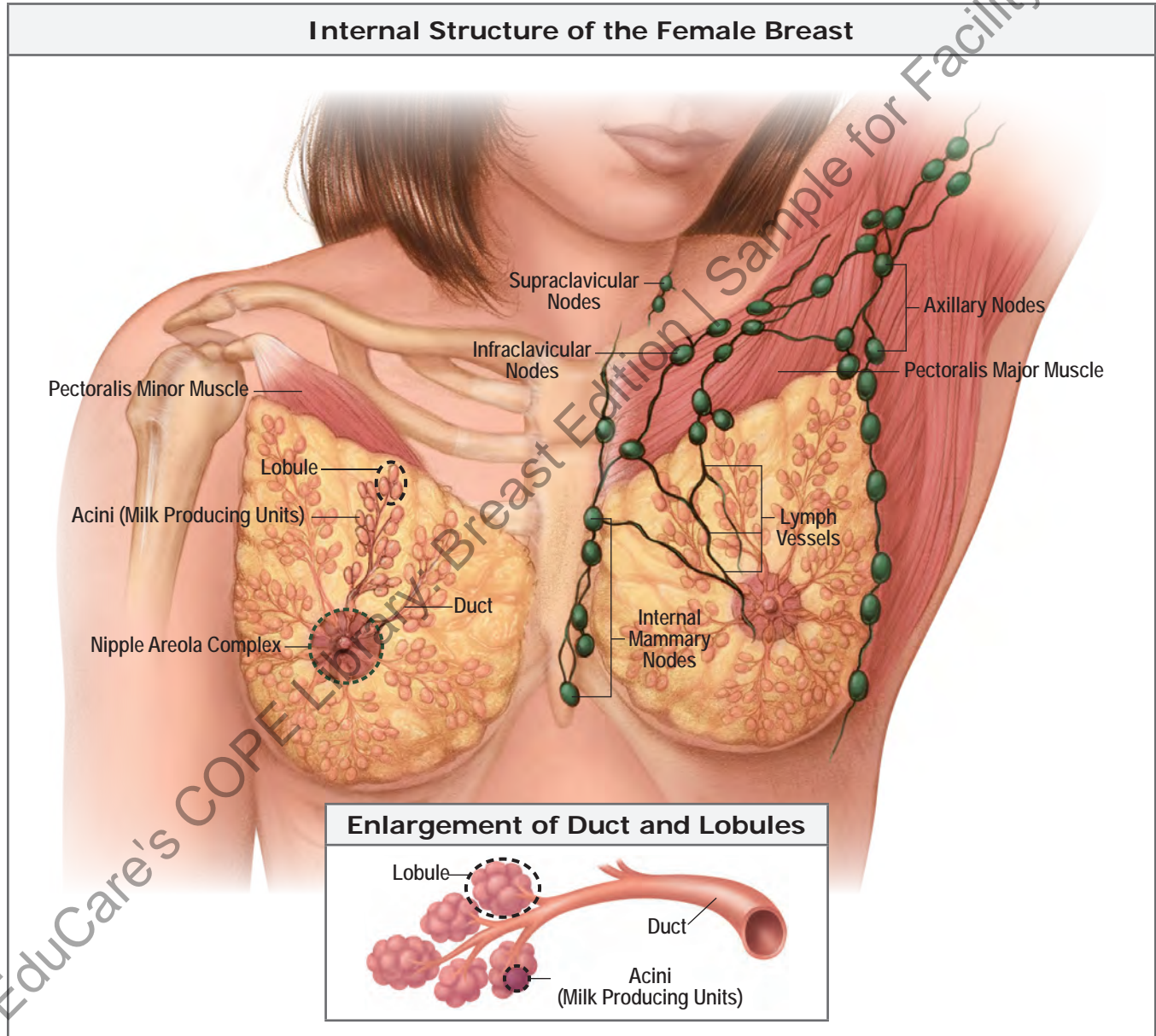
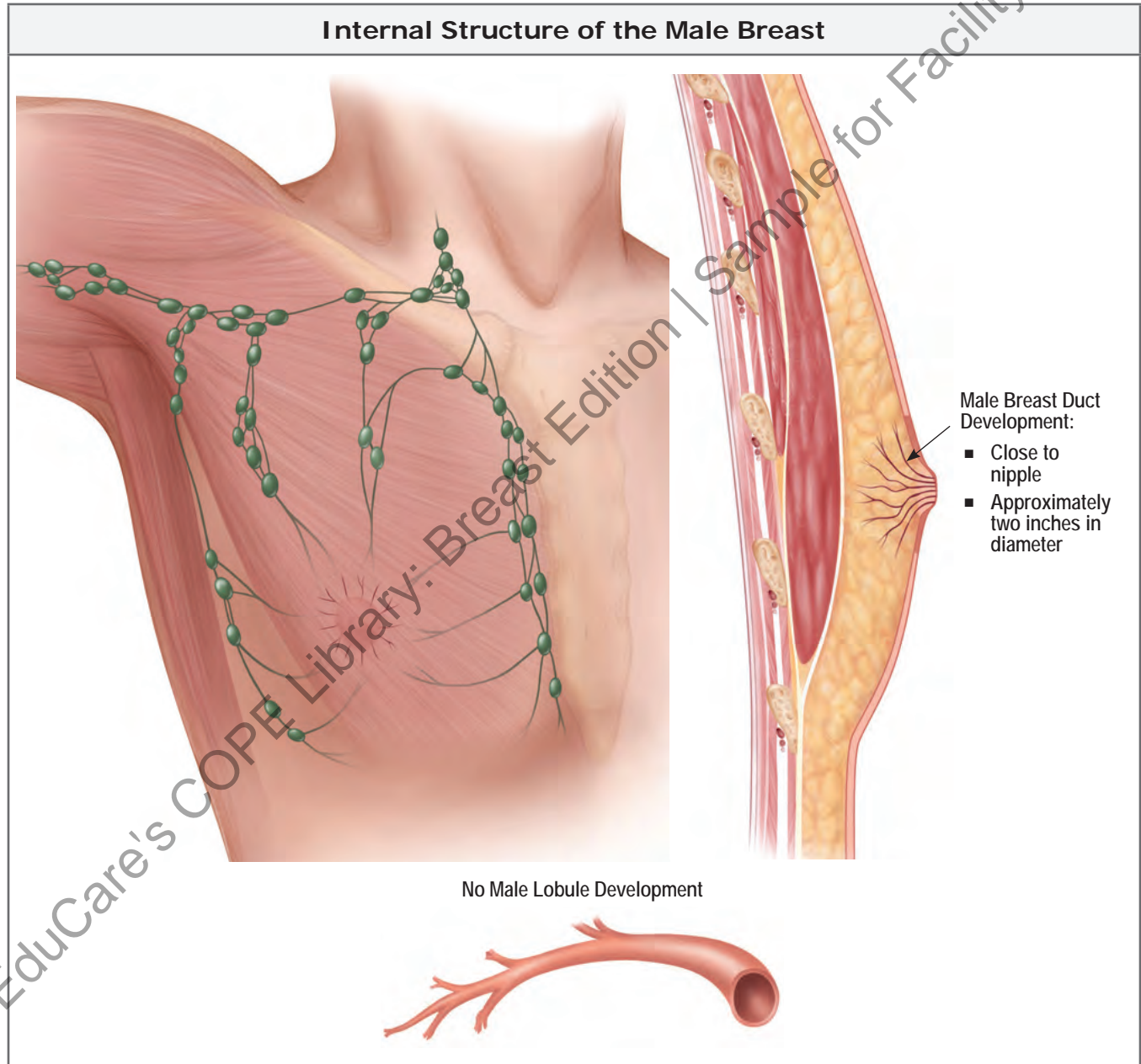


