Critical Care Medicine (SCCM). Five mailings of the survey went out between July and November of 1997 to a total of 1,584 pediatric intensivists (there was some overlap on the mailing lists). Each mailing contained the standard questionnaire and the pediatric critical care questionnaire, a cover letter emphasizing the importance of the survey, and a return envelope. The survey had an effective sample size of 1,437 and a response rate of 64.4% (925 out of 1,437). Pediatric intensivists most likely to respond belonged to both the Section and the SCCM, and were sub-board certified (83%); least likely to respond were those who belonged only to the Section (41%).

For reporting purposes, respondents were divided into three groups: those who have trained in pediatric critical care (PCC) medicine and are currently practicing PCC (74%); those who have not trained in PCC but are practicing PCC (13%); and those who once practiced PCC but are no longer doing so (13%).

Acknowledgments

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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.

Jimmy L. Simon, MD
Project Chairperson

Russell W. Chesney, MD
Project Vice Chairperson

Errol R. Alden, MD
Principal Investigator

Holly J. Mulvey
Director

Workforce Survey for Child Health Care

Demographics of Respondents

On average, the respondents were 42 years of age and planned to fully retire from the practice of medicine at age 63. Those who have trained in and are currently practicing PCC are significantly younger (age 41) than those who did not train in PCC, but are practicing in the field (age 45), and those who are no longer practicing PCC (age 47). Three fourths of the respondents were male and one fourth were female. In terms of ethnicity, 78.7% were White/Non-Hispanic, 9.4% were Asian/Pacific Islanders, 6% were White/Hispanic, 2.2% were African American, and 0.2% classified themselves as Native Americans or Alaskan Natives. Eighty percent of the respondents were graduates of U.S. medical schools, 0.6% were graduates of Canadian medical schools, and just over 19% were graduates of medical schools in other countries.

Specialty, Residency Training, and Board Certification

The survey instrument asked respondents to list the specialties and subspecialties in which they had been trained, to specify the year they completed residency training, and to indicate for each specialty/subspecialty listed whether they were board certified (or had a certificate of specialty competence). 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. Eighty-six percent of the respondents listed general pediatrics as one their specialties and 81% listed critical care. Other specialties listed included anesthesiology (12%), pulmonology (6%), neonatology/perinatology (6%), pediatric surgery (5%), cardiology (4%), and general surgery (4%).

Table 1. Board Certification and Residency Training of Survey Respondents

| Specialty | Number | % of Total | % Bd Cert. | Residency Completion Year (Mean) |
|--------------------------|--------|------------|------------|----------------------------------|
| General pediatrics | 797 | 86.2 | 92.2 | 1987 |
| Critical care | 750 | 81.1 | 66.5 | 1989 |
| Anesthesiology | 109 | 11.8 | 88.1 | 1986 |
| Pulmonology | 59 | 6.4 | 83.1 | 1987 |
| Neonatology/perinatology | 57 | 6.2 | 82.5 | 1983 |
| Pediatric surgery | 45 | 4.9 | 93.3 | 1981 |
| Cardiology | 39 | 4.2 | 74.4 | 1984 |
| General surgery | 35 | 3.8 | 91.4 | 1979 |
| Other | 82 | 8.9 | 67.0 | |

Among those who listed general pediatrics as one of their specialties, 92% indicated they were board certified in that specialty, with the mean year for completion of their residencies being 1987. Among those who listed critical care medicine as an area of practice, two-thirds indicated they were board certified, with the average year of residency completion being 1989.

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, 60% indicated their main practice setting was a medical school; 13%, a community hospital; 10%, a specialty group practice; 5%, a multispecialty group; 4%, a pediatric group, and 2%, solo practice.

For those who have trained in, and are currently practicing, pediatric critical care medicine, 61% indicated their main practice setting was a medical school; 16%, a community hospital; 10%, a specialty group practice; 4%, a multispecialty group; 3%, a pediatric group, and 1%, solo practice.

