National Cancer Institute

What You Need To Know About™

Breast Cancer

U.S. DEPARTMENT OF
HEALTH AND HUMAN SERVICES
National Institutes of Health

National Cancer Institute Services

This is only one of many free booklets for people with cancer.

You may want more information for yourself, your family, and your friends.

Call NCI's Cancer Information Service
1-800-4-CANCER (1-800-422-6237)

Visit NCI's website
http://www.cancer.gov

Chat online
LiveHelp, NCI's instant messaging service
https://livehelp.cancer.gov

E-mail
cancergovstaff@mail.nih.gov

Order publications
http://www.cancer.gov/publications
1-800-4-CANCER (1-800-422-6237)

Get help with quitting smoking
1-877-44U-QUIT (1-877-448-7848)

About This Booklet

This National Cancer Institute (NCI) booklet is for you—a woman who has just been diagnosed with breast **cancer**.

> Words that may be new to you are shown in **bold.** See the **Words To Know** section on page 35 to learn what a new word means and how to pronounce it.

This booklet is about medical care for women with breast cancer. Learning about medical care for breast cancer can help you take an active part in making choices about your care.

You can read this booklet from front to back. Or, you can read only the sections you need right now.

This booklet has lists of questions that you may want to ask your doctor. Many people find it helpful to take a list of questions to a doctor visit. To help remember what your doctor says, you can take notes. You may also want to have a family member or friend go with you when you talk with the doctor—to take notes, ask questions, or just listen.

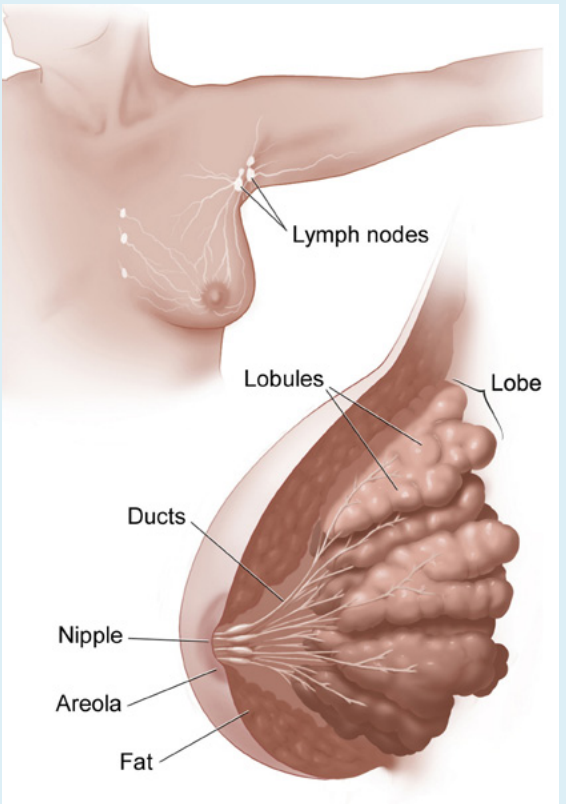
> Breast cancer also develops in men. In 2012, about 2,200 American men will learn they have breast cancer.
>
> NCI's website has information about breast cancer in men at **http://www.cancer.gov/cancertopics/types/breast**.
>
> In addition, NCI's Cancer Information Service at **1-800-4-CANCER (1-800-422-6237)** and at **LiveHelp (https://livehelp.cancer.gov)** can answer questions about breast cancer in men.

Contents

The Breasts

Inside a woman's breast are 15 to 20 sections (**lobes**). Each lobe is made of many smaller sections (**lobules**). Lobules have groups of tiny **glands** that can make milk.

After a baby is born, breast milk flows from the lobules through thin tubes (**ducts**) to the nipple. **Fibrous tissue** and fat fill the spaces between the lobules and ducts.



This picture shows the lobes and ducts inside the breast. It also shows lymph nodes near the breast.

Cancer Cells

Cancer begins in **cells**, the building blocks that make up all tissues and **organs** of the body, including the breast.

Normal cells in the breast and other parts of the body grow and divide to form new cells as they are needed. When normal cells grow old or get damaged, they die, and new cells take their place.

Sometimes, this process goes wrong. New cells form when the body doesn't need them, and old or damaged cells don't die as they should. The buildup of extra cells often forms a mass of tissue called a lump, growth, or **tumor**.

Tumors in the breast can be **benign** (not cancer) or **malignant** (cancer):

- **Benign tumors:**
  - Are usually not harmful
  - Rarely invade the tissues around them
  - Don't spread to other parts of the body
  - Can be removed and usually don't grow back
- **Malignant tumors:**
  - May be a threat to life
  - Can invade nearby organs and tissues (such as the chest wall)
  - Can spread to other parts of the body
  - Often can be removed but sometimes grow back

Breast cancer cells can spread by breaking away from a breast tumor. They can travel through **blood vessels** or **lymph vessels** to reach other parts of the body. After

spreading, cancer cells may attach to other tissues and grow to form new tumors that may damage those tissues.

For example, breast cancer cells may spread first to nearby **lymph nodes**. Groups of lymph nodes are near the breast under the arm (**axilla**), above the collarbone, and in the chest behind the breastbone.

When breast cancer spreads from its original place to another part of the body, the new tumor has the same kind of abnormal cells and the same name as the primary (original) tumor. For example, if breast cancer spreads to a lung, the cancer cells in the lung are actually breast cancer cells. The disease is **metastatic** breast cancer, not lung cancer. For that reason, it's treated as breast cancer, not lung cancer.

Types

Breast cancer is the most common type of cancer among women in the United States (other than skin cancer). In 2012, about 227,000 American women will be diagnosed with breast cancer.

The most common type of breast cancer is **ductal carcinoma**. This cancer begins in cells that line a breast duct. See page 1 for a picture of breast ducts. About 7 of every 10 women with breast cancer have ductal carcinoma.

The second most common type of breast cancer is **lobular carcinoma**. This cancer begins in a lobule of the breast. See page 1 for a picture of lobules. About 1 of every 10 women with breast cancer has lobular carcinoma.

Other women have a mixture of ductal and lobular type or they have a less common type of breast cancer.

Tests

After you find out that you have breast cancer, you may need other tests to help choose the best treatment for you.

Lab Tests with Breast Tissue

The breast tissue that was removed during your **biopsy** can be used in special lab tests:

- **Hormone receptor tests:** Some breast cancers need hormones to grow. These cancers have **hormone receptors** for the hormones **estrogen**, **progesterone**, or both. If the hormone receptor tests show that the breast cancer has these receptors, then **hormone therapy** is often recommended as part of the treatment plan. (The **Hormone Therapy** section is on page 23.)
- **HER2 test:** Some breast cancers have large amounts of a protein called **HER2**, which helps them to grow. The HER2 test shows whether a woman's breast cancer has a large amount of HER2. If so, then **targeted therapy** against HER2 may be a treatment option. (The **Targeted Therapy** section is on page 26.)