Breast Anatomy - Female



Breast Anatomy - Male



Incisional Biopsy

Procedure Scheduled:

Patient Name _____

Procedure Date _____ Time _____ Facility _____

Facility Address _____ Telephone _____

Physician _____

Definition of Terms:

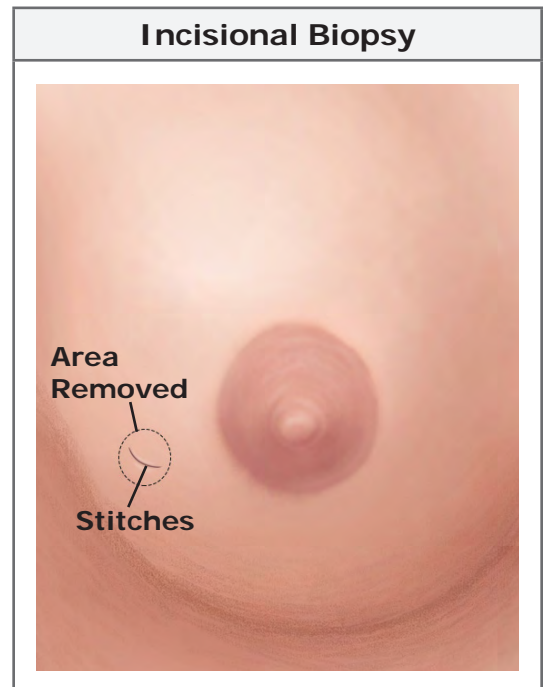
- **Antiseptic** — An agent to disinfect or to remove bacteria and other microorganisms.
- **Anesthetic** — Medication that produces loss of sensation for pain. May be local or general.
- **Benign** — Not cancerous; no threat to the body.
- **Biopsy** — Procedure to remove cells or tissues for study by a pathologist.
- **Chest Wall** — Deep in the breast, near the muscle of the chest.
- **Hematoma** — An accumulation of blood under the tissues from bleeding.
- **Incisional** — A cut made with a knife into the body.
- **Malignant** — Cancerous; a threat to the body.
- **Pathology** — The study of disease processes and consequences.

Procedure Overview

If a surgeon can feel a suspicious lump, an incisional biopsy may be performed (using a surgical knife in an operating room) to remove a portion of the suspicious lump, rather than the entire lump. An incisional biopsy is usually performed when the lump is large and a preliminary diagnosis is needed. This is routinely performed in a clinic or in a hospital on an outpatient basis.

Before the Procedure:

- You will be asked to sign an informed consent document. This form states that a member of the healthcare team has thoroughly explained the risks and benefits of the procedure. Before signing, ask any questions you may have.





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Prior to Biopsy:

- Several days prior to the biopsy, you may be required to have lab work performed according to your doctor's orders.
- An assessment and medical history will be taken to determine any conditions such as allergies and previous surgeries.
- Remember to write down the names of any medications or herbal medications that you take on a regular basis to report during your assessment.
- Tell your healthcare provider if you are taking blood-thinning medications such as Coumadin, Plavix, Eliquis, Pradaxa, Xarelto, Effient, Brilinta, prednisone, aspirin or over-the-counter supplements such as fish oil or ginkgo.

Day of Biopsy:

- On the day of the surgery, you will report to the surgical unit.
- Local anesthetic (in the breast only) or general anesthetic (putting you to sleep) will be administered.
- The breast will be cleansed with an antiseptic to destroy bacteria on the skin.
- The surgeon will cut through the skin and remove a small portion of the lump.
- Several stitches will close the area.
- You will be taken to an outpatient recovery room where you will be monitored until your vital signs are normal.
- You will be discharged if you are not experiencing vomiting, bleeding, or excessive pain.
- A small bandage will cover the incision and you will be given discharge instructions on how to care for the wound.
- Ask your doctor when you may get the area wet and return to your normal activities.
- A return appointment with your physician will be made to have the stitches removed and to see how the wound is healing.

After Your Biopsy:

- The area may be slightly sore for several days.
- There is potential for infection after an incisional biopsy because of the cut through the skin. Follow the instructions provided by your physician on how to care for the wound.
- Be sure to keep the bandage dry.
- You may have a mild, aching pain that can be controlled with over-the-counter medications.
- You may have a blood-tinged drainage from fluid in the biopsy cavity; this is normal.
- Discoloration of the breast (bluish turning to yellowish tones) may occur.

