

Breast Cancer and Treatment

Breast cancer affects nearly 200,000 women each year in the United States.

The risk of developing breast cancer over a lifetime is 1 in 8, or 12%. Breast cancer also develops in men. Each year, about 2,000 men in this country learn they have breast cancer.

A breast cancer can be found on a mammogram, through self-exam, or felt by a doctor. Breast cancers that are very small are often early stage cancers and can be successfully treated. It is important to follow these guidelines for the early detection of breast cancer:

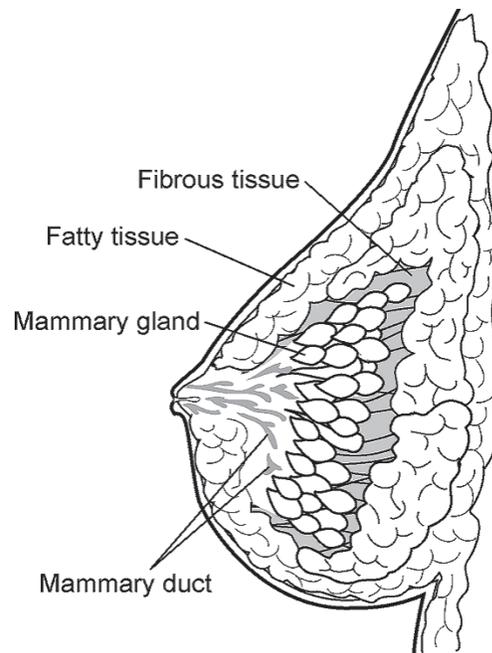
- Monthly breast self-exam
- Yearly doctor exam
- Annual mammograms after age 40

Breast Cancer

Breast Tissue

The breast is made up of different types of tissues. These tissues change in a woman as her hormones change. Before menopause, the breasts are mostly made of dense, fibrous tissue and fat. As a woman passes through menopause, this fibrous tissue often turns to fat.

This causes the breasts to feel much softer and less lumpy. If a woman takes estrogen after menopause, her breasts may often remain fibrous.



This handout is for informational purposes only. Talk with your doctor or health care team if you have any questions about your care.

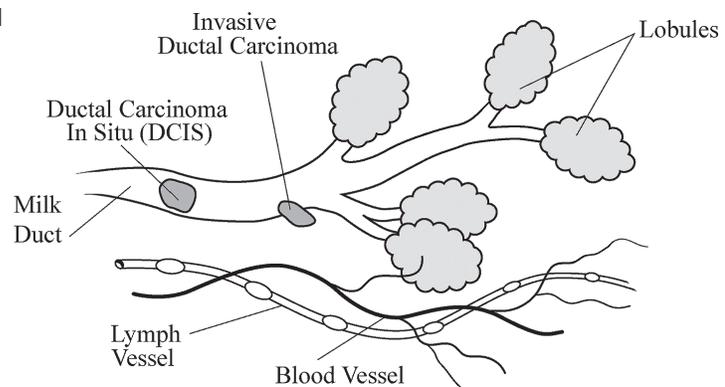
Fibrous tissue can sometimes hide a small cancer and make it more difficult to feel or find on a mammogram. It is important to have annual mammograms and examine your breast regularly. As you become older and have less hormonal effects on your breast tissue, it is easier to see a lump on a mammogram.

Types of Breast Cancer

Here is information on the different types of breast cancer.

- **Infiltrating/Invasive Ductal Carcinoma** (most common type) is a breast cancer that starts in the milk duct and spreads through the ductal wall into the surrounding tissue. Once it has spread, the cells can enter the lymph vessels and blood vessels. These vessels are pathways that can carry cancer cells to other parts of the body.

- **Ductal Carcinoma in Situ (DCIS)** is a non-invasive type of breast cancer. It cannot spread. It is important to surgically remove all traces of the DCIS to improve local control of the cancer.



