

Dr. Leslie Ballas: Radiation is a little bit hard sometimes to comprehend. It's important to understand exactly what we're talking about. So it's a local treatment and it only works where we target it where we aim it. It's basically a super high energy X-ray.

So you can't see it. You can't feel it when it's being delivered. It's not delivered like an MRI in a confined space, so people who are claustrophobic don't have problems with it. There are different types of radiotherapy. Radiotherapy or radiation is a very large umbrella category of different things, and we break it down into the most, sort of, broad categories.

There's external beam radiation, radiation delivered from the outside. There's a machine that looks like a giant X-ray machine, and you lay still and it moves around you. We use image guidance every day to direct radiation to the correct spot. Usually, it's given in small daily doses or what we call fractions to add up to the total dose...needs to be delivered in order to treat the prostate cancer.

There are lots of...give the radiation. Sometimes we give it in more frequent smaller pieces. Sometimes we give it in less frequent larger pieces. And that when you do that, when you give it in less frequent, larger pieces, it's called stereotactic radiation. I always tell patients that it's—radiation dose is like pumpkin pie. You're going to eat the whole pie.

Your tumor is going to see the whole dose. It's just a matter if you want to eat that pie in lots of little pieces or slightly bigger pieces.

The second large group, within radiation therapy, is Brachytherapy. And that's an internal delivery of radiation either from seeds that get implanted into the prostate or from catheters, which kind of look like needles that get inserted into the prostate from the outside of your body so that the radiation can—a radioactive pellet can be delivered through the catheter and into the prostate gland and then it comes out...Which type of radiotherapy is best for you depends on what you are looking for, your anatomy, and where in the disease spectrum you are. I like to always break things down into pros and cons. Everything in life has pros and cons, everything in medicine has pros and cons. External beam radiotherapy is probably the most well-tolerated.

There is no procedures associated, no anesthesia. However, small amounts of dose can be delivered to normal surrounding structures with brachytherapy. It's a very localized delivery of treatment in certain cases, it is delivered in conjunction with external beam that's commonly done in high-risk and very high-risk patients. It may also decrease the amount of time that you need hormones, and a very important use for brachytherapy, which we're not

going to really get into on this call, is that it can be used for local recurrence following prior radiation.

Commonly there's this concern that "if I get radiation as my primary treatment, I'm not going to be able to get further radiation." And while that is, you know, generally correct, there are situations where you can get brachytherapy for recurrence following prior radiation. However, brachytherapy is two procedures and anesthesia is commonly required. And you know, there are potentially some additional urinary side effects that go along with it or the need for a catheter.

Stereotactic radiotherapy again, is the more—the higher dose, fewer number of treatments can be more convenient type of external beam radiation, but possibly may have increased side effects, you know, in the 9 to 15 months that follow radiation.

Proton therapy, something that is advertised on the radio, is, you know, a treatment option that's offered in, you know, a few centers around the country.

Not every center has that. And the benefit is theoretic, it's theoretical. It's that you potentially have less dose to normal surrounding structures. And, of course, there isn't any procedure or anesthesia. It's a type of external beam radiation and it has never been compared head to head with external beam radiation. There are trials ongoing at Penn and Mass General looking at this exact question. Because it's only offered in select places with no proven benefit, there might be the financial toxicity associated with relocating to one of the centers that offers proton therapy.

... Are there other things involved with radiation, other sort of special things that your doctor may or, you know, may talk to you about, when you get radiation, especially external beam radiation, your doctor may speak to you about what are called hydrogel spacers, something that is implanted between the rectum and the prostate to create space between those two organs, to help minimize side effects from radiation to the rectum.

Lowering the dose of radiation to the rectum means less side effects. These products are on the market. Not every patient is a candidate. If you have evidence of extracapsular extension, the disease has spread, you know, and kind of broken through the capsule of the prostate. You may not be a candidate. And so it's important to discuss with your doctor, you know, these products and whether or not you will be able to tolerate them.

There are side effects associated with the implantation. And of course, if you are a candidate, you need to have a frank discussion about what those side effects are.

Fiducial markers are also used. Typically they're gold seeds inserted into the prostate that help localize the prostate for each treatment. These are not radioactive seeds like brachytherapy because they don't emit radiation.

They are only used for localization and targeting. Not every institution uses fiducial markers, and you don't necessarily need them. And so it is important to understand, when talking with your doctor, are you a candidate for these things? Why or why not? Do the physicians choose to use them? And that is obviously part of any discussion with the radiation oncologist.

I, you know, welcome questions. The topic of radiation is broad and somewhat complex. And so, Dr. Klaassen, if you have any questions that might help patients find how to understand?

Dr. Zachary Klaassen: Thank you, Doctor Ballas. So we have about one minute for questions. So the one I want to ask, which I think is probably one of the most important, is how does a patient know what schedule and what type of radiation is correct for them?

Dr. Leslie Ballas: I think really that is about talking with your doctor and saying, "hey, what are my options in terms of radiation?"

Having the doctor lay out what the potential side effects from each treatment are, and then you as a patient saying, "hey, with brachytherapy added to the external beam, I may get a 15 to 20% increase in the ability of this to, you know, my PSA to be controlled by prostate cancer, but no overall survival benefit. I don't want to have two anesthesia treatments. and have, you know, catheters inserted into my prostate. If I'm not really going to get an overall survival benefit." And it may come with additional side effects.

So I think it's really about, as is everything, I think with prostate cancer, understanding what the treatment ramifications are for you and what you feel comfortable with and what you can live with in terms of daily side effects or toxicity.

Dr. Zachary Klaassen: Yeah. Well said. Dr. Ballas, thank you for that great overview. I'll bring Becky in to introduce our next session.