

# Using Proton Therapy to Treat Spinal and Paraspinal Tumors



## Overview

Proton therapy is a powerful treatment tool for fighting malignancies on or near the spine, and it is now available to patients at the Maryland Proton Treatment Center (MPTC). Physicians at MPTC use the latest pencil-beam scanning (PBS)/intensity modulated proton therapy (IMPT) to target tumors and deliver high doses of radiation with unmatched precision. Using proton therapy, the tumor can receive higher doses of radiation, while sparing more of the surrounding healthy tissue.

Many spinal and paraspinal tumors require high doses of radiation to be effective at eradicating cancer cells. For patients with spinal or paraspinal tumors, proton therapy has the potential to lead to fewer short- and long-term side effects to critical structures, such as the brain, spinal cord, kidneys, or lungs. Proton therapy is also safe to deliver concurrently with chemotherapy agents.

This revolutionary treatment is a non-invasive and low-risk option, which has demonstrated benefits for patients with:

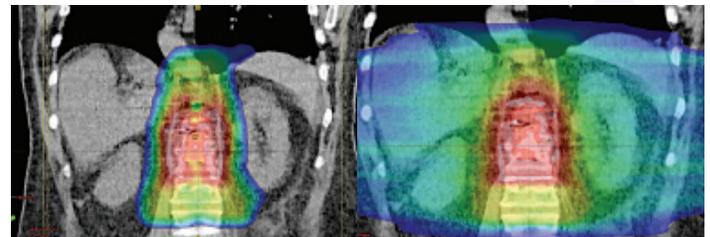
- chordomas
- chondrosarcomas
- malignant peripheral nerve sheath tumors
- desmoid tumors
- ependymomas
- Ewing's and other sarcomas

Proton therapy is likely to benefit additional spinal and paraspinal patient subgroups, including:

- **Patients with disease recurrence:** Proton therapy can aim a higher dose of radiation precisely at the site of the recurrence, limiting normal tissue exposure and potentially leading to better outcomes.
- **Pediatric patients:** While there is no threshold below which radiation is risk free, proton therapy can expose a smaller volume of tissue to radiation, offering a benefit for pediatric patients, whose growing bodies are especially susceptible to radiation damage.

## Proton Therapy Versus Photon Therapy

Because of the physics of proton particles, proton radiation goes to the site of the tumor and stops. This means that proton therapy allows for higher doses of radiation to be delivered to the tumor without damaging surrounding healthy tissue and organs. The image below shows the areas surrounding the tumor exposed to radiation (dose delivered to tumor and surrounding tissue shown in color) during treatment. The proton therapy (left) delivers significantly less radiation to the surrounding areas than the photon treatment (right).



Proton therapy

Photon therapy

## MPTC-Specific Clinical Trial Offerings

MPTC is dedicated to advancing scientific knowledge about the role of proton therapy in the treatment of spinal and paraspinal tumors. All patients treated at the center have access to a wide range of clinical trials available through the Maryland Proton Alliance, including currently open and additional planned in-house and multi-institutional clinical trials.

Clinical trials at MPTC include:

- NCT01255748: Evaluation Tracking Project: A Prospective Chart Review of Patients Treated with Radiation Therapy
- NCT01696721: Pediatric Proton Consortium Registry (PPCR): A Multi-Center Registry of Pediatric Patients Treated with Proton Radiation Therapy

For more information on our currently available clinical trials, **please call our research department at 410-369-5353.**



## Outcomes

Your patients may be hesitant to explore new treatment options and may pose questions related to side effects and outcomes. Proton therapy is an effective, noninvasive, low-risk treatment option that can improve the quality of life for cancer patients and survivors. Studies are ongoing, and early results confirm this treatment's power and precision. Proton therapy's unique properties can improve outcomes for many patients with spinal or paraspinal malignancies.

A study of proton therapy for adolescent and adult patients with extracranial chordoma (ECC) concluded that proton therapy "is safe and highly effective in patients with ECC without major surgical instrumentation even in view of large, unresectable disease."<sup>1</sup>

## About the Maryland Proton Treatment Center

The Maryland Proton Treatment Center is affiliated with the University of Maryland Marlene and Stewart Greenebaum Comprehensive Cancer Center, an NCI-designated comprehensive cancer center. MPTC is focused on clinical excellence, affordability, accessibility, as well as comfort and convenience for your patients. In addition, our team has initiated the Maryland Proton Alliance to bring the latest research and clinical trials to patients and physicians. We have taken a leadership role in the industry by offering proton therapy at the same cost as IMRT.

MPTC provides a unique level of proton therapy experience and expertise. Our University of Maryland Department of Radiation Oncology physicians have a combined 20-plus years of proton therapy experience. Associate Professor and MPTC Medical Director Charles Simone has more than 5 years of experience from the University of Pennsylvania Proton Therapy Center; Professor Robert Malyapa has more than 12 years of experience from the Paul Scherrer Institute, which is world renown as a key innovator of proton therapy, and University of Florida Proton Therapy Institute; Assistant Professor Adeel Kaiser has three years of experience from the Loma Linda Proton Therapy Center and Assistant Professor Shahed Badiyan trained at the Paul Scherrer Institute.

## Contact Information

To refer a patient or to discuss treatment options with one of our physicians, please call **410-369-5200** or email us at **[info@mdproton.com](mailto:info@mdproton.com)**.

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<sup>1</sup> "Spot-scanning-based proton therapy for extracranial chordoma." Int J Radiat Oncol Biol Phys. 2011 Nov 15;81(4): 489-496.