- **Infiltrating/Invasive Lobular Carcinoma** is a cancer that starts in the lobule of the breast. It has microscopic projections that can break through the lobule wall and start moving into the surrounding tissue. This often makes it a more difficult cancer to diagnose at an early stage. It is treated the same as infiltrating ductal carcinoma, although sometimes it may be difficult to get clear lumpectomy margins.
- **Inflammatory Breast Cancer** symptoms include redness and swelling of the breast with skin changes. This breast cancer can grow very rapidly. It has a higher chance of spreading to another part of the body and must be treated more quickly. It is treated first with chemotherapy first, followed by surgery and radiation therapy.

Breast Biopsy Methods

Several methods may be used to remove breast tissue for the pathologist to examine. A pathologist is someone who looks at cells under the microscope. The choice of biopsy method depends on the size and location of your lump, and if it can be felt or not.

- **Fine Needle Aspiration** uses a very thin needle and small syringe to remove either fluid or cells from a lump.
- **Core Needle Biopsy** uses a special spring loaded needle to take small tube like (cylinder) cores of tissue. These slightly larger pieces of tissue provide more information.
- **Excisional Biopsy** is used to remove a small lump that can be felt. This biopsy is done in the operating room. The skin around the abnormal area is numbed with medicine. The lump is removed through a small incision in the breast and closed with stitches.
- **Ultrasound Guided Core Needle Biopsy** uses a larger, hollow needle and a spring loaded instrument. With the help of ultrasound, small tubes like (cylinder) cores of tissue are removed.
- **Mammotome Biopsy** is used to sample an area that cannot be felt by your doctor. With the help of ultrasound, a larger, hollow needle is used to remove several cores of tissue.
- **Stereotactic Biopsy** is used to sample an area that cannot be felt by the your doctor. Lying face down on a special table, the skin around the abnormal area is numbed with medicine. The biopsy needle is then placed in the skin of the breast. Using computer guidance, another needle removes small slivers of tissue.
- **Needle Localization Biopsy** is used when the abnormal area in your breast is hard to feel. The skin around this area is numbed with medicine. Using ultrasound or mammogram as a guide, a thin needle is put into the breast to remove tissue through a small incision in the breast.
- **MRI Guided Biopsy** uses computer technology to exam an abnormal area seen on a MRI scan. Lying face down, the breast hangs through an opening in this special table. MRI images will be taken to locate the abnormal area. Using computer imaging, the area of the breast tissue to be biopsied is located. The biopsy needle is then inserted and samples of breast tissue are taken.

Breast Cancer Surgery and Local Treatment

Breast cancer is treated both in the immediate area of the cancer (local) and through the whole body (systemic). Local treatment may include surgery and possibly radiation therapy. If systemic treatment is needed, it may involve **anti-hormonal therapy** and/or chemotherapy. (Note: anti-hormonal therapy is often referred to as “hormonal therapy” when you read about breast cancer treatment. Here it will be called anti-hormonal therapy since that is how it works.) Using the information from imaging studies and biopsy results, your health care team will talk with you about what treatment is best for your type of breast cancer.

Most women have more than one option for local treatment. The size, type and location of the tumor will determine your treatment options. The entire breast must be treated. Either the breast is removed (mastectomy) or a part of the breast is removed (lumpectomy). When a lumpectomy is done, follow up radiation treatment is needed. With a mastectomy or lumpectomy plus radiation, the lymph nodes need to be checked if an invasive breast cancer is found or may be done if your doctor feels it is needed. Here is information about the possible surgery treatments.