For those who have not trained in pediatric critical care but are practicing in that field, 59% indicated their main practice setting was a medical school; 9%, a community hospital; 11%, a specialty group practice; 5%, a multispecialty group; 5%, a pediatric group, and 6%, solo practice.

For those who once practiced pediatric critical care but are no longer doing so, 50% indicated their main practice setting was a medical school; 3%, a community hospital; 12%, a specialty group practice; 9%, a multispecialty group; 9%, a pediatric group, and 4%, solo practice.

Table 2. Main

| Practice Site | |
|----------------------------------|----------------------------------|
| Main Site | Percentage of Respondents |
| Solo practice | 2.3 |
| Pediatric group | 4.0 |
| Specialty group | 10.0 |
| Multispecialty group | 4.9 |
| HMO | 0.6 |
| Community health center | 0.8 |
| Uniformed health services clinic | 0.1 |
| Medical school | 59.5 |
| Community hospital | 13.3 |
| Other | 4.5 |

When asked to describe the area in which their primary practice site is located, 39% indicated that it is an urban-inner-city area; 46%, said it was an urban (but not inner city) area; 12% described it as a suburban area; and 4% specified a rural area.

For those who have trained in, and are currently practicing, pediatric critical care medicine, 38% said their practice site is in an urban-inner-city area; 48%, an urban--not inner city--area; 12%, a suburban area; and 3% a rural area.

For those who have not trained in pediatric critical care but are practicing in that field, 48% said their practice site is in an urban-inner-city area; 41%, an urban--not inner city--area; 8%, a suburban area; and 4% a rural area.

For those who once practiced pediatric critical care but are no longer doing so, 37% said their practice site is in an urban-inner-city area; 38%, an urban--not inner city--area; 15%, a suburban area; and 11% a rural area.

Time Spent in Professional Activities

On average, pediatric intensivists work 67 hours per week, with those who no longer practice PCC working significantly fewer hours per week (61) than the other respondents. Table 3 depicts the average percentage of time spent by critical care physicians in various professional activities. On average, just over one half of the total time spent by critical care

physicians in professional activities is devoted to direct patient care. Administrative and teaching responsibilities account for most of the remaining time spent by critical care physicians in professional activities.

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

| Professional Activity | Percentage of Time (%) |
|--------------------------------|-------------------------------|
| Direct patient care | 56.0 |
| Administration | 14.5 |
| Teaching | 14.4 |
| Clinical research | 5.4 |
| Basic science research | 5.0 |
| Health services research | 0.6 |
| Residency/fellowship | 9.9 |
| Other, non-direct patient care | 4.2 |

Those who have not trained in pediatric critical care but are practicing in that field on average spend more time in direct patient care (an average of 61% of their time); those who have trained in, and are currently practicing, pediatric critical care medicine, on average spend more time in basic science research (an average of 5.9% of their time); and those who once practiced pediatric critical care but are no longer doing so tend to spend more time in administration (an average of 18.4% of their time).

A typical respondent spends 7.6% of direct patient care time in primary care pediatrics, 79% in a pediatric medical subspecialty (principally critical care), 9.5% in a pediatric surgical subspecialty (principally pediatric surgery), and the remainder in another specialty (principally anesthesiology). Only one in five of those trained and practicing PCC spends any time in primary care pediatrics, versus one in four of those not trained in PCC, but practicing, and one in three of those who are no longer practicing PCC. The latter two groups are also more likely to spend some time in various pediatric medical and surgical subspecialties, whereas the former group is most highly concentrated in PCC.

On average, the respondents said that, of their total time in *direct patient care*, 70% is spent in pediatric critical care units, 8% is spent in an intermediate care (step down) unit, 5% is spent in the hospital, ward attending; 12% is spent in a subspecialty other than critical care; and the remaining time is spent in other direct patient care activities. Those critical care physicians who have trained in pediatric critical care generally reported spending a greater portion of their time in pediatric critical care units (74%) than those *not* trained in the specialty--but practicing in the field (43%), while the latter group reported spending a greater portion of their time in a subspecialty other than critical care (34% of their time versus 9% for those trained in critical care medicine).