Contact Healthcare Provider:

- If you have a fever over 100.4° F.
- If you have increasing redness around the incision site.
- If pain increases in the area and is not controlled by over-the-counter pain medication.
- If you have bright red bleeding from the site.



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Telephone number to call during office hours: _____

Telephone number to call after office hours: _____

Procedure Results:

The biopsy tissue will be sent to the pathology lab and the results, stating whether the tissue is benign (not cancer) or malignant (cancerous), will be made available to your physician. Ask your physician when and how you will be informed of the results of the biopsy report.

Your results/report will be available: _____

You will receive the results/report from: _____

If you have not received your results/report by the date indicated, please call the office.

Additional Information:

EduCare's COPE Library: Breast Edition | Sample for Facility Review

Dense Breasts

Dense breasts have a higher level of dense tissue compared to the level of fatty tissue. This diagnosis is made after a radiologist views your mammography pictures and compares the ratio of dense tissue to fatty tissue.

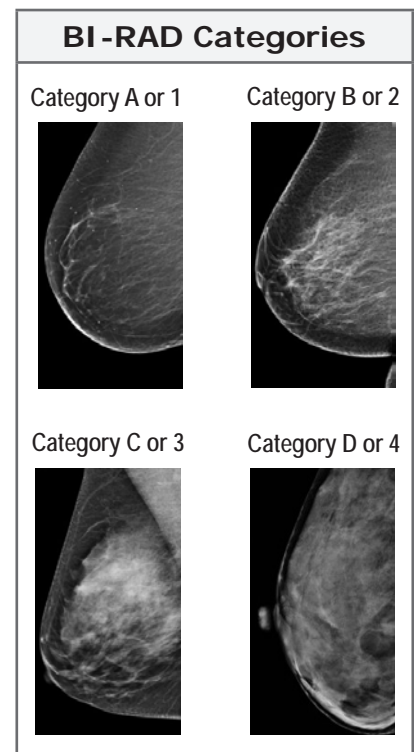
The breasts are composed of fibroglandular (fibrous and glandular) tissue and fatty tissue. The fibrous tissue is the supportive tissue of the breast that holds the breast to the chest wall. Glandular tissues include the working units of the breasts, the milk glands and milk ducts. When looking at a mammogram, the glandular and fibrous tissues appear white. Fatty tissues appear black. Abnormalities, including cancer, also appear white on a mammogram. Since dense tissue and cancer both show up as white during mammography, dense breasts create a challenge for the radiologist. Abnormalities in the breast become more difficult to identify in dense breasts.

How Do You Know If You Have Dense Breasts?

Your breast density is determined when a radiologist analyzes your mammography pictures and determines the ratio of fibroglandular (dense) tissue to fatty (non-dense) tissue. The radiologist will assign a level of density based on the BI-RADS reporting system into one of four levels of density.

- **Category A or 1:** The breasts are almost entirely fatty. Approximately 1 in 10 women have this result.
- **Category B or 2:** There are scattered areas of fibroglandular density. The majority of the breast is non-dense. Approximately 4 in 10 women have this result.
- **Category C or 3:** The majority of the breasts are dense with some areas of non-dense tissue. Approximately 4 in 10 women have this result.
- **Category D or 4:** The breasts are extremely dense. Nearly all of the breast tissue is dense. Density may lower the sensitivity of a mammogram. Approximately 1 in 10 women have this result.

Women who are assigned Category C (3) or Category D (4) are considered to have dense breasts. The radiologist will report the grade level of density in the written mammography report.



Causes of Dense Breast Tissue:

- **Young Age:** Younger women are more likely to have dense breasts caused by higher levels of female hormones. Breast tissue tends to become less dense as one ages and hormonal levels decrease. However, women may have dense breasts at any age.
- **Hormonal Therapy:** Women who take hormonal therapy, estrogen/progesterone, for menopausal symptoms are more likely to have dense breast tissues.



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Concerns About Dense Breasts

Dense breast tissues cause your mammogram to be more difficult to interpret by a radiologist since both dense tissue and cancer appear as white on mammography pictures.

What to Do if You Have Dense Breasts:

- Closely follow your recommended schedule for regular mammography screening.
- Digital mammography is highly recommended for dense breasts.
- Tomosynthesis (3-D) mammography has recently been approved and has been found effective in the imaging of dense breasts. Tomosynthesis is a specially designed digital mammography machine, which includes an additional X-ray tube that rotates over the top of the compressed breast and takes a series of approximately 11 pictures. The images are sent to a computer and are converted into a 3-D image. The 3-D image increases the visibility of abnormalities.

A contrast-enhanced mammogram is a new technology that uses intravenous contrast material to improve the pictures of the inside of the breast. It is recommended as an option for high-risk patients. Ask your breast center if this option is available.

Discuss your breast density and risk factors with your healthcare provider. Ask for recommendations about additional supplemental imaging methods.

Supplemental Imaging Types

Each of the imaging tests discussed below has advantages and disadvantages. Each test has proven to detect more breast cancers than mammography alone. However, none of these tests has proven to reduce the risk of dying from breast cancer.

- **Breast MRI:** MRI (magnetic resonance imaging) uses magnets to create images of the breasts. MRI does not use radiation. It is recommended for women with a very high risk of breast cancer including those with known BRCA mutations, which increase breast cancer risk.
- **Breast Ultrasound:** Breast ultrasound uses sound waves with no radiation to analyze breast tissue. Diagnostic breast ultrasound is commonly used to further evaluate areas of concern found during mammography.
- **Molecular Breast Image (MBI):** MBI uses a special camera (gamma) to record the activity of an injected radioactive tracer. The tracer is injected into an arm vein. Normal tissues and cancerous tissues react differently to the tracer, which is identified when the breasts are scanned with the gamma camera.