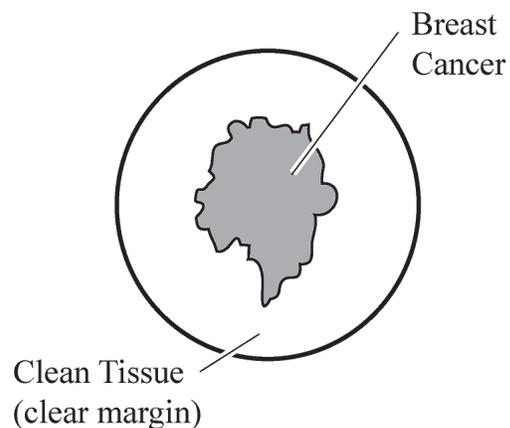
Lumpectomy

A lumpectomy may be a treatment option after the cancer has been found with a biopsy. The surgeon makes a 2 to 3 inch incision on the surface of the breast near the area of the tumor. This incision may be curved to help maintain the natural contour of the breast tissue. If a previous incision exists from the biopsy, the incision is usually made in the same area.

If the surgeon is unable to feel the tumor, a wire may be placed in the breast to “localize” or find the tumor. This is called a needle-localization procedure. The radiologist does this. The morning of surgery, you will be directed to one of the radiology areas in the hospital where a radiologist will do the needle localization. Using ultrasound or mammogram as a guide, the radiologist will place a very slender wire/needle in your breast. The tip of the wire is placed near the area to be removed. Part of the wire will extend outside your breast and will be taped in place. This wire will guide the surgeon to your tumor. This procedure also helps reduce the amount of tissue that may need to be removed.

The goal of a lumpectomy is to remove the cancerous tissue. Some other, noncancerous tissue is also removed from around the edges of a tumor. This is called a margin of tissue. It is very important to remove all of the cancer cells. Sometimes, the surgeon will do a test called a frozen section during surgery. This test checks to see if all of the cancer cells were removed on a certain edge. It is not possible to test all of the margins while you are asleep. When the final pathology report is received, several days after surgery, your surgeon will know if all the cancer cells were removed.

When a lumpectomy removes a breast cancer completely with clear surrounding tissue (i.e. a clean margin), and is followed by radiation therapy, the outcome for local control of the tumor is similar to having a mastectomy. If there is no evidence of cancer anywhere else in the breast, removing all of the breast tissue (i.e. a mastectomy) does not improve a woman's chance of cure from her current breast cancer. If the pathology report shows that cancer



cells remain, then another surgery will often be needed. This may be another lumpectomy or a mastectomy. It is uncommon for the surgeon to make the decision to switch from a lumpectomy to a mastectomy during surgery. This decision is based on the final pathology results and discussed with you before surgery.

The reason a woman would choose a lumpectomy is to keep her breast. This treatment provides the best cosmetic result. After a lumpectomy, the breast is still normally rounded, but may not be quite as full in the area where the tumor was removed. Usually a woman looks very normal in a bra after a lumpectomy. If a lumpectomy is done, radiation therapy is also needed to give the best local control of the cancer.

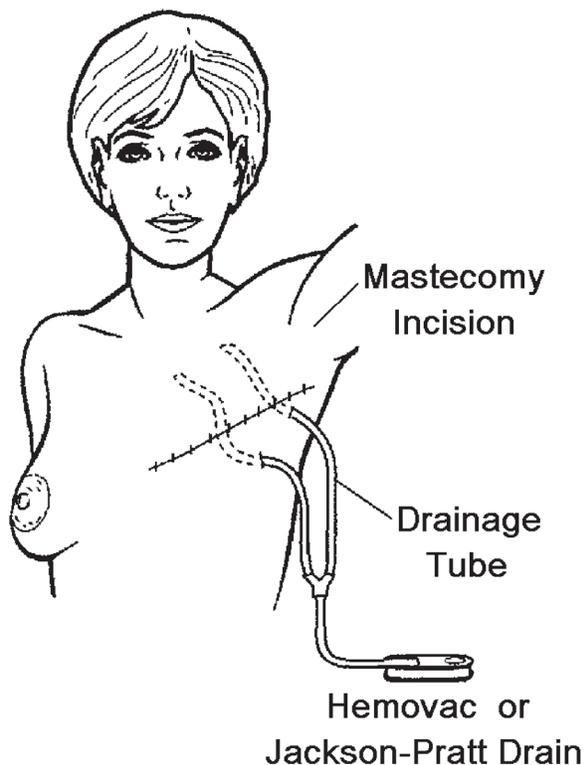
Mastectomy

A mastectomy is a surgical option for any breast cancer patient. Sometimes a mastectomy must be done due to the size or location of a tumor. Other times, a mastectomy may be done based on a woman's choice. Unfortunately, removing one or both breasts does not guarantee the breast cancer will be gone from the whole body. Typically, radiation therapy is not needed after a mastectomy. However, if the tumor is large or if several lymph nodes have cancer in them, radiation to the chest wall may be recommended.