Referrals

Ninety percent 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 critical care physicians are pediatric generalists, pediatric medical and surgical subspecialists, and family physicians. Among respondents who said they receive referrals for pediatric patients, 95% said they receive referrals from pediatric generalists, 91% said they receive referrals from pediatric medical and surgical subspecialists, and 84% said they receive referrals from family physicians. Pediatric nurse practitioners represent another significant source of referrals, with nearly one third of respondents saying they receive referrals from this source

Table 4. Source of Referrals of Pediatric Patients to Critical Care Physicians

| Source of Referrals | Percentage (%) |
|---|-----------------------|
| Pediatric generalists | 94.5 |
| Pediatric medical/surgical subspecialists | 91.2 |
| Family physicians | 83.5 |
| Pediatric nurse practitioners | 32.0 |
| Physician assistants | 21.9 |
| Adult medicine subspecialists | 19.7 |
| General internists | 14.6 |
| Obstetricians/gynecologists | 13.9 |
| Others | 14.3 |

Those who have trained in, and are currently practicing, pediatric critical care medicine, are less likely to receive referrals from general internists (13%), obstetricians and gynecologists (8%), pediatric nurse practitioners (27%) and physician intensivists (18%), while those who have *not* trained in pediatric critical care but are practicing in that field are more likely to receive referrals from these sources (general internists-20%; obstetricians and gynecologists-40%; pediatric nurse practitioners-54%, physician assistants - 38%).

Critical care physicians also were asked to report whether they receive referrals from urgent care centers, community agencies, and school districts. Seventy percent (70%) of the respondents indicated that they receive referrals from urgent care centers, 29% said they receive referrals from community agencies, and 14% indicated that they receive referrals from schools. One fourth of critical care physicians said that they receive no referrals from urgent care centers, community agencies, or school districts. Those who have trained in, and are currently practicing, pediatric critical care medicine, are less likely to receive referrals from community agencies (23%) and school districts (8%), while those

who have *not* trained in pediatric critical care but are practicing in that field are more likely to receive referrals from these sources (community agencies-52%; school districts-31%).

Critical care physicians also were asked whether their pediatric referrals come only from within their own practice or managed care network. Only 8% indicated that their pediatric referrals were restricted in that manner.

Approximately one third of critical care physicians 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. Among those critical care physicians who have experienced a change in the volume *or* complexity of pediatric referrals, approximately two thirds indicated that they have seen an increase in the volume of referrals and roughly the same number said there has been an increase in the complexity of the pediatric cases referred to them. Approximately 19% said they have experienced a decrease in the volume of referrals and 5% said they have seen a decrease in the complexity of the cases referred to them; 14% said they have experienced no change in the volume of referrals and 29% said they have experienced no change in the complexity of the cases referred to them.

Critical care physicians 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. Almost half 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, 48% attributed the change to a decreased likelihood of general pediatricians and other generalists to treat more complex subspecialty patients, and 41% said that the change can be attributed to increased competition from other pediatric subspecialists. A substantial minority of the respondents (38%) expressed the opinion that an increase in the incidence or severity of illness in their community was responsible at least in part for the change in the volume or complexity of pediatric referrals.

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. Seventy percent of respondents indicated that the changes in health care have not caused a need for additional training in primary care and 78% said that the changes have not caused a need for additional training in their subspecialty. Over one fourth of the respondents indicated a need for a “little” additional training in primary care and one in five indicated a need for a “little” additional training in their subspecialty. Seventy nine percent of respondents said that they did not feel the need for additional training in another specialty. Those critical care physicians who have *not* trained in the specialty, but are practicing in the field, were more likely than those trained in

pediatric critical care to say that they needed additional training in their subspecialty (33% vs. 20%) as a result of changes in health care.

Competition

Seventy one percent of critical care physicians said they face competition for pediatric subspecialty services in their geographical area, with the major source of competition being other pediatric subspecialists. Physicians trained in adult medicine in the same subspecialty, along with general pediatricians, however, pose significant sources of competition as well (see Table 5). Pediatric intensivists trained in the specialty were more likely to say they faced competition from other pediatric subspecialists, and less likely to say they faced competition from adult intensivists than those not trained but practicing in the specialty; 85% vs. 74%, and 25% vs. 36%, respectively.

