

Breast Cancer Diagnosis, Treatment and Follow-up

What is breast cancer?

Each of the body's organs, including the breast, is made up of many types of cells. Normally, healthy cells grow and divide to produce more cells only when the body needs to replace those that are injured or dying. This orderly process helps keep the body in balance. Sometimes cells keep dividing even when more new cells are not needed. These extra cells form a mass of tissue, called a growth or tumor.

Some of these growths are made up of completely normal looking cells – there are just too many of them in the place where they are growing. These “benign” tumors do not invade surrounding tissue or spread to other parts of the body. They are not cancer. Benign tumors can cause problems by pushing on normal structures in the body. Sometimes a biopsy is needed to tell whether a growth is benign or not.

Some growths can be made up of abnormal looking cells, but they are confined to the place from where they started. They have not spread to surrounding tissue or other parts of the body. These are called “in situ” cancer cells. Ductal carcinoma in situ (DCIS) forms in the milk ducts and is the most common type of in situ cancer. If untreated, it may spread to surrounding tissue.

Malignant (cancerous) tumors are made up of abnormal-looking cells that have spread into surrounding tissue. Cells from malignant tumors can also break off from the main tumor and spread to other parts of the body by traveling through blood or lymph vessels. The spread of cancer cells is called metastasis.

When a malignant tumor begins in the breast, it is typically called breast cancer. Cancers that arise from different parts of the body have distinct features, such as appearance of the cells and how they respond to treatment. When a breast cancer spreads to another part of the body, it is still considered a breast cancer. It keeps the same features as the original breast cancer. For example, if breast cancer spreads to the lungs, it is called “metastatic breast cancer in the lung” instead of “lung cancer.” Treatment is used that is targeted for breast cancer. The most common site for breast cancer to spread is the lymph nodes near the breast. While serious, this is not as dangerous as it spreading to distant sites like the lungs, bones, liver or brain.

Not all breast cancers are exactly alike since they can be made up of different types of abnormal cells. Most breast cancers begin in the milk ducts and are called ductal carcinomas. The next

most common type of breast cancer begins in the lobules and is called lobular carcinoma. A rare kind of ductal carcinoma is called inflammatory breast cancer. It grows quickly and has an appearance similar to that of a breast infection. Sometimes, other tumor types, like lymphoma or sarcoma, can begin in the breast.

How is breast cancer diagnosed?

The steps taken to evaluate a new breast lump, breast symptom or mammogram change is very important. They help the doctor make the clearest diagnosis with the least chance for harm or error. Your health care team will choose the best tests so they can fully understand your cancer and then recommend the best type of treatment. Exactly which tests are done will depend on a number of factors, which they can discuss with you.

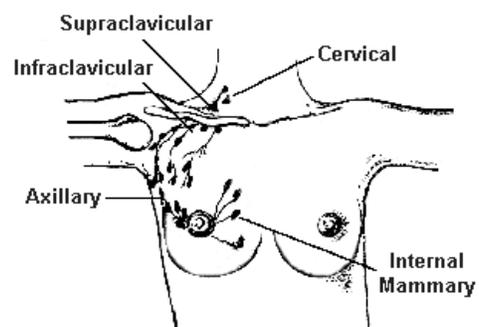
A thorough medical history and physical exam will be done. Breast imaging tests, such as mammograms, ultrasounds and MRI, may be recommended. If your doctor finds a suspicious breast lump, or if the imaging tests show an area of concern, he or she may recommend a biopsy. If the biopsy shows that cancer cells are present, other imaging and lab tests may be needed.

Medical History and Physical Exam

During your first clinic visit, a thorough medical history and physical exam will be done. When taking your medical history, you may be asked about your symptoms and other factors that may be related to breast cancer risk (e.g., family or personal history of cancer). During the initial physical exam, you will have a thorough breast exam. You may have a more general exam if that is needed. You will be assessed for any changes that might show that the cancer has spread.

During the breast exam, you will be evaluated for

- Changes in the texture or size of your breasts,
- Changes in the nipples or skin of the breast,
- Lumps or masses, and
- Enlarged lymph nodes
 - under the arm (axillary nodes)
 - along the breast bone (internal mammary nodes)
 - near the collarbone (clavicular nodes)
 - at the sides of the neck (cervical nodes)



Lymph Node Locations

Breast Imaging Tests

Almost all patients will have a mammogram. This looks at the breast using x-rays.

Mammography is most useful when current images are compared to older ones, so providing any past mammograms is very important.