After a mastectomy, a soft, temporary prosthesis can be worn with a bra or camisole to provide a mound under clothing. A permanent prosthesis and special bras can be fitted after the area is healed. This healing usually takes about three months. A prosthesis looks very normal under most clothing. There are a number of different prostheses and bras that can be chosen specifically for each woman.

Types of Mastectomy

- **Total Mastectomy** removes all the breast tissue, the skin and the nipple. A 6 to 8 inch incision is made on the chest wall angled towards the armpit. The edges of the incision are brought together, creating a thin incision across the chest wall. One or two drainage tubes will be inserted at the time of surgery. Once healed, the chest area is flat where the breast tissue was removed. The skin across the chest wall may have decreased sensation, especially to hot and cold. This may improve, but not totally disappear as the healing continues.



- **Modified Radical Mastectomy (MRM)** removes all the breast tissue, skin and nipple as well as the axillary lymph nodes.

- **Radical Mastectomy** removes all the breast tissue, skin, nipple and lymph nodes, and all or part of the chest wall muscle. This procedure is rarely done.

Reconstruction

Surgery to create the appearance of a breast can be chosen when a mastectomy has been done. This surgery can be started either at the time of the mastectomy (immediate reconstruction) or at a later time (delayed reconstruction). Most reconstructive procedures involve a number of steps and a couple surgical procedures. Several options are available and need to be discussed with a plastic surgeon prior to your cancer surgery. There are two types of reconstruction. In one, tissue and muscle are moved to the chest wall. In the other kind, a saline filled (salt-water) expander is placed under the chest wall muscle.

The goal of either type of reconstruction is to have a normal appearing breast in a bra or under clothing, but not when naked.

Unfortunately, reconstruction cannot be done after a lumpectomy. If a large amount of breast tissue must be removed, often a more acceptable appearance can be achieved with a mastectomy and reconstruction.

Two Types of Reconstruction

- A saline filled expander is placed under the chest wall muscle by the plastic surgeon after the breast is removed. The incision is closed, and the chest wall looks fairly similar to a mastectomy, with a little fullness. The saline expander can be filled periodically after the person has healed from the surgery. Saline is injected into a port in the expander. This process is repeated every 1 to 2 weeks. The skin over the chest wall slowly stretches with the expander until the desired size can be reached. The expander is then overfilled to stretch the skin further. The expander is later removed surgically as an outpatient. It is replaced with a permanent saline filled prosthesis that is a little smaller than the expander. This creates a little sag in the breast. A nipple can be attached or tattooed at a later time.
- The other type of reconstruction that involves moving tissue and muscle can be done in two ways. In one type, tissue and part of the latissimus dorsi muscle are moved to the chest area. This muscle

is located on your side and extends to your back. The second way involves the moving of tissue and part of the abdominus rectus muscle. This muscle is located up and down along your abdomen.

Both types of tissue and muscle reconstruction need discussion and a number of decisions to be made between the patient and the plastic surgeon. This type of reconstructive surgery is much more involved, and requires at least a 3 to 4 day hospital stay. If you are a current smoker, tissue healing may be impaired. In this case, tissue and muscle reconstruction may not be recommended.

Once healed from the surgery, the reconstruction is complete. If desired, a nipple may be added later. The outcome of tissue reconstruction is a more natural type breast, with more natural sag. A reasonable goal of this reconstruction is to have a normal look in a bra or clothing, but not when naked.

