

Career Opportunities

in Pediatric Infectious Diseases



Pediatric Infectious Diseases Society

About the Pediatric Infectious Diseases Society

The mission of the Pediatric Infectious Diseases Society (PIDS) is to enhance the health of infants, children and adolescents by promoting excellence in the diagnosis, management and prevention of infectious diseases through clinical care, education, research and advocacy.

Membership in PIDS is open to physicians, doctoral-level scientists, and others who have training or are in the course of training in infectious diseases or its related disciplines, and who are identified with the discipline of pediatric infectious diseases or its related disciplines through clinical practice, research, teaching, administration, or any combination of these activities. Members receive a yearly subscription to the official PIDS publication, *The Pediatric Infectious Disease Journal*, which features original studies, reviews, and case reports on all aspects of infectious diseases in children that have relevance to clinical practice. For residents and fellows in pediatric infectious diseases, PIDS membership dues are waived.

Career Opportunities in Pediatric Infectious Diseases

For medical students and residents, determining which subspecialty to pursue can be a confusing and complex decision. At present, about two dozen approved medical specialty boards grant certification in more than 120 specialized areas. Choosing the right field requires a careful evaluation of your motivations and professional goals; the choice you make will have a longstanding impact on your life's work.

What do you want from your medical career? Some physicians seek intellectual challenge. Some derive satisfaction from identifying and solving problems. Some enjoy close interaction with patients, while others prefer a research setting. The key is to determine which skills you possess and how best to apply them in a field of practice.



A Dynamic, Evolving Specialty

Although physicians have been diagnosing and treating childhood infections for many decades, the formal subspecialty of pediatric infectious diseases is relatively new. More than 1,100 pediatric infectious diseases (ID) specialists have been certified since the American Board of Pediatrics (ABP) began offering the examination in 1994. As of December 2009, a total of 96,514 general pediatricians and 19,742 subspecialty pediatricians have been certified by the ABP (see Table 1). Among all subspecialty pediatricians, about six percent chose the subspecialty of infectious diseases, according to ABP.

Compared with other pediatric subspecialists, the average infectious disease practitioner has a more even split between clinical and non-clinical activities (see Figure 1).

Pediatric ID respondents in the American Academy of Pediatrics Future of Pediatric Education II (FOPE II) survey reported spending a little less than half their time each week on direct patient care, while research, teaching, administration, and sometimes healthcare epidemiology and infection prevention, accounted for the remaining time in roughly equal proportions.

Market demand for pediatric ID physicians appears to be stronger than for some other pediatric subspecialties. According to FOPE II, pediatric ID subspecialists were among those least likely to report facing significant competition for pediatric subspecialty services in their geographic areas.

Table 1: Pediatric Subspecialties, December 2009

Adolescent Medicine	547
Cardiology	2,206
Critical Care Medicine	1,668
Developmental-Behavioral	598
Emergency Medicine	1,614
Endocrinology	1,316
Gastroenterology	1,129
Hematology-Oncology	2,276
Infectious Diseases	1,192
Medical Toxicology	36
Neonatal-Perinatal Medicine	4,785
Nephrology	727
Neurodevelopmental Disabilities	255
Pulmonology	897
Rheumatology	270
Sports Medicine	164
Transplant Hepatology	62
Total Pediatric Subspecialists	19,742

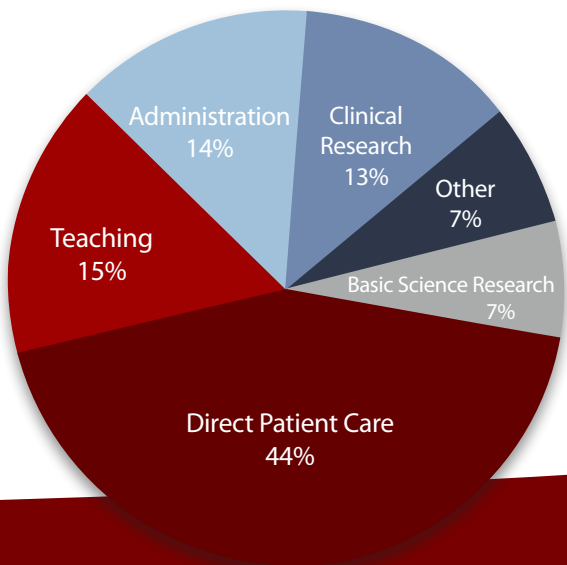


Figure 1:

Weekly time allocation for Pediatric ID specialists

Numerous Career Options

Pediatric ID specialists have a considerable array of career choices. Many in the field choose to follow several paths during their careers, applying their unique cross-section of training and experience to new and diverse challenges, ranging from infection prevention/control to research to public health in addition to maintaining clinical responsibilities.