It may take several weeks to get the results of these tests. The test results help your doctor decide which cancer treatments may be options for you.

Triple-negative breast cancer

About 15 of every 100 American women with breast cancer have triple-negative breast cancer. These women have breast cancer cells that…

- **Do not have estrogen receptors** (estrogen negative)
- **Do not have progesterone receptors** (progesterone negative)
- **Do not have a large amount of HER2** (HER2 negative)

Staging Tests

Staging tests can show whether cancer cells have spread to other parts of the body.

When breast cancer spreads, cancer cells are often found in the underarm lymph nodes (**axillary lymph nodes**). Breast cancer cells can spread from the breast to almost any other part of the body, such as the lungs, liver, bones, or brain.

Your doctor needs to learn the stage (extent) of the breast cancer to help you choose the best treatment. Staging tests may include…

- **Lymph node biopsy:** If cancer cells are found in a lymph node, then cancer may have spread to other lymph nodes and other places in the body. Surgeons use a method called **sentinel lymph node biopsy** to remove the lymph node most likely to have breast cancer cells. The NCI fact sheet *Sentinel Lymph Node Biopsy* has more information, including pictures of the method.

If cancer cells are not found in the sentinel node, the woman may be able to avoid having more lymph nodes removed. The method of removing more lymph nodes to check for cancer cells is called **axillary dissection**.

- **CT scan:** An **x-ray** machine linked to a computer takes a series of detailed pictures of your chest or abdomen. You may receive contrast material by mouth and by injection into a blood vessel in your arm or hand. The **contrast material** makes abnormal areas easier to see. The pictures from a **CT scan** can show cancer that has spread to the lungs or liver.

- **MRI:** A strong magnet linked to a computer is used to make detailed pictures of your chest, abdomen, or brain. An **MRI** can show whether cancer has spread to these areas. Sometimes contrast material makes abnormal areas show up more clearly on the picture.

- **Bone scan:** The doctor injects a small amount of a **radioactive** substance into a blood vessel. It travels through the bloodstream and collects in the bones. A machine called a scanner detects and measures the **radiation**. The scanner makes pictures of the bones. Because higher amounts of the substance collect in areas where there is cancer, the pictures can show cancer that has spread to the bones.

- **PET scan:** You'll receive an injection of a small amount of radioactive sugar. The radioactive sugar gives off signals that the **PET** scanner picks up. The PET scanner makes a picture of the places in your body where the sugar is being taken up. Cancer cells show up brighter in the picture because they take up sugar faster than normal cells do. A PET scan can show cancer that has spread to other parts of the body.

Questions you may want to ask your doctor about tests

- What did the hormone receptor test show?
- What did the HER2 test show?
- May I have a copy of the report from the pathologist?
- Do any lymph nodes show signs of cancer?
- What is the stage of the disease? Has the cancer spread?
- Would genetic testing be helpful to me or my family?

Stages

The stage of breast cancer depends on the size of the breast tumor and whether it has spread to lymph nodes or other parts of the body.

Doctors describe the stages of breast cancer using the Roman numerals 0, I, II, III, and IV and the letters A, B, and C.

A cancer that is Stage I is **early-stage breast cancer**, and a cancer that is Stage IV is **advanced cancer** that has spread to other parts of the body, such as the liver.

The stage often is not known until after **surgery** to remove the tumor in the breast and one or more underarm lymph nodes.

Stage 0

Stage 0 is **carcinoma in situ**. In **ductal carcinoma in situ** (DCIS), abnormal cells are in the lining of a breast duct, but the abnormal cells have not invaded nearby breast tissue or spread outside the duct.

Stage IA

The breast tumor is no more than 2 centimeters (no more than 3/4 of an inch) across. Cancer has not spread to the lymph nodes.

A tumor that is 2 centimeters is about the size of a peanut, and a tumor that is 5 centimeters is about the size of a lime.

Stage IB

The tumor is no more than 2 centimeters across. Cancer cells are found in lymph nodes.

Stage IIA

The tumor is no more than 2 centimeters across, and the cancer has spread to underarm lymph nodes.

Or, the tumor is between 2 and 5 centimeters (between ¾ of an inch and 2 inches) across, but the cancer hasn't spread to underarm lymph nodes.

Stage IIB

The tumor is between 2 and 5 centimeters across, and the cancer has spread to underarm lymph nodes.

Or, the tumor is larger than 5 centimeters across, but the cancer hasn't spread to underarm lymph nodes.

Stage IIIA

The breast tumor is no more than 5 centimeters across, and the cancer has spread to underarm lymph nodes that are attached to each other or nearby tissue. Or, the cancer may have spread to lymph nodes behind the breastbone.

Or, the tumor is more than 5 centimeters across. The cancer has spread to underarm lymph nodes that may be attached to each other or nearby tissue. Or, the cancer may have spread to lymph nodes behind the breastbone but not spread to underarm lymph nodes.

Stage IIIB

The breast tumor can be any size, and it has grown into the chest wall or the skin of the breast. The breast may be swollen or the breast skin may have lumps.

The cancer may have spread to underarm lymph nodes, and these lymph nodes may be attached to each other or nearby tissue. Or, the cancer may have spread to lymph nodes behind the breastbone.

Stage IIIC

The breast cancer can be any size, and it has spread to lymph nodes behind the breastbone and under the arm. Or, the cancer has spread to lymph nodes above or below the collarbone.

Stage IV

The tumor can be any size, and cancer cells have spread to other parts of the body, such as the lungs, liver, bones, or brain.

Inflammatory Breast Cancer

Inflammatory breast cancer is a rare type of breast cancer. It occurs in about 1 of every 100 American women with invasive breast cancer.

The breast looks red and swollen because cancer cells block the lymph vessels in the skin of the breast.

When a doctor diagnoses inflammatory breast cancer, it's at least Stage IIIB, but it could be more advanced.

Treatment

Women with breast cancer have many treatment options. Treatment options include…

- **Surgery**
- **Radiation therapy**
- **Hormone therapy**
- **Chemotherapy**
- **Targeted therapy**

You may receive more than one type of treatment.

You and your doctor will develop a treatment plan.

The treatment that's best for one woman may not be best for another. The treatment that's right for you depends mainly on…

- **The stage of breast cancer**
- **Whether the tumor has hormone receptors**
- **Whether the tumor has too much HER2**
- **Your general health**

In addition, your treatment plan depends on…

- **The size of the tumor in relation to the size of your breast**
- **Whether you have gone through menopause**

At any stage of disease, care is available to control pain and other symptoms, to relieve the **side effects** of treatment, and to ease emotional concerns. You can get information about coping on NCI's website at **http://www.cancer.gov/cancertopics/coping**.

