



## FACTS ABOUT BREAST CANCER

Breast cancer is the most common type of cancer in American women, according to the American Cancer Society. This year, 230,480 women and 2,140 men will learn they have breast cancer. Another 57,650 women will learn they have noninvasive (also called in situ) breast cancer. Breast cancer can often be cured. About 80 percent of all patients with breast cancer live at least 10 years after their diagnosis.

## TREATING BREAST CANCER

### Surgery

The main curative treatment for breast cancer is surgery. This is often followed by radiation therapy to decrease the risk of cancer returning in the breast, chest wall and/or lymph nodes.

Breast conserving surgery involves surgical removal of the cancerous tissue along with a small rim of surrounding healthy breast tissue to preserve as much of the normal breast as possible. This type of surgery is called a lumpectomy or partial mastectomy and is often followed by radiation therapy.

Mastectomy is surgical removal of the entire breast. Sometimes, breast reconstruction can be performed after the mastectomy. While less common, radiation is sometimes recommended after mastectomy as well.

Often, a select number of lymph nodes near the breast are removed to determine if they contain tumor cells. This procedure is called a sentinel node biopsy. If one or more of the selected lymph nodes are involved with tumor, a more complete removal of lymph nodes may be recommended. This procedure is called an auxiliary lymph node dissection. In most cases, an examination of the lymph nodes is performed with the breast surgery of choice.

Both mastectomy and breast conserving therapy (surgery and radiation) can be equally effective approaches in curing breast cancer. Ask your surgeon and radiation oncologist about the risks and benefits of both options.

### Radiation Therapy

After surgery, radiation therapy can decrease the chance of cancer returning in the breast and improve survival. Radiation therapy involves delivering focused radiation to the breast/chest wall to treat any cancer cells not detected or removed by surgery. Radiation therapy kills cancer cells by destroying their ability to multiply. Surrounding healthy tissue is also affected by radiation and may have some damage. However, healthy normal cells are better able to heal from radiation injury, compared to cancer cells, because they have maintained the ability to repair radiation induced damage.

### Medical Therapy

While surgery and radiation focus directly on treating the breast, medication is often recommended to improve cure rates or prevent a new breast cancer from developing. A medical oncologist will evaluate you and determine what medications may be most helpful in accomplishing those goals.

**Chemotherapy** has the ability to destroy cancer cells by different methods. Often, two or three different types of drugs may be combined to get the best outcome. The dose and schedule for treatment varies, but chemotherapy is usually delivered every two to three weeks for a few months.

**Hormonal therapy** can block the effects of estrogen in the body. The normal female hormone, estrogen, has been shown in some cases to help your tumor grow. Usually taken as a daily pill, this medication may be started during or after radiation therapy is completed.

**Immunotherapy** can stimulate your immune system to help target cancer cells. Some cancer cells overexpress the HER2 molecule, which somehow makes these tumors more aggressive. Currently, trastuzumab has been used to target these aggressive breast cancers with HER2 molecule overexpression.

For more details about these drugs or newer medications, ask your medical oncologist what may be best for you.

## EXTERNAL BEAM RADIATION THERAPY AFTER LUMPECTOMY

After breast conserving surgery (lumpectomy), the usual course of radiation treats only the breast, although you may need to have nearby lymph node areas treated as well. The radiation beam comes from a machine called a linear accelerator or linac. The radiation beam is painless and treatment itself lasts only a few minutes. Treatment is delivered every day, five days a week, Monday through Friday. The full course of treatment is usually delivered over three to seven weeks.

Before beginning treatment, you will be scheduled for a planning session to map out the area your radiation oncologist wishes to treat. This procedure is called a simulation. Simulation involves having X-rays and/or a CT scan. You may also receive tiny marks on your skin, like a permanent tattoo, to help the radiation therapist precisely position you for daily treatment.

Typically, radiation therapy is done with high energy X-rays, or photons, for the bulk of the treatment. When there is a reason to focus the radiation where the lump was taken out, sometimes a “boost” will be given with electrons to treat with a less penetrating, more focused beam instead of photons.

Different techniques can be used to give radiation therapy for breast cancer. Three-dimensional conformal radiotherapy (or 3D-CRT) combines multiple radiation treatment fields to deliver very precise doses of radiation to the breast and chest wall while sparing nearby normal tissue. Intensity modulated radiation therapy (IMRT) is a form of 3D-CRT that further modifies the radiation by varying the intensity of each radiation beam. Doctors are still studying IMRT for the treatment of some types of breast cancer. Talk to your radiation oncologist for more information about the details of your treatment plan.

Recent clinical trials suggest that treatment with whole breast radiation may be shortened by treating with higher daily doses to finish in less time. Ask your doctor for details about the right dose and schedule for your case.

Additional research suggests women aged 70 or older with hormone receptor positive early stage breast cancer benefit from radiation in terms of lowering their risk of getting breast cancer again in the treated breast. This local control benefit, however, has not been shown to affect their long term survival. Because the risks and benefits of radiation differ based not only upon age but other health factors and personal preferences, discuss with your doctor whether radiation is necessary.

## ACCELERATED PARTIAL BREAST IRRADIATION

The present standard of care for the treatment of early-stage breast cancer is a lumpectomy followed by several weeks of whole breast radiation. However, ongoing research suggests that it may be safe to give radiation treatment to only part of the breast, which would allow the radiation to be delivered over a shorter period of time.

In clinical trials, doctors are studying if accelerated partial breast irradiation (or APBI)—where radiation is delivered to only part of the breast over four to five days—works as well as the present standard whole breast radiation. Because APBI is still being studied, it is used more selectively than whole breast radiation.

### There are two different approaches to APBI:

**1. Breast brachytherapy** involves placing flexible plastic tubes called catheters or a balloon directly into the cavity where the lump was taken from. After simulation, the catheters or the balloon are connected to a machine called a high-dose-rate afterloader, which stores a radioactive source. With a special computer, a small, radioactive seed is guided into the catheters or balloon near where the tumor was removed. The radioactive seed is left in place for several minutes, based upon the treatment plan designed by your radiation oncologist. After the end of the five days, the catheters or balloon are removed.

**2. External beam radiation with 3D-CRT** can also treat part of the breast but it is more focused around the area of surgery. Treatment is delivered using the same machine (linear accelerator) and a similar technique as what is used for standard whole breast radiation.

Treatment with both approaches of APBI are typically given twice a day, five days a week. Treatment can be completed in one week. The long-term results of these techniques appear promising but are still being studied. Talk with your radiation oncologist for more information.

## RADIATION AFTER MASTECTOMY

After a mastectomy, your doctor may suggest radiation therapy for the chest wall and often nearby lymph node areas. Whether or not radiation therapy should be used after removal of your breast depends on several factors. These factors include the number of lymph nodes involved, tumor size, and whether or not cancer cells were found near the edge of the tissue that was removed. Many patients who have a mastectomy can safely skip radiation therapy. Ask your doctor for more information.

For women undergoing reconstruction, post-mastectomy radiation may affect your options for reconstruction or the cosmetic outcome. Discuss with your surgeon and radiation oncologist to learn more.

