



## PART TWO: DIAGNOSING BREAST CANCER

### What is Breast Cancer?

Normal cells can turn into cancer because of genetic inheritance or repeated exposure to a cancer-related substance in the environment, such as alcohol, dietary fat, or excessive X-ray radiation. When cells become cancerous, they divide out of control, forming tumors and potentially spreading to other parts of the body. When cells in the breast are affected this way, breast cancer results.

### What are the Symptoms of Breast Cancer?

Early breast cancer usually has no symptoms, but is picked up with screening tests. It is important to note that **most new breast lumps are not cancer**, but it must be "ruled out" anyway.

You know your own breasts better than anyone else in the world. You not only look at them and touch them more often, but also know how they feel, internally as well as externally, throughout the month, and over the course of your lifetime. You are more likely than anyone else to know when something has changed and to be able to detect even subtle changes. A healthcare provider only sees you for routine check-ups and when you come to them having noticed a change. This is important information, so be attentive. The more you notice, the better the chance that you will catch a problem early.

### Symptoms

- A lump or thickening in or near the breast or in the underarm area;
- A change in the size or shape of the breast;
- Nipple discharge or tenderness, or the nipple pulled back (inverted) into the breast;
- Ridges or pitting of the breast (the skin looks like the skin of an orange); or
- A change in the way the skin of the breast, areola, or nipple looks or feels (for example, warm, swollen, red, or scaly). Redness does not necessarily indicate cancer. It may also indicate infection.
- Ulceration or eroded skin on the breast
- Pain: There is a fairly widespread myth that if you feel pain in your breast it cannot be cancer. This is not always the case. Most likely it is cyclic pain associated with fibrocystic breasts, but it is always important to find out.

### How Is Breast Cancer Diagnosed?

The most common ways of screening for breast cancer are Breast Exams and Mammograms  
<http://www.healthandage.com/Home>

### Breast Examinations

Breast Examination by a Health Professional- Early detection of breast cancer significantly reduces the risk of death. Every woman between the ages of 20 and 49 should have a physical examination by a health professional every one to two years. Those over 50 should be examined annually. A breast exam by a health professional can find 10% to 25% of breast cancers that are missed by mammograms. Between 6% to 46% of the lumps detected by examination are malignant. (The yield is lowest in younger women and highest in older women.)

Self-Examinations- Women have been encouraged to perform a self-examination each month, but well-conducted studies in 2002 reported no difference in mortality rates between women who were intensively instructed in self-examination and those who were not. For one, they are difficult to perform and women are often not very proficient. Most women also stop doing them. This does

not mean women should stop attempting self-examinations, but they should not replace the annual examination done by a health professional, which evidence suggests is beneficial.

## **MAMMOGRAMS**

Current Recommendations for Screening- Mammograms are very effective low-radiation screening methods for breast cancer. At this time, the U.S. Preventive Services Task Force recommends screening mammograms, with or without breast examination every one to two years for all women over 40. After age 50 screening should be annual. (Women over 65 account for most new cases of breast cancer.) Women with risk factors for breast cancer, including a close family member with the disease, should consider having annual mammograms starting 10 years earlier than the age at which the relative was diagnosed. (Uninsured women or those who have not been referred to a mammogram center can contact their local American Cancer Society for available low-cost programs.)

Issues Involved with Screening- Mammograms are not foolproof, however. In general, they still miss up to 25% of cancers (which can sometimes be caught on a physical examination). And, furthermore, between 80% and 90% of suspicious mammograms turn out to be benign. According to one study, by the time a woman has nine mammograms, she has a 43% chance of having a false-positive mammogram (one that suggests cancer that isn't really there). This means many women are requiring biopsies who do not have cancer (but the only way to be sure is to perform the biopsy). Digital mammography is a recent technique that converts the image of the breast so it can be viewed and manipulated on a computer screen. It is improving accuracy but no screening technique is perfect yet.

Even given current recommendations, there are a number of issues as to who should screen and when to screen.

For Women between Ages 50 and 60- Evidence suggests that annual mammograms save lives in this age group. Furthermore, according to one study, because regular screening tends to find cancers in earlier stages there has also been a decline in the number of mastectomies (surgical removal of the breast).

