Your Guide to

Breast Cancer Treatment

at Fox Chase

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Breast cancer will affect an estimated 232,340 women and 2,240 men in the United States in 2013.

If you or a loved one has been diagnosed with breast cancer, accurate information about the disease and its treatment can make all the difference in ensuring a successful outcome. The Breast Cancer Team at Fox Chase Cancer Center believes that your understanding of breast cancer and the range of treatment options is essential to making the best possible decisions regarding your care. We are dedicated to working with you, and this guide was developed with that in mind.

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Diagnosing Breast Cancer

Breast cancer screening recommendations for most women will consist of monthly self-breast examination, yearly breast examination by a trained clinician such as a nurse practitioner or physician, and annual mammography typically starting at age 40. Although an unexpected finding in the breast or an abnormality on a routine mammogram can be frightening, most breast changes are not related to cancer. However, any new finding must be evaluated thoroughly to determine the cause. This may include additional mammographic images, a breast ultrasound, or a breast MRI. When there is concern that malignancy could be present, a biopsy (removing tissue to examine microscopically) is necessary. This should normally be performed as a “needle biopsy” allowing a small amount of tissue to be removed without surgery. The biopsy can be directed at a lump felt on a physical exam, but is often guided by imaging such as mammography, ultrasound, or occasionally MRI. A small metal clip will be placed into the breast at the time of the biopsy to mark the biopsy site for future reference. If the results confirm cancer, further evaluation and a discussion of treatment will be necessary. Only rarely is a biopsy performed surgically, usually because the needle biopsy is inconclusive.

“A diagnosis of breast cancer is a life changing experience. Our goal is to have our patients and their families walk out feeling better than when they walked in due to our comprehensive care.”

Lori J. Goldstein, MD
Types of Breast Cancer

Breast cancer (carcinoma) can best be divide into two types – in-situ and invasive. In-situ cancers are confined within the microscopic gland structures of the breast, rarely cause symptoms, and are usually detected on screening mammography. They are named for the part of the gland in which they develop – either the duct or the lobule. In situ carcinoma becomes invasive when it begins to grow through the gland walls and into the surrounding breast tissue. This invasive character is associated with a risk that the cancer could spread outside of the breast through nearby lymph channels or blood vessels. While many invasive cancers do not spread, some will travel to the lymph nodes, usually in the armpit (axilla), or to other parts of the body such as the lungs, liver, or bones. Because in situ cancers are confined to the breast while invasive cancers can spread, in situ and invasive cancers require very different treatment programs.

Ductal carcinoma in situ (DCIS) is usually considered a direct precursor to invasive ductal carcinoma, and complete surgical removal is the primary treatment. Radiation and preventive medication may also be indicated, as the goal is to eradicate the DCIS before it has a chance to become invasive. Lobular carcinoma in situ (LCIS) more rarely progresses to invasive cancer, and is usually considered a marker of lifetime risk for developing a future cancer. Surgical removal is sometimes indicated, but LCIS is often managed by close observation or risk reduction interventions including medication or surgery.

Invasive carcinoma is about 70% ductal and 20% lobular with the remainder showing a mixed pattern or unusual characteristics. Regardless of whether they are ductal or lobular, invasive cancers tend to be treated based on their individual features and risk of spread. In-
Invasive cancers normally require both local therapy (surgery and/or radiation) and systemic therapy (medication) for the best chance of cure. Local therapy is intended to remove the cancer and prevent it from regrowing at the original location in the breast or chest area. Systemic therapy is intended to prevent it from coming back at a later time in other parts of the body.

**Staging Breast Cancer**

Breast cancers have historically been staged according to the size of the tumor and the presence or absence of tumor cells in the axillary lymph nodes. The staging system is intended to reflect the seriousness of the cancer and to help determine best treatment options. All in-situ carcinomas are considered Stage 0, as their risk is more consistent with a “precancer” than a true cancer. Invasive cancers are staged from 1 to 4. Stage 1 cancers are small (less than 2cm) with normal lymph nodes. Stage 2 cancers are larger (2-5cm) or have lymph nodes showing cancer. Stage 3 tumors are larger than 5cm or more extensively involve the nearby tissue or lymph nodes. Stage 4 cancers have spread beyond the nearby lymph nodes to other parts of the body.

