

More targeted pre-surgery radiation significantly reduces long term negative impact in certain cancers

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Using advanced imaging technology to more precisely target radiation beams to treat soft tissue cancers (sarcomas) in the extremities significantly reduces long term side effects without effecting survival rates, according to research results published online today in the *Journal of Clinical Oncology*.

The findings should establish a new standard of care for soft tissue sarcomas. "This study proves that we are able to use this modern technology —image-guided [radiotherapy](#) —to irradiate smaller target volumes (less normal tissue included) and reduce long term side effects in extremity sarcoma patients compared with conventional radiotherapy," says Dr. Dian Wang, the lead author of the paper. He is professor of Radiation Oncology at Rush University Medical Center and chair of the NRG Oncology Sarcoma Working Group.

"This is one of few successful multi-institutional studies on localized sarcoma in almost a decade," Dr. Wang said "It should provide oncologists with validation and evidence of this new radiotherapy approach that takes full advantage of rapidly developing technologies. The absence of marginal-field recurrence and favorable toxicity profiles suggest that parameters used in this study are appropriate for preoperative image-guided radiotherapy of extremity sarcoma," Wang added.

The study results came from a multi-year, multi-institution phase 2 clinical trial conducted by the Radiation Therapy Oncology Group (RTOG), now conducting research as NRG Oncology.

The RTOG 0630 trial studied more than one hundred patients with extremity-based soft tissue sarcomas (STS) who received pre-surgical radiation delivered to a substantially smaller area than typically targeted when treating this type of cancer. Prior to tumor removal surgery, a series of daily pre-treatment images of the tumor were digitally integrated with previous scans to determine a custom tailored radiation dose that minimized exposure to adjacent normal tissue. Assessments two years later showed that long term side effects were 10.5 percent, significantly fewer than the 37 percent of patients in a previous study who received radiation to a larger target area.

The paper, "Significant reduction of late toxicities in extremity sarcoma patients treated with image-guided radiotherapy to a reduced target volume: results of RTOG 0630," was designated for rapid publication as the prestigious journal because the findings are considered to be among "the most important clinical cancer research." The trial was conducted over three years at eighteen medical centers across the country, including several rated among the nation's top cancer hospitals.

Soft tissue sarcomas are cancerous tumors that begin in the muscle, fat, nerves, tendons, blood vessels or connective tissues. Though relatively rare, soft tissue sarcomas are quite deadly due to the presence of advanced disease, or metastasis, at initial diagnosis. Nearly 12,000 new cases of [soft tissue sarcoma](#) are expected to be diagnosed in 2015 with approximately 5,000 deaths from the disease projected.

Rush is among the leaders in sarcoma patients—bone and soft tissue—treated in Illinois. A team of specialists at Rush work together to create a personalized treatment plan that typically involves surgery in

combination with [radiation therapy](#) or chemotherapy before or after tumor resection.

"Although [radiation oncology](#) is a technologically intense discipline, wisdom in using these technologies is essential for optimal outcomes. Dr. Wang and his collaborators in the Sarcoma Working Group of the NRG co-operative [oncology group](#) are to be lauded for improving the use of these technologies in a way that makes the limb preservation care of patients with sarcoma less toxic without compromising efficacy. While these results will need to be confirmed by other groups, I am excited that one of my colleagues and faculty at Rush was a leader in this effort." said Dr. Ross Abrams, Chairman of Rush's Radiation Oncology Department.

"These positive results are an excellent example of the important multi-institutional research carried out by the research groups that comprise the NCI Clinical Trials Network. No other research enterprise is likely to investigate strategies to reduce treatment-related toxicities for patients with these rare tumors," said Dr. Walter J. Curran, Jr., an NRG Oncology Group Chairman and Executive Director of the Winship Cancer Institute of Emory University in Atlanta.

More information: "Significant Reduction of Late Toxicities in Patients With Extremity Sarcoma Treated With Image-Guided Radiation Therapy to a Reduced Target Volume: Results of Radiation Therapy Oncology Group RTOG-0630 Trial" *JCO*; published online on February 9, 2015; [DOI: 10.1200/JCO.2014.58.5828](https://doi.org/10.1200/JCO.2014.58.5828)

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