Table 5. Perceived Source of Competition for Pediatric Subspecialty Services

| Source of Competition | Percentage of Critical Care Physicians* (%) |
|---|--|
| Other pediatric subspecialists | 82.1 |
| Physicians trained in adult medicine in my subspecialty | 28.8 |
| General pediatricians | 16.2 |
| Family physicians | 7.4 |
| Urgent care centers | 3.2 |
| Non-physician medical personnel (e.g., advanced practice nurses, chiropractors) | 2.5 |
| Related health professionals (e.g., psychologists, nutritionists) | 0.5 |
| Other | 10.4 |

* Percent of respondents who said they face competition from each of the listed sources.

Although a clear majority of respondents indicated that they face competition for pediatric subspecialty services in their geographical area, only 39% of these respondents have modified their practice as a result of competition. For those critical care physicians who have modified their practices, the most common strategies were to decrease their research/administrative activities, add physicians to the practice, increase office hours, and make changes to their support staff. (See Table 6.) Specifically, 31% have cut back on research/administrative activities, 28% have added physicians to their practice, 19% have

increased office hours, and 19% have increased the number and/or responsibilities of support staff.

Those critical care physicians who have *not* trained in the specialty, but are practicing in the field, were far more likely than those trained in pediatric critical care (32% vs. 14%) to say that they have increased office hours in response to competition.

Table 6. Practice Modifications as a Result of Competition

| Change (%) | Increased | Decreased (%) | No Change (%) |
|------------|------------------------------------|---------------|---------------|
| | Hours Spent in Direct Patient Care | | |
| | 19.1 | 0 | 80.9 |
| | Fees | 2.8 | 11.6 |
| | 85.6 | | |
| | Number/responsibilities of support | | |
| staff | 19.1 | 10.2 | 70.7 |
| | Number of advanced practice nurses | | |
| | 14.4 | 3.7 | 81.9 |
| | Number of physicians for practice | | |
| | 28.4 | 9.8 | 61.9 |
| | Amount of research/administrative | | |
| activities | 17.7 | 31.2 | 51.2 |

When asked whether, during the last twelve months, their practice had been sold to or merged with another practice or health care organization, 14% responded affirmatively.

Workforce

Over one half of all respondents (56%) said that there are just the right number of pediatric critical care physicians in practice today; 27%, too many; and 17%, too few. Those critical care physicians who have trained in pediatric critical care were more likely than those *not* trained in the specialty--but practicing in the field--to say that there are too many pediatric critical care physicians in practice today (29% vs. 17%).

Fifty nine percent of respondents did not anticipate that their communities would need additional pediatric subspecialists in the next 3-5 years, 27% felt there would be a need for more pediatric subspecialists in their discipline, and 25% felt there would be a need for more pediatric subspecialists in other 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 respondents were very evenly

divided, with approximately one-third saying “yes,” one third saying “no,” and one third saying they were unsure.

Although a majority of the respondents feel that there are just the right number of pediatric critical care physicians in practice today, almost two thirds (65%) expressed the view that too many pediatric critical care physicians are being trained to meet patient care needs for the next 3-5 years. Less than one third (30%) said that the right number of pediatric critical care physicians are being trained, while only 5% said that too few are being trained. Those critical care physicians who have trained in pediatric critical care were more likely than those *not* trained in the specialty--but practicing in the field--to say that too many are being trained (69% vs. 41%).

Among those respondents who expressed the view that too many pediatric critical care physicians are being trained, over half (53%) said that stricter criteria for accreditation of programs should be developed as a mechanism to reduce the number being trained. Nineteen percent said that market forces should be relied on to reduce the number; 17%, mandatory cutback by one fellow for all programs; 6%, reduce graduate medical education funding; and 5%, other mechanisms.

