



# A Career in Pediatric Hematology-Oncology?

## *Think About It...*

What does a pediatric hematologist-oncologist do?

What kind of training is necessary?

Is there a future need for specialists in this area?

**T**his pamphlet answers these and other frequent questions from undergraduates, medical students, and pediatric residents to explain the specialty of pediatric hematology-oncology and stimulate consideration of becoming one of these specialists.

# A pediatric hematologist-oncologist

*is a physician who has completed a minimum of 6 years of training after medical school. The training begins with a 3-year residency in pediatrics. During this time, residents gain some exposure to pediatric hematology-oncology as part of required and elective inpatient and outpatient rotations. Some residency programs also offer opportunities to engage in a short-term clinical or laboratory research project. Many who enter the field develop their initial interest as pediatric residents experiencing the challenges and joys of caring for children with complex disorders such as cancer, sickle-cell disease, and hemophilia.*

**U**pon completion of a pediatric residency in an accredited program (followed by certification in general pediatrics by the American Board of Pediatrics), the second period of training, a *pediatric hematology-oncology fellowship*, begins. In the United States, approximately 60 programs, most of them at major children's hospitals and academic medical centers, offer this training, which involves diagnosis and management of children with cancer and hematologic disorders and exposure to and involvement in medical teaching and clinical or laboratory research. The curriculum features familiarization with laboratory tools, biostatistical methods, principles of responsible conduct of research and clinical trials, and participation on a multidisciplinary team.

The first year of the 3-year fellowship training program is primarily devoted to patient-care activities, and the final 2 years emphasize research. After the minimum 3 years of successful training, individuals may take

an examination by the Subboard of Hematology-Oncology of the American Board of Pediatrics that leads to their certification as pediatric hematology-oncology specialists. In many cases, an extended period of research training (one or more additional years) is then undertaken.

**M**ost hematologic disorders and malignancies occurring during infancy, childhood, and adolescence are uncommon and require a highly sophisticated approach to diagnosis and treatment based on molecular and cellular biology, epidemiology, and other academic disciplines. The rapid and impressive progress in the field in recent decades (and the expected advances in the future) require the specialty to be practiced in a milieu in which teaching and research are actively conducted. Therefore, most pediatric hematology-oncology specialists serve full time on medical school faculties or in hospital-based departments. Some pediatric hematology-oncology specialists are in private practice.

**A** related specialty is *medical* oncology or hematology. The duration of training for this specialty is similar; however, medical oncologists and hematologists care for adult patients. Their residency is in internal medicine rather than pediatrics, and their fellowship training emphasizes disorders common in adults. Pediatric hematology-oncology deals primarily with genetic hematologic disorders (sickle-cell disease, other hemolytic anemias, hemophilia, von Willebrand disease), acute lymphoblastic leukemia, and embryonal tumors. Adult specialists, on the other hand, focus more on oncology (especially solid tumors) and acquired hematologic conditions. Other specialties that overlap with pediatric hematology-oncology are radiology and pathology, with a focus on cancer diagnosis or transfusion medicine; laboratory hematology; and cytogenetics. Although these specialists are engaged in teaching and research, they have little or no direct patient contact, unlike pediatric hematologists-oncologists. Other specialists with whom pediatric hematology-oncology



specialists interact do engage in direct patient care, including pediatric surgeons, radiation oncologists, and infectious-disease specialists.

**T**he link between pediatric hematology and oncology has a historical basis. Children with acute leukemia, the most serious of the relatively common oncologic disorders, are usually referred to and cared for by hematologists. As chemotherapy and other treatment approaches were developed during the 1950s and 1960s, these hematology specialists, who were familiar with cancer chemotherapy, began to also care for and study children with solid tumors. Today pediatric hematology-oncology specialists are involved with a wide range of tumors, from hemangiomas and other benign vascular malformations to malignant brain neoplasms. Most pediatric hematology-oncology specialists are satisfied with their career choice. The answers to questions on the following pages explain why. It has been and will continue to be an exciting, challenging, and highly gratifying field. Think about it!

# Careers in Pediatric Hematology-Oncology

## Questions and Answers

*How many pediatric hematology-oncology specialists work in the United States? What is the current market for these specialists? Will more hematology-oncology specialists be needed in the future?*

Almost 1,900 pediatric hematology-oncology specialists have been certified by the American Board of Pediatrics since the first subboard examination was administered in 1974. An estimated 1,365 pediatric hematology-oncology specialists (compared to about 53,000 general pediatricians) currently practice in the United States, most on medical school faculties or based in hospitals.

The need for physicians trained to diagnose and treat children with cancer and hematologic disorders remains strong. Unfortunately, the incidence of virtually all of these diseases (sickle-cell disease, hemophilia, childhood cancer) is not decreasing, and some are even becoming more common. Moreover, the diagnostic and treatment strategies, although more effective, are increasingly sophisticated, requiring specialized physicians to care for these children.

*Is hematology-oncology depressing?*

Cancer remains the leading cause of death from disease in children younger than 15 years old. Most of us have been touched by older loved ones who have succumbed to cancer. Dealing with death and dying can be depressing, but the field of pediatric hematology-oncology is certainly not.

Survival rates for most childhood cancers have increased; almost all children are now treated with curative intent and in most cases treatments are successful. Cure rates for all childhood cancers are approximately 75%, and most centers have "off therapy" programs to follow these children.