The career opportunities in pediatric infectious diseases generally fall into four major categories:



Academic Medicine - Most pediatric infectious diseases physicians are employed by medical schools, children's hospitals or community-based teaching hospitals. In a recent survey by the American Academy of Pediatrics, more than 60 percent of board-certified (or eligible) pediatric ID physicians reported a medical school as their main practice setting. This career choice includes a rewarding mixture of research, teaching, administration, and sometimes healthcare epidemiology and infection prevention or antimicrobial stewardship.



Public Service - Another option is to work for public health agencies, including the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA) or state/local public health departments. The work includes tracking the epidemiology of infectious diseases, monitoring vaccine preventable diseases and investigating unusual or emerging pathogens. The CDC's National Center for Immunization and Respiratory Diseases provides leadership for the planning, coordination, and conduct of immunization activities nationwide. State and local public health departments

promote the need for vaccination, assess vaccination coverage levels, evaluate outbreaks of disease, educate parents and providers, and purchase, distribute, and administer vaccines.



Private Practice - According to the American Board of Pediatrics, only about five percent of pediatric ID physicians practice their specialty full time in the private sector. Those in private clinical practice focus primarily on patient care, diagnosing and treating a broad spectrum of infectious diseases in both the outpatient and inpatient settings. Many pediatric ID specialists in this category practice both infectious disease and general pediatrics, or provide subspecialty administrative and advisory functions for large health care organizations, including healthcare epidemiology and infection prevention as well as antimicrobial stewardship.



Industry - Pharmaceutical companies continue to develop pediatric vaccines and anti-infective agents. Infectious Diseases remains a top subspecialty in demand among drug/vaccine manufacturers. Industry positions include those requiring expertise in both scientific and management issues. Pediatric ID experts play a role in every aspect of the drug and vaccine development and evaluation process.

The Challenges and Triumphs of Pediatric ID



If intellectual challenge, medical “detective work,” and an array of rewarding career options appeal to you, consider the exciting field of pediatric infectious diseases. ID specialists focus on the interface between humans, their immune systems and the microbial world. Children are particularly susceptible to infections and their consequences, yet they represent the greatest opportunity to prevent disease through comprehensive immunization programs. Pediatric ID specialists develop and employ strategies to diagnose, treat, and prevent infectious diseases in children.

By championing the development and administration of vaccines, pediatric ID specialists have led a triumphant charge against many serious childhood afflictions (see Table 2). Since the mid-1900s, immunization strategies have led to the eradication or dramatic reduction of diseases such as smallpox, poliomyelitis, and measles, among others. Vaccines against these three infections alone save nearly 8 million lives annually, according to the National Institutes of Health (NIH). But challenges remain. Of the approximately 52 million deaths worldwide each year, 17 million are caused by infectious diseases - including 9 million among children.

More effective use of existing vaccines globally could prevent at least 3 million deaths annually, according to the NIH. In addition, the threat of re-emerging and new diseases — more than 30 new diseases have been identified in the past two decades alone — and the spread of antimicrobial resistance are constant reminders of the need for talented, committed physicians and scientists in the field of pediatric infectious diseases.

New vaccines that were tested or developed or both by PIDS members include vaccines for human papillomavirus, rotavirus, and pneumococcal and meningococcal disease. These vaccines will further reduce diseases burden in children.

One might then be concerned about the ongoing need for infectious diseases subspecialists, but there is no basis for such concerns. There are always new diseases and other challenges such as antimicrobial resistance to be addressed. Even established pathogens develop new virulence mechanisms and continue to challenge the pediatric infectious diseases specialist.