Also, you can get information about coping from NCI's Cancer Information Service at **1-800-4-CANCER (1-800-422-6237).** Or, chat using NCI's instant messaging service, **LiveHelp (https://livehelp.cancer.gov)**.

Doctors Who Treat Breast Cancer

Your health care team will include specialists. There are many ways to find doctors who treat breast cancer:

- Your doctor may be able to refer you to specialists.
- You can ask a local or state medical society, or a nearby hospital or medical school for names of specialists.

- NCI's Cancer Information Service can give you information about treatment centers near you. Call **1-800-4-CANCER (1-800-422-6237)**. Or, chat using **LiveHelp (https://livehelp.cancer.gov)**, NCI's instant messaging service.
- Other sources can be found in the NCI fact sheet *How To Find a Doctor or Treatment Facility If You Have Cancer*.

Your health care team may include the following specialists:

- **Surgeon:** This type of doctor can perform surgery. You may want to find a breast cancer surgeon.
- **Medical oncologist:** A **medical oncologist** is a doctor who specializes in treating cancer with drugs, such as **chemotherapy**, hormone therapy, and targeted therapy.
- **Radiation oncologist:** A **radiation oncologist** is a doctor who specializes in treating cancer with **radiation therapy.**

Your health care team may also include a **plastic surgeon** or **reconstructive surgeon**, an **oncology nurse**, a **physical therapist**, a **social worker**, and a **registered dietitian**.

Your health care team can describe your treatment choices, the expected results of each treatment, and the possible side effects. Because cancer treatments often damage healthy cells and tissues, side effects are common. These side effects depend on many factors, including the type of treatment. Side effects may not be the same for each woman, and they may even change from one treatment session to the next.

Before treatment starts, ask your health care team about possible side effects and how treatment may change your normal activities.

You and your health care team can work together to develop a treatment plan that meets your medical and personal needs.

You may want to talk with your health care team about taking part in a research study (**clinical trial**) of new treatment methods. Research studies are an important option for women at any stage of breast cancer. See the **Cancer Treatment Research** section on page 33.

Questions you may want to ask your doctor about treatment choices

- What are my treatment choices? Which do you recommend for me? Why?
- What are the expected benefits of each kind of treatment?
- What are the risks and possible side effects of each treatment?
- How can the side effects be managed?
- What can I do to prepare for treatment?
- Will I need to stay in the hospital? If so, for how long?
- What is the treatment likely to cost? Will my insurance cover it?
- How will treatment affect my normal activities?
- Would a research study (clinical trial) be right for me?

Second Opinion

Before starting treatment, you might want a second opinion about your treatment plan. Some women worry that the doctor will be offended if they ask for a second opinion. Usually the opposite is true. Most doctors welcome a second opinion. And many health insurance companies will pay for a second opinion if you or your doctor requests it. Some companies actually require a second opinion.

If you get a second opinion, the second doctor may agree with your first doctor's treatment plan. Or, the second doctor may suggest another approach. Either way, you have more information and perhaps a greater sense of control. You can feel more confident about the decisions you make, knowing that you've looked at all of your options.

It may take some time and effort to gather your medical records and see another doctor. In most cases, it's not a problem to take several weeks to get a second opinion. The delay in starting treatment usually will not make treatment less effective. To make sure, you should discuss this delay with your doctor.

Surgery

Surgery is the most common treatment for breast cancer. There are several kinds of surgery.

Your surgeon can describe each kind of surgery, compare the benefits and risks, and help you decide which kind might be best for you:

- **Removing part of the breast:** **Breast-sparing surgery** is an operation to remove the cancer and a small amount of the normal tissue that surrounds it. This is also called

breast-conserving surgery. It can be a **lumpectomy** or a **segmental mastectomy** (also called a **partial mastectomy**). A woman usually has radiation therapy after breast-sparing surgery to kill cancer cells that may remain in the breast area.

Some women will have more tissue removed but not the whole breast. For these women, the surgeon will remove lymph nodes under the arm and some of the lining over the chest muscles below the tumor.

- **Removing the whole breast:** Surgery to remove the whole breast (or as much of the breast tissue as possible) is a **mastectomy**. In some cases, a skin-sparing mastectomy may be an option. For this approach, the surgeon removes as little skin as possible.
  - In **total** (simple) **mastectomy**, the surgeon removes the whole breast but not the underarm lymph nodes.
  - In **modified radical mastectomy**, the surgeon removes the whole breast and most or all of the lymph nodes under the arm. Often, the lining over the chest muscles is removed. A small chest muscle may also be taken out to make it easier to remove the lymph nodes.

The choice between breast-sparing surgery and mastectomy depends on many factors:

- **The size, location, and stage of the tumor**
- **The size of your breast**
- **Certain features of the cancer**
- **How you feel about how surgery will change your breast**

- **How you feel about radiation therapy**
- **Your ability to travel to a radiation treatment center for daily treatment sessions**

The surgeon usually removes one or more lymph nodes from under the arm to check for cancer cells. If cancer cells are found in the lymph nodes, other cancer treatments will be needed. (For more about information about lymph node biopsy, see the **Tests** section on page 4.)

After mastectomy, you may choose to have breast reconstruction. This is **plastic surgery** to rebuild the shape of the breast. If you're considering breast reconstruction, talk with a plastic surgeon before having cancer surgery. See the **Breast Reconstruction** section on page 27.

It's common to feel tired or weak for a while after surgery for breast cancer. The time it takes to heal is different for each woman.

Surgery causes pain and tenderness, and the skin where your breast was removed may feel tight. Your arm and shoulder muscles may feel stiff and weak, and your neck and back may hurt. Medicine can help control your pain. Before surgery, discuss the plan for pain relief with your health care team. After surgery, they can adjust the plan if you need more pain control.

Any kind of surgery carries a risk of infection, bleeding, or other problems. Tell your health care team right away if you develop any problems.

Removing the underarm lymph nodes slows the flow of lymph fluid. The fluid may build up in your arm and hand and cause swelling. This swelling is called **lymphedema**. It can develop soon after surgery or months or even years later.

Always protect the arm and hand on the treated side of your body from cuts, burns, or other injuries. Remind nurses not to measure your blood pressure or give you injections on the treated side of your body. Information about preventing and treating lymphedema is available on NCI's website at **http://www.cancer.gov/cancertopics/coping** and from NCI's Cancer Information Service at **1-800-4-CANCER (1-800-422-6237)** or **LiveHelp (https://livehelp.cancer.gov)**.