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Supplemental Exam	Advantages	Disadvantages
Breast MRI	<ul style="list-style-type: none"> No additional radiation exposure Widely available Detects 18 more cancers per 1,000 women screened 	<ul style="list-style-type: none"> Requires injection of contrast material; potential allergic reaction to contrast material Identifies non-cancerous areas that require additional imaging or biopsy Expensive test: often not covered by insurance unless very high risk is proven
Breast Ultrasound	<ul style="list-style-type: none"> No additional radiation exposure Widely available Detects 3-4 more cancers per 1,000 women screened 	<ul style="list-style-type: none"> Identifies areas that require additional imaging but are not cancerous Highly dependent on the skill of the person performing exam
Molecular Breast Imaging (MBI)	<ul style="list-style-type: none"> Least likely of all the tests to require an unnecessary biopsy of benign lesions Detects approximately 7 cancers per 1,000 women screened 	<ul style="list-style-type: none"> Requires injection of radioactive tracer, exposing the patient to a very low dose of radiation Not readily available in all centers Expensive

Additional Information:

Pathology Report

After the surgical removal of your tumor, it goes to a pathology laboratory for numerous evaluations and tests. A pathologist, a physician specializing in diagnosing diseases from tissue samples under a microscope, analyzes your tumor for a number of characteristics. These characteristics compile your pathology report.

Gross Description

The pathologist first describes the size, weight and color of the tissues removed during your surgery called the gross description. The shape of the tumor is reported as round, spherical or having irregular contours (edges), described as stellate or spiculated.

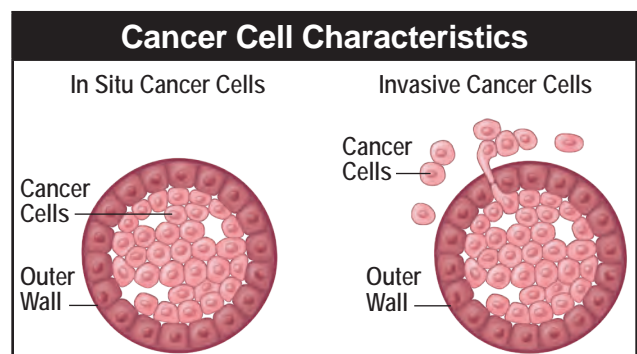
Tumor Preparation

The tumor is prepared for study under a microscope by cutting the tissue into very thin slices. Each slice is then mounted on a slide for microscopic study. These studies provide critical information about your tumor's biology (how it behaves in your body). A pathology report containing your unique characteristics is prepared and sent to your physician. The characteristics identified in this report provide foundational information on which your physician makes treatment decisions. In the future, if additional studies are needed or if research unfolds new tissue diagnostic tests, your pathology slides will be available at the pathology lab.

Type of Breast Cancer Identified

Normal ducts and lobules are lined with one or more layers of cells in an orderly pattern. When normal cells become cancerous, they change their appearance from a normal cell to an abnormal cell. Cancerous cells may lose some or all of their normal cell characteristics. Cancer cells behave in an abnormal way. Unlike a normal cell, cancer cells do not stop dividing but continue to divide and grow in size. They can also leave the breast duct or lobule where they started and grow through the wall into surrounding tissues. The first step in evaluating your cancer is to determine if your tumor has grown through the wall where your cancer started.

- **In Situ Cancer:** Cancer cells are contained within the duct or lobule where they originated. The cancer cells have **not** grown through the walls and invaded healthy surrounding tissues. In situ cancer is non-invasive. This type of cancer has a good prognosis.
- **Invasive (Infiltrating) Cancer:** Cancer cells have grown through the wall of the duct or lobule and are growing in healthy surrounding tissues. Micro-invasive means that only a small number of cells have grown through the duct or lobular walls.



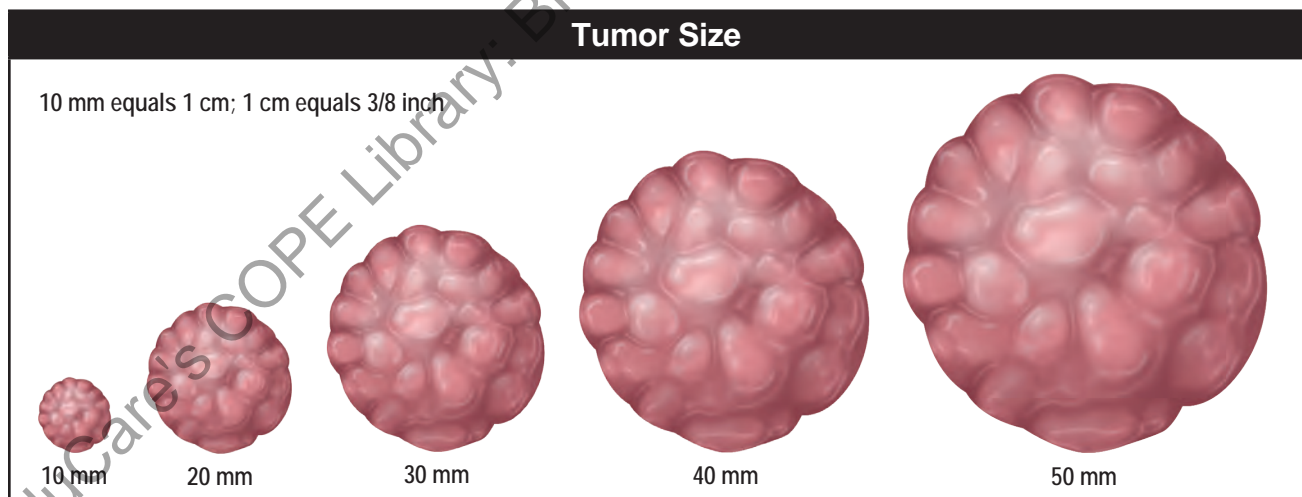
Histological Name Of Your Breast Cancer

There are over 15 types of breast cancer (histological types) based on the pattern of tumor cell arrangement when viewed under a microscope. Pathologists identify the histology pattern, and your pathology report provides the histological name of your breast cancer. The most common histological types and names of breast cancer are listed below along with the approximate percentage of occurrence.

