

The New Face of Pediatric Oncology in Mexico

*An epidemiological transition is taking place in Mexico—pediatric cancers are emerging as one of the leading causes of childhood morbidity and mortality with between 5,000–7,000 new cases diagnosed each year. Ironically, this increase signals Mexico's transition from a developing country in which the childhood diseases of poverty—pneumonia, diarrhea, etc.—were rampant to a society that supports universal access to healthcare for its children; thus, more children survive to the age at which cancers are then diagnosed. However, pediatric oncologists in Mexico are now able to offer a new standard of treatment, which includes the best in medical diagnostics and opportunities to participate in clinical trials of the most promising new drugs. Former CCR Fellow **Aurora Medina-Sanson, M.D.**, now Head of Pediatric Oncology and Hematology at the Hospital Infantil de Mexico Federico Gomez, offers her perspective as someone who has been an integral part of shaping this change by emphasizing the importance of fostering clinical research in parallel with patient care. Part of her inspiration derived from her experiences at CCR.*

Laying the Foundation

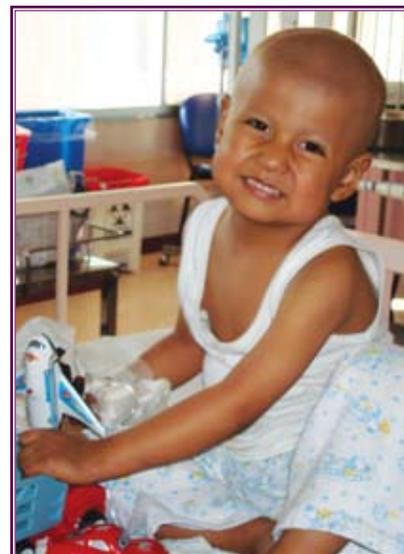
In 1993, I came to the Hospital Infantil de Mexico Federico Gomez for the first time to do a fellowship in pediatric oncology. From the time I started pediatrics training, I knew that I wanted to be a pediatric oncologist. All sick children are special, of course, but I noticed something particular about these children. They really suffer from the treatment, as well as the cancer, but they remain optimistic and happy when they can still retain some ties to normal life. I committed myself to helping them, not only as a physician but also by improving the standard of care we could offer. Of course, at that time, we were in a different world of healthcare in Mexico—before we could even treat these children for their disease, we had to contend with the social issues of where we could find financial support to sponsor their treatment and where they could live during the course of treatment. One of the biggest problems at our hospitals was abandonment; patients simply did not have the resources to complete treatment.

However, even then, I wanted to learn more about the biology of these

cancers and about current research efforts to develop newer and better therapies. In fact, I wanted to start a program of research in Mexico to integrate our large patient base into studies to build new knowledge and contribute to the international effort to solve these diseases. I had met Lee Helman, M.D., Head of the Molecular Oncology Section of CCR's Pediatric Oncology Branch and the current Scientific Director for Clinical Research, on one of his visits to Mexico, and he encouraged me to apply for a grant to do academic research at the NIH. Working in his laboratory at CCR for one and a half years was a transforming experience in my career. It was a turning point in my views of how research is done and on the importance of integrating clinical research into oncology programs. I also learned the value of leadership in a research team—how to develop and translate a vision into an integrated research program while inspiring and trusting your team to be creative and to do remarkable things.

When I came back to Mexico in 2001, I knew we could not begin work on the same scale that I had experienced at the

NIH. But through donations, we procured the equipment to introduce molecular diagnostic techniques—e.g., fluorescent *in situ* hybridization (FISH) and polymerase chain reaction (PCR)—and gradually built up to a formal research program that has been running for the last five years.



(Photo: Courtesy of A. Medina-Sanson)

Pediatric cancer research and treatment are two complementary sides of the same goal: saving children's lives.

A Clinical Research Hub

Hospital Infantil de Mexico Federico Gomez opened in 1943 as the first hospital of Mexico's National Institutes of Health. Our Pediatric Oncology and Hematology Unit receives patients from across the country. We see approximately 300 cases per year, of which 40 percent are leukemia patients, and the rest are solid tumors. Our Laboratory for Research in Hematology and Oncology was formed just two years ago, and it is dedicated solely to research. We have seven pediatric oncologists in our group, all of whom are active researchers. As in the United States, we apply for government and foundation grants to support our research activities.

Every year we take on five to ten fellows in pediatric oncology. Last year, we increased the residency program from two to three years in order to include a research component, and acceptance into the program has become increasingly competitive. Our hope is that we will train future pediatric oncologists to naturally embrace the vision of cancer treatment and research as being two complementary sides of the same goal: saving children's lives.

Mexico, like any other country, has its own unique battles with this disease.

We have several research programs, many in collaboration with other institutions in Mexico and abroad. Currently, we are running approximately 20 investigations, with some of the most important work related to the leukemias that affect the largest proportion of our patients. We are studying the basis of drug resistance that develops in the treatment of acute lymphoblastic leukemia, as well as trying to understand the re-programming events that give rise to the stem cells underlying this disease. Our clinical work also means that we place an emphasis on developing better biomarkers for diagnosis and staging of different cancers, including those for osteosarcoma and retinoblastoma. In addition, cancer immunology and the role of immune status in the development

of cancers are significant parts of our research agenda.

Recently, our hospital became the first Mexican institution to be accepted as a member of the Children's Oncology Group, a worldwide clinical trial cooperative group sponsored by NCI, created with the mission of studying childhood cancers. Through this cooperative, we will be able to participate in and contribute to international multicenter clinical trials for pediatric cancers.

A Focus on Mexico

Cancer is universal, with the same molecular mechanisms at play in people of vastly different genetic and environmental backgrounds. Cancer is also very personal, such that two individuals with seemingly the same disease can respond differently to the same treatment. Cancer is regional as well, and Mexico, like any other country, has its own unique battles with this disease.

Not surprisingly, the dietary habits and available resources of a particular region influence the role of nutrition in pediatric oncology. Thus, our studies of the role of nutrition in pediatric cancers

mean removal of the eyes and even death from disease metastasis. We have several ongoing studies to address retinoblastoma with a particular emphasis on preservation of the eyes—thus far, our success rate for eye preservation has reached close to 90 percent. We are also part of the Mexican Retinoblastoma Group, which aims to create a national registry to better track disease impact and to develop a national treatment protocol.

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Looking Forward

The last decade has witnessed enormous positive change in the treatment of childhood cancers in Mexico. Only 10 years ago, one of our greatest problems was that patients did not have the money to complete treatment. When I came back to Mexico from the NIH in 2001, we still had many difficulties in obtaining the financial resources to treat patients, a common obstacle faced by doctors in developing countries. Now, we have all of the molecular and imaging tools for making a complete diagnosis, our survival scores have improved, and abandonment rates are reduced thanks to changes in our government's policies to completely cover treatment for our children.

Our research program in pediatric oncology and hematology is still relatively young, and so cannot yet be judged by the extent of published results, but we are encouraged by the findings that are beginning to emerge. This year, we will fulfill a longstanding aim of creating a new comprehensive three-floor Pediatric Oncology Unit that should triple our capacity. We are looking forward to the continuing expansion of our research programs and collaborations, both in Mexico and abroad, so that we become equal contributors with institutes like CCR to the international search for cures to childhood cancers.