The doctor, nurse, or physical therapist can suggest exercises to help you regain movement and strength in your arm and shoulder. Exercise can also reduce stiffness and pain. You may be able to begin gentle exercise within days of surgery.

Because nerves may be injured or cut during surgery, you may have numbness and tingling in your chest, underarm, shoulder, or upper arm. These feelings may go away within a few weeks or months.

You can find pictures and more information about breast cancer surgery on NCI's website at **http://www.cancer.gov/cancertopics/types/breast**.

Questions you may want to ask your doctor about surgery

- What kinds of surgery can I consider? Is breast-sparing surgery an option for me? Is a skin-sparing mastectomy an option? Which operation do you recommend for me? Why?
- Will any lymph nodes be removed? How many? Why?
- How will I feel after the operation? Will I have to stay in the hospital?
- What are the risks of surgery?
- How many surgeries for breast cancer have you done?
- Will I need to learn how to take care of myself or my incision when I get home?
- Where will the scars be? What will they look like?
- If I decide to have plastic surgery to rebuild my breast, how and when can that be done? Can you suggest a plastic surgeon for me to contact?
- Will I have to do special exercises to help regain motion and strength in my arm and shoulder? Will a physical therapist or nurse show me how to do the exercises?

Radiation Therapy

Radiation therapy uses high-energy rays to kill cancer cells. It affects cells only in the part of the body that is treated.

Radiation therapy may be used after surgery to destroy breast cancer cells that remain in the chest area. Women usually have radiation therapy after breast-sparing surgery, but it's sometimes used after mastectomy too.

You can get radiation therapy to treat breast cancer in two ways:

- **Machine outside the body** (**external radiation therapy**): The radiation comes from a large machine outside the body. You'll go to a hospital or clinic for treatment. Usually, women get treatment once a day, 5 days a week for 3 to 6 weeks. Each treatment session lasts only a few minutes. External radiation is the most common type used for breast cancer.
- **Material inside the body** (**brachytherapy**): The doctor will place one or more thin tubes inside the breast through a tiny incision. A radioactive substance is loaded into the tube. The treatment session may last for a few minutes, and the substance is removed. When it's removed, no radioactivity remains in your body. This method of radiation therapy may be repeated every day for a week.

Side effects depend mainly on the type of radiation and how much is given. Ask your health care team to describe what you can expect.

It's common for the skin in the treated area to become red, dry, tender, and itchy. Check with your doctor before using lotion, cream, or deodorant on the treated area. After treatment is over, the skin will slowly heal. However, there may be a lasting change in the color of your skin.

With either type of radiation therapy, your breast may feel heavy and tight. Internal radiation therapy may make your breast look red or bruised. These problems usually go away over time.

Bras and tight clothes may rub your skin and cause soreness. You may want to wear loose-fitting cotton clothes during this time.

You're likely to become tired during radiation therapy, especially in the later weeks of treatment. Although getting enough rest is important, most people say they feel better when they exercise every day. Try to go for a short walk, do gentle stretches, or do yoga.

You may wish to discuss with your doctor the possible long-term effects of radiation therapy. For example, radiation therapy to the chest may harm the lung or heart. Also, it can change the size of your breast and the way it looks. If any of these problems occur, your health care team can tell you how to manage them.

The NCI booklet *Radiation Therapy and You* has helpful ideas for coping with side effects.

Questions you may want to ask your doctor about radiation therapy

- Which type of radiation therapy can I consider? Are both types an option for me?
- When will treatment start? When will it end? How often will I have treatment?
- How will I feel during treatment? Will I need to stay in the hospital? Will I be able to drive myself to and from treatment?
- What can I do to take care of myself before, during, and after treatment?
- How will we know the treatment is working?
- Will radiation therapy harm my skin?
- How will my chest look afterward?
- Are there any lasting effects?
- What is the chance that the cancer will come back in my breast?

Hormone Therapy

Hormone therapy can also be called anti-hormone treatment. If lab tests show that your breast cancer cells have hormone receptors, then hormone therapy may be an option. (See the part about Lab Tests with Breast Tissue on page 4.) Hormone therapy keeps the cancer cells from getting or using the natural hormones (estrogen and progesterone) they need to grow.

If you have not gone through **menopause**, the options for hormone therapy include…

- **A drug that blocks estrogen's activity in the body** (**tamoxifen**)
- **Surgery to remove your ovaries** (which make estrogen)
- **A drug that reduces the amount of estrogen made by the ovaries** (**LH-RH agonist**)

If you have gone through menopause, the options include…

- **A drug that prevents the body from making estrogen** (**aromatase inhibitor**)
- **Tamoxifen**

The side effects of hormone therapy depend on the type used. The most common side effects are hot flashes, vaginal discharge, and nausea.

The NCI fact sheet *Hormone Therapy for Breast Cancer* has information about the use and side effects of hormone therapy.

Chemotherapy

Chemotherapy uses drugs to kill cancer cells. It may be given to women with Stage I, II, III, or IV breast cancer. Chemotherapy may be given before or after surgery.

The drugs for breast cancer are usually given directly into a vein (**intravenously**) through a thin needle or as a pill. You may receive a combination of drugs.

You may receive chemotherapy in a clinic, at the doctor's office, or at home. It's unusual for a woman to need to stay in the hospital during treatment.

The side effects depend mainly on which drugs are given and how much. Chemotherapy kills fast-growing cancer cells, but the drugs can also harm normal cells that divide rapidly:

- **Blood cells:** When drugs lower the levels of healthy blood cells, you're more likely to get infections, bruise or bleed easily, and feel very weak and tired. Your health care team will check for low levels of blood cells. If your levels are low, your health care team may stop the chemotherapy for a while or reduce the dose of the drug. There are also medicines that can help your body make new blood cells.
- **Cells in hair roots:** Chemotherapy may cause hair loss. If you lose your hair, it will grow back after treatment, but the color and texture may be changed.
- **Cells that line the digestive tract:** Chemotherapy can cause a poor appetite, nausea and vomiting, diarrhea, or mouth and lip sores. Your health care team can give you medicines and suggest other ways to help with these problems.

Some drugs used for breast cancer can cause tingling or numbness in the hands or feet. This problem often goes away after treatment is over.

Other problems may not go away. For example, some of the drugs used for breast cancer may weaken the heart. Your doctor may check your heart before, during, and after treatment. A rare side effect of chemotherapy is that years after treatment, a few women have developed **leukemia** (cancer of the blood cells).

If you have not yet gone through menopause, some anticancer drugs may damage the **ovaries** and cause hot flashes, vaginal dryness, and other menopause symptoms. Your **menstrual periods** may no longer be regular or may stop, and you may lose the ability to become pregnant. The older you are, the more likely that this damage to the ovaries will be permanent. Women who may want to get pregnant later on should ask their health care team about ways to preserve their eggs before treatment starts.

