

Proton imaging provides more accuracy, less radiation to pediatric cancer patients

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Proton radiography imaging used prior to and during proton treatments for pediatric cancer patients provides for more accurate treatment delivery and a lower dose of radiation compared to standard diagnostic X-rays and cone beam CT, according to a study presented today at the Cancer Imaging and Radiation Therapy Symposium in Atlanta. The symposium is co-sponsored by the American Society for Radiation Oncology (ASTRO) and the Radiological Society of North America (RSNA).

The amount of radiation a pediatric cancer patient receives is a top concern for physicians, as children's bodies are still growing rapidly and excess radiation to normal tissues can cause more problems in children than in adults. Pediatric cancer patients are also more susceptible to radiation induced malignancies and toxicities from both diagnostic and therapeutic radiation.

Researchers investigated pediatric patients with various cancers to evaluate the use of proton radiography as well as nonpediatric [lung tumors](#) to evaluate the ability of proton radiography to allow real-time tumor tracking while the patient is breathing. The images were compared to both diagnostic quality X-ray portal images and digitally reconstructed radiographs from CT data.

They found that proton radiography provided higher quality images to determine tumor location and to use during daily quality assurance checks and tumor tracking with less radiation than an X-ray or CT scan.

"Proton imaging techniques have been around in the field of [proton beam therapy](#) for over 30 years; however, poor image quality reduced its use in mainstream proton oncology centers. In recent years, novel developments in detector technology, very fast (pico-second) electronics and single-event reconstruction imaging have allowed a significant improvement in the quality of the images, which can benefit ultimately proton oncology." Shannon MacDonald, MD, a study author and radiation oncologist at Massachusetts General Hospital in Boston, said.

"The development and enhancement of proton imaging has the advantage of allowing for a further decrease in radiation delivery to healthy growing tissues outside of the tumor, which is so important when treating children."

More information: The abstract, "Proton Radiography for Pediatric Malignancies; Development and Enhancement of a Proton Imaging Technique," will be presented at 4:30 p.m. Eastern time on April 29, 2011.

Provided by American Society for Radiation Oncology

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