Respondents also were asked whether, within the next 2-3 years, they or their employer anticipated hiring additional new, non-replacement physician assistants or nurse practitioners to provide care in their pediatric ICUs. Approximately 15% said “yes,” 47% said “no,” and 38% said they didn’t know. Among those who said they anticipated hiring additional new, non-replacement physician assistants or nurse practitioners to provide care in their pediatric ICUs, the average number given was 1.5.

Income

Although critical care physicians rely on a variety of payment arrangements for their income, salaried arrangements are the most common. As Table 7 illustrates, just over half of critical care physicians receive some income from salaries (without performance-based incentives), while over a third receive some income from salary arrangements with performance-based incentives. Traditional and discounted fee-for-service payment arrangements are the next most common, with roughly one-third of critical care physicians receiving some income from each of those sources. Capitation arrangements are far less common, with approximately one in five critical care physicians reporting some income from those sources.

Table 7. Sources of Income for Critical Care Physicians

| Source of Income | Percentage With Income from Each Source (%) |
|-----------------------------------|--|
| Salary | 54.1 |
| Salary with performance incentive | 37.3 |
| Traditional fee for service | 34.0 |
| Discounted fee for service | 31.7 |
| Prepaid, capitated, nonsalaried | 21.7 |
| Prepaid, capitated, salaried | 18.5 |

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

For those critical care physicians who said they receive some income from fee-for-service payment arrangements--traditional or discounted--the most common response was that these payment arrangements account for 0-33% of their total income. Similarly, among those critical care physicians who said they receive some income from prepaid, capitated arrangements--salaried or nonsalaried--the most common response was that these payment arrangements account for only 0-33% of their total income.

Table 8. Percent of Income by Source

| Income Source | 0-33% | 34-66% | 67-100% | Don't Know |
|-----------------------------------|--------------|---------------|----------------|-------------------|
| Salary | 8.5 | 4.6 | 70.6 | 16.3 |
| Salary with performance incentive | 17.1 | 3.1 | 58.7 | 21.0 |
| Traditional fee for service | 48.3 | 16.6 | 4.2 | 30.9 |
| Discounted fee for service | 34.8 | 25.8 | 7.8 | 31.6 |
| Prepaid, capitated nonsalaried | 45.7 | 12.8 | 0 | 41.5 |
| Prepaid, capitated salaried | 42.4 | 4.3 | 3.6 | 49.6 |

Those critical care physicians who have *not* trained in the specialty, but are practicing in the field, were more likely than those trained in pediatric critical care (33% vs. 8%) to say that prepaid, capitated nonsalaried arrangements account for 33-66% of their total income.

Finally, when asked whether they have used telemedicine, fax machines or other forms of information as part of a consultation with another practitioner because of lack of ready access to appropriate subspecialists (eg, in a rural area), over two thirds of the respondents (68%) responded affirmatively.

Pediatric Critical Care Survey

Role of Critical Care Physicians and Other Physicians in Pediatric ICUs

For various categories of patients, respondents were asked to indicate whether they typically serve as a *primary physician* (responsible for writing orders and directing patient care), *co-manager* (shared responsibility for care), or *consultant physician* (make suggestions for patient care that are implemented by other physicians) in the pediatric intensive care unit. Table 9 summarizes the responses to this question.

A clear majority of the respondents (83%) indicated that they serve as the primary physician for general medical patients in pediatric ICUs. A significant portion of the respondents also indicated that they serve as the primary physician for nephrology patients (44%), hematology/oncology patients (42%), and cardiology patients (36%). Those critical care physicians who have trained in pediatric critical care were more likely than those *not* trained in the specialty--but practicing in the field--to say that they serve as primary physician for general medical patients (88% vs. 54%), nephrology patients (47% vs. 26%), and hematology/oncology patients (44% vs. 29%). Those not trained in the specialty, but practicing in the field, were more likely than those trained in the specialty to serve as primary physician to general surgery patients (29% vs. 11%).