On the other hand, other anticancer drugs don't damage the ovaries and you may remain able to become pregnant during chemotherapy. Before treatment begins, talk with your doctor about birth control because many anticancer drugs given during the first trimester are known to cause birth defects.

The NCI booklet *Chemotherapy and You* has ideas for coping with side effects.

Targeted Therapy

Women whose lab tests show that their breast cancer cells have too much HER2 protein may receive targeted therapy. The targeted therapies used to treat breast cancer block cancer cell growth by blocking the action of the extra HER2 protein.

These drugs may be given intravenously or as a pill. The side effects depend mainly on which drug is given. Possible side effects include nausea, vomiting, and diarrhea. The drugs may also cause heart damage, heart failure, and serious breathing problems. During treatment, your doctor will watch for signs of heart and lung problems.

You may want to read the NCI fact sheet *Targeted Cancer Therapies*.

Questions you may want to ask your doctor about hormone therapy, chemotherapy, or targeted therapy

- What drugs will I be taking? What will they do?
- When will treatment start? When will it end? How often will I have treatments?
- Where will I have treatment?
- What can I do to take care of myself during treatment?
- How will we know the treatment is working?
- Which side effects should I tell you about?
- Will there be long-term side effects?

Breast Reconstruction

A woman who plans to have a mastectomy has a choice about whether or not to have surgery to rebuild the shape of the breast (breast reconstruction). Instead of breast reconstruction, a woman could choose to wear a breast form (a device that replaces the breast), wear padding inside her bra, or do nothing. All of these options have pros and cons. What is right for one woman may not be right for another.

Breast reconstruction may be done at the same time as the mastectomy, or it may be done later on. If radiation therapy is part of the treatment plan, some doctors suggest waiting until after radiation therapy is complete.

If you're thinking about breast reconstruction, talk to a plastic surgeon before the mastectomy, even if you plan to have your reconstruction later on.

A surgeon can reconstruct the breast in many ways. Some women choose to have breast implants, which are filled with saline or silicone gel. You can read about breast implants on the Food and Drug Administration's website at **http://www.fda.gov**.

Another method of breast reconstruction is to create a breast shape using tissue taken from another part of your body. The plastic surgeon can take skin, muscle, and fat from your lower abdomen, back, or buttocks.

The type of reconstruction that is best for you depends on your age, body type, and the type of cancer surgery that you had. A plastic surgeon can help you decide.

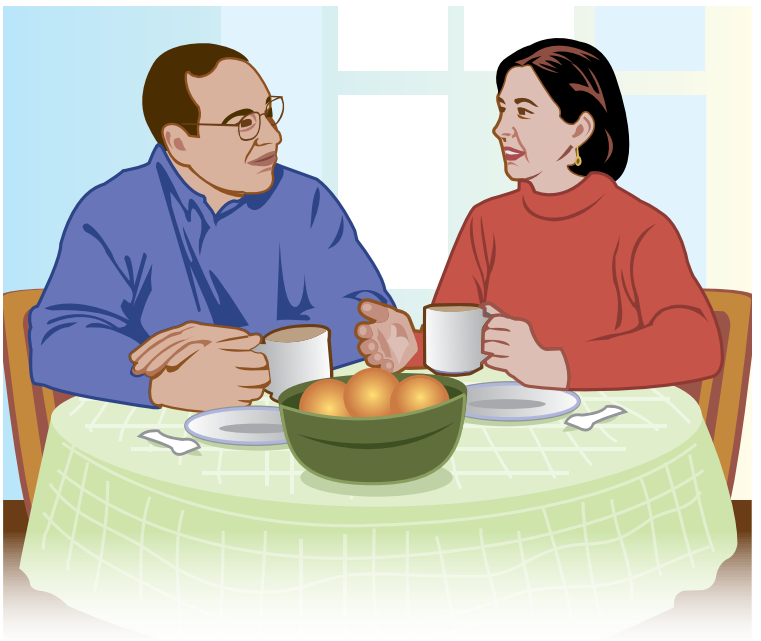
Questions you may want to ask your doctor about breast reconstruction

- Which type of surgery would give me the best results? How will I look afterward?
- When can my reconstruction begin?
- How many surgeries will I need?
- What are the risks at the time of surgery? Later?
- Will I have scars? Where? What will they look like?
- If tissue from another part of my body is used, will there be any permanent changes where the tissue was removed?
- What activities should I avoid after surgery? When can I return to my normal activities?
- Will I need follow-up care?
- How much will reconstruction cost? Will my health insurance pay for it?

Nutrition

Eating well is important before, during, and after cancer treatment. You need the right amount of calories to maintain a good weight. You also need enough protein to keep up your strength. Eating well may help you feel better and have more energy.

Sometimes, especially during or soon after treatment, you may not feel like eating. You may be uncomfortable or tired. You may find that foods don't taste as good as they used to. In addition, poor appetite, nausea, vomiting, mouth blisters, and other side effects of treatment can make it hard for you to eat. On the other hand, some women treated for breast cancer may have a problem with weight gain.



Eating well may help you feel better.

Your doctor, a registered dietitian, or another health care provider can suggest ways to help you meet your nutrition needs. Also, the NCI booklet *Eating Hints* has many useful recipes and lists of foods that can help with side effects.

Follow-up Care

You'll need regular checkups (such as every 3 to 6 months) after treatment for breast cancer. Checkups help ensure that any changes in your health are noted and treated if needed. If you have any health problems between checkups, contact your doctor.

Checkups help detect…

- **Breast cancer that comes back after treatment:** Breast cancer may return in the breast or chest wall. Or, it may return in any other part of the body, such as the bones, liver, lungs, or brain.
- **Health problems that can result from cancer treatment**
- **A new breast cancer**

Checkups usually include an exam of the neck, underarm, chest, and breast areas. Since a new breast cancer may develop, you should have regular **mammograms**. You probably won't need a mammogram of a reconstructed breast or if you had a mastectomy without reconstruction. Your doctor may order other imaging procedures or lab tests.

You may find it helpful to read the NCI booklet *Facing Forward: Life After Cancer Treatment*. You may also want to read the NCI fact sheet *Follow-up Care After Cancer Treatment*.

Ask your doctor how often you'll need checkups.

Sources of Support

Learning that you have breast cancer can change your life and the lives of those close to you. These changes can be hard to handle.

Concerns about treatments and managing side effects, hospital stays, and medical bills are common. You may also worry about caring for your family, keeping your job, or continuing daily activities. It's normal for you, your family, and your friends to need help coping with such worries.

Several organizations offer special programs for women with breast cancer. Women who have had the disease serve as trained volunteers. They may talk with or visit women who have breast cancer, provide information, and lend emotional

support. They often share their experiences with breast cancer treatment, breast reconstruction, and recovery.