For Women between Ages 40 and 49- Whether premenopausal women should have routine mammograms is controversial. The areas of debate are as follows:

- Arguments against Regular Screening. A number of studies have now reported that any survival benefits from regular mammography in this group are likely to be small compared to breast examinations alone. Most of the arguments against mammography in this population are due its inefficiencies in this age group. The probability that woman in this age group with a suspicious mammogram will actually have breast cancer is only 2% to 4%; so frequent screening becomes very cost-inefficient and produces many unnecessary biopsies. In addition, breast tissue is dense in premenopausal women and mammography often fails to detect breast cancers that are present. Breast cancers in this age group are also often aggressive and two-year intervals may not detect them early enough to affect survival.
- Arguments for Regular Screening. Breast cancer fatality rates are highest in women between ages 40 and 49. And in spite of some negative studies, recent ones are finding some survival benefits for screening every one or two years. Advances in imaging techniques are helping to improve accuracy.

For Women Over 69- Most breast cancers appear in women over 70 and such women are more likely to be diagnosed at a later stage, most often because of less frequent screenings. Still, experts disagree about the benefits of regular screening in older women. Some evidence suggests that regular screening would prevent only about one death per 1,000 women screened. Elderly women are also particularly likely to have non-malignant abnormalities in their breasts and so undergo unnecessary biopsies.

For Women with breast implants- These women should be examined with special breast positioning techniques, which include pushing the implant back toward the chest wall in order to image a maximum of breast tissue. Women should therefore inform their mammogram technologists if they have implants.

**Timing of Mammograms: Is Timing of Mammograms Important?**

A study published in the August 1997 issue of the journal "Cancer" found that women having their mammogram during the last two weeks of their menstrual cycle were twice as likely to have false-negative mammogram results. A false-negative mammogram occurs when the x-ray is interpreted as not suspicious, when cancer is actually present. Dr. Cornelia Baines, one of the authors of the study stated, "From our research we've learned menstruation may partially explain why women under 50 years of age do not benefit from screening mammograms as much as older women."

Data were collected from 8,887 menstruating women between the age of 40 and 44. Researchers compared mammogram results of women in days one through 14 of their menstrual cycle (the follicular phase), with those in days 15 through 28 of their cycle (the luteal phase). Dr. Baines concluded that this study "shows there is an opportunity to improve the accuracy of mammograms by choosing to have mammograms during the first half of the menstrual cycle."

**Comparing Different Breast Exams**

Size of Tumors Found by Mammography and Breast Self-Exam	
	Average-size lump detected with routine mammogram (0.43 inches / 1.1 cm)
	Average-size lump detected with first mammogram (0.59 inches / 1.5 cm)
	Average-size lump found by regularly practicing breast self-exam (0.83 inches / 2.1 cm)
	Average-size lump found accidentally (1.42 inches / 3.6 cm)

\* These images were created for viewing at 800 by 600 resolution on a 16-inch monitor. They will appear larger or smaller depending upon display size and resolution. However, the relative size of the detected tumor will remain consistent. <http://imaginis.com/breasthealth/earlydetection.asp>

## Other Imaging Techniques

**Magnetic Resonance Imaging (MRI) and Ultrasound-** MRI and ultrasound techniques can detect very small tumors (less than half an inch). However, they are expensive and are time-consuming procedures. Nevertheless, some experts believe they are important in identifying small tumors missed on mammography in women who are receiving lumpectomy or breast-conserving surgeries. Such findings would allow the surgeons to remove the optimal amount of abnormal tissue. Ultrasound may also be particularly important for women with dense breast tissue who show signs of breast cancer.

**Ultrasound (Sonograms)-** High-frequency sound waves have been used to create images of internal organs for the past 50 years. Since 1951 they have been used in breast screening, although not as a primary method, since many lesions cannot be seen on ultrasound. Ultrasound is considered safe for women of any age, as well as during pregnancy. The examination takes 5-15 minutes and is completely painless.

Ultrasound is most useful in distinguishing solid masses, which may be malignant (cancerous), from cystic lesions (fluid filled sacs), which are usually benign (noncancerous). Utilizing this technique can reduce the number of unnecessary biopsies. However, ultrasound can miss solid lesions, especially in fatty breasts.

**Scintimammography-** Scintimammography employs a radioactive chemical injected into the circulatory system, which is then selectively taken up by the tumor and revealed on mammograms. This method is very accurate in detecting the presence or absence of breast cancer, and some experts hope that it might eventually reduce the number of unnecessary invasive biopsies.