Table 2: Comparison of 20th Century Annual Morbidity and Current Morbidity: Vaccine-Preventable Diseases

Disease	20th Century Annual Morbidity [†]	2009 Reported Cases ^{††}	% Decrease
Smallpox	29,005	0	100
Diphtheria	21,053	0	100
Measles	530,217	61	>99
Mumps	162,344	982	99
Pertussis	200,752	13,506	93
Polio (paralytic)	16,316	0	100
Rubella	47,745	4	>99
Congenital Rubella Syndrome	152	1	99
Tetanus	580	14	98
<i>Haemophilus influenzae</i>	20,000	243*	99

[†] Source: JAMA. 2007; 298(18):2155-2163 ; ^{††}Source: CDC. MMWR January 8, 2010; 58(51-52);1458-1468. (provisional, 2009 week 52 NNDSS data) ; *25 type b and 218 unknown (< 5 years of age)

Training Requirements



To receive certification in pediatric infectious diseases, a physician must complete the required pediatric residency and pass written examinations for pediatrics, and then for pediatric infectious diseases, both of which are administered by the American Board of Pediatrics (ABP). Candidates should go to ABP's website (www.abp.org) for specific requirements, as these may change. To qualify for the examination in pediatric infectious diseases, applicants must:

1. Hold a current certificate in pediatrics by the American Board of Pediatrics. Applicants whose time-limited certification in pediatrics will expire before the examination must attain recertification at least five months before the examination date.
2. Hold a current and valid unrestricted license to practice medicine in one of the states, districts, or territories of the United States (or a province of Canada) or have unrestricted privileges to practice medicine in the U.S. armed forces. The license must be unrestricted in all states where the physician is licensed.
3. Complete three years of full-time, broad-based fellowship training in pediatric infectious diseases in a training program accredited by the Accreditation Council for Graduate Medical Education (ACGME). The program director(s) will be required to verify completion of training, attest to clinical competence including professionalism, provide evidence of the trainee's scholarly activity and meaningful research, and indicate whether the candidate is recommended to take the certifying examination.
4. Complete a core curriculum in scholarly activities, demonstrate the ability to conduct scholarly activity, have evidence of research performance by the candidate's personal Scholarship Oversight Committee, and provide a "work product." Areas in which scholarly activity may be pursued include, but are not limited to, basic, clinical or translational biomedicine; health services; quality improvement; bioethics; education; and public policy. Examples of ways in which the scholarly activity requirement may be met include:
 - a) a peer-reviewed publication in which the candidate had a substantial role
 - b) an in-depth manuscript describing a completed project
 - c) a thesis or dissertation written in connection with the pursuit of an advanced degree
 - d) an extramural grant application that has either been accepted or favorably reviewed
 - e) a progress report for projects of exceptional complexity, such as a multi-year clinical trial

Training in pediatric infectious diseases must be in a program accredited for training in pediatric infectious diseases by the Residency Review Committee (RRC) for Pediatrics in the United States or the Royal College of Physicians and Surgeons of Canada (RCPSC).

Detailed information about accredited pediatric infectious disease training programs is listed in *Training Programs in Pediatric Infectious Diseases*. This publication is produced by PIDS and is available on the Society's website (www.pids.org).

Meet the Specialists

Meet some pediatric infectious disease specialists and learn why they chose and continue to enjoy their careers in infectious diseases.



Mark Kline, MD

Professor and Chairman of Pediatrics, Baylor College of Medicine; Physician-in-Chief and President of the Baylor International Pediatric AIDS Initiative at Texas Children's Hospital

Mark Kline, MD, is pioneering access to care and treatment for children with HIV and other life-threatening diseases in resource-limited countries. As head of the Baylor International Pediatric AIDS Initiative, Dr. Kline oversees a program that provides care to more than 60,000 HIV-infected children in a network of clinical centers in Romania and sub-Saharan Africa. "It is tremendously fulfilling to be involved in providing life-saving medical care and treatment to some of the world's least fortunate children," Dr. Kline says. The centers are staffed in part by American trainees in tropical medicine and HIV from Baylor who are assigned positions of at

least one year in Africa.

Dr. Kline received his medical degree from Baylor College of Medicine in 1981. He went on to complete his pediatric residency and a fellowship in pediatric ID at the same institution. In explaining the personal allure of pediatric ID, Dr. Kline remarks, "I enjoy the fact that infectious diseases is a 'generalist subspecialty,' which encompasses such a large share of general pediatric practice and aspects of every other pediatric subspecialty."

On the balance of teaching, clinical care, research, and administration, Dr. Kline notes that his work spans all these areas. "The program I lead builds infrastructure, trains local professionals to expand pediatric health professional capacity, and works closely with host governments to ensure integration with existing public health programs," he explains. Dr. Kline's work also lends itself to a balanced professional and personal life. He travels and works in multiple settings with his colleagues. "My fellow team members are some of my best friends," he notes. When he's not working, Dr. Kline runs almost daily, lifts weights, and enjoys outdoor activities.