Most newly diagnosed invasive breast cancers are stage 1 or 2. However, in order to more accurately guide treatment plans, all invasive cancers are now tested for the presence or absence of 3 proteins which help to determine their sensitivity to cancer treatment drugs and provide a clue as to the aggressiveness of the cancer. These are the estrogen receptor (ER), the progesterone receptor (PR), and HER2/neu. These test results do not necessarily affect recommendations for local treatment, but can be critical in determining the best systemic therapy recommendations.
Treatment Options

**Surgery** is a critical component of local therapy for breast cancer, and is usually the first step in treatment. Under some circumstances, surgery may be performed after a course of systemic (medication) therapy, particularly if the tumor is aggressive or if shrinking the size of the tumor preoperatively will produce a better cosmetic outcome. In any case, the primary goal of surgery is to remove all known or suspected cancer from the breast, ideally including a margin of healthy tissue around the tumor. If invasive cancer is present, surgery is also used to remove lymph nodes from the axilla (sentinel node biopsy or axillary dissection) to provide the required staging information and to assess the tumor’s behavior and risk of spread. Most women diagnosed with breast cancer will have the option of surgically removing the tumor with either a “lumpectomy” or a mastectomy, with no difference in the success of treatment. However, there are obviously differences between these two approaches. From a medical perspective, the main difference is how the healthy breast tissue is protected from the cancer returning after treatment. After a “lumpectomy” (which is probably more correctly called “breast conserving surgery” as there may not be an actual “lump”), the remaining breast tissue is normally treated with a course of radiation therapy (see below). With a mastectomy, the healthy breast tissue is removed along with the tumor, and radiation is used only selectively. Breast reconstruction can usually be performed at the time of a mastectomy, but requires coordination in advance with a plastic and reconstructive surgeon.

**Breast conserving surgery** refers to removal of only the portion of the breast containing the tumor, and is ideally suited for single tumors which are small enough relative to the breast size that the final appearance of the breast will be close to normal. If the tumor was detected on imaging and cannot be felt, a wire or needle localization is performed. This in-
volves placing a wire into the breast under imaging guidance on the day of surgery to show the surgeon the exact location of the tumor. Typically the small marker clip placed at the time of needle biopsy is used as the target, and an x-ray of the tissue specimen is obtained in the operating room to confirm that the correct area of the breast, including the marker clip, has been removed. All lumpectomy specimens are oriented with sutures or clips before they are sent for microscopic examination to indicate how the tissue was originally positioned in the breast. If microscopic tumor cells are discovered near a specimen edge (“surgical margin”), this orientation allows the surgeon to determine exactly which edge is close. In some circumstances, further surgery will then be recommended to ensure that no tumor has been left in the breast. In addition, most surgeons will place marker clips within the breast at the site of the lumpectomy to identify the tumor location on future mammography, as well as for radiation planning. Breast conserving surgery is performed as an outpatient, is easily combined with sentinel node biopsy (see below), and does not require the placement of surgical drains. Recovery is usually fairly quick – days to a week or two, but the exact postoperative care and restrictions will vary depending on the surgeon.

**Mastectomy** was the first surgical procedure used for breast cancer treatment, but has changed significantly over the years. Currently, mastectomy surgery is intended to remove all visible breast tissue including the tumor site, but does not normally affect the underlying chest muscles and can be performed through a variety of incisions including a “skin-sparing” approach. Because the healthy breast tissue is removed along with the tumor, there is a more limited role for radiation after mastectomy, and most women will have the option of immediate breast reconstruction. Mastectomy can be performed for any breast cancer, but is most appropriate for women who cannot receive radiation, who have more than one site

“From the start, I felt like everything at Fox Chase was handled with a team approach.”... “and all of the doctors really spent time with me, explaining exactly what was going on and going to happen.”

Nicole Holtz
of tumor in the same breast, or whose tumor is large relative to the breast size suggesting a poor cosmetic result with lumpectomy. When mastectomy is combined with reconstruction, the reconstructive surgical procedure will usually determine the placement of incisions, the need for surgical drains, the duration of the surgery and hospital stay, and the postoperative care and restrictions. Mastectomy without reconstruction is usually performed through a curved or horizontal incision which includes removal of the nipple, requires placement of one or two surgical drains, and is associated with a 1-2 night stay in the hospital. Women can expect a 4-6 week period before full recovery.

