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Fox Chase Cancer Center Study Shows Adaptive Radiation Therapy Increases Safety and Preserves Quality of Life

- *Study found adaptive radiation therapy offered patients with hard-to-treat recurrent sarcomas a safe, effective option.*
- *Adaptive radiation therapy offered greater precision, with radiation to the small intestine reduced by 21% while radiation dose delivered to tumors rose by 7.7%.*
- *Adaptive therapy also preserved quality of life, as patients maintained normal bowel and bladder function.*

A New Option for Patients Recurrent Disease

For patients with recurrent retroperitoneal sarcomas that cannot be treated surgically, treatment choices are limited. These tumors can grow quite large in the abdomen adjacent to vital organs or enmeshed within the bowel. Given their radioresistant nature they require high doses of radiation that risk damaging healthy nearby tissue. Once patients have undergone an initial radiation course, doctors are often left with no safe radiation treatment option.

But a pilot study from Fox Chase Cancer Center, presented today at the 2025 American Society for Radiation Oncology (ASTRO) Annual Meeting, offers patients and physicians new options. Researchers found that using **CT adaptive stereotactic body radiation therapy (CTA-SBRT)** can make repeat radiation not only possible, but safe. The study also underscores the promise this new therapy offers for many different types of cancer.

Inside the Study

The study was conducted by Maryanne J. Lubas, DO, a fifth-year radiation oncology resident at Fox Chase, under the leadership of Rebecca Shulman, MD, Assistant Professor in the Department of Radiation Oncology. Their team reviewed the cases of five patients treated with adaptive re-irradiation between April 2024 and January 2025.

At each treatment, the team prepared two plans: a standard one created in advance and a second adaptive plan built from same-day imaging. Every session, the adaptive plan proved to be the better choice.

“These patients often face a difficult situation,” Lubas explained. “With adaptive therapy, we’ve shown it’s possible to move beyond short-term palliative intent and aim for long-term control of disease.”

Study Highlights at a Glance

- **Greater precision:** Radiation to the small intestine was reduced by 21% while tumor doses rose by 7.7%.
- **Safety first:** Patients experienced no serious complications and no emergency surgeries.
- **Quality of life preserved:** Patients maintained normal bowel and bladder function.
- **Truly personalized care:** Each treatment session was re-optimized in real time.

An Advance in Cancer Care

At the center of this progress is the **Ethos cone-beam CT adaptive system**, which uses imaging and AI software to re-optimize each plan while the patient is already on the treatment couch. Together, these innovations make it possible to closely track tumors during treatment.

Traditional radiation therapy relies on a single plan designed before treatment begins. That plan never changes, even as a patient’s anatomy shifts during weeks of care. Adaptive therapy, however, creates a new plan for every radiation session.

“Adaptive radiation therapy takes us one step further,” said Eric M. Horwitz, MD, FABS, FASTRO, Chair of the Department of Radiation Oncology at Fox Chase and the Lewis Katz School of Medicine at Temple University. “We can now adjust not just the position of the patient, but the actual treatment plan itself in real time, giving a large dose of radiation to the cancer while protecting healthy cells.”

Expanding Treatment Across Cancer Types

Fox Chase has been steadily bringing adaptive radiation therapy into mainstream cancer care and runs one of the largest clinical trial programs in the country focused on adaptive. The team was the first in the U.S. to launch a prostate cancer trial using this technology. Over the past year, the team has used the adaptive therapy approach in cancers of the prostate, bladder, liver, pancreas, breast, lung, and head and neck.

The Fox Chase team took years to develop the resources, clinical knowledge, and infrastructure to bring adaptive radiation therapy to patients.

“It was a huge learning curve, but we dedicated ourselves to it. Every Fox Chase radiation oncologist is cross trained to offer adaptive radiation as an option to every eligible cancer patient,” said Horwitz. “Equally skilled is our partner team of PhD physicists who work directly with us at the linear accelerator as part of standard treatment.”

Looking Ahead

For patients with sarcomas and many other hard-to-treat cancers, adaptive radiotherapy is changing the conversation. This therapy presents a new way of thinking about cancer care, where treatment adapts to the patient instead of the other way around.

The Fox Chase team will continue following patients from the sarcoma study and expanding adaptive therapy into new clinical trials. For now, their early results point to a future where patients once considered untreatable may now have a chance for effective therapy.

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