Angela Myers, MD

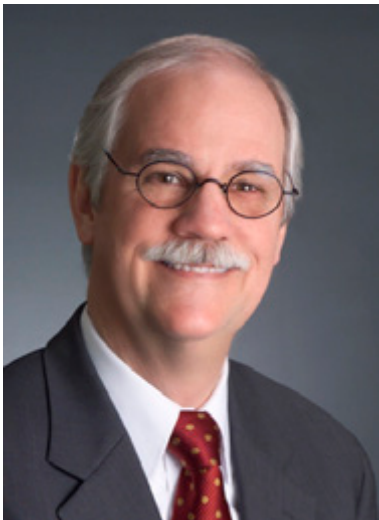
Assistant Professor of Pediatrics at the University of Missouri-Kansas City School of Medicine

Angela Myers, MD, came to pediatric ID through a rather unusual route. During her teenage years, Dr. Myers experienced pediatric medicine as a patient undergoing treatment for osteosarcoma. She was sure that she would become a pediatric oncologist – until her second year of her residency. "My first elective of my second year of residency was an ID rotation, during which I fell in love with the diversity of patients and illnesses that we encountered in the hospital setting," she explains. "I realized that I would still come in contact with oncology patients as an ID specialist, but also otherwise healthy children with acute infection."

Dr. Myers earned her medical degree from the University of Missouri-Kansas City in 2001 and remained in Kansas City School of Medicine where she completed her pediatric residency and pediatric ID fellowship at Children’s Mercy Hospital.

Dr. Myers loves the detective work that is often a part of making a difficult or elusive diagnosis. “From the truly rare and obscure to the more common infections, it is a truly enjoyable experience to watch a sick child get better once the diagnosis is made and appropriate treatment is initiated,” she says. Dr. Myers is involved in a diverse range of professional activities. She participates in the development of the medical student and resident lecture series and rounds with resident teams. As her young career matures, Dr. Myers plans to pursue a PhD in public health (she already earned a Masters in public health during her fellowship) and to initiate advocacy work in her community that focuses on enhancing vaccine uptake in children.

Balancing work and family isn’t always easy, but Dr. Myers – who has two young children - has had wonderful support from her colleagues and family. “I delayed finishing residency by a few months in order to have my first child and then took three months off again during fellowship to have my second, but my colleagues were incredibly supportive of my decision to take some time to have children.” During the few minutes that Dr. Myers isn’t working or spending time with her family, she enjoys swimming and working out.



Larry Pickering, MD

Senior Advisor to the Director, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention

Can medicine be fun for life? That was the question posed by an article published in the *Journal of the American Medical Association* some years ago. “My work in the field of pediatric infectious diseases proves that it can be,” says Larry Pickering, MD. “I hope to be doing much of what I am doing now,” he says of where he envisions his career five years from now, “Teaching, mentoring, writing and formulating public health policy.”

Dr. Pickering’s decision to enter pediatrics and ID was influenced by two exceptional mentors, Gwen Hogan, MD, and Ralph Feigin, MD – both of whom imparted that it is an honor to care for children. Dr. Pickering received his medical degree from the West Virginia University School of Medicine and then completed his pediatric residency and ID fellowship at St. Louis Children’s Hospital/Washington University

School of Medicine in St. Louis.

Since then, Dr. Pickering has had a strong academic career, rich in patient care, research and teaching. For the past several years, Dr. Pickering has been at the Centers for Disease Control and Prevention (CDC), where he has devoted his time to public health issues. He works closely with the AAP Committee on Infectious Diseases and the CDC Advisory Committee on Immunization Practices. He also edits the AAP *Red Book* and co-edits *Principles and Practices of Pediatric Infectious Diseases*. “These activities have enabled me to approach preventive care issues from a much broader perspective,” he says.

Dr. Pickering recognizes that it is easy to become consumed in professional activities but feels that raising children is the most important thing we can do. His position allows him to spend time with family and friends and a little time for sports, reading, and writing.



Patricia Whitley-Williams, MD

Interim Chair of the Department of Pediatrics, UMDNJ-Robert Wood Johnson Medical School

Patricia Whitley-Williams, MD, was drawn to pediatric ID for the detective work. “ID consultations tend to be requested for patients with unknown or difficult diagnoses. Therefore it is an interesting challenge to try to find out what is the patient’s diagnosis and trying to manage that patient,” she explains. As interim chair, Dr. Whitley-Williams’ time is spent mostly on administration; but, before assuming this position, she spent the majority of her time doing clinical research, teaching students and residents, and seeing patients. She has provided care for HIV-infected and affected children and their families for the past 25 years and continues to be an

advocate for youth with HIV. “I enjoy seeing outpatients and inpatients in ID consultations,” she says. “I see all types of patients with all types of infections, as infections can occur in otherwise healthy patients as well as those with chronic diseases.” Dr. Whitley-Williams has also served on several national advisory committees whose work had an impact on health care policy in the areas of HIV/AIDS, childhood immunizations, and tuberculosis.

