

Frequently Asked Questions

1. How does radiation kill cancer?

Cancer is made of abnormal cells that tend to grow without control. Cancer DNA is more sensitive to radiation than normal cells. Radiation kills cancer cells directly or when the cells attempt to multiply while normal tissue in the region is able to repair and recover.

2. What is Brachytherapy?

The prefix “brachy” is the Greek word for “short” distance. Brachytherapy is a form of radiation treatment where radioactive sources are placed in or near cancerous tissues. The radiation sources may be inserted either permanently or temporarily. The two most common forms of brachytherapy treatment are low dose rate (LDR) permanent seeds for prostate cancer and high dose rate (HDR) temporary brachytherapy, that can be used for any localized cancer.

3. What is High Dose Rate (HDR) Brachytherapy?

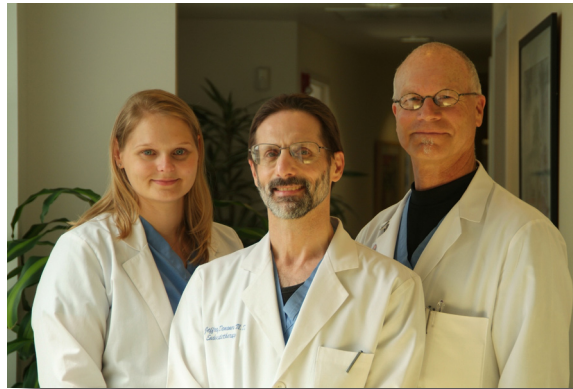
HDR brachytherapy is a technically advanced form of brachytherapy. A high intensity radiation source is delivered with millimeter precision under computer guidance directly into the tumor killing it from the inside out while avoiding injury to surrounding normal healthy tissue.

4. What are the advantages of HDR Brachytherapy?

- Improved accuracy and precision of radiation dose delivery.
- Knowledge of radiation dose distribution before treatment is given and a minimized area of radiation overdose (hot spots) or underdose (cold spots).
- Ability to shape the radiation dose to fit the tumor.
- Control of adjacent organ doses resulting in fewer side effects.
- No risk of radiation source (seeds) migration into other organs and no radiation exposure to other people.
- Shortest course of treatment (days rather than weeks to months as required for permanent seeds or external beam).
- Excellent coverage of possible microscopic extension of cancer and effective treatment for cancer recurrence, “salvage” therapy.
- Organ motion (target movement) is not a problem for HDR as it is with external beam.

5. How successful is HDR Brachytherapy?

HDR brachytherapy is proven to be effective for the treatment of local disease in many forms of cancer including **prostate, gynecologic, breast, head and neck, esophagus, lung, anal/rectal, bile duct, sarcoma**, and other primary cancers or localized metastasis as reported in medical literature. CET’s findings on prostate cancer, for example have demonstrated 90% 10-year tumor control for HDR/EBRT combined therapy and a 96% 5 and 8 year disease free survival rate for HDR monotherapy. Success rates for other tumors vary according to the type and stage of cancer being treated.

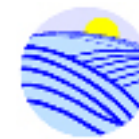


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- California Endocurietherapy Cancer Center (CET) is the first brachytherapy only center in the United States.
- Founded by D. Jeffrey Demanes, M.D. in 1981.
- Dedicated solely to High Dose Rate (HDR) brachytherapy since 1991.
- Most experienced HDR brachytherapy center in the country.
- Over 8,500 implants performed and over 17,000 treatments delivered.
- A training destination for physicians and residents.
- Innovations in HDR brachytherapy equipment design and protocol development.
- Dedicated to long-term patient follow-up, outcome studies, and publications in medical journals.

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CET Cancer Center

Founded by D. Jeffrey Demanes, M.D. in 1981

High Dose Rate Brachytherapy Specialists
26 years of brachytherapy experience

Prostate Treatment

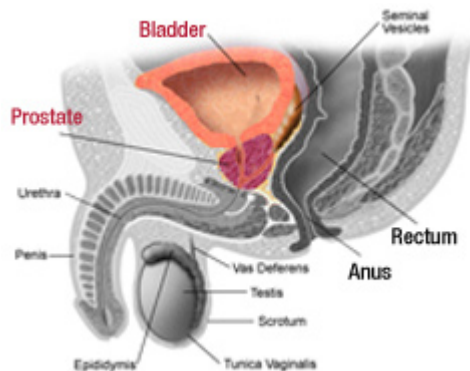


Questions and
Answers
about
High Dose Rate
Brachytherapy

Prostate Cancer and HDR Brachytherapy

Who Qualifies for High Dose Rate (HDR) Brachytherapy?

- Patients who want an alternative treatment method to a radical prostatectomy, external beam radiation alone or permanent seeds.
- Patients with any stage of disease (T1-T3b).
- Patients who may/may not have extra-capsular extension, seminal vesicle invasion or perineural involvement.
- Patients with any PSA value.
- Patients with any Gleason score without evidence of distant metastatic disease (ie. lung, bone).
- Patients who have had a prior transurethral resection of the prostate (TURP) and even those with recurrent local disease after radical prostatectomy, external beam radiation or permanent seed implants.