Axillary Lymph Node Evaluation

If an invasive cancer has been diagnosed or is suspected, the axillary lymph nodes need to be checked. These are located under the arm.

There are several ways to check your lymph nodes. The most accurate way is to take tissue and look at it under the microscope. The doctor may recommend a **sentinel lymph node biopsy** that checks the first lymph node(s) that drain the tumor. Sometimes all of the axillary lymph nodes are removed at the time of your breast surgery, which is called an **axillary lymph node dissection**.

Lymph nodes are filters. We have hundreds of them in our body. They form chains to drain fluid from different areas of the body. Most fluids in the breast drain into the axillary nodes which is why these are checked. The condition of axillary nodes and the size of the tumor are the most important pieces of information regarding the stage of your tumor. This information helps the doctor decide how to best treat your breast cancer.

- **Sentinel Lymph Node Biopsy**

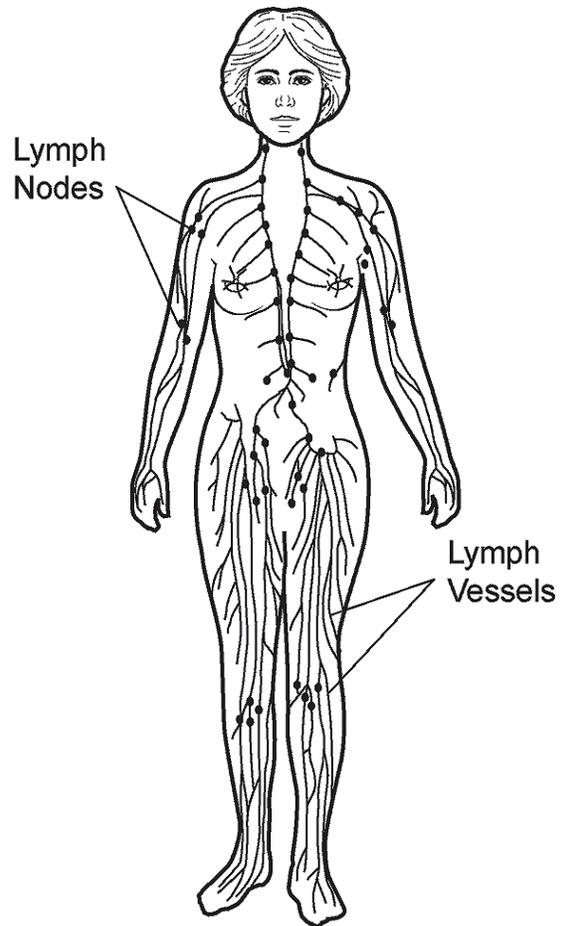
In some cases, a sentinel lymph node biopsy may be discussed. Usually this can be used when a tumor is small and no lymph nodes can be felt in the armpit.

The sentinel lymph node is the first lymph node(s) that drains the breast tumor. The goal is to find this node and test to see if there are cancer cells in it. This node tells the status of the other remaining lymph nodes in the armpit area.

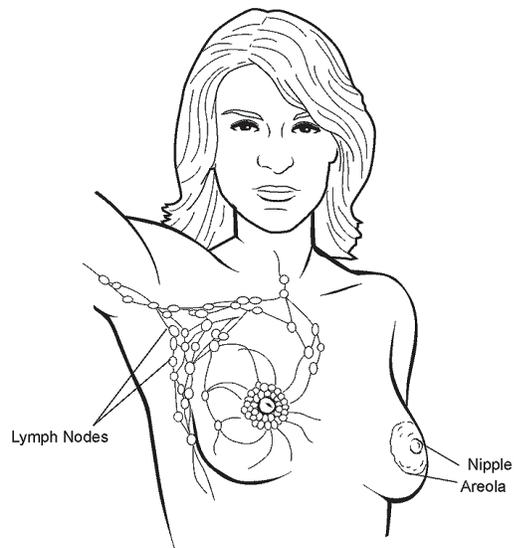
Several hours before surgery you will go to the radiology area in the hospital. A tiny amount of radioactive dye (radionuclide) will be injected either into the tumor, on the skin over the tumor, or in the area of your nipple and areola. The breast lymph vessels drain into the lymph nodes located in the armpit, so this dye will drain to the armpit area in 1 to 2 hours. The sentinel node(s) will be located in the armpit by a special instrument called a gamma ray probe.