**Lymph node surgery** is required for invasive carcinomas with very few exceptions, and is normally unrelated to the specific choice of breast surgery. If there is clear evidence that cancer is present in the axillary lymph nodes, an axillary dissection may be necessary to assure complete removal of all nodes which might contain tumor. This is usually combined with the planned breast surgery and may require placement of a drain. In most cases, however, a sentinel node biopsy will be recommended first. This procedure allows identification and surgical removal of just the node or nodes which are most likely to contain any travelling tumor cells if they are present. Fortunately, almost all the lymph drainage from the breast exits through a small number of specific lymph nodes in the axilla, referred to as the sentinel or “indicator” nodes. These nodes are the ones most likely to trap or filter any tumor cells travelling from the breast. The location of the nodes varies from person to person, but injection of a small amount of tracer into the breast at the time of surgery, either a blue dye or a radioisotope, will map the lymph outflow and identify the sentinel nodes.

By removing these specific node(s), it is possible to get a very accurate idea of whether the breast tumor cells have begun to spread beyond the breast. This important information
helps to determine the best treatment recommendations after surgery. Additionally, if the sentinel nodes are clear there is normally no reason to remove any other nodes – as they are even less likely to contain tumor. If the sentinel nodes have tumor cells in them, it may be necessary to perform a more complete axillary dissection to be sure no additional lymph nodes are involved. This is more likely the case when no radiation is planned. A sentinel node biopsy can be performed at the time of the planned breast surgery, or may be performed alone as a short outpatient procedure when accurate staging information is required prior to the definitive breast surgery. Sentinel node mapping and biopsy does not require placement of a drain, and carries a very minimal risk of any complication including arm swelling (lymphedema). There are no long term restrictions on use of the arm after this procedure.

**Drug Therapy**

At the time of your diagnosis of breast cancer the tumor cells are tested in the laboratory for proteins called receptors (estrogen receptor, progesterone receptor and HER2). These proteins are located on the surface of the tumor cell and define the “subtype” of breast cancer that you have been diagnosed with. These subtypes provide your oncologist with the key information necessary to guide the best systemic (drug) therapy for you.

**Hormone Therapy** The hormone estrogen causes hormone receptor positive (estrogen receptor and/or progesterone receptor) tumor cells to grow. If tests show that the cancer cells have the estrogen and/or progesterone receptor then hormone therapy (also called endocrine therapy or anti-estrogen therapy) is used to either block hormones or lower hormone levels in your blood. In premenopausal woman, estrogen levels can be lowered by removing the ovaries or using drug therapy to shut down the production of estrogen from
the ovaries. Tamoxifen is a drug that attaches to the estrogen receptor and blocks the action of estrogen and is used in premenopausal and postmenopausal women with early stages of breast cancer and metastatic breast cancer (cancer that has spread to other parts of the body). Aromatase inhibitors are drugs that decrease estrogen levels in postmenopausal women by blocking an enzyme called aromatase from turning androgen into estrogen. Aromatase inhibitors are used in postmenopausal women with early or metastatic stages of breast cancer.

Chemotherapy is drug therapy that is injected into a vein or taken by mouth. Chemotherapy works by killing tumor cells or stopping them from dividing. Depending on the stage of breast cancer, chemotherapy may be given before surgery to shrink the tumor in the breast and/or lymph nodes (neoadjuvant therapy) or after surgery (adjuvant chemotherapy). Chemotherapy can harm or kill some normal cells in your body resulting in side effects but there are many supportive treatments that minimize these side effects as much as possible. Chemotherapy is used to treat “triple negative breast cancer” (tumor cells that lack the estrogen receptor, progesterone receptor and HER2); HER2 positive breast cancer in combination with trastuzumab (Herceptin) and sometimes for hormone receptor positive breast cancer.