What can I expect during the HDR Brachytherapy prostate treatment?

While each procedure will be tailored to the individual patient needs, the following are typical procedures that you can expect during your treatment.

- The procedure is performed in the operating room using spinal anesthesia, which numbs your body from the waist down, and/or general sedation.
- For the procedure you will lay on your back, knees bent and in holders (stirrups). When you are in position, the perineum (skin between the testicles and rectum) will be washed with a cleansing soap.
- A cystoscopy (scope in the bladder) and sigmoidoscopy (scope into the rectum) will be performed to visualize the anatomy before placement of the implant.
- A urinary catheter will be inserted into the bladder and a transrectal ultrasound (TRUS) will be utilized for identification of the prostate gland.
- With the use of TRUS and fluoroscopic guidance, the implant needles are carefully inserted through the skin's surface into the prostate gland. At CET we use a non-fixed template technique for placing the treatment catheters, called "flexiguides" around and through the prostate. The physicians can tip and angle the non fixed template allowing them to flare the flexiguides so as

to encompass any size prostate gland as well as any perineural, extracapsular disease or seminal vesicle involvement that may be present.

- Once the implant needles are in position, the template is sutured to the perineum and immobilized. You are then brought to the recovery room where the nurses will monitor your vital signs and ensure that you are comfortable with your anesthesia. From this point forward it's important that you don't sit up >10 degrees in the bed due to movement and pressure on the implant.
- After proper monitoring you are brought to the CET facility by transportation. X-ray and CT scans are taken to verify the position of the implant needles and assist the physician in defining precisely where the radiation will be delivered.
- Once the prescription is finalized you will be brought into the treatment room where the implant needles are connected to the high dose rate remote afterloader machine. This machine houses the tiny radiation source which will be used to treat your prostate cancer. The machine will be programmed with your individualized treatment plan.
- The machine sends the radiation source (Ir192) into the prostate applicator needles during treatment. At this time you may hear the movement of the source within the machine but you will not feel anything.



- CET staff monitor your radiation treatment and maintain constant communication with you throughout the treatment delivery.
- It's important to remain still during the radiation treatment, which lasts only 15-20 minutes. The entire process of setting the patient up before the radiation delivery however lasts a few hours.
- Upon completion of the treatment, the radiation source automatically returns to the protective storage unit inside the HDR afterloader. The implant needles are disconnected from the machine but the template with the needles remain in your perineum.
- Afterwards, you will be transferred to the hospital's nursing department where you will stay over night and receive either one or two more radiation treatments the following day depending on the physician's prescription. Remember you are not radioactive after your treatment.

- After the final radiation dose has been delivered on the second day, the implant needles and template are removed from the perineum. The urinary catheter is also removed and you may go home that afternoon and return to a normal routine within a few days.
- One week later you are brought back to the operating room where a second implant will be placed for your second round of radiation treatments.
- All prostate patients have two implants but the number of radiation treatments (2 or 3) per implant depends upon the physician's prescription. The physician will discuss this with you prior to your first implant.

What are the side effects of HDR Brachytherapy?

Post-HDR acute side effects usual last two to four weeks and vary from patient to patient. These include urinary frequency, urgency, dysuria (burning with urination), and occasionally urinary retention. There may also be some slight rectal irritation. The perineal area will be tender for a few days so activities like bicycle riding that put pressure on this area should be avoided. Medications are prescribed to help alleviate these temporary side effects.

CET Publication Highlights

For both studies cited below, the following three risk groups were established:

- Low = Stage T1c or T2a, Gleason ≤ 6 , and PSA level ≤ 10 ng/mL.
- Interm. = Stage T2b, T2c, Gleason 7, & PSA level 10–20 ng/mL.
- High = Stage T3, Gleason 8–10, & PSA level >20.

Combined Therapy-Our ten-year outcomes and morbidity results of high-dose-rate brachytherapy (HDR) combined with external beam radiation therapy (EBRT) for localized prostate cancer were recently published. The sample contained 209 consecutive patients (from all 3 risk groups) with no prior hormone suppression that were treated between Sept. 1991 and Dec. 1998.

- **The clinical control rate was 90% (188 of 209).**
- **The cause-specific survival rate was 97%.**
- The PSA progression-free survival (ASTRO) rate was 90%, 87%, and 69% for the low-, interm.-, & high-risk groups, respectively.
- Low rate of Grade 3 & 4 urinary morbidity; No Grade 3 & 4 rectal morbidity.

Monotherapy-Our five-year follow-up results and morbidity for patients who were treated with HDR brachytherapy alone for prostate cancer was recently presented at the ASTRO annual conference. The sample was limited to low and intermediate risk groups.

- **The clinical control rate was 99% (116 of 117).**
- **The cause-specific survival rate was 100%.**
- The PSA progression-free survival (ASTRO) rate was 96%.
- Low rate of Grade 3 urethral stricture & catheterization morbidity; No Grade 4 urinary side effects were observed; No Grade 3 & 4 rectal morbidity.

For more details, please visit www.cetcancercenter.com/publications.html