After you are sedated in the operating room, the tumor will also be injected with a blue dye to further help identify the sentinel node(s).

During surgery, the sentinel lymph node is found and removed through a small incision under the arm. The node is taken to the laboratory where a test called a “frozen section” may be done. If no cancer cells are found in the sentinel lymph node(s), the remaining nodes are usually not removed. If the sentinel lymph node has cancer cells, an axillary lymph node dissection may be done.



Underarm Lymph Nodes



Some patients having a lumpectomy, will have sentinel nodes removed during surgery, however, a “frozen section” will not be done. The final pathology report will show the status of the lymph nodes. If the lymph node is positive and a patient is to have radiation, more surgery may not be needed in the axilla. This information and decision will be discussed with you.

The pathologist will do more testing after surgery to make sure there are no cancer cells in the sentinel lymph node(s). Sometimes, the “frozen section” does not detect microscopic disease in the lymph node(s). If the final pathology report shows cancer in the sentinel lymph node(s), you and your surgeon will decide if further surgery is needed to remove any additional more lymph nodes.

Some tumors will still require an axillary node dissection. This may be needed if any of the following are present:

- ▶ A tumor close to the armpit (axilla)
- ▶ Large tumors or tumors that look different (abnormal)
- ▶ If the breast has developed scar tissue after chemotherapy or radiation therapy
- ▶ If there are enlarged lymph nodes in the axilla
- ▶ If there is more than one tumor
- ▶ If the breast has an infection or blood clot (hematoma)

- **Axillary Node Dissection**

If an axillary lymph node dissection is needed with a lumpectomy, another incision will be made. This second incision is about four inches long. This incision will be parallel to your armpit, about 1 to 2 inches below the hollow of your armpit. If a mastectomy is being performed, the axillary lymph nodes can be removed through the chest wall incision.

These incisions cut through the skin nerves. As a result, the skin will feel numb over the chest wall, along the armpit and underside of the upper arm. This area is completely numb right after surgery. Limited feeling comes back over the first several weeks after surgery. This feeling may include sensations of numbness and tingling, “pins and needles,” and a tender, raw feeling. All of these sensations will go away as the healing process continues. Over time you may get back the ability to feel a touch on the outer skin of the armpit and along the underside of the

arm. However, these areas may not be able to feel hot and cold. You can expect your arm to function normally again when healing is complete. This is because the surgery does not affect the deep nerves that control movements of the arm.

The axillary nodes are found throughout a fat pad in your armpit. This pad is removed. This takes out the lower 2/3 of your axillary nodes, which are about 15 to 25 nodes for most women. These nodes provide important information about the risk for cancer in other parts of your body.

Care After Biopsy or Dissection

When the lymph nodes are removed, a space is created in the armpit. This can fill up with fluid. At the end of surgery, one or more drainage tubes are placed to drain this fluid and to promote healing. This type of tube is called a Hemovac or Jackson-Pratt. The drainage tube(s) exit the body on the side of the surgery, several inches below the armpit. Stitches hold the tube(s) in place. The tube(s) are left in place for 7 to 10 days after surgery, sometimes longer. A container is attached to the end of the tube to collect watery bloody fluid. It should be emptied twice a day, measured and recorded. The tube(s) will be removed in the doctor's office when the fluid decreases.

Side Effects of Biopsy or Dissection

The side effects of removing the nodes include a chance of permanent swelling in that arm. This is called **lymphedema**.

Another side effect after axillary node dissection is an increased risk of infection. You must protect the affected arm from swelling and infection. More information will be given to you after surgery.