## Other Screening Tools

**Ductal Lavage and Ductoscopy-** In this new technique, fluid obtained by ductal massage and nipple aspiration is being tested, particularly in women at high risk of breast cancer, such as carriers of the breast cancer gene. It is believed that ductal lavage may be a useful addition to mammography, ultrasonography, and clinical examination in the early detection of cancers in such women. Often the fluid aspirated contains no cells, however if a good sample can be obtained, it is often very accurate in predicting the presence or absence of breast cancer. Since performing this technique is intensive, requires considerable skill, and the results depend upon the skill of the operator, it will probably be used mainly for high-risk women. Studies of its reliability and acceptability in such women over long periods of time must be carried out before its long-term usefulness can be truly assessed.

**Thermography (Digital Infrared Thermal Imaging-DITI) -** DITI is a non-invasive diagnostic imaging procedure which records the temperature patterns of a person's skin. It is useful in detecting very early vascular changes such as when a tumor begins to create the blood supply needed by it in order to grow. This is much earlier than conventional diagnostic tools such as mammogram and ultrasound would indicate change, since they rely on picking up density and at this point a tumor has not yet developed sufficient density to be detected by these exams. If early changes are seen on thermographic imaging, a mammogram would also be indicated to scan that area. If the changes are early enough that they do not yet show up on mammogram, further DITI imaging could be used to follow changes in the area and a woman would have time to employ 'alternative' means of improving her health and immune system before the tumor began to grow. Essentially, DITI looks at physiology; mammography at anatomy. Used together, they may increase your chance of detecting a mass early.

A recent study from the American Roentgen Ray Society, **Efficacy of Computerized Infrared Imaging Analysis to Evaluate Mammographically Suspicious Lesions**, looked at thermography and concluded that Infrared imaging offers a safe noninvasive procedure that would be valuable as an adjunct to mammography in determining whether a lesion is benign or malignant.

## Biopsies

If a lump is found using any of the techniques described, a biopsy must be done. **A diagnosis of breast cancer can be made only by a biopsy** (a microscopic examination of a tissue sample of the suspicious area). breast cancer biopsy table-<http://www.wcn.org>

Biopsy Type	How It's Done	Where	Pain Level	Results
<b>Fine needle aspiration biopsy</b>	Doctor uses a thin needle to remove fluid/tissue from the breast lump. This shows if a lump is a fluid-filled cyst, which usually means it is not cancer, or a solid mass, which may or may not be cancer.	A surgeon or radiologist's office. Patient may be given local anesthesia.	Discomfort similar to what a person would feel having blood drawn.	If the results are abnormal, a woman may be sent to have a different kind of biopsy.
<b>Core needle biopsy</b>	The doctor will use a larger needle to remove one or more small cylinders of tissue. An ultrasound may serve to guide the needle to the lump or area being tested.	A surgeon or radiologist's office. Generally performed with local anesthesia.	Mild pain and discomfort after. Area biopsied will be tender for a couple of days.	Tissue removed in a needle biopsy goes to a lab to be checked by a pathologist for cancer cells.
<b>Stereotactic biopsy</b>	The patient will lie down on a table with a hole in it so the breast will hang down. Needle is placed into the breast using computer plans. Fluid or cells are taken from the lump. Usually, several biopsies are done.	Done in radiologist's office or radiology dept. of hospital.  Local anesthesia is used	Leaves no scar. Mild discomfort in area - more so if tissue was taken than if just fluid was removed.	Tissue removed in a needle biopsy is x-rayed to make sure it includes the abnormal area seen on the mammogram. Then, it goes to a lab to be checked by pathologist for cancer cells.
<b>Needle localization</b>	This uses two mammograms. A fine needle, with a wire the size of a strand of hair, is put into breast with the tip of the needle resting on the abnormal area seen in the first mammogram. Second mammogram makes sure needle is in right place. The lump or abnormal tissue is removed with the wire, by a surgeon.	The fine needle is put into the breast in the radiology department of a hospital. A surgeon removes the tissue in an operating room. Local anesthesia is used.	This biopsy may leave a scar, depending on how much tissue was removed. Discomfort may be more severe and last for longer than with other biopsies.	Tissue removed in a needle biopsy goes to a lab to be checked by a pathologist for cancer cells.
<b>Incisional surgical biopsy</b>	Part of the lump is removed through a cut in the skin.	In a hospital, surgeon's office, or clinic. Uses local or general anesthesia.	May leave a scar. Also, discomfort for several days after biopsy.	Tissue removed in a needle biopsy goes to a lab to be checked by a pathologist for cancer cells.
<b>Excisional surgical biopsy</b>	The entire lump and some tissue around it are removed. Used for small lumps.	In outpatient part of hospital, or surgical center, or operating room. Local or general anesthetic used.	This biopsy can change the shape of the breast depending on how big the lump is. Also, a scar may occur.	Tissue is examined by a pathologist. If cancer is found, more surgery <b>may not</b> be needed as long as surgeon removed entire lump and the cancer has not spread.

