Fred Hutch Cancer Center

A Guide to Proton Therapy for Patients with Prostate Cancer

More than 268,000 new cases of prostate cancer are diagnosed in men every year. For most patients with prostate cancer, radiation therapy is a treatment option. However, excess radiation from standard therapy that uses X-rays can cause side effects years or decades later. These side effects include erectile and bladder dysfunction, and a small risk of secondary cancers. To avoid treating healthy tissue, doctors often reduce the optimal dose to the prostate. An alternate option to standard therapy using X-rays is proton therapy.

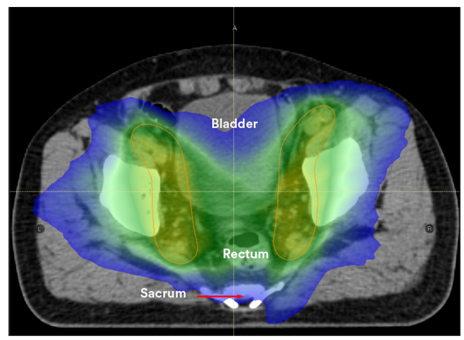
Advantages of Proton Therapy

Proton therapy is a next-generation, precisely targeted radiation technology developed to treat tumors. With proton therapy, radiation oncologists can deliver higher, more effective doses while minimizing radiation to healthy tissue because protons can be more precisely controlled to release most of their energy within the prostate.

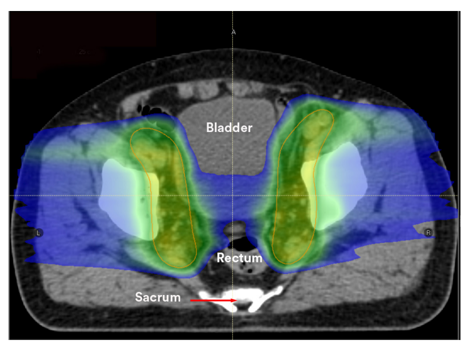
One study found that proton therapy does not suppress testosterone in patients with prostate cancer[1]. Testosterone is the major male hormone that controls sex drive and overall energy and stamina. Clinical trials report that patients with lower-risk prostate cancer who get proton therapy have a cure rate of 90–99% at five years. These trials also reported only a 1–2% risk of serious side effects and great quality of life.

Proton Therapy vs. Standard Therapy with X-rays

Standard radiation



Proton therapy



Radiation levels

Less Radiation — More Radiation

The illustration of treatment plans for prostate cancer with pelvic node involvement shows the difference between proton therapy on top, where less healthy tissue is is subjected to radiation, and standard X-ray radiation on the top, where more radiation affects surrounding, healthy tissue.

About Proton Therapy

The Bragg Peak

During proton therapy, a beam of subatomic particles called protons is sped up in an accelerator and then aimed at the tumor. The nature of protons is such that the radiation dose increases suddenly, in what is called a Bragg Peak. Then the radiation falls effectively to zero. This allows radiation oncologists to precisely target tumors, minimize radiation to healthy tissue in front of the tumor, and avoid healthy tissue behind the tumor. Radiation oncologists can spread the Bragg Peak to cover the entire tumor.

The advantages of Pencil Beam Scanning (PBS)

PBS is the latest proton technology that allows for even greater accuracy when treating cancer with proton radiation. PBS uses a narrow proton beam to paint the tumor with radiation. Because the pencil beam can be targeted even more precisely, higher, more effective doses can be used. The pencil beam deposits radiation starting at the deepest layer, and works slice by slice through the tumor.

About our specialists

All our radiation oncologists are faculty at the University of Washington School of Medicine and all are board certified.

Many patients with prostate cancer are good candidates for proton therapy. To better understand the use of proton therapy in your treatment, call to schedule a consultation with a radiation oncologist. The radiation oncologists who practice at Fred Hutch Cancer Center and UW Medicine use many forms of radiation to treat prostate cancer. They will provide you with an expert treatment recommendation to consider.

References

1. Acta Oncol. 2013 Apr;52(3):492-7. doi: 10.3109/0284186X.2013.767983. Kil WJ1, Nichols RC Jr, Hoppe BS, Morris CG, Marcus RB Jr, Mendenhall W, Mendenhall NP, Li Z, Costa JA, Williams CR, Henderson RH.

2. Int J Radiat Oncol Biol Phys. 2014 Mar 1;88(3):596-602. doi: 10.1016/j.ijrobp.2013.11.007. Mendenhall NP1, Hoppe BS2, Nichols RC2, Mendenhall WM2, Morris CG2, Li Z2, Su Z2, Williams CR3, Costa J3, Henderson RH2.

Find out more.

To learn more about proton therapy for prostate cancer or to schedule a consultation, please call us at (888) 645-6934 or visit **FredHutch.org/protontherapy**

Fred Hutch Cancer Center - Proton Therapy
Located on UW Medicine's Northwest Campus
1570 N. 115th Street