Targeted Therapy is the type of drug therapy that recognizes a specific target on tumor cells and kills these cells often without harming normal cells. Trastuzumab (Herceptin) is a monoclonal antibody that blocks the effects of HER2. Approximately 25% of breast cancers have tumor cells that are HER2 positive and are treated with the combination of trastuzumab and chemotherapy. Another antibody that blocks HER2 is pertuzumab and is used in combination with trastuzumab and chemotherapy to treat metastatic HER2 positive breast cancer. The drug ado-trastuzumab emtansine (Kadcyla) is used to treat HER2 positive breast cancer that has progressed after trastuzumab and taxane chemotherapy. Tyrosine kinase inhibitors are targeted drugs that block growth signals inside the tumor cell. Lapatinib (Tykerb) is a tyrosine kinase inhibitor that blocks the effects of HER2 and is used to treat patients with HER2-positive breast cancer that has progressed following treatment with trastuzumab.
Radiation Therapy

Although the word “radiation” has a bad reputation, there are many types of radiation, and therapeutic radiation is a well controlled, very beneficial type of treatment for certain cancers. Radiotherapy is safe and uses precision application of the radiation beams to the area in need. The radiation that is given is a type of energy applied to cells and does not make you, or them, “radioactive.”

Radiation to the breast is typically performed after breast conservation surgery (see above). There are also circumstances where radiation to the chest wall is performed after mastectomy, but this is based upon the extent of disease found at surgery. In settings where chemotherapy is given before surgery to lower the tumor burden at the time of mastectomy, radiation of the chest wall is also typically performed.

The breast radiotherapy that is given after lumpectomy is most frequently given five days a week for a total of six weeks. Side effects include irritation of the skin of the breast, and perhaps some fatigue. You do not lose your hair from this type of treatment, nor develop nausea and vomiting.

Fox Chase Cancer Center typically has several radiation clinical trials that may provide patients alternative radiation options including variations in how the radiation is administered, the dose of radiation, and the length of radiation treatment. Ask your radiation oncologist about what clinical trials options may be appropriate for you.

Breast Cancer Can Also Affect Men

Although we typically think of women when we think of breast cancer, approximately 2,000 men per year are diagnosed with the disease. We know that male breast cancer seems to behave similarly to female breast cancer, but although the
numbers are small, we treat the disease similarly. One difference between the two is in the timing of when men present with the disease, as versus when women seek care for the issue.

Women now typically undergo mammographic screening, bringing tumors that are not palpable to the attention of a doctor. Men do not undergo such screening because they usually have far less breast tissue and most tumors in the breast can be felt. Unfortunately however, while women are well aware that a breast lump is a concerning sign that should be brought to the attention of a doctor, many men still feel either embarrassed about seeking care for a breast lump, or are incredulous at the idea that they could have breast cancer or a serious illness that has become symptomatic. The consequence is that men tend to present to their doctors at a later stage, initially ignoring the finding more frequently than women do. When you compare the genders however, men do as well as women, stage for stage.

The typical treatment for men having breast cancer is a mastectomy, because there is little breast tissue to save, and resecting the tumor completely with “negative margins” (a margin of normal tissue surrounding the tumor, showing that it has been completely removed) may be more difficult. In women, the cosmetic and sexuality issues surrounding the breast prompted investigation of lumpectomy with radiation as an alternative to mastectomy, and has been found to be equally safe. In men this has not been investigated sufficiently in trials to date to conclude this is safe. Men therefore have mastectomies as standard surgical treatment, along with assessment of lymph nodes.

When a man develops a breast lump, it is consequently important that he seek evaluation by a physician. While most lumps tend to be benign, a breast surgeon is best qualified to determine if this is something that may be normal or should be further assessed to rule out breast cancer. Never ignore such a finding, and certainly don’t be embarrassed to seek care. Better to “overreact” and seek care for something that’s benign, than ignore the problem and find out too late that it could have more easily been addressed earlier.
In Summary, when breast cancer is found, it is important to seek evaluation at a facility which provides expertise in all aspects of care. The team approach at Fox Chase includes experienced radiologists, radiation oncologists, medical oncologists, and breast and reconstructive surgeons - all who are specialists in breast cancer. We also provide nurse educators, social workers, lymphedema therapists, and other specialty staff who can truly make a positive difference during a difficult time. Since this experience can be so overwhelming, at the heart of the Fox Chase breast cancer program are our nurse navigators, who function as both a primary contact and patient advocate to arrange any necessary evaluation studies and appointments. Fox Chase offers excellent care as well as access to the most current research and clinical trials. With our 100-year history of caring for cancer patients, our dedication to the mission of prevailing over cancer and our comprehensive experience in treating patients with breast cancer, Fox Chase Cancer Center may just be the right place for you.
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Map

For directions by car and public transportation, call 1-888-FOX CHASE or visit our website at www.foxchase.org/information/directions

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