- **In Situ Cancers Histological Names:**
 - Ductal carcinoma in situ (20%)
 - Paget disease with intraductal (1%)
- **Invasive Cancers Histological Names:**
 - Invasive (infiltrating) ductal (52%)
 - Invasive lobular (10%)
 - Medullary (6%)
 - Inflammatory breast cancer (5%)
 - Mucinous or Colloid (3%)
 - Tubular (2%)
 - Cribriform (1% or less)
 - Papillary (1% or less)
 - Micropapillary (1% or less)
 - Adenoid Cystic (1% or less)
 - Secretory (1% or less)
 - Mixed Ductal and Lobular

Tumor Size

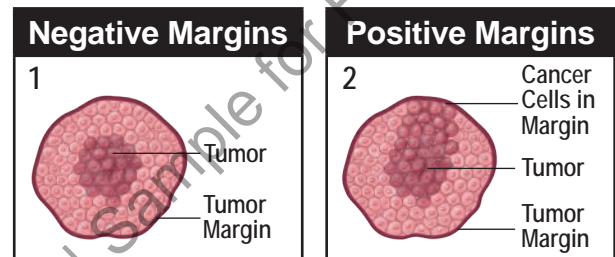
Tumor size is measured at the widest diameter and reported in millimeters (mm) or centimeters (cm).



Surgical Margins

Surgical margins report the shortest distance between the tumor edge and the surgical edge of the tissue removed during surgery. This distance is called the margin of resection. The margin of resection is looked at closely to determine if cancer cells are present. Pathology margins are reported as:

- **Negative, Clear, Clean or Uninvolved:** There was no evidence of cancer cells in the margins (*illustration 1*)
- **Positive, Involved or Residual Cancer:** Cancer was found in the margins and will probably require more surgery (*illustration 2*)
- **Close:** Cancer cells are close to margins and may require more surgery
- **Indeterminate:** Pathologist could not determine the margin status



Lymph Node Status

If your surgery included lymph node removal, the report states the removal area, the number of nodes removed and how many nodes tested positive for cancer cells. Pathology reports lymph nodes as:

- **Lymph Node-Negative:** No cancer found in the lymph nodes
- **Lymph Node-Positive:** Cancer found in the lymph nodes

Breast Cancer Biomarkers

Biomarkers play a significant role in the management of breast cancer. These biomarkers include estrogen (ER) and progesterone (PR) receptor status, and HER2 receptor status. Each biomarker is evaluated for its degree of impact on a tumor. Biomarkers provide essential treatment guidance by predicting the future sensitivity to different treatments.

Determining Biomarkers Status

During pathology examination, your tumor is tested for estrogen (ER), progesterone (PR) and HER2 **receptors** located on the cell surface. If present, receptors for ER, PR or HER2 stimulate your tumor growth. Receptors are like little chairs with different shapes that sit on the surface of breast cancer cells. When blood passes a cell, an element in the blood may be a perfect match in size and shape to fit into the chairs. When an element fits a cell chair, it sends a signal to stimulate cell growth. Your pathology report will state if you are positive or negative for ER, PR or HER2 receptors and the degree of positivity.

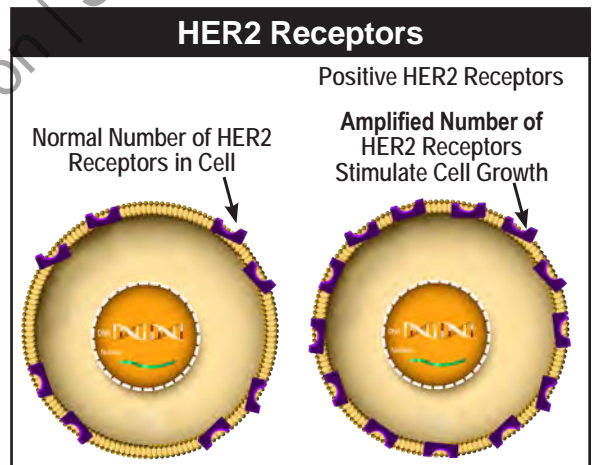
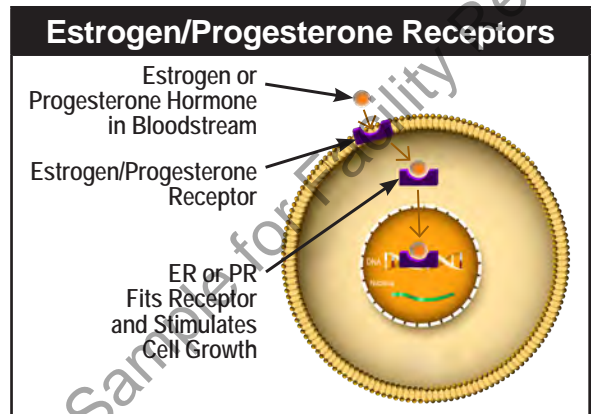
- **Estrogen/Progesterone Receptors:** If ER or PR receptors are present, your tumor is stimulated by the female hormones estrogen or progesterone to grow. The number of receptors for ER/PR may range from none (negative) to high. ER and PR are studied and documented separately. One hormone may test positive and the other negative or both may be negative or positive. ER/PR receptor status is a determining factor for treatment decisions. The status of your hormone receptors determines if you will benefit from

endocrine (hormonal) therapy. Hormone receptor status is reported as:

- ER positive (+) PR positive (+)
- ER positive (+) PR negative (-)
- ER negative (-) PR positive (+)
- ER negative (-) PR negative (-)

Some reports may show the number of cell receptors out of 100 that test positive for ER or PR, called the Allred score. The score is reported on a scale from 0 to 8. The higher the score, the higher the number of positive receptors found.