Here's where you can go for support:

- Doctors, nurses, and other members of your health care team can answer questions about treatment, working, or other activities.

- Social workers, counselors, or members of the clergy can be helpful if you want to talk about your feelings or concerns. Often, social workers can suggest resources for financial aid, transportation, home care, or emotional support.

- Support groups can also help. In these groups, women with breast cancer or their family members meet with other patients or their families to share what they have learned about coping with the disease and the effects of treatment. Groups may offer support in person, over the telephone, or on the Internet. You may want to talk with a member of your health care team about finding a support group.

  Women with breast cancer often get together in support groups, but please keep in mind that each woman is different. Ways that one woman deals with cancer may not be right for another. You may want to ask your health care provider about advice you receive from other women with breast cancer.

- NCI's Cancer Information Service can help you locate programs, services, and NCI publications. Call **1-800-4-CANCER (1-800-422-6237).** Or, chat using **LiveHelp (https://livehelp.cancer.gov)**, NCI's instant messaging service.

- Your doctor or a sex counselor may be helpful if you and your partner are concerned about the effects of breast cancer on your sex life. Ask your doctor about possible treatment of side effects and whether these effects are likely to last. Whatever the outlook, you and your partner may find it helps to discuss your concerns.

For tips on coping, you may want to read the NCI booklet *Taking Time: Support for People With Cancer*.

Cancer Treatment Research

Doctors all over the world are conducting many types of cancer treatment studies (clinical trials) in which people volunteer to take part. Research has already led to advances in the prevention, detection, and treatment of breast cancer.

Doctors continue to search for new and better ways to treat breast cancer. NCI is sponsoring many studies with women who have breast cancer, such as studies that combine surgery, chemotherapy, hormone therapy, and radiation therapy.

Even if a woman in a research study doesn't benefit directly from the treatment under study, she may still make an important contribution by helping doctors learn more about breast cancer and how to control it. Although research studies may pose some risks, researchers do all they can to protect their patients.

If you're interested in being part of a research study, talk with your doctor. You may want to read the NCI booklet *Taking Part in Cancer Treatment Research Studies*. It describes how treatment studies are carried out and explains their possible benefits and risks.

NCI's website has a section on research studies at **http://www.cancer.gov/clinicaltrials**. It has general information about research studies as well as detailed information about specific ongoing studies of breast cancer.

NCI's Cancer Information Service can answer your questions and provide information about research studies. Contact CIS at **1-800-4-CANCER (1-800-422-6237)** or at **LiveHelp (https://livehelp.cancer.gov)**.

Words To Know

Definitions of thousands of terms are on NCI's website in NCI's Dictionary of Cancer Terms. You can access it at **http://www.cancer.gov/dictionary**.

Advanced cancer: Cancer that has spread to other places in the body and usually cannot be cured or controlled with treatment.

Aromatase inhibitor (uh-ROH-muh-tayz in-HIH-bih-ter): A drug that prevents the formation of estradiol, a female hormone, by interfering with an aromatase enzyme. Aromatase inhibitors are used as a type of hormone therapy for postmenopausal women who have hormone-dependent breast cancer.

Axilla (ak-SIL-a): The underarm or armpit.

Axillary dissection (AK-sih-LAYR-ee dy-SEK-shun): Surgery to remove lymph nodes found in the armpit region. Also called axillary lymph node dissection.

Axillary lymph node (AK-sih-LAYR-ee limf): A lymph node in the armpit region that drains lymph from the breast and nearby areas.

Benign (beh-NINE): Not cancer. Benign tumors may grow larger but do not spread to other parts of the body.

Biopsy (BY-op-see): The removal of cells or tissues for examination by a pathologist. The pathologist may study the tissue under a microscope or perform other tests on the cells or tissue.

Blood vessel: A tube through which the blood circulates in the body. Blood vessels include a network of arteries, arterioles, capillaries, venules, and veins.

Brachytherapy (BRAY-kee-THAYR-uh-pee): A type of radiation therapy in which radioactive material sealed in needles, seeds, wires, or catheters is placed directly into or near a tumor. Also

called implant radiation therapy, internal radiation therapy, and radiation brachytherapy.

Breast-sparing surgery (SER-juh-ree): An operation to remove the breast cancer but not the breast itself. Types of breast-sparing surgery include lumpectomy (removal of the lump), quadrantectomy (removal of one quarter, or quadrant, of the breast), and segmental mastectomy (removal of the cancer as well as some of the breast tissue around the tumor and the lining over the chest muscles below the tumor). Also called breast-conserving surgery.

Cancer (KAN-ser): A term for diseases in which abnormal cells divide without control and can invade nearby tissues. Cancer cells can also spread to other parts of the body through the blood and lymph systems.

Carcinoma in situ (KAR-sih-NOH-muh in SY-too): A group of abnormal cells that remain in the place where they first formed. They have not spread. These abnormal cells may become cancer and spread into nearby normal tissue. Also called stage 0 disease.

Cell: The individual unit that makes up the tissues of the body. All living things are made up of one or more cells.

Chemotherapy (KEE-moh-THAYR-uh-pee): Treatment with drugs that kill cancer cells.

Clinical trial: A type of research study that tests how well new medical approaches work in people. These studies test new methods of screening, prevention, diagnosis, or treatment of a disease. Also called clinical study.

Contrast material: A dye or other substance that helps show abnormal areas inside the body. It is given by injection into a vein, by enema, or by mouth. Contrast material may be used with x-rays, CT scans, MRI, or other imaging tests.

CT scan: A series of detailed pictures of areas inside the body taken from different angles. The pictures are created by a computer linked to an x-ray machine. Also called CAT scan, computed tomography scan, computerized axial tomography scan, and computerized tomography.

Duct (dukt): In medicine, a tube or vessel of the body through which fluids pass.

Ductal carcinoma (DUK-tul KAR-sih-NOH-muh): The most common type of breast cancer. It begins in the cells that line the milk ducts in the breast.

Ductal carcinoma in situ (DUK-tal KAR-sih-NOH-muh in SYE-too): A noninvasive condition in which abnormal cells are found in the lining of a breast duct. The abnormal cells have not spread outside the duct to other tissues in the breast. In some cases, ductal carcinoma in situ may become invasive cancer and spread to other tissues, although it is not known at this time how to predict which lesions will become invasive. Also called DCIS and intraductal carcinoma.

Early-stage breast cancer: Breast cancer that has not spread beyond the breast or the axillary lymph nodes. This includes ductal carcinoma in situ and stage I, stage IIA, stage IIB, and stage IIIA breast cancers.

