Proton Therapy for Prostate Cancer: Your Questions, Our Answers.

When you’re looking for the right treatment for your prostate cancer, nothing’s more important than accurate information. Read on, and learn the truth about prostate cancer, proton therapy, cure rates and side effect risks. If you still have questions, visit us at floridaproton.org, or call 1-877-686-6009.
Q: Are there clinical data that show proton therapy is an effective cure for prostate cancer?

A: There are. Long-term data from Loma Linda University shows that proton therapy is an effective prostate cancer treatment. More important, a recent study showed that proton therapy successfully treated prostate cancer with a very low risk of severe side effects to the bladder or rectum.

Q: What’s the cure rate for prostate cancer patients treated with proton therapy? How does it compare with other radiation treatments?

A: The cure rate is high but it’s important to remember that, no matter which treatment is used, the cure rate ultimately depends on the radiation dose used. (Mendenhall et al. AJCO 31: 496-503, 2008).

While an early Loma Linda study put proton therapy’s 5-year cure rate around 73%, we now know that proton radiation doses need to be higher to increase the rate of cured patients. Later studies of proton-based therapy have achieved very high cure rates (97% JAMA, Zeitman, 2008) with fewer of the complications associated with conventional radiation therapy at similar high doses.

Proton therapy shares a high cure rate with other treatments, including brachytherapy and IMRT. The difference is in the risk for severe side effects to the rectum and bladder: 99% of patients treated with proton therapy are free from these side effects. (Slater et al. UROBJ 59: 348-352, 2004).

Q: How much more effective is proton therapy than Intensity-Modulated Radiation Therapy (IMRT)?

A: When we look at patients who have similar cases of prostate cancer, cure rates with IMRT and proton therapy are comparable. The big difference between IMRT, brachytherapy and proton therapy is seen in radiation levels – and how those levels affect delicate tissues in the bladder and rectum.
Q: Is proton therapy driving up health care costs?

A: Proton therapy does have a higher initial cost than other prostate cancer treatment options. However, patients who receive proton therapy are less likely to experience costly side effects - including secondary cancers and severe problems with the bladder and rectum. This means that, in the long term, proton therapy may be less expensive than other treatments. It’s also important to remember that, as proton technology becomes more widespread, the costs associated with it are likely to decrease.

Q: Does stray radiation from proton therapy cause secondary cancers?

A: No. In fact, some data suggests that the risk of secondary cancers is actually lower with proton therapy. When proton therapy is used to treat cancer in other parts of the body, long-term data shows a reduced risk of secondary cancers.

Q: Does an uncertain dose fall-off make proton therapy an imprecise treatment?

A: No; it’s the predictability of proton therapy's dose fall-off that makes it such an excellent choice for cancer treatment. Thanks to the unique nature of protons, physicians are able to ensure that radiation stops at the tumor, so there's no “exit dose” or damage to healthy tissues. Protons are so precise that they were used successfully for decades at the Harvard cyclotron to treat skull base tumors, with excellent long-term outcomes.

Q: I’ve been told that the cure rate with proton therapy is less than one-half the cure rate with either radical prostatectomy (76%-80%) or ProstRcision® (83%). Is this true?

A: No. The cure rate after surgery is similar to the cure rate after radiation with either IMRT or protons. However, the risk of urinary incontinence and erectile dysfunction is higher after surgery than with proton therapy. (Mendenhall et al. AJCO, opus, 2010).
Q: How old is proton therapy? Is the technology still relevant?

A: Although the technology that proton therapy is based on originated many decades ago, so did the technology behind X-ray and gamma rays – and none of these treatments are out of date.

What makes proton therapy a modern choice for cancer treatment is the method of radiation delivery, making protons applicable to a greater variety of tumors, including prostate cancer. Only recently has proton radiation been available in large gantry delivery systems, which make proton delivery possible to cancers throughout the body.

Q: Does proton "scattering" spread the radiation dose beyond the tumor site?

A: Not at all. There is minimal radiation to surrounding normal tissues with proton therapy compared with conventional external beam radiation. What's more, the radiation dose to surrounding normal tissues is higher after IMRT compared with protons, so the chance for IMRT-related side effects is higher.

Q: I've heard IMRT is better for prostate cancer treatment because the photons can be manipulated into the same spherical shape as the prostate. Is this true?

A: No. The prostate is not spherically shaped, and neither are most prostate cancers. However, no matter what shape the tumor takes, proton beams produce a tighter, more accurate dose compared to IMRT.
Q: How does proton therapy compare to robotic surgery?

A: Success rates for proton therapy and robotic surgery are similar. (Mendenhall et al. AJCO, epus, 2010).

Once again, the main difference in these treatments is related to side effects – especially incontinence and impotence.

In 30% to 50% of prostate cancer cases, the cancer extends beyond the gland itself. In these cases, a radical prostatectomy may not remove all of the cancer and postoperative radiotherapy is necessary to reduce the risk of dying from prostate cancer. (Mendenhall et al. AJCO 32: 529-324, 2009; Trock et al. JAMA 299: 2760-2769, 2008).

Prostate cancer is most likely to extend outside of the gland along the neurovascular bundles, the parts that are spared during a nerve-sparing prostatectomy. So, a nerve-sparing prostatectomy is even more likely to leave some cancer behind. Prostate cancer can also spread to the apex of the prostate, where the risks of damaging the urethra compete with the benefits of surgically removing all the cancer.

With proton therapy’s precise dosing, all areas of the tumor can be destroyed with a low risk of side effects – even if the tumor reaches beyond the prostate or near delicate tissues.

Q: How does proton therapy compare to brachytherapy?

A: As far as cure rates go, proton therapy and brachytherapy have been shown to produce similar outcomes. Patients undergoing brachytherapy, however, may be more likely to experience side effects, especially severe toxicity to the bladder and rectum.

What’s more, some patients are given hormone therapy to make them more favorable for brachytherapy; it is important to know two things about this practice. First, these patients may have a higher complication rate than with brachytherapy alone; and second, they may also have complications from the hormone therapy. These complications may include hot flashes, fatigue, depression, loss of libido, and erectile dysfunction. (Mendenhall et al. AJCO 32: 443-447, 2009). Some of these symptoms may remain even after hormone therapy is stopped.