- **HER2:** The HER2 gene makes a protein that controls how a cell grows, divides and repairs itself. If HER2 receptors are amplified (increased), it causes the breast cells to grow and divide in an abnormal way, stimulating cancer growth. Positive tumors have over-expressed or amplified HER2. Approximately 25 percent of diagnosed patients have elevated HER2 levels. Although elevation of HER2 indicates a more aggressive cancer, targeted drugs, like Herceptin, block its influence on tumor growth. Having a positive HER2 means that a HER2-targeted drug will be included in your chemotherapy regimen.

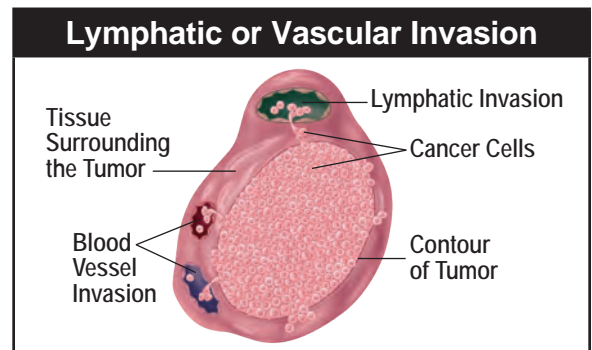


Tumor Growth Rate

Ki-67 is a proliferation (how fast a tumor is growing) study that measures a protein in a cell that increases prior to dividing. Study results below 10 percent are considered low; counts of 10 to 20 percent are considered borderline; counts over 20 percent are considered high. Higher Ki-67 levels indicate a more aggressive tumor.

Blood Vessel or Lymphatic Invasion

Vessel invasion is determined by microscopic examination of the tumor. No blood vessel or lymphatic vessel invasion offers a better prognosis. Evidence of invasion means cancer cells have entered into systemic circulation. *Note: Lymphatic invasion is different than lymph node involvement.*





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Histological Grade

The histological grade of a tumor is determined by the Nottingham Scale (Scarff-Bloom-Richardson Grading System). The grading system evaluates the three tumor characteristics listed below on a scale from 1 – 3:

- **Tubular Formation:** How much of the tumor is arranged as tubules (Grading Scale range 1 – 3)
- **Nuclear Grade:** Size, shape and color of the nucleus in the tumor cells (Grading Scale range 1 – 3)
- **Mitotic Rate:** How fast the tumor cells are growing and dividing (Grading Scale range 1 – 3)

Final Histological Grade: The score of each tumor characteristic is added together to produce a final grade. The final grade may range from 3 – 9. A lower score (3) indicates a less aggressive tumor. A higher score (9) indicates an aggressive tumor and a need to consider more aggressive treatment.

Breast Cancer Subtypes

In some cancer centers, breast cancer is placed into categories based on ER, PR, HER2 and Ki-67 **combined status**, which indicate cancer aggressiveness. Breast cancer subtype categories include Luminal A, Luminal B, HER2 Positive and Triple Negative (Basal). Each subtype category has different gene expressions, metastatic potential and sensitivity to existing therapies. Subtype characteristics are profiled in the following chart.

Breast Cancer Subtypes Characteristics				
	Estrogen	Progesterone	HER2	Ki-67
Luminal A	Positive	Positive or Negative	Negative	Less than 14%
Luminal B	Positive	Positive or Negative	Positive or Negative	Greater than 14%
HER2 Positive	Negative	Negative	Positive	Greater than 14%
Triple Negative (Basal)	Negative	Negative	Negative	Greater than 14%

Triple-Negative Breast Cancer

Triple-negative breast cancer (TNBC) describes a cancer when three different breast cancer markers are all negative. TNBC tests negative for (1) estrogen receptors (ER-), (2) progesterone receptors (PR-), and (3) amplified human epidermal growth factor (HER2-). Traditionally, TNBC did not respond to existing **targeted** therapies for other breast cancers and treatment was limited to chemotherapy. However, new treatment options have recently become available, which include immunotherapy, PARP inhibitors and antibody drugs. Clinical trials are also currently studying other therapies for TNBC.

Pathology Report

The pathologist prepares a written report that is sent to your physician. If the hospital or cancer center conducts multidisciplinary conferences, the pathologist presents the findings at the conference. Time varies as to when the final report will be available. Many pathologists have a commitment to report within 24 hours after receiving the specimen. Ask your physician when you can expect to receive your pathology report. If the diagnosis reveals cancer, the pathologist's findings will help the physician(s) determine what further treatments will be needed. Additional diagnostic tests, such as a bone scan, liver scan, chest X-ray, CT scan or an MRI (magnetic resonance imaging), may be ordered. When all the test results are received, your cancer will be staged on a scale from zero (in situ cancer) to four (a cancer with distant metastasis). Stage zero cancer is the least aggressive and has the best prognosis.

Pathology Report Summary

The bottom-line information is contained in the summary or final diagnosis section of your pathology report. Combining information from all of the other sections of the pathology report will provide a synopsis of the most important information regarding your cancer.

Pathology Report Questions

When you discuss the findings of your pathology report with your physician, you may want to ask the following questions and write down the answers. Some doctors will provide a copy of your pathology report for your records.

- What is the name of the type of cancer I have?
- Was my tumor in situ (inside ducts or lobules) or invasive (grown through the walls of the ducts or lobules)?
- What size was my tumor? (The size is in millimeters (mm) or centimeters (cm). 10 mm equals 1 cm. 1 cm equals 3/8 inch. 1 inch equals approximately 2.5 cm.)
- Was the cancer found anywhere else in my breast tissue?
- How many lymph nodes were removed? How many levels of lymph nodes did you sample or remove? (You have three levels of nodes.)
- Were any nodes positive with cancer cells?
- Was my tumor estrogen or progesterone receptor positive?
- Was my tumor HER2/neu positive?
- Did you grade my tumor on a grading scale and if so, what was the final cumulative score? (Grade 1: least aggressive; Grade 3: most aggressive)
- Is there anything else that I need to know about my cancer?