Often, a breast ultrasound may be recommended. An ultrasound looks at the breast tissue with sound waves. This will help determine if the area of concern is a fluid-filled cyst or if it is solid tissue that may be cancer. An ultrasound can also look at lymph nodes to see if they are involved.

Some patients may have a breast magnetic resonance imaging (MRI) procedure done, in addition to the mammogram and ultrasound. This can help define the size and extent of cancer within the

breast tissue.

Breast Biopsies

If the mammogram, ultrasound or MRI shows an area of concern, a biopsy will be recommended. A biopsy is a way of getting a small sample of the tumor to examine it under a microscope. This is done to see if cancer is present. There are several different types of breast biopsies. The type you have will depend on your particular situation. It is common to have more than one biopsy if this helps to understand the tumor.

In most cases, a needle biopsy is preferred over a surgical biopsy when making the initial cancer diagnosis. A needle biopsy is quick and can be performed with little discomfort. Only a local anesthetic (numbing of the skin) is needed. A needle biopsy also gives the patient a chance to discuss treatment options with the doctor before any surgery is done.

There are two types of needle biopsies – core needle biopsy and fine needle aspiration (FNA). A core needle biopsy is the most common way to sample the breast. It removes a small sample of tissue. A FNA is more often used to assess the regional lymph nodes. It only removes a small amount of cells. Typically, the biopsies are performed using an ultrasound or mammogram to help map the exact location of the abnormality and guide the tip of the needle to the right spot. The choice to use a mammogram or ultrasound-guided biopsy will depend on the type of breast change and its location.

Sometimes, the tumor cannot be completely characterized by needle biopsies. These patients may need a surgical biopsy. These commonly use a mammogram or ultrasound to guide the procedure.

After the tissue has been removed, it will be sent to pathology for examination under a microscope. The pathologist (a doctor who identifies disease by looking at cells and tissue with a microscope) will then determine if cancer cells are present or not. This process may take several days. Once the process is complete, the results will be discussed with you.

Other Recommended Tests

If your biopsy results indicate that breast cancer is present, it is common to need additional tests. These tests will help determine the extent of the cancer, and the best course of treatment for you. Additional tests may include:

- Chest x-ray
- Bone scan
- Computerized tomography (CT) scans
- Magnetic resonance imaging (MRI)
- Positron emission tomography (PET) scan
- Blood tests (complete blood count (CBC), blood chemical and enzyme tests)
- Tumor tests, which may include:
 - Estrogen and progesterone receptor tests, which measure the amount of estrogen and progesterone receptors in the cancer tissue. This helps determine if treatment to block estrogen and progesterone receptors may stop the cancer from growing.
 - HER2/neu tests, which determine if extra HER2/neu genes are present and how much of

the HER2/neu protein is made. This helps determine if drugs that target the HER2/neu protein may stop the cancer from growing.

- Molecular testing

How is breast cancer treated?

How your breast cancer is treated depends on many factors. The type of cancer cells, how much the disease has spread, the size of the tumor in relation to the breast, and your general health will all be considered.

Your doctor will also consider the two main risks of breast cancer - local recurrence and distant metastasis. Local recurrence is when your cancer returns to the breast and regional lymph nodes that were originally involved. Distant metastasis is when your cancer spreads to other parts of your body. Knowing your personal risk for your breast cancer coming back or spreading will help determine the best treatment options.

The treatment you receive and the order you receive it depends upon the characteristics of your cancer. You may have surgery first, followed by chemotherapy or hormone therapy. This is called adjuvant therapy. Adjuvant therapy is given after surgery, when no cancer cells can be seen, to prevent cancer from recurring. It may be recommended for you to have neoadjuvant therapy. Neoadjuvant therapy is given before surgery to shrink the tumor and make it easier to remove. Metastatic cancer, cancer that has spread to other parts of the body, is typically treated with chemotherapy or hormone therapy, which treats the entire body. Radiation therapy or surgery may be used to reduce pain or symptoms of metastatic cancer.

Surgery

There are two (2) main surgical treatments for removal of the cancer in the breast: 1) total mastectomy (removal of the entire breast) and 2) breast conserving surgery, also called lumpectomy or partial mastectomy, which consists of removal of the tumor only. In addition, women who have no evidence of cancer involving their lymph nodes may be recommended to undergo a surgical biopsy of the lymph nodes under the arm for further work up. This is called sentinel lymph node biopsy. Women, who are confirmed to have lymph node involvement, may require an axillary node dissection (removal of all the lymph nodes under the arm).

Most patients with early stage breast cancer are candidates for breast preserving surgery. This is usually followed by radiation therapy. Most patients with locally advanced cancers will need to have a mastectomy.

