Promising high-dose radiation therapy for neuroblastoma

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The University of Chicago Medicine Comer Children's Hospital has become the first in Illinois to offer pioneering, targeted, high-dose, intravenous radiation therapy for relapsed neuroblastoma and other difficult-to-treat cancers. The hospital is one of only about a dozen across the country equipped to administer this advanced therapy, called metaiodobenzylguanidine or MIBG, which requires highly-specialized staff and a dedicated lead-lined patient room designed to minimize radiation exposure to families, other patients and staff.

Neuroblastoma, a solid tumor of the sympathetic nervous system that usually strikes infants and children under age 5, affects roughly 650 kids in the United States each year. For about 50 percent of cases, this cancer has high cure rates. For the other 50 percent of patients, an aggressive form can be very difficult to treat and has often spread widely by the time of diagnosis. For these children conventional treatments including surgery, chemotherapy and even stem cell transplant may not be enough to prevent relapse.

MIBG is a molecule that is internalized by neuroblastoma cells. When combined with radioactive iodine and administered to patients intravenously, MIBG can target and kill tumor cells while sparing healthy tissue. Once a child receives the medication, he or she is isolated in a patient room lined with 45,000 pounds of lead brick for three to five days while the radiation is eliminated through urine and other bodily fluids.

Renowned neuroblastoma expert Susan Cohn, MD, director of clinical research in the section of pediatric hematology and oncology at the Comer Children's Hospital, says that while MIBG therapy is not yet a cure for neuroblastoma, it is a promising next step in a complex treatment plan for high-risk patients.

"MIBG is one of the most effective therapies available with a response rate of about 30 percent," said Cohn. "Over the last several years, we've developed an outstanding care team here at Comer Children's Hospital with expertise in neuroblastoma, nuclear medicine and radiation safety. We're pleased to have the facilities in place to provide every effective modality of treatment so that families do not need to travel away from Chicago to receive MIBG or other cutting-edge therapies."

Cohn's multidisciplinary team includes oncologists, advanced practice nurses, nuclear medicine physicians and technicians, radiation safety experts, radiopharmacists, child life specialists and social workers all focused on providing comprehensive medical care, safety and support for patients and their families. Parents play an important role on the care team during this unique procedure, serving as the primary caregivers in order to minimize radiation exposure for nurses who will care for dozens of patients in a given year.

Accommodations for each patient's family are a significant consideration. Parents can stay in an adjacent full-sized patient room for the duration of the treatment, an option often not available with other MIBG therapy providers. Technology, including a leading-edge two-way audio and visual communication system and iPads, allow parents ongoing interaction with their child.

"This is not an easy process for the child or the parents," said Cohn, "but for those who are emotionally able to tolerate the necessary separation, this is a promising treatment option for a complex cancer. It is my hope

that MIBG will eventually become a standard of care for newly-diagnosed neuroblastoma patients, versus just those who have relapsed. Our research continues."

Provided by University of Chicago Medical Center