Table 9. Role of Critical Care Physicians in Pediatric Intensive Care Units

| Patient Group | Primary Physician (%) | Co-Manager Physician (%) | Consultant Physician (%) | Do Not Treat (%) |
|---------------------------------|------------------------------|---------------------------------|---------------------------------|-------------------------|
| General medical patients | 82.9 | 9.1 | 8.6 | 4.1 |
| General surgical patients | 13.4 | 60.0 | 26.8 | 3.0 |
| Neurosurgery patients | 14.4 | 69.9 | 16.3 | 2.4 |
| Orthopaedic surgery patients | 21.9 | 59.2 | 16.9 | 3.2 |
| Cardiology patients | 35.6 | 46.5 | 12.6 | 6.4 |
| Cardiovascular surgery patients | 10.5 | 49.2 | 13.6 | 24.2 |
| Hematology/oncology patients | 41.7 | 42.7 | 12.1 | 6.5 |
| Neonatology patients | 28.3 | 11.7 | 7.2 | 52.7 |
| Nephrology patients | 44.2 | 38.5 | 10.7 | 6.8 |

A majority of the respondents said that they serve as co-managers in pediatric ICUs for neurosurgery patients (70%), general surgical patients (60%), and orthopaedic surgery patients (59%). A significant number of respondents also said that they serve as co-manager for cardiovascular surgery patients (49%), cardiology patients (47%), and hematology/oncology patients (43%). For all categories other than neonatology patients, those critical care physicians who have trained in pediatric critical care were more likely than those *not* trained in the specialty--but practicing in the field--to say that they serve as co-managers: neurosurgery patients (73% vs. 50%), general surgical patients (63% vs. 43%), orthopaedic surgery patients (63% vs. 39%), cardiology patients (49% vs. 30%), and cardiovascular surgery (52% vs. 34%). Those not trained in the specialty, but practicing in the field, were twice as likely to serve as co-manager physician for neonatology patients compared to those trained in the field (21% vs. 10%).

Just over one fourth of the respondents indicated that they serve as consultant physicians for general surgical patients in pediatric ICUs. For the other patient groups listed, relatively insignificant numbers of respondents (17% or less) said they serve in a consultant capacity. For all patient groups other than general and cardiovascular surgical patients, those critical care physicians *not* trained in the specialty--but practicing in the field--were more likely than those who have trained in pediatric critical care to say that they serve as consultant physicians.

Just over one half of the respondents said that they do not provide care for neonatology patients in their ICU and approximately one fourth said they do not provide care for cardiovascular surgery patients in their ICU.

The respondents said their pediatric ICU had an average of 15 beds and 877 admissions per year and that their institution had an average of 2.2 pediatric critical care fellows, as well as .21 physician assistants and .40 nurse practitioners providing critical care services in the pediatric ICU. Just over one half of the respondents reported that they had no pediatric critical care fellows at their institution, approximately 95% reported that their institution did not have any physician assistants providing critical care services, and over 85% said their institution did not have any nurse practitioners providing critical care services.

Almost three fourths (73%) of the respondents said that all non-pediatric critical care physicians routinely consult with a pediatric critical care physician when attending patients in the pediatric ICU. Among those respondents who said that some physicians do not consult with a pediatric critical care physician when attending patients in the pediatric ICU, 75% said that general surgeons attend without consultation with pediatric critical care physicians. Other specialties cited were cardiovascular surgeons (30%), neurosurgeons (28%), neonatologists (24%), cardiologists (23%), orthopaedic surgeons and general pediatricians (18%), nephrologists (10%) and hematologists/oncologists (9%).

Provision of Care in Pediatric ICUs

Table 10 lists those who typically provide care in pediatric ICUs. Respondents were asked to indicate whether each provider type routinely provides care in the pediatric ICU between the hours of 8:00 a.m. and 5:00 p.m. and between the hours of 5:00 p.m. and 8:00 a.m.

During the hours of 8:00 a.m. and 5:00 p.m., most care is provided by pediatric critical care attending physicians, with assistance from residents or fellows. During the hours of 5:00 p.m. and 8:00 a.m., pediatric residents and fellows assume much greater direct responsibility for providing care in pediatric ICUs.

