

Innovations in Neurology & Neurosurgery



*Rady Children's - A comprehensive system
focused solely on children.*



PEOPLE

Dr. John Crawford: Advancing neuro-oncology care



John Crawford, M.D., M.S., is the director of neuro-oncology at Rady Children's Hospital-San Diego, the only program in the San Diego region providing comprehensive care to children and young adults with brain and spinal cord tumors. He is also the director of the pediatric neurology fellowship program at Rady Children's and an associate clinical professor at UC San Diego School of Medicine.

Dr. Crawford leads one of the highest-volume programs in California, which cares for more than 500 children with newly diagnosed or previously treated central nervous system tumors. He works with an expert multidisciplinary team, with physicians from

Hematology/Oncology, Neurosurgery, Neurology, Radiology,

Endocrinology/Diabetes, Rehabilitation Medicine, Ophthalmology and Pathology. Jennifer Elster, M.D., who recently joined the Hematology/Oncology division, will be working with Dr. Crawford to grow the program so that even more children can receive care.

State-of-the-art treatment is provided for both newly diagnosed and recurrent tumors. Advanced neurosurgery procedures, targeted radiation oncology and the latest biologic therapies are available to patients through an alliance with the UC San Diego Moores Cancer Center and research collaborations with the Sanford Burnham Prebys Medical Discovery Institute and The Scripps Research Institute. Patients also have access to proton therapy through a partnership with Scripps Health (see "Programs" story).

Through an alliance with the UC San Diego Moores Cancer and St. Jude Children's Research Hospital, and participation in collaborative clinical trials groups, Dr. Crawford oversees an active research program. Along with Janet Yoon, M.D., he is the principal investigator at Rady Children's for the Pacific Pediatric Neuro-Oncology Consortium, a network of 15 children's hospitals that conduct clinical trials of new therapies for children with brain tumors. The consortium's goal is to improve outcomes by translating the latest findings in cancer biology into better treatments and to focus on personalized medicine. The treatment studies currently offered are for patients with refractory low-grade gliomas and newly diagnosed high-grade brainstem gliomas.

Additionally, Dr. Crawford will be designing his own clinical trials to provide personalized medicine for his patients with medulloblastoma. Patients will be given promising therapies resulting from a collaborative research effort among Rady Children's, the Sanford Burnham Prebys Medical Discovery Institute and UC San Diego Moore's Cancer Center (see "Innovations" story).



INNOVATIONS

Personalized medicine for
treating medulloblastoma



Individualized brain cancer therapy will soon be possible through a collaborative effort among Rady Children's, the Sanford Burnham Prebys Medical Discovery Institute and UC San Diego Moore's Cancer Center.

At Rady Children's, [Michael Levy, M.D., Ph.D.](#), director of the [Division of Neurosurgery](#), is currently sending tissue of newly diagnosed children with brain cancer from the operating room to the team of Robert Wechsler-Reya, Ph.D., at Sanford Burnham and to [Donald Durden, M.D., Ph.D.](#), at the Moore's Cancer Center. Dr. Wechsler-Reya's team and Dr. Durden are then implanting the tumor cells into the brain of mice to mimic the pediatric disease. The brain tumors that form in mice, termed "avatars," are used for molecular analysis to further categorize the genetics and drug screening, and to identify potential therapies should the patients fail standard-of-care therapies.



[Reid Hoshide, M.D., M.P.H.](#), the 2016 recipient of the Gordon Fellowship in Pediatric Neuro-Oncology at Rady Children's, is working in the Wechsler-Reya lab and is using his neurosurgical expertise to identify potential treatments. Upon tumor growth, he and his colleagues perform surgical extraction of the xenografted tumors and study the genetic landscape and tumor responsiveness to chemotherapeutic agents using a high-throughput drug-screening process pioneered at Sanford Burnham that may help children at the time of disease relapse.

Along with treating the mice with single chemotherapeutic agents, Dr. Hoshide experiments with different dose sizes, different cycles of treatment and different combinations of compounds and sees how they tolerate and respond to the treatments. He will also be studying the ability of the mice to tolerate radiation, surgical resections and a combination of these treatments.

Through screening thousands of drugs, several promising compounds have been identified against medulloblastoma that will be used by [John Crawford, M.D., M.S.](#), Rady Children's director of neuro-oncology, to design clinical trials for his patients based on their own tumors. Tumor cell lines that have been created through the collaborative effort have also been shared with researchers around the world in an attempt to cure medulloblastoma, the most common malignant brain cancer in children and the most common cause of death among all childhood cancers (based on the latest statistics from the Centers for Disease Control and Prevention).



Learn more at [RCHSD.org](#)

innovation
belongs in every moment



PROGRAMS

Proton therapy program continues to grow

More than 140 children and adolescents have been referred to [Rady Children's Proton Therapy Program](#) since the program started in June 2014, including patients from nearby states, such as Arizona and Utah, and as far away as Minnesota. Seventy-one patients have completed treatment to date.

Rady Children's is the only program in California providing the most advanced proton therapy for pediatric brain and central nervous system tumors. The team includes



Dr. Chang

[Andrew L. Chang, M.D.](#), a pediatric radiation oncologist and chief of pediatric proton beam therapy, certified pediatric oncology nurses, radiation therapists, medical dosimetrists, medical physicists and pediatric anesthesiologists.

A multidisciplinary Neuro-Oncology Tumor Board at Rady Children's with specialists in neuro-oncology, oncology, radiation oncology, neurosurgery, pathology and radiology reviews the imaging, pathology, clinical condition and treatment plan of each patient presented. The [Neuro-Oncology team](#) collaborates with Scripps cancer specialists on treatment planning and follows patients during their treatment.

The program is located at the Scripps Proton Therapy Center, the only proton beam facility in San Diego and just one of five west of the Rockies. The 102,000-square-foot facility has the capacity to treat approximately 2,400 pediatric and adult patients annually. Rady Children's patients and their families have a dedicated entrance to the center as well as child-friendly reception and recovery areas.