Estrogen (ES-truh-jin): A type of hormone made by the body that helps develop and maintain female sex characteristics and the growth of long bones. Estrogens can also be made in the laboratory. They may be used as a type of birth control and to treat symptoms of menopause, menstrual disorders, osteoporosis, and other conditions.

External radiation therapy (RAY-dee-AY-shun THAYR-uh-pee): A type of radiation therapy that uses a machine to aim high-energy rays at the cancer from outside of the body. Also called external-beam radiation therapy.

Fibrous: Containing or resembling fibers.

Gland: An organ that makes one or more substances, such as hormones, digestive juices, sweat, tears, saliva, or milk.

HER2: A protein involved in normal cell growth. It is found on some types of cancer cells, including breast and ovarian. Cancer cells removed from the body may be tested for the presence of HER2/neu to help decide the best type of treatment. Also called c-erbB-2, human EGF receptor 2, and human epidermal growth factor receptor 2.

Hormone receptor (HOR-mone reh-SEP-ter): A cell protein that binds a specific hormone. The hormone receptor may be on the surface of the cell or inside the cell. Many changes take place in a cell after a hormone binds to its receptor.

Hormone therapy (HOR-mone THAYR-uh-pee): Treatment that adds, blocks, or removes hormones. For certain conditions (such as diabetes or menopause), hormones are given to adjust low hormone levels. To slow or stop the growth of certain cancers (such as prostate and breast cancer), synthetic hormones or other drugs may be given to block the body's natural hormones. Sometimes surgery is needed to remove the gland that makes a certain hormone. Also called endocrine therapy, hormonal therapy, and hormone treatment.

Inflammatory breast cancer (in-FLA-muh-TOR-ee): A type of breast cancer in which the breast looks red and swollen and feels warm. The skin of the breast may also show the pitted appearance called peau d'orange (like the skin of an orange). The redness and warmth occur because the cancer cells block the lymph vessels in the skin.

Intravenous (IN-truh-VEE-nus): Into or within a vein. Intravenous usually refers to a way of giving a drug or other substance through a needle or tube inserted into a vein. Also called IV.

Leukemia (loo-KEE-mee-uh): Cancer that starts in blood-forming tissue such as the bone marrow and causes large numbers of blood cells to be produced and enter the bloodstream.

LH-RH agonist: A drug that inhibits the secretion of sex hormones. In men, LH-RH agonist causes testosterone levels to fall. In women, LH-RH agonist causes the levels of estrogen and other sex hormones to fall. Also called luteinizing hormone-releasing hormone agonist.

Lobe: A portion of an organ, such as the liver, lung, breast, thyroid, or brain.

Lobular carcinoma (LAH-byuh-ler KAR-sih-NOH-muh): Cancer that begins in the lobules (the glands that make milk) of the breast. Lobular carcinoma in situ (LCIS) is a condition in which abnormal cells are found only in the lobules. When cancer has spread from the lobules to surrounding tissues, it is invasive lobular carcinoma. LCIS does not become invasive lobular carcinoma very often, but having LCIS in one breast increases the risk of developing invasive cancer in either breast.

Lobule (LOB-yule): A small lobe or a subdivision of a lobe.

Lumpectomy (lum-PEK-toh-mee): Surgery to remove abnormal tissue or cancer from the breast and a small amount of normal tissue around it. It is a type of breast-sparing surgery.

Lymph node (limf): A rounded mass of lymphatic tissue that is surrounded by a capsule of connective tissue. Lymph nodes filter lymph (lymphatic fluid), and they store lymphocytes (white blood cells). They are located along lymphatic vessels. Also called lymph gland.

Lymph vessel (limf): A thin tube that carries lymph (lymphatic fluid) and white blood cells through the lymphatic system. Also called lymphatic vessel.

Lymphedema (LIM-fuh-DEE-muh): A condition in which excess fluid collects in tissue and causes swelling. It may occur in the arm or leg after lymph vessels or lymph nodes in the underarm or groin are removed or treated with radiation.

Malignant (muh-LIG-nunt): Cancerous. Malignant tumors can invade and destroy nearby tissue and spread to other parts of the body.

Mammogram (MAM-o-gram): An x-ray of the breast.

Mastectomy (ma-STEK-toh-mee): Surgery to remove the breast (or as much of the breast tissue as possible).

Medical oncologist (MEH-dih-kul on-KAH-loh-jist): A doctor who specializes in diagnosing and treating cancer using chemotherapy, targeted therapy, hormonal therapy, and biological therapy. A medical oncologist often is the main health care provider for someone who has cancer. A medical oncologist also gives supportive care and may coordinate treatment given by other specialists.

Menopause (MEH-nuh-PAWZ): The time of life when a woman's ovaries stop working and menstrual periods stop. Natural menopause usually occurs around age 50. A woman is said to be in menopause when she hasn't had a period for 12 months in a row. Symptoms of menopause include hot flashes, mood swings, night sweats, vaginal dryness, trouble concentrating, and infertility.

Menstrual period (MEN-stroo-al): The periodic discharge of blood and tissue from the uterus. From puberty until menopause, menstruation occurs about every 28 days, but does not occur during pregnancy.

Metastatic (meh-tuh-STA-tik): Having to do with metastasis, which is the spread of cancer from one part of the body to another.

Modified radical mastectomy (RA-dih-kul ma-STEK-toh-mee): Surgery for breast cancer in which the breast, most or all of the lymph nodes under the arm, and the lining over the chest muscles are removed. Sometimes the surgeon also removes part of the chest wall muscles.

MRI: A procedure in which radio waves and a powerful magnet linked to a computer are used to create detailed pictures of areas inside the body. These pictures can show the difference between normal and diseased tissue. MRI makes better images of organs and soft tissue than other scanning techniques, such as computed tomography (CT) or x-ray. MRI is especially useful for imaging the brain, the spine, the soft tissue of joints, and the inside of bones. Also called magnetic resonance imaging.

Oncology nurse (on-KAH-loh-jee): A nurse who specializes in treating and caring for people who have cancer.

Organ: A part of the body that performs a specific function. For example, the heart is an organ.

Ovary (OH-vuh-ree): One of a pair of female reproductive glands in which the ova, or eggs, are formed. The ovaries are located in the pelvis, one on each side of the uterus.

Partial mastectomy (ma-STEK-toh-mee): The removal of cancer as well as some of the breast tissue around the tumor and the lining over the chest muscles below the tumor. Usually some of the lymph nodes under the arm are also taken out. Also called segmental mastectomy.

PET scan: A procedure in which a small amount of radioactive glucose (sugar) is injected into a vein, and a scanner is used to make detailed, computerized pictures of areas inside the body where the glucose is used. Because cancer cells often use more glucose than normal cells, the pictures can be used to find cancer cells in the body. Also called positron emission tomography scan.