As Table 10 illustrates, 81% of respondents said that pediatric critical care attending physicians, with assistance from residents or fellows, provide care in pediatric ICUs between the hours of 8:00 a.m. and 5:00 p.m.; 22%, pediatric critical care attending physicians, *without* assistance from residents or fellows; and 20%, pediatric residents directly. Lesser percentages of respondents indicated that care is provided during those hours by fellows, non-pediatric residents, and physician assistants and nurse practitioners.

Table 10. Provision of Care in Pediatric ICUs

| Provider | 5:00 p.m. to | 8:00 a.m. to |
|---|-------------------------|------------------|
| | 5:00 p.m. (%) | 8:00 a.m. (%) |
| | PCC attending physician | |
| <i>with</i> residents or fellows | 80.7 | 44.2 |
| PCC attending physician <i>without</i> residents or fellows | 21.8 | 19.8 |
| Pediatric residents | 20.1 | 47.1 |
| Non-pediatric residents | 11.0 | 14.2 |
| Fellows | 16.1 | 30.5 |
| Physician assistants or nurse practitioners | 7.4 | 4.7 |

As for the hours between 5:00 p.m. and 8:00 a.m., 47% of respondents said that pediatric residents provide care in the pediatric ICU; 44%, pediatric critical care attending physicians, with assistance from residents or fellows; 30%, fellows directly; and 20%, pediatric critical care attending physicians *without* assistance from residents or fellows.

Pediatric Critical Care Fellowships

Of the respondents who said they have trained in pediatric critical care, 90% have completed pediatric critical care fellowships. When these respondents were asked about the amount of attention given to various subject areas in their fellowship programs, over three fourths said that administrative and managed care issues should have been addressed more, and over one half said that more time should have been devoted to computer training and manuscript preparation (see Table 11).

Table 11. Perceptions Regarding Attention to Various Subjects in Pediatric Critical Care Fellowships

| Subject | Needed | Right | Needed |
|--------------------------------------|--------|--------|--------|
| | More | Amount | Less |
| (%) | | (%) | (%) |
| Pediatric trauma | 35.6 | 63.4 | 1.1 |
| Post-operative cardiac critical care | 22.4 | 72.2 | 5.4 |
| Training in clinical procedures | 7.2 | 91.3 | 1.4 |
| Administrative issues | 77.1 | 22.0 | 0.9 |
| Anesthesia | 28.0 | 70.0 | 2.0 |
| Training in managed care issues | 80.4 | 17.9 | 1.7 |

| | | | |
|---|------|------|-----|
| Computer training | 60.9 | 38.4 | 0.7 |
| Training in basic science research skills | 40.9 | 52.4 | 6.6 |
| Training in manuscript preparation | 51.1 | 46.2 | 2.6 |

Attitudes and Future Plans Regarding Pediatric Critical Care Practice

Forty two percent (42%) of the respondents indicated that they anticipate practicing pediatric critical care medicine for the rest of their professional careers. Of those who do not plan to continue in pediatric critical care medicine for the remainder of their careers, 33%, 10 more years; 28%, 15 more years; and 21%, 20 more years; 18% said they plan to practice in the specialty 5 more years. On average, those critical care physicians who have trained in pediatric critical care medicine indicated that they planned to practice in the specialty for more years than those critical care physicians *not* trained in the specialty--but practicing in the field; 53% vs. 25% plan to practice 15 to 20 more years.

When asked what they will do after they finish practicing pediatric critical care medicine, 42% of the respondents said they will retire from medicine altogether; 32%, pursue medical administration; 21%, practice general pediatrics; and 18%, continue or resume practice in another subspecialty in which they have already trained.

Approximately two thirds of all respondents said that they are happy (30%) or very happy (38%) with their decision to practice pediatric critical care, while only 16% said they are unhappy or very unhappy with their decision; the remainder of the respondents expressed a neutral attitude toward their decision to enter pediatric critical care.