Here are life-long suggestions for care of the arm:

- Do not have your blood pressure taken in the affected arm.
- Do not have blood drawn, or an injection, in the affected arm.
- Do not sleep on the affected side, especially with your arm tucked up.
- Wear garden gloves when working with dirt, digging, or around thorns.
- Prevent getting sunburn on that arm. Use sunscreen.

- Prevent bug bites. Wear insect repellent.
- Do not lift heavy anything (greater than 15 to 25 pounds) with the affected arm.
- Control your weight and salt intake.
- Wear oven mitts to keep from burning your arm or hand.
- Use an electric razor if you shave the underarm area.
- Carefully trim fingernails to prevent hangnails and tearing the cuticles.
- If you cut or burn your affected arm, wash with soap & water, apply antibiotic ointment, and watch for signs of infection or arm swelling.

Call your doctor right away if you have signs of infection in the affected arm, or if swelling continues. Signs of infection include:

- Pain
- Arm is warm to the touch
- Redness
- New or sudden swelling
- Fever of 100.4 degrees Fahrenheit (38 degrees Celsius) or higher
- Chills or general achiness

Radiation Therapy

Radiation therapy will start once your drain(s) have been removed and you are completely healed from the surgery. This happens about 4 to 6 weeks after surgery. If you need chemotherapy, then your **radiation treatments will follow the chemotherapy**. Radiation therapy is usually given after all chemotherapy has been completed. Radiation therapy is needed so the whole breast receives treatment. You may talk with a radiation oncologist before surgery to learn more about this treatment. If you choose not to have radiation therapy, a mastectomy must be done.

Radiation therapy:

- Is done as an outpatient.
- Is given daily, Monday through Friday, for 6 to 7 weeks.

- Must be done at the same facility. You cannot start radiation at one facility and then switch to another.
- Will be given at The Stefanie Spielman Comprehensive Breast Center just south of the Ohio State University campus.

Side effects of radiation treatment may include:

- A temporary reddening (like a sunburn) of the breast and thickening of the skin.
- The breast that is treated with radiation may feel firmer than the other breast.
- The radiated breast can also swell, making it tender and uncomfortable during therapy.
- It can be tiring, especially since it is a treatment that must be done every day.

Breast Cancer - Systemic Treatment

Systemic treatment is treatment that goes throughout the body. Systemic treatments for breast cancer include anti-hormonal therapies, chemotherapy and targeted therapies. Invasive breast cancer is both a local problem and a systemic disease. Studies have shown that most women with breast cancer benefit from the use of systemic treatment. Even though there may be no sign of cancer, there may be cancer cells remaining in the body.

Systemic treatments may destroy any circulating cancer cells and prevent them from growing somewhere else in the body. The best time to treat cancer systemically is when it is diagnosed, not when it appears in another part of the body. If a cancer spreads to organs in the body, this is called metastasis. Cancer that has spread to other organs can be controlled for a period of time, but is rarely completely cured.

These therapies can be done before or after surgery. **Neoadjuvant therapies** are done prior to surgery when shrinkage of the tumor is desired. This may be needed if a tumor is in an advanced stage or if you want to preserve most of the breast tissue with a subsequent lumpectomy. **Adjuvant therapies** are given after surgery. The options for adjuvant therapies are discussed after surgery when the initial healing process is complete.

Systemic treatment for breast cancer consists of two options:

- **Anti-hormonal medicine:** (Tamoxifen / Nolvadex; Anastrozole / Arimidex, Letrozole / Femara; Exemestane / Aromasin) are drugs that act against the circulating estrogen in your body. They come in pill form. This medicine is taken once or twice a day for five years. There are several possible side effects. The most common are menopausal symptoms, such as hot flashes or night sweats. The side effects depend on your age, menopausal status, and whether you have your uterus. Overall, this type of medicine is tolerated well, especially in older women or women who are post-menopausal.
- **Chemotherapy:** These drugs are usually given intravenously through a vein in the arm. They are used to kill circulating cancer cells that cause metastatic cancer (cancer which has spread to other parts of the body). The side effects from chemotherapy depend on which drugs are used, how they are used, and for how long. Overall, the more common side effects of chemotherapy for breast cancer include:
 - ▶ Fatigue
 - ▶ Low white blood cell count
 - ▶ Hair loss or thinning of the hair
 - ▶ Nausea

These side effects are all temporary. Most people can go back to their normal lifestyle after treatment is done.