If cancer is found in the biopsy, a pathologist will determine its type. The doctor can then tell the patient whether it is ductal or lobular or invasive.

**Fortunately, 65% - 80% of breast biopsies result in benign (non-cancerous) diagnosis.**

## **Preparing for Biopsy Results**

Website Devoted Entirely to Breast Biopsy- <http://www.breastbiopsy.com>

### **Answers to these questions will help you prepare for the results of a biopsy:**

1. If I do have cancer, what other tests should I have?
2. Will estrogen or progesterone receptor tests be done on the biopsied tissue you remove?
3. What will these tests tell you?
4. Will other special tests (flow cytometry and other markers for tumor aggressiveness) be done on the tissue?
5. Will you do a two-step procedure? (With a two-step procedure, the patient is informed of treatment options after the biopsy results are available. Any further surgery is done as a separate procedure.)
6. How visible will the biopsy scar be?
7. Are there any after affects of biopsy? If so, what are they?
8. After the biopsy, how soon will I know if I have cancer or not?
9. After a biopsy, if cancer is found, how much time can I take to decide what type of treatment to have?

### **Questions to Ask Your Doctor Before a Breast Biopsy or Needle Aspiration**

Understanding the Procedure-Answers to these questions will help you understand the procedures involved:

1. What type of biopsy will I have?
2. Why that type of biopsy over another?
3. Will the entire lump be removed or just part of it?
4. Can the sample be aspirated (the fluid drained or a small number of cells removed) with a needle?
5. How reliable is a needle biopsy?
6. How long will the biopsy or aspiration take?
7. Will I be awake during the biopsy or aspiration and can it be done on an outpatient basis?

## TYPES OF BREAST CANCER

**Carcinoma in Situ:** In situ means that the cancer stays confined to ducts or lobules and has not spread into surrounding fatty tissues in the breast or to other organs in the body. There are 2 types of breast carcinoma in situ:

**Lobular carcinoma in situ (LCIS):** Also called lobular neoplasia. It begins in the lobules, but does not grow through the lobule walls. Breast cancer specialists do not think that LCIS, itself, becomes an invasive cancer, but women with this condition do run a higher risk of developing an invasive cancer in either breast.

**Ductal carcinoma in situ (DCIS):** The most common type of noninvasive breast cancer. Cancer cells inside the ducts do not spread through the walls of the ducts into the fatty tissue of the breast. DCIS is treated with surgery and sometimes radiation, which are usually curative. Having untreated DCIS greatly increases the risk of invasive breast cancer.

**Infiltrating (or Invasive) Ductal Carcinoma:** The cancer starts in a milk passage, or duct, of the breast, but then the cancer cells break through the wall of the duct and spread into the breast's fatty tissue. They can then spread into lymphatic channels or blood vessels of the breast and to other parts of the body. About 80% of all breast cancers are infiltrating or invasive ductal carcinoma.

**Infiltrating (or Invasive) Lobular Carcinoma (ILC):** This type of cancer starts in the milk-producing glands. Like IDC, this cancer can spread beyond the breast to other parts of the body. About 10% to 15% of invasive breast cancers are invasive lobular carcinomas.

**Medullary Carcinoma:** This special type of infiltrating ductal cancer has a relatively well-defined, distinct boundary between tumor tissue and normal breast tissue. It also has a number of other special features, including the large size of the cancer cells and the presence of immune system cells at the edges of the tumor. It accounts for about 5% of all breast cancers. It is difficult to distinguish medullary breast cancer from the more common infiltrating ductal breast cancer. NCCN recommends that medullary breast cancers be treated as if they were the usual form of infiltrating ductal cancer.