When asked to describe their attitude toward their present position, an even larger percentage of the respondents said they were happy (23%) or very happy (61%). Only 9% said they were unhappy or very unhappy with their current position. Pediatric intensivists trained in the specialty were more likely to state they were happy (25%), very happy (63%) in their present position compared to those not trained in the specialty, but practicing in the field (24%, happy; 45%, very happy).

Table 12. Ranking of Reasons Given for Leaving Pediatric Critical Care

| Subject | Most Important Reason | Important Reason | Least Important Reason |
|--------------------------------|-----------------------|------------------|------------------------|
| (%) | | | (%) (%) |
| Received a better job offer | 28.0 | 6.5 | 9.3 |
| The hours were too long | 12.1 | 13.1 | 10.3 |
| The practice was too stressful | 11.2 | 12.1 | 13.1 |
| Disliked the politics | 4.7 | 9.3 | 1.9 |

| | | | |
|--------------------------------|-----|-----|-----|
| Disliked the specialty | 2.8 | 0.9 | 1.9 |
| Lost job because of downsizing | 1.9 | 0.9 | --- |
| Reached retirement age | 1.9 | 0.9 | 0.9 |

Of those who no longer practice pediatric critical care (13% of all the respondents), 35% said that an important, or the most important, reason for leaving the field was that, even though they liked practicing pediatric critical care, they received a better job offer outside the field. (See Table 12.) One fourth of those who have left the field pointed to the long hours associated with pediatric critical care as being an important, or the most important, reason for leaving the field, and nearly as many (23%) cited the stress associated with the field. The politics associated with working in an intensive care unit was the most important factor for 5% of those who have left the field and was an important factor for an additional 9%. Only 4% said that their dislike of the specialty was an important, or the most important, reason for leaving the field, while 3% cited downsizing or having reached retirement age as important or very important reasons.

Summary

Medical schools are the main practice setting for a majority of those who are currently practicing pediatric critical care medicine, followed by community hospitals and specialty groups.

For most physicians in pediatric critical care, their main practice site is located in an urban area.

On average, just over one half of the total time spent by critical care physicians in professional activities is devoted to direct patient care, followed by administrative and teaching responsibilities.

The three biggest sources of referrals of pediatric patients to critical care physicians are pediatric generalists, pediatric medical and surgical subspecialists, and family physicians.

Among those critical care physicians who have experienced a change in the volume or complexity of pediatric referrals, approximately two thirds indicated that they have seen an increase in the volume of referrals and roughly the same number said there has been an increase in the complexity of the pediatric cases referred to them.

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

Most critical care physicians feel they face competition for pediatric subspecialty services in their geographical area, with the major source of competition being other pediatric subspecialists. The most common strategies for responding to increased competition are to increase office hours, to add physicians to the practice, and to make some alteration in support staff.

A majority of pediatric critical care physicians feel that there are just the right number of pediatric critical care physicians in practice today, but approximately two thirds believe that too many pediatric critical care physicians are being trained to meet future patient care needs.

Although critical care physicians rely on a variety of payment arrangements for their income, salaried arrangements are by far the most common.

In addition to typically serving as the primary physicians for general medical patients in pediatric ICUs, a significant number of pediatric critical care physicians serve as the primary physician for nephrology patients, hematology/oncology patients, and cardiology patients. A majority also serve as co-managers in pediatric ICUs for neurosurgery patients, general surgical patients, and orthopaedic surgery patients.

During the hours of 8:00 a.m. and 5:00 p.m., most care in pediatric ICUs is provided by pediatric critical care attending physicians, with assistance from residents or fellows, but between 5:00 p.m. and 8:00 a.m. pediatric residents and fellows assume much greater direct responsibility for providing patient care.

Most pediatric critical care physicians believe that administrative and managed care issues should receive more attention in pediatric critical care residency programs.

Approximately two thirds of all pediatric critical care physicians report that they are happy or very happy with their decision to practice in the field, while an even higher percentage report that they are happy or very happy with their current position.

Of those who no longer practice pediatric critical care, the biggest single reason for leaving the field is that they received a better job offer outside the field, followed by unhappiness with the long hours and stress associated with pediatric critical care.