Breast Reconstruction

If you are going to have a total mastectomy, you may want to think about having breast reconstruction (having a new breast made). Plans for breast reconstruction are often part of your cancer treatment plan. Reconstruction can be done at the time of the surgery or at some time in the future. The breast may be made with your own tissue or by using implants filled with saline or silicone. Breast reconstruction is not considered cosmetic surgery, so it is typically covered by health insurance plans.

Reconstructive options such as tissue rearrangement or partial breast reconstruction may also be available for women undergoing lumpectomy in order to minimize the impact of surgery and radiation on the appearance of the breast.

Radiation Therapy

This treatment uses high-energy x-rays to kill cancer cells and shrink tumors. Radiation may come from a machine outside the body (external beam radiation therapy) or from putting materials that produce radiation through thin plastic tubes into the area where the cancer cells are found (brachytherapy). Radiation therapy is usually given after breast conserving surgery to kill any cancer cells that might be left in the breast. Radiation is also used after mastectomy in patients with advanced stage disease.

Chemotherapy

Chemotherapy is the use of special drugs to damage or kill cancer cells. Chemotherapy may be taken by mouth, or it may be put into the body by a needle in a vein. Chemotherapy drugs enter the bloodstream, travel through the body, and can kill cancer cells outside the breast area. It is used to improve survival and reduce the possibility of metastasis. Chemotherapy is also given to some patients to reduce the size of the tumor before surgery.

Hormone Therapy

If tests show that the breast cancer cells contain estrogen and progesterone receptors you may be given hormone therapy. Hormone therapy is used to change the way hormones in the body help cancers grow. This is done primarily by using drugs that block the action of hormones.

Targeted Therapy

Targeted therapy uses drugs to identify and attack specific cancer cells, thereby decreasing harm to normal cells. Some types of targeted therapy kill cancer cells directly by affecting how the cells grow and survive. Other targeted therapies help the body's immune system, its natural defense, attack and fight the cancer. Monoclonal antibodies and tyrosine kinase inhibitors are two types of targeted therapies used in the treatment of breast cancer.

Clinical Trials

Cancer clinical trials are cancer research studies that involve people. The main purpose of a clinical trial is to find a better way to prevent, diagnose or treat a disease. Clinical trials are part of a long, careful research process. Patients who participate in a clinical trial receive drugs or procedures that already have been researched in successful laboratory and/or animal studies. Most clinical trials study new drugs or procedures, but some study drugs or procedures that have already received approval by the U.S. Food and Drug Administration.

All patients who participate in clinical trials are volunteers. They can choose to stop their participation in a clinical trial at any time.

Clinical trials are part of a long, careful process, which may take many years. First, doctors study a new treatment in the lab. Then they often study the treatment in animals. If a new treatment

shows promise, doctors then test the treatment in people. Doctors do this in three to four steps, or phases. Your doctor may offer you a clinical trial as a treatment option.

Clinical trials can be an option for all cancer patients; however, each research study has its own guidelines for participation, called eligibility criteria. Generally, participants in a specific clinical trial are alike in important ways—such as the type and stage of their cancer and other factors. Typically, new treatments are introduced in clinical trials for patients who have few or no alternative treatments. Promising treatments are then studied in larger trials that measure the advantages and disadvantages as compared to standard therapy.

What other things should I consider during and after treatment?

Breast cancer affects all aspects of a person's life – not just the physical aspect. The disease affects relationships with family members and friends, work patterns and feelings about sexuality. Although every person will react differently to the diagnosis of breast cancer and to the effects of treatment, dealing with the emotional impact of breast cancer is essential to the recovery process. Family, friends, doctors, nurses, social workers and others can all help with emotional as well as physical recovery. The most important thing to remember is that a person can lead a fulfilling, normal life after having had breast cancer.

What follow-up care should I receive?

Good follow-up care (care that is given after the initial treatment is completed) is essential for all breast cancer patients. Good follow-up care includes clinical examination and diagnostic testing to check for signs of possible recurrence and social and psychological support to help you cope with the long-term effects of diagnosis and treatment.

For most patients, one of the greatest difficulties after treatment is the fear of recurrence. Any change in the treated breast or chest wall or elsewhere in the body can cause a woman to become alarmed. It is important to realize, however, that while these changes might be signs of a breast cancer recurrence, they also might be signs of other physical problems. Regular follow-up exams can tell the difference between recurrences and other physical problems, and ensure that if there is a recurrence, it will be detected early.

Your doctor and nurse are the best sources of information for your follow-up care schedule. If you have any questions, do not hesitate to ask them.