**Colloid Carcinoma:** This rare type of invasive ductal breast cancer, also called mucinous carcinoma, is formed by mucus-producing cancer cells. Colloid carcinoma has a slightly better prognosis and a slightly lower chance of metastasis than invasive lobular or invasive ductal cancers of the same size.

**Tubular Carcinoma:** Tubular carcinoma is a special type of infiltrating ductal breast carcinoma. About 2% of all breast cancers are tubular carcinomas. Women with this type of breast cancer have a better outlook because the cancer is less likely to spread outside the breast than invasive lobular or invasive ductal cancers of the same size.

**Inflammatory Breast Cancer:** This uncommon type of invasive breast cancer accounts for about 1% to 3% of all breast cancers. The skin of the affected breast is red, feels warm, and has the appearance of an orange peel. Doctors now know that these changes are not caused by inflammation, but by cancer cells invading the skin and blocking lymph vessels. Inflammatory breast cancer has a higher chance of spreading and a worse prognosis than typical invasive ductal or lobular cancers. Inflammatory breast cancer is always staged as stage IIIB unless it has already spread to other organs at the time of diagnosis which would then make it stage IV. (See discussion of [Stage](#)).

**Benign Breast Lumps:** Most breast lumps are benign (not cancerous). Fibrocystic changes usually cause most of these lumps. Fibrosis refers to excessive formation of scar-like connective tissue; [cysts](#) fluid-filled sacs. Women with fibrocystic changes often experience breast swelling and pain. The breasts may feel lumpy and the nipple may discharge a clear or slightly cloudy liquid. Benign breast lumps such as fibroadenomas or papillomas are quite common. They cannot spread outside of the breast to other organs. Some breast lumps need to have a biopsy. Women who have some types of benign conditions have a higher risk of developing a future invasive breast cancer.

## Evaluating Cancer with Tumor Markers

- Tumor marker levels can be elevated in people with benign conditions.
- Tumor marker levels are not elevated in every person with cancer-- especially in the early stages of the disease.
- Many tumor markers are not specific to a particular type of cancer; the level of a tumor marker can be raised by more than one type of cancer.

Your blood, urine or body tissues may be tested for certain substances called tumor markers, which may indicate the presence of certain cancers in your body. We do not yet have tumor markers for every cancer, but are discovering more every day. Tumor markers have many uses:

- Screening for the presence of cancer
- Making a diagnosis of cancer
- Determining the status of the cancer
- Evaluating the success of surgery, radiation, or chemotherapy in controlling cancer
- Monitoring the health of a patient in remission (no active cancer seen)

**CA 27-29-** CA 27-29 is found in the blood of most breast cancer patients. CA 27-29 levels may be used in conjunction with other procedures (such as mammograms and measurements of other tumor marker levels) to check for recurrence in women previously treated for stage II and stage III breast cancer.

CA 27-29 levels can also be elevated by cancers of the colon, stomach, kidney, lung, ovary, pancreas, uterus, and liver. First trimester pregnancy, endometriosis, ovarian cysts, benign breast disease, kidney disease, and liver disease are noncancerous conditions that can also elevate CA 27-29 levels.

**The CA15.3** (Cancer Antigen 15-3) assay uses monoclonal antibodies to detect two antigenic sites associated with breast carcinoma cells. It is used primarily as a marker for cancer of the breast, but may also be elevated in cancers of the stomach, liver, pancreas, lung and ovary. As with other tumour markers, CA15.3 is most useful for serial monitoring.

CA 15-3 and CA 27-29 markers are useful in following the course of breast cancer and its response to treatment. They are not used as screening tests since they are not detectable in early stage breast cancer.

## **QUESTIONS TO ASK YOUR DOCTOR ABOUT YOUR DIAGNOSIS**

- What kind of cancer do I have?
- Is it invasive?
- What lab tests were completed, and what did they show?
- Do I need any additional lab tests or diagnostic studies?
- What is the purpose of each test or study?
- How will this information help decide what types of further tests or treatments I should have?
- What do I need to do next?
- What if I do nothing else?

## Notes

*Specific Questions that you would like answered. (Write down your questions before your doctor's appointment and then write down the answers for future reference.)*

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