Physical therapist: A health professional who teaches exercises and physical activities that help condition muscles and restore strength and movement.

Plastic surgeon (SER-jun): A surgeon who specializes in reducing scarring or disfigurement that may occur as a result of accidents, birth defects, or treatment for diseases.

Plastic surgery (SER-juh-ree): An operation that restores or improves the appearance of body structures.

Progesterone (proh-JES-tuh-RONE): A type of hormone made by the body that plays a role in the menstrual cycle and pregnancy. Progesterone can also be made in the laboratory. It may be used as a type of birth control and to treat menstrual disorders, infertility, symptoms of menopause, and other conditions.

Radiation (RAY-dee-AY-shun): Energy released in the form of particle or electromagnetic waves. Common sources of radiation include radon gas, cosmic rays from outer space, medical x-rays, and energy given off by a radioisotope (unstable form of a chemical element that releases radiation as it breaks down and becomes more stable).

Radiation oncologist (RAY-dee-AY-shun on-KAH-loh-jist): A doctor who specializes in using radiation to treat cancer.

Radiation therapy (RAY-dee-AY-shun THAYR-uh-pee): The use of high-energy radiation from x-rays, gamma rays, neutrons, protons, and other sources to kill cancer cells and shrink tumors. Radiation may come from a machine outside the body (external-beam radiation therapy), or it may come from radioactive material placed in the body near cancer cells (internal radiation therapy). Systemic radiation therapy uses a radioactive substance, such as a radiolabeled monoclonal antibody, that travels in the blood to tissues throughout the body. Also called irradiation and radiotherapy.

Radioactive (RAY-dee-oh-AK-tiv): Giving off radiation.

Reconstructive surgeon (REE-kun-STRUK-tiv SER-jun): A doctor who can surgically reshape or rebuild (reconstruct) a part of the body, such as a woman's breast after surgery for breast cancer.

Registered dietitian (dy-eh-TIH-shun): A health professional with special training in the use of diet and nutrition to keep the body healthy. A registered dietitian may help the medical team improve the nutritional health of a patient.

Segmental mastectomy (seg-MEN-tul ma-STEK-toh-mee): The removal of cancer as well as some of the breast tissue around the tumor and the lining over the chest muscles below the tumor. Usually some of the lymph nodes under the arm are also taken out. Also called partial mastectomy.

Sentinel lymph node biopsy: Removal and examination of the sentinel node(s) (the first lymph node(s) to which cancer cells are likely to spread from a primary tumor). To identify the sentinel lymph node(s), the surgeon injects a radioactive substance, blue dye, or both near the tumor. The surgeon then uses a scanner to find the sentinel lymph node(s) containing the radioactive substance or looks for the lymph node(s) stained with dye. The surgeon then removes the sentinel node(s) to check for the presence of cancer cells.

Side effect: A problem that occurs when treatment affects healthy tissues or organs. Some common side effects of cancer treatment are fatigue, pain, nausea, vomiting, decreased blood cell counts, hair loss, and mouth sores.

Social worker: A professional trained to talk with people and their families about emotional or physical needs, and to find them support services.

Surgery (SER-juh-ree): A procedure to remove or repair a part of the body or to find out whether disease is present. An operation.

Tamoxifen (tuh-MOK-sih-FEN): A drug used to treat certain types of breast cancer in women and men. It is also used to prevent breast cancer in women who have had ductal carcinoma in situ (abnormal cells in the ducts of the breast) and in women who are at a high risk of developing breast cancer. It blocks the effects of the hormone estrogen in the breast.

Targeted therapy (TAR-geh-ted THAYR-uh-pee): A type of treatment that uses drugs or other substances, such as monoclonal antibodies, to identify and attack specific cancer cells. Targeted therapy may have fewer side effects than other types of cancer treatments.

Tissue (TISH-oo): A group or layer of cells that work together to perform a specific function.

Total mastectomy (ma-STEK-toh-mee): Removal of the breast. Also called simple mastectomy.

Tumor (TOO-mer): An abnormal mass of tissue that results when cells divide more than they should or do not die when they should. Tumors may be benign (not cancer), or malignant (cancer). Also called neoplasm.

X-ray: A type of high-energy radiation. In low doses, x-rays are used to diagnose diseases by making pictures of the inside of the body. In high doses, x-rays are used to treat cancer.

National Cancer Institute Publications

NCI provides publications about cancer, including the booklets and fact sheets mentioned in this booklet. Many are available in both English and Spanish.

You may read NCI publications online and print your own copy. Also, you may order publications in two ways:

- **NCI's telephone service:** People in the United States and its territories may order these and other NCI publications by calling NCI's Cancer Information Service at **1-800-4-CANCER (1-800-422-6237)**.
- **NCI's website:** Many NCI publications may be viewed, downloaded, and ordered from **http://www.cancer.gov/publications**.

Publications by Topic

- **Staging Test**
  - *Sentinel Lymph Node Biopsy*
- **Cancer Treatment and Supportive Care**
  - *How To Find a Doctor or Treatment Facility If You Have Cancer*
  - *Radiation Therapy and You*
  - *Chemotherapy and You*
  - *Hormone Therapy for Breast Cancer*
  - *Targeted Cancer Therapies*
  - *Eating Hints*
  - *Pain Control*

Research Studies

- *Taking Part in Cancer Treatment Research Studies*

Coping With Cancer

- *Taking Time: Support for People with Cancer*

Life After Cancer Treatment

- *Facing Forward: Life After Cancer Treatment*
- *Follow-up Care After Cancer Treatment*
- *Facing Forward: Making a Difference in Cancer*

Advanced or Recurrent Cancer

- *Coping With Advanced Cancer*
- *Metastatic Cancer*
- *When Cancer Returns*

Complementary Medicine

- *Thinking about Complementary & Alternative Medicine*

Caregivers

- *When Someone You Love Is Being Treated for Cancer: Support for Caregivers*
- *When Someone You Love Has Advanced Cancer: Support for Caregivers*
- *Facing Forward: When Someone You Love Has Completed Cancer Treatment*
- *Caring for the Caregiver: Support for Cancer Caregivers*

For the Latest Information About Breast Cancer

Visit NCI's website at **http://www.cancer.gov/cancertopics/types/breast**

To Request Permission To Use Artwork

Although the text of this booklet is in the public domain, private-sector artists retain the copyright to artwork that they create under contract to NCI.

You must have permission to use the artwork for other purposes.

In many cases, artists will grant you permission, but they may require a credit line and/or usage fees.

To obtain contact information for the artists, e-mail us at **cancergovstaff@mail.nih.gov**.

NATIONAL® CANCER INSTITUTE

NIH Publication No. 12-1556
Revised April 2012
Printed August 2012

NIH… Turning Discovery Into Health