Dr. Whitley-Williams received her medical degree from the Johns Hopkins University School of Medicine. She completed her pediatric residency at the University of Cincinnati School of Medicine and her pediatric ID fellowship at the Boston University School of Medicine.

“I have considered it a personal mission to increase the number of underrepresented minorities in medicine,” Dr. Whitley-Williams said of one of the most important aspects of her career. She served as assistant dean for Minority Affairs at Boston University School of Medicine and later as a dean for Clinical Students at Morehouse School of Medicine where she encouraged and served as a role model for all medical students especially minority students, since only two percent of medical school faculty in the United States are from underrepresented minorities.

When she is not working, Dr. Whitley-Williams enjoys listening to music, playing tennis, dancing, reading, traveling, playing Scrabble, going to concerts and the theatre and visiting art museums.



Theoklis Zaoutis, MD

Associate Professor of Pediatrics and Epidemiology at the University of Pennsylvania School of Medicine and Associate Chief, Division of Infectious Diseases, The Children’s Hospital of Philadelphia

As director of the pediatric infectious diseases training program, Dr. Zaoutis spends the vast majority of his time in epidemiology and research – either independently or with his trainees. “The aspect of my career that I enjoy most is researching best practices for treating infectious diseases in children,” he says. “I also enjoy my role as fellowship director and influencing fellows and students to think critically about how they care for patients and how they approach research questions,” he explains.

Dr. Zaoutis received his medical degree from the Jefferson Medical College at the Thomas Jefferson University. He completed his residency in pediatrics at the A.I. duPont Hospital for Children/Jefferson Medical College and his ID fellowship at The Children’s Hospital of Philadelphia. He also received a Master’s degree in Clinical Epidemiology from the University of Pennsylvania School of Medicine.

For Dr. Zaoutis, a research-focused career has helped him balance his career with family life. "Having a significant amount of research time offers me some flexibility in work hours and allows me to make time for school plays, soccer games, etc. However, that time sometimes has to be made up by working at home in the evening or on a weekend or even during vacation because grant deadlines do not recognize these barriers," he explains.

In his spare time, Dr. Zaoutis enjoys watching and playing soccer with his children, reading, hiking, biking, listening to rock and roll and traveling to Greece to visit family and friends.



Margaret B. Rennels, MD

Executive Director, U.S. Scientific Vaccine Policy, GlaxoSmithKline Biologicals

Pediatric ID is "the most intellectually fascinating field," says Dr. Margaret "Peggy" B. Rennels on the appeal of the field. "It was one of the few disciplines where you could 'cure' people," she explains. "I once had a patient with sepsis and meningitis who was basically comatose when I administered an intravenous antibiotic. The next day she was alert, sitting up in bed," Dr. Rennels recalls. "She then threw her bottle across the room at me." Subsequently, I focused on vaccine development to help prevent the infections from ever occurring.

Dr. Rennels received her medical degree at the University of Maryland School of Medicine and completed her residency and pediatric ID fellowship at the same institution, where she stayed for most of her career. Five years ago, Dr. Rennels left her academic post for GlaxoSmithKline Biologicals. "I was approached by industry to head U.S. vaccine science policy," she explains, "and I thought that would be a new, interesting change in direction, which I was ready for."

Today, Dr. Rennels works with a team of dedicated, smart individuals where she coordinates communication of data to the CDC, ACIP and Red Book committee. "I am involved in all of the vaccines being developed for the U.S. and have the opportunity to be part of the discussion of most of the downstream aspects of vaccine product development, which keeps it interesting."

While Dr. Rennels finds her current position extremely satisfying, she does miss seeing patients and teaching. But she has found ways to fulfill some of those interests. She organizes and presents at "lunch and learn" seminars, where she and colleagues discuss disease and vaccine products.

Dr. Rennels enjoys kayaking and bird watching along Maryland's Eastern Shore. "Even though we work tremendously hard, industry offers me a little more control over my time than academia," she says. "I don't get paged at four in the morning."



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