Overview
Proton therapy is a powerful treatment tool for fighting a variety of cancers, and it is now available to patients at the Maryland Proton Treatment Center (MPTC). Physicians at MPTC use the most advanced form of proton therapy, called pencil-beam scanning (PBS), or intensity modulated proton therapy (IMPT) to target tumors with unmatched precision, while minimizing damage to surrounding healthy tissue.

When any part of the body is radiated a second time, the risk of short- and long-term side effects increases.

Proton therapy can be used for re-irradiation of almost any disease site. The ability of proton therapy to spare normal tissues that have been previously irradiated can be particularly helpful for this high-risk scenario.

According to a 2014 study, “there are special cases where proton therapy may offer a substantial potential benefit compared to photon treatments where toxicity concerns dominate. Re-irradiation may theoretically be made safer with proton therapy due to lower cumulative lifetime doses to sensitive tissues.”

For this reason, patients who have previously received radiation from prior cancers are often good candidates for proton therapy’s precision targeting. For 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.

IMPT can allow for dose escalation, resulting in potentially improved cure rates. IMPT is also well suited for tumors with complex shapes: the proton beam “paints” the radiation on layer-by-layer. These attributes allow physicians to treat tumors aggressively while reducing the risk of short- and long-term side effects of re-irradiation.

Proton Therapy Versus Photon Therapy
One reason proton therapy is so promising in re-irradiation scenarios is that the highly targeted proton beams go to the site of the tumor and stop, eliminating “exit radiation.” Like photon therapy, proton therapy can be used alone, or in conjunction with surgery and/or chemotherapy.

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).

MPTC-Specific Clinical Trial Offerings
MPTC is dedicated to advancing scientific knowledge about the role of proton therapy in the treatment of cancer. All patients treated at the center have access to a wide range of clinical trials available through the Maryland Proton Alliance. Plans are also underway at MPTC to open in-house clinical trials in addition to multi-institutional trials.

Clinical trials at MPTC will soon include:
• NCT01730950: Randomized Phase II Trial of Concurrent Bevacizumab and ReIrradiation Versus Bevacizumab Alone as Treatment for Recurrent Glioblastoma

NCT01255748: Evaluation Tracking Project: A Prospective Chart Review of Patients Treated with Radiation Therapy (available now)

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

Published Research and Outcomes
The Maryland Proton Treatment Center is led by nationally recognized radiation oncologists from the University of Maryland School of Medicine who are involved in cutting-edge research and clinical trials.

Your patients may be hesitant to explore new treatment options and may pose questions related to side effects and outcomes. Proton therapy’s unique properties can improve outcomes for many patients with a variety of cancers who are undergoing radiation for a second time.

A 2013 study of patients with chordoma found that “full-dose proton re-irradiation of recurrent chordoma is clinically feasible and provides encouraging initial local disease control and survival.” Likewise, a 2015 study of pediatric intracranial ependymoma found proton therapy to be “safe and efficacious.”

In 2016, researchers examined re-irradiation for patients with esophageal cancer and their data showed that “proton re-irradiation is feasible, with an encouraging symptom control rate, modest radiation-related toxicity, and favorable survival in this high-risk population.” For patients with locally recurrent head and neck cancers, re-irradiation represents “the only potentially curative option,” according to a 2016 multi-institutional study of early outcomes. The researchers concluded that “Proton beam re-irradiation of the head and neck can provide effective tumor control with acceptable acute and late toxicity profiles likely because of the decreased dose to the surrounding normal, albeit previously irradiated, tissue.”

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.

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.

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