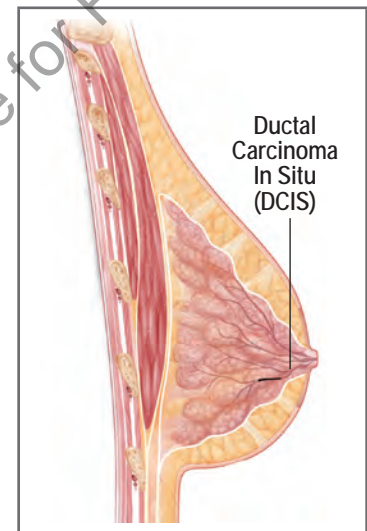
After the Pathology Report

Obviously, you have no control over the findings described in your pathology report. However, you can become an active participant with your physicians to help defeat the disease.

Ductal Carcinoma In Situ (DCIS) Female Patient

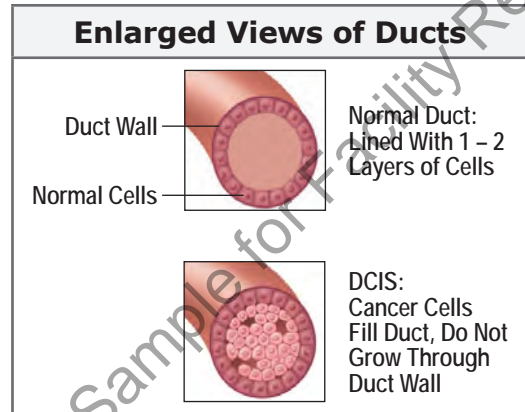
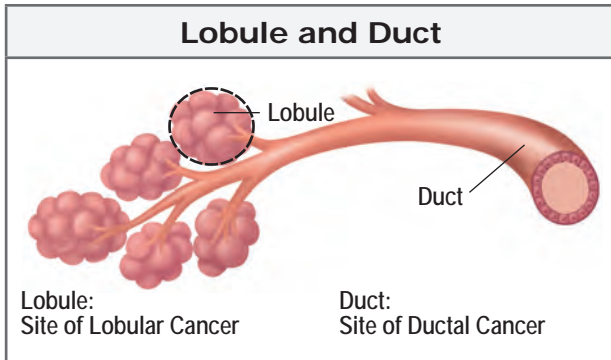
Definition of Terms:

- **Benign** — Not cancerous; no threat to the body
- **Carcinoma** — Cancer cells that start in surface layers or lining of the ducts
- **In Situ** — In one contained area
- **Lumpectomy** — Removal of a lump and some surrounding tissues in the breast
- **Lymph Nodes** — Pea-like areas in the lymphatic system that act as filters of the body's cellular waste; lymph nodes under the arms filter waste from breast tissues
- **Malignant** — Cancerous; threat to the body
- **Mastectomy** — Removal of a breast by surgery
- **Metastasis** — Spread of cancer to other parts of the body
- **Microcalcifications** — Small areas of calcium deposits seen during mammography; may be related to a malignant or benign condition
- **Radiation Therapy** — Treatment with X-rays to kill remaining local cancer cells after surgery



Ductal carcinoma in situ (DCIS) is a non-invasive, or pre-invasive, form of breast cancer. It occurs when abnormal cells grow excessively within the milk ducts of the breast but remain confined inside the duct walls, without spreading to surrounding tissue. Although DCIS itself is not life-threatening, it carries the potential to progress into invasive ductal carcinoma if left untreated.

Most cases are detected during routine mammography, when clusters of tiny calcium deposits, called microcalcifications, are seen in a pattern that follows the duct. If five or more calcifications are closely grouped and their shapes appear suspicious, further evaluation is usually recommended. This may involve procedures such as needle localization, to mark the area for surgical biopsy, or a stereotactic biopsy guided by imaging. In some cases, DCIS may also present as a thickened area or a soft mass in the breast.



Pathology Slides

Pathology Slide of Breast

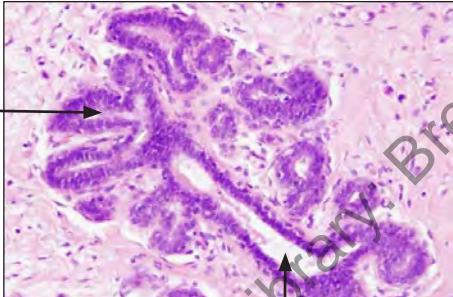
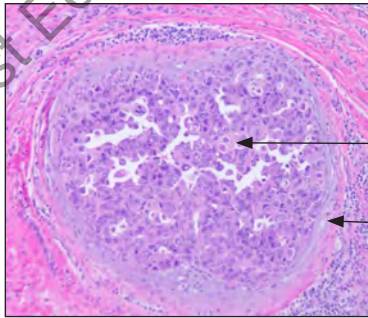


Image courtesy of
www.breastpathology.info/images

Pathology Slide of DCIS



Cancer Cells

Duct Wall

Cancer cells are still within the duct and have not broken through the duct wall into surrounding tissues.

Image courtesy of
www.pathologyoutlines.com

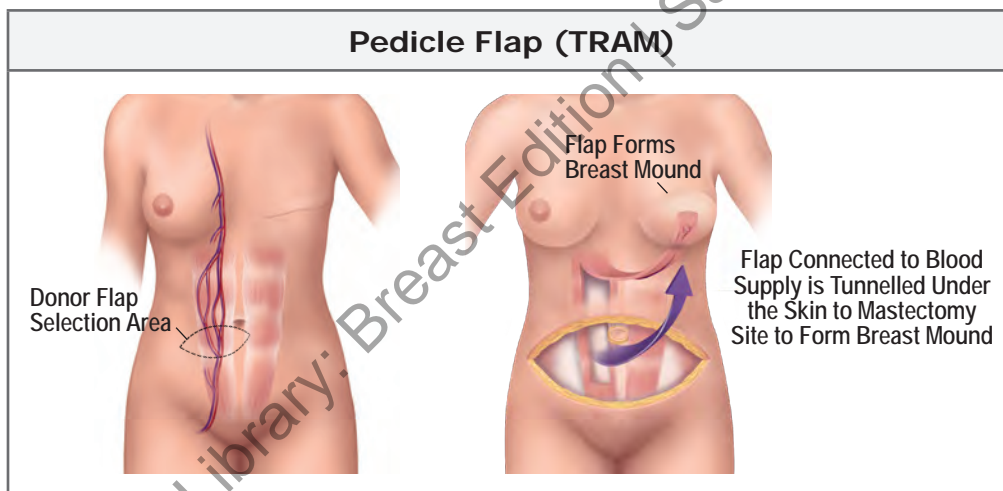
Reconstruction Flap Types

Female Patient

If you are using your own body tissue (autologous) for reconstruction, your donor tissues will be moved to the breast area with the blood supply left intact (**pedicle flap**) or the blood supply may be cut and reattached to the breast area (**free flap**).

