

Brachytherapy in the Treatment of Tumors of the Female Reproductive Tract

Information Sheet

General indications for the proposed procedure/treatment:

This procedure is done as part of treatment for malignancy of the female reproductive tract. Organs of the female reproductive tract include the vulva (the part of the body immediately around the opening of the vagina), the vagina (birth canal), the cervix (the neck of the uterus) and the uterus (the womb).

Description of the proposed procedure/treatment:

“Brachytherapy” is a technique to deliver radiation therapy by temporarily placing radioactive material inside the body to treat cancer. Intracavitary brachytherapy uses cylinders or tubes that are inserted into natural openings and channels, such as those of the vagina and uterus. Interstitial brachytherapy uses needles or catheters to directly insert radioactivity through tissue into the tumor area. Either way, the purpose of brachytherapy is to place radioactive material directly into or next to tumor bearing tissues as part of radiation treatment.

Categories of brachytherapy: Low dose rate and high dose rate brachytherapy

There are several ways of delivering brachytherapy. “Low dose rate” brachytherapy uses low intensity radioactive sources that deliver the radiation relatively slowly. This approach involves leaving the radioactive material in place inside the holders continuously for between 24 – 48 hours. Often 2 sessions are needed, separated by 1-2 weeks, to deliver the optimal dose of radiation. While the radioactive material is in place, visitors are limited. When done this way, inpatient hospitalization in a private room is always required. The patient must stay in bed with little movement and a catheter is placed into the bladder so that the urine flows out into a bag. Medicines are given to prevent need for bowel movement during this time. Pain medications and other medications for comfort are available, as needed.

“High dose rate brachytherapy” uses higher intensity radioactive sources, that are placed inside the after-loading devices and delivers the radiation quickly, typically over 10 – 20 minutes for a treatment session. These sessions are done in the radiation department. The sources move into the holders painlessly through catheters from a specially shielded safe that holds the radioactive sources. If the patient is hospitalized, visitors are allowed because there is no radioactivity that stays in the patient between treatment sessions. Several HDR sessions are usually required. Sometimes the sessions are done twice a day for 1 – 2 days (3 - 4 sessions). Sometimes the sessions are done once a week over several weeks in association with external beam radiotherapy.

The reasons for choosing between interstitial and intracavitary treatment are technical, tumor-specific, and patient specific. Intracavitary treatment is almost always the first

choice, if it can be used, to provide an adequate treatment. Similarly, the reasons for choosing low dose rate or high dose rate treatment can be technical and also patient specific. In both cases the choices made are generally those that are felt to represent the safest and most effective approach for each patient

Types of brachytherapy

Intracavitary radiation:

1) Vaginal cuff radiation

If treatment is limited to the vagina (such as after a hysterectomy), a non-radioactive, hollow cylinder is placed in the vagina. Often, this can be done in the radiation department. No anesthesia is required. A CAT scan is obtained to check the position of the cylinder and to plan the radiation. After planning is completed (which may take up to an hour), small radioactive sources (which look like “pellets”) are inserted into precise, predetermined positions in the cylinder and left in place for a predetermined period of time (generally minutes). After treatment is completed, the vaginal cylinder is removed. This is almost always done with high dose rate brachytherapy.

2) Cervix and intrauterine radiation

If treatment includes the cervix, non-radioactive hollow holders or tubes are placed in the vagina, the cervix, and the uterus in the operating room under anesthesia. These holders or “after-loading devices” are held in place with special packing material. An x-ray is obtained to check the position of the devices. After recovery from general anesthesia, the treatment is then planned using a CAT scan to check the device positions and determine how and for how long the radiation should be delivered. Following this planning, small radioactive sources (which look like “pellets”) are inserted into precise, predetermined, positions in the holders and left in place for the necessary amount of time to deliver the planned radiation dose. After treatment is completed, the radioactive sources and then the holders are removed. Taking out the holders does not require anesthesia.

Interstitial radiation:

Multiple pointed catheters are put directly into the cancer with a “template” that helps guide precise positioning of the catheters. These are put in place in the operating room under anesthesia. Xrays pictures are used to help guide catheters placement. After recovery from anesthesia, A CAT scan is obtained to check the position of the catheters and plan how the radiation sources should be placed and for how long. After treatment is completed, the radioactive sources and then the catheters are removed. Taking out the catheters does not require anesthesia

Material risks and benefits of the procedure:

The risks of these procedures are associated both with the insertion of the devices and the use of radiation.

1. When general anesthesia is required, there are risks involved and the patient will be given a separate information sheet about this.
2. When general anesthesia is not required, there may be some mild to moderate discomfort at the time of insertion.
3. When intracavitary insertion is done, there is some risk of bleeding (usually minimal), infection, or clinically important damage to an involved or nearby organ. Occasionally the uterus is accidentally perforated (has a hole punctured from inside the uterus to outside the uterus). This is almost always recognized at the time and the holder is removed or repositioned without any noticeable consequence.
4. When interstitial insertion is done, the risk of bleeding, infection, or perforation of the bladder, rectum, or intestine is higher but usually without any short term or long term important consequence.
5. When brachytherapy is used requiring a hospital stay, there is some risk of blood clots forming in the veins of the legs or pelvis because of the required inactivity. To minimize this risk, low-dose blood thinners may be used and/or compression devices may be placed on the legs.
6. Radiation can cause tissue irritation or damage. Tissue irritation, if it occurs, is usually mild, occurs within a few days of treatment, and resolves within 1 – 2 weeks. Months or years after treatment, signs of radiation damage may occur in the areas treated and can include scarring or thickening of tissue, bleeding, obstruction or narrowing of vagina, rectum, or urethra. The chance of serious or life threatening complications occurring is usually around 5% but can be higher or lower depending on the details and specifics of treatment
7. In women of childbearing age the use of radiation treatment may cause permanent onset of menopause.

Procedure alternatives, if any:

In situations where brachytherapy is the best choice, there may or may not be a good “second” choice. Sometimes surgery or higher doses of external beam radiotherapy are used.

Probable consequences of refusing the recommended procedure:

In situations where brachytherapy is the best choice, the refusal of brachytherapy may compromise the chance of tumor control, increase the chance of complications, or do both.

Person(s) providing the procedure/treatment:

Radiation Oncology Doctors
Gynecology Oncology Doctors
Radiation Therapists
Radiation Nurses
Radiation Dosimetrists and Physicists

All decisions regarding the type and use of radiation therapy are made by a *Radiation Oncologist* and *Gynecological Oncologist* who are physicians on the medical staff of Rush University Medical Center. They are either Board Certified or Board Eligible (in the process of becoming Board Certified) by national organizations in their specialty. The Radiation Oncologist designs, implements, and supervises all aspects of the radiation treatment. He/she is often assisted by a resident physician. Resident physicians are licensed physicians in an approved residency program. Their level of participation varies depending on their level of training and ability.

The Radiation Oncologists are assisted by *Radiation Therapists*, *Radiation Nurses*, *Radiation Dosimetrists* and *Radiation Physicists*. *Radiation Therapists* are licensed and certified technicians who trained to assist the patient at the time of treatment and to administer the daily radiation treatments according to the instructions of the Radiation Physicians. *Radiation Nurses* are licensed nurses with special training and certification in Oncology Nursing. *Dosimetrists* are master level technicians with special training and certification in designing radiation treatments. *Radiation Physicists* are Ph.D. level physicists who have taken special training in Medical Physics. Medical Physics is the discipline that supports the use of radiation for treating patients. The patient may or may not see all the individuals involved during the treatment.