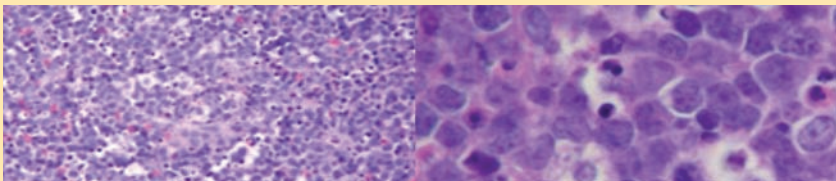
Death rates for other diseases that pediatric oncologists-hematologists treat (e.g., hemophilia, sickle-cell anemia, thalassemia) have declined dramatically, so many children with hematologic disorders are expected to have a nearly normal lifespan. Pediatric hematology-oncology specialists now practice as part of multidisciplinary teams, with many providing care and comfort to dying children and their families. Many find it rewarding to care for patients with complex diseases and to provide long-term care for patients during treatment and after therapy. The emerging field of palliative care provides extensive support and resources for dying patients, families, physicians, and the treatment team.

*What is the lifestyle of a pediatric hematology-oncology specialist?*

Personal time and family life are important for every person. Despite the hard work, most pediatric hematology-oncology specialists are able to design their career so that their professional life is well balanced with leisure and family time. However, virtually all work more than 40 hours a week, so those considering a pediatric hematology-oncology career should be prepared to work hard during training and thereafter.

*What about income?*

Pediatric hematology-oncology specialists generally earn salaries similar to those of other pediatric subspecialists. Salaries in private practice are often somewhat higher than in the academic arena, although less so than in previous years. However, most employment opportunities for pediatric hematology-oncology specialists offer a comfortable lifestyle.



## Questions and Answers *continued...*

*What are some of the career choices for a pediatric hematology-oncology specialist?*

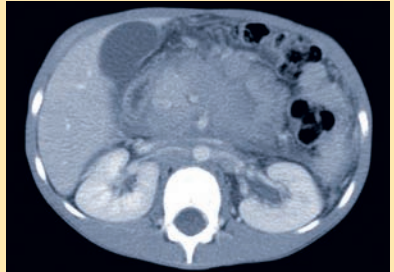
Though widely varied, the most common pathway after completing a fellowship is a position as an instructor or assistant professor of pediatrics in an academic pediatric hematology-oncology division. Primary duties, which vary from day to day and are often unpredictable (one reason it is so interesting), are diagnosing and caring for children with blood diseases and cancer; teaching medical students, residents, fellows, and other healthcare professionals; and conducting clinical research through case studies and clinical trials. Most teaching activities are performed one-on-one in the clinic or at the bedside, rather than as didactic lectures in the classroom (although pediatric hematology-oncology specialists give many of those, so good public speaking skills are important). Most pediatric hematology-oncology specialists are part of a team of physicians, advanced practice nurses, social workers, and other healthcare professionals in an academic group practice.

A small but important subset of pediatric hematology-oncology specialists, after completing their standard fellowship training, devote extra years to laboratory experience, which sometimes follows or includes obtaining a doctoral degree. This research is usually performed in basic science laboratories. These individuals usually spend the majority of their time conducting laboratory research in a basic or translational research area of pediatric hematology-oncology. A smaller but important percentage of their time is devoted to the clinical duties outlined above. Because determining the causes of these diseases and discovering improved treatments rest in better understanding of the fundamental biology of cancer and the blood, it is logical that some individuals in the specialty engage in laboratory research.

Other researchers focus on clinical investigation. These individuals often receive extended training in epidemiology, biostatistics, and protocol design, and some obtain a master's degree in public health. They conduct studies to better understand the cause and nature of disease and to develop improved treatment strategies through randomized clinical trials or health services research—an exciting pathway for many young pediatric hematology-oncology specialists.

A few other specialists are engaged in administrative activities as division chiefs, department chairs, and deans. Still others pursue the private practice of pediatric hematology-oncology or are employed by pharmaceutical firms.

In addition, opportunities exist for the pediatric hematology-oncology specialist to travel to and participate in exciting scientific meetings, to network and become friends with colleagues from around the world, and to design and participate in summer camping experiences and other support activities for patients and their families.



*Is it possible to further subspecialize in some aspect of hematology or oncology after receiving the general training?*

Many pediatric hematology-oncology specialists care for patients with diverse diseases. However others, especially those on larger medical school faculties or for whom research constitutes a significant portion of their duties, focus on the field in which they develop special expertise. Many individuals emphasize clinical oncology, and some narrow their expertise specifically to solid tumors or to a specific type of tumor (e.g., neuroblastoma, bone tumors). Others deal primarily with acute leukemia, neuro-oncology (brain tumors), cancer pharmacology, or development of experimental agents. An emerging field is bone marrow (stem cell) transplantation, and some pediatric hematology-oncology specialists devote most or all of their time to diagnosing and caring for the transplant patient and conducting clinical, translational, or laboratory research in transplantation. Some individuals deal primarily with nonmalignant hematology and become experts in sickle-cell disease, hemophilia, thrombotic disorders, or quantitative or qualitative disorders of neutrophils. Hematologists who do not deal with oncology generally practice at larger academic medical centers.

## Want More Information?

If you would like further information about the specialty of pediatric hematology-oncology, just ask any of the faculty with whom you have contact. Other useful information can be obtained by contacting the following organizations:

### **American Society of Pediatric Hematology/Oncology**

847/375-4716

[www.aspho.org](http://www.aspho.org)

### **American Academy of Pediatrics**

[www.aap.org](http://www.aap.org)

American Academy of Pediatrics  
Hematology-oncology training programs  
[www.aap.org/training/hemonc](http://www.aap.org/training/hemonc)

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