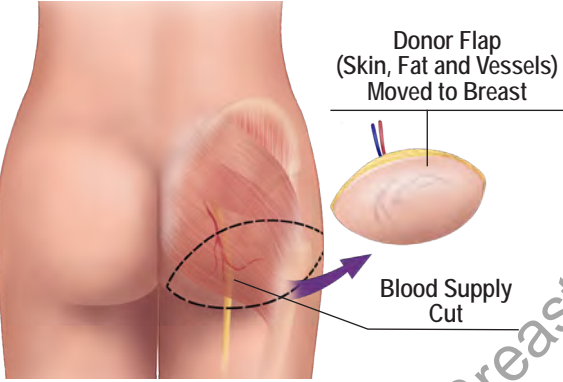
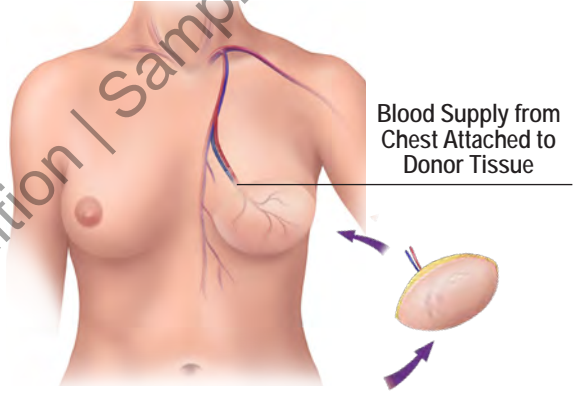
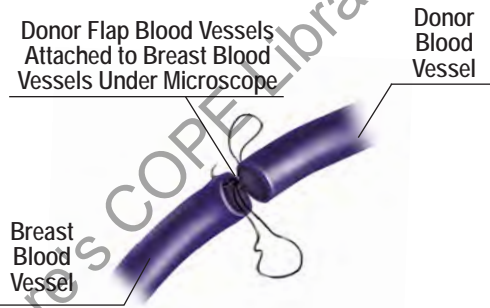
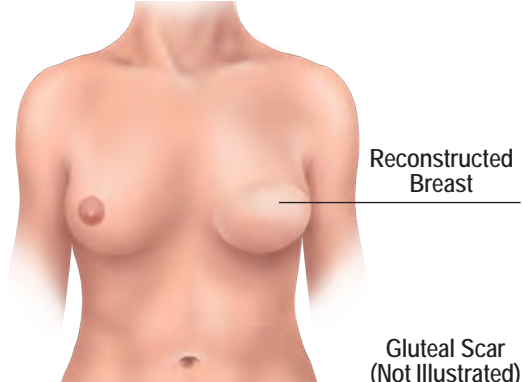
Pedicle Flap

Pedicle flap is a procedure that moves the tissues, along with their own blood supply (artery and vein), to the breast area. The tissues are **not** cut free by the surgeon.



Free Flap

Free flap is a procedure where skin, muscle and fat from a selected part of the body, such as the buttocks, abdomen, inner thigh or upper thigh, is detached (cut free) from its blood supply and reattached to the breast area blood supply. This procedure requires microsurgery to connect the vessels to restore the blood flow to the tissues. According to the difficulty of the reattachment, surgery can range from 3 – 8 hours.

1. Donor Tissue Removal	2. Donor Tissue Attachment
	
3. Donor Blood Vessel Attachment	4. Post-Surgical Appearance
	

Additional Information:

Recurrent Breast Cancer

Breast cancer can recur months or years after primary treatment is completed. However, all recurrences are not alike.

Local Recurrence

Cancerous cells may remain in the original site and over time grow back. Cancer cells are microscopic and cannot be seen by the human eye during surgery; therefore, some cells may be left behind. Most physicians do not define local breast cancer recurrence (only in the breast) as the spread of breast cancer, but instead the failure of the primary surgical treatment. Even after mastectomy is performed, portions of the breast tissue and fat remain, making local recurrence possible. Surgeons report that mastectomy can only remove approximately 95 percent of the breast tissue. Local recurrence after mastectomy is rare, but it is still a possibility.

Lumpectomy Symptoms of Local Recurrence:

- A new lump in your breast
- Firmness in an area of the breast
- Skin that is red or inflamed
- Nipple discharge

Mastectomy Symptoms of Local Recurrence:

- One or more painless nodules on or under the skin
- A thickening along the mastectomy scar

Distant Metastatic Recurrence

Breast cancer that has spread to distant parts of the body is the most serious type of recurrence. The most common site of distant metastatic recurrence is in the bones. Other common metastatic sites include the bone marrow, lungs, liver, brain or other organs. Most any area of the body may be invaded by breast cancer recurrence.

Symptoms of Distant Recurrence:

- **Bone Metastasis:** Persistent and increasing level of pain in an area of the body
- **Lung Metastasis:** Persistent cough or shortness of breath
- **Liver Metastasis:** Loss of appetite, weight loss or yellowing of the skin
- **Brain Metastasis:** Severe headaches; changes in vision; loss of bowel or bladder control; personality changes; seizures

It is essential that you communicate with your healthcare team about any changes that you experience after breast cancer treatment. Most recurrences are detected by a patient's observation of physical changes in their body followed by a healthcare provider's clinical exam. If you experience breast cancer recurrence, your healthcare providers will work with you to develop the most effective treatment plan.