

Targeting CANCER

There's a new weapon to fight cancer—and it promises to transform the way the disease is treated.

Ever since scientists discovered that radiation was an effective tool against cancer, there's been an ongoing quest to develop a system that targets tumors quickly and precisely while preserving surrounding healthy tissue. Now, due to groundbreaking technology called RapidArc™, radiation oncologists at the Chao Family Comprehensive Cancer Center at University of California, Irvine Medical Center have taken a giant step toward realizing that goal.



Two-minute therapy. When teamed up with a Trilogy linear accelerator—the newest generation of machines that produces and delivers radiation—RapidArc administers radiation treatments up to eight times faster than conventional methods. At the same time, the system is extremely accurate, utilizing precisely measured doses of radiation, which are computer-designed to match the exact size, shape and depth of tumors. This approach is known as intensity-modulated radiation therapy (IMRT). During therapy sessions, radiation beams with varying intensities are aimed at the tumor from multiple angles. The treatment is delivered in a single, 360-degree rotation of the linear accelerator around the patient. Because it's so precise, RapidArc is especially suited for tumors that are close to vital organs. “The new system helps us avoid the salivary glands when treating head and neck cancers, and the bladder, rectum and seminal vesicles when treating the prostate gland,” says **Dr. Nilam Ramsinghani**, a radiation oncologist at UC Irvine's cancer center, Orange County's only National Cancer Institute-designated comprehensive cancer center. In fact,

RapidArc technology is so precise that it permits doctors to destroy brain tumors that are too large or irregular for the Gamma Knife® to treat.

With the arrival of RapidArc, radiation therapy has become faster, more accurate and easier for patients.

A typical session of RapidArc radiation therapy can be completed in two minutes, compared to 10 minutes or more with the last generation of IMRT. Because the turnaround time is so fast, there's less chance the patient will move during the treatment than with conventional radiation therapy. “Side effects are often the result of damage to nearby normal tissue that occurs when the patient changes position even slightly,” says Ramsinghani. “However, it's difficult for many patients to lie flat on a treatment table for long periods of time, especially if they're very young, old or sick.”

The new system also features technology that allows patients to be positioned on the treatment table with sub-millimeter accuracy so radiation beams

align perfectly with the tumor. Additionally, the Trilogy linear accelerator that works in conjunction with RapidArc has a built-in CT-like imaging system that takes three-dimensional pictures of the tumor before therapy. “Tumors can shift slightly during treatment due to the normal movement of internal organs caused by digestion and breathing,” says Ramsinghani. “The linear accelerator's three-dimensional imaging system allows doctors to track the tumor, ensuring targeted precision.” As a result, RapidArc significantly reduces side effects, enhances patient comfort and improves outcomes.

Targeting tumors. RapidArc complements a full range of other state-of-the-art radiotherapy methods at UC Irvine Medical Center, making the hospital's radiation oncology service one of the most advanced in the region. “Other types of radiation therapy also aim to spare healthy tissue and may be more appropriate for patients depending on the type, size and position of the cancer and other factors,” says Ramsinghani. In addition to external beam radiation therapy that utilizes photon and electron beams, the Chao Family Comprehensive Cancer Center offers advanced brachytherapy procedures. These methods involve the implantation of radioactive seeds in the tumor, destroying cancer from the inside right where it grows. A similar type of treatment called MammoSite® targeted radiation therapy is used for breast cancer. This highly precise approach takes only five days of treatment rather than the six weeks or more required for conventional radiation therapy. For information about radiation oncology services offered at the Chao Family Comprehensive Cancer Center, call 714.456.5651 or visit www.ucihealth.com.

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