Systemic treatment decisions are based on a number of factors. There are four important results that will be known 3 to 4 days after your surgery. This information will help your doctor decide on which type(s) of systemic treatment is best for you, if needed. Sometimes a tumor is very small, and systemic treatment is not necessary. Other times, both chemotherapy and hormonal therapy are used.

Four important factors in systemic treatment decisions:

- **Final tumor size** - The pathologist will confirm the final tumor size after looking at the tissue with cancer under the microscope. A final tumor size is confirmed after clean tissue is found around the entire tumor.

- **Lymph node status** - After the pathology report is complete, the number of lymph nodes that were removed, and how many, if any, had tumor in them will be confirmed. The lymph nodes are then divided into groups:
 - ▶ 0 nodes involved
 - ▶ 1 to 3 nodes involved
 - ▶ 4 to 9 nodes involved
 - ▶ 10 or more nodes involved

The lymph node status also determines the stage of your cancer. For example, if a tumor is Stage I by size, but even one node is positive, it becomes a Stage II.

- **Estrogen / progesterone receptor status (ER/PR)** - Another test that is performed on the breast cancer tissue is the ER/PR. This test finds receptors that allow circulating estrogen to attach to the tumor cell, providing food for growth. This type of receptor makes the tumor ER positive and/or PR positive and potentially more responsive to anti-hormonal systemic treatment medicines.

If a tumor is ER and PR negative, then it is unlikely that the anti-hormonal drugs will be used. Often, chemotherapy alone is suggested as systemic treatment. If a tumor is ER or PR positive, often both chemotherapy and anti-hormonal therapy are used, depending on the stage of the cancer.

- **HER-2-neu Test** - (pronounced: 'her 2 new') HER 2neu is the name of a gene. This gene (also called an oncogene) is found on breast cancer cells. Invasive breast cancer cells that have an abnormally high number of this gene, may be more likely to metastasize, or spread, to other sites. Levels of the HER-2-neu or oncogene are measured to help the doctor estimate how aggressive a tumor may be. This test is done on a portion of the breast cancer tissue. It provides another piece of information to help the doctor decide what therapy is best for the treatment of your breast cancer.

Breast Cancer Sequence of Treatments

There are a number of ways that local treatment (surgery and radiation), and systemic treatment (anti-hormonal and chemotherapy) can be given. The following are the most common treatment plans:

- Surgery - chemotherapy - radiation - anti-hormonal therapy
- Surgery - chemotherapy - radiation
- Surgery - chemotherapy - anti-hormonal therapy
- Surgery - chemotherapy
- Surgery - radiation - anti-hormonal therapy
- Surgery - radiation
- Surgery - anti-hormonal therapy
- Chemotherapy - surgery

We hope this information is helpful to you as you make decisions with your doctor about treatment for breast cancer.

For More Information:

- James Hospital Patient Education office at 614-293-3256
- Library for Health Information in the Atrium, located on the 5th floor of Ohio State University Medical Center on the main campus. Phone: 614-293-3707 or Email: mailto:health_info@osu.edu
- The JamesLine at 1-800-293-5066
- The National Cancer Institute (also in Espanol) at 1-800-4-Cancer (1-800-422-6237)

James Hospital Patient Education Materials include:

- [Breast Cancer Surgery](#)
- [Breast Biopsy Methods](#)
- [Care of Your Arm After Lymph Node Removal \(Female\)](#)
- [Cancer Internet Resources](#)
- [Making the Most of Visits with Your Doctor](#)
- [Cancer Genetics Consultation](#)