

Can Proton Therapy Benefit Sarcoma Patients?

Fred Hutch radiation oncologist Stephanie Schaub considers proton therapy for sarcomas on a case-by-case basis. Here's more.

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[Sarcomas](#) are tumors that form in the body's connective tissues such as bone, muscle and fat. They are rare and, because there are more than 150 types, patients benefit from seeing a sarcoma specialist to help determine their treatment options.

At Fred Hutch Cancer Center – Proton Therapy, [Stephanie Schaub, MD](#), is a radiation oncologist who specializes in treating both adults and children with sarcoma. She is part of a sarcoma-focused multidisciplinary team that includes surgeons and medical oncologists.

“The many different sarcoma types have different behaviors and can be more or less responsive to treatment,” said Schaub. “That is why we are always doing further research to find the best therapy options.”

Last year, the sarcoma multi-disciplinary team at Fred Hutch opened a new [clinical trial](#) for which they are currently recruiting patients, led by medical oncologist, [Elizabeth Loggers, MD, PhD](#). The trial focuses on a specific type of sarcoma called adipocytic retroperitoneal sarcoma (dedifferentiated liposarcoma) – a type that arises from fat tissue near the kidneys, adrenal glands, pancreas, parts of the intestines and in major blood vessels like the aorta and [vena cava](#).

Schaub and Loggers are looking to test the safety, side effects and best dose of a drug called abemaciclib, and how well it works with radiation therapy before surgery. Abemaciclib may stop the growth of tumor cells by blocking some of the enzymes needed for cell growth. Giving abemaciclib together with radiation therapy may shrink tumors in patients with high-risk disease, Schaub said.

“Depending on the exact location, we evaluate the optimal type of radiation that would result in reduced side effects for patients, which may include the use of protons,” she said.

For any sarcoma treatment, Schaub and her radiation oncology colleagues consider proton therapy on a case-by-case basis and take many factors into consideration, including the location of the tumor. Protons can be helpful when the tumor is located near vital organs because it can be

precisely controlled to avoid impacting healthy tissues, or in the pelvis in younger patients to preserve a patient's fertility.

She also considers protons when she needs to treat with a very high dose if a particular type of sarcoma is [radioresistant](#), meaning it isn't as easily killed with radiation. This is the case for primary bone tumors of the base of skull, spine and sacrum, such as chordomas and chondrosarcomas.

There are also cases when protons are not indicated.

Sometimes, when patients have titanium hardware in the area to be treated because of previous medical conditions, it casts a "shadow" where radiation cannot reach with protons. Generally, when the tumor is located in an extremity such as an arm or leg, X-rays are better suited because this type of radiation can be more robust to subtle changes in tumor swelling or shrinkage and X-rays cause less skin irritation. There are select times when proton therapy is used for the treatment of an extremity in pediatric patients, such as to reduce radiation dose to the growth plates when feasible.

"Keeping risks of side effects low while treating the tumor optimally is the goal," said Schaub. "Sometimes that is achieved with proton therapy and sometimes with X-ray — or photon radiation."

Schaub recently recorded a [webinar](#) titled "Demystifying the Patient Experience" in conjunction with The Northwest Sarcoma Foundation. In the webinar, Schaub and [Megan Pittaway, PA-C](#), with UW Medicine, explain what a patient can expect when being treated with radiation, including side effects.

"I am thankful to be able to provide a resource for the community that will help sarcoma patients find and understand the right treatment and know what they can expect from that treatment," said Schaub.

Schaub feels fortunate to be part of a specialized team of radiation oncology providers caring for patients with sarcoma, including [Ed Kim, MD](#), [Michael Folkert, MD, PhD](#), and Megan Pittaway, PA-C, who care for adult patients, and [Lisa Ni, MD](#), [Ralph Ermoian, MD](#), and Layne Chapple, ANRP, who care for pediatric and adolescent and young adult patients.

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