CONDITION

Breast cancer

Learn about breast cancer symptoms, risk factors, diagnosis, treatment options, complications, and follow-up care.

WHAT IT IS
Uncontrolled growth of breast cells

BODY SYSTEM
Breasts

MAIN SYMPTOMS
Breast lump, breast shape change, skin dimpling, nipple discharge

WHAT CAUSES IT
Genetic changes, usually unknown

HOW IT IS DIAGNOSED
Biopsy with microscopic examination

MAIN TREATMENT
Surgery, radiation, systemic therapy

CAN IT BE CURED?
Sometimes - when found before spread

IS IT AN EMERGENCY?
Sometimes - with severe trouble breathing

LONG-TERM OUTLOOK
Often treatable early, controllable when metastatic

Overview

Breast cancer begins when cells in the breast grow out of control. It can develop in people of any sex, although it is much more common in women.

Most breast cancers start in the milk ducts or the glands that make milk. Ductal carcinoma in situ , or DCIS, means abnormal cells are limited to a milk duct and have not invaded nearby breast tissue. Invasive breast cancer has grown into surrounding tissue and may spread through lymph vessels or the bloodstream.

Breast cancer is not one disease. Tumors can differ in how quickly they grow and which treatments are likely to work. Laboratory testing may show whether cancer cells have estrogen receptors, progesterone receptors, or excess HER2 protein. These features help guide treatment.

When breast cancer is found before it has spread, treatment often aims to remove it and reduce the chance that it will return. Cancer that has spread to distant organs is called metastatic or stage IV breast cancer. Treatment at this stage usually focuses on controlling the cancer, relieving symptoms, and maintaining quality of life.

Screening can find some breast cancers before symptoms appear. Recommendations depend on age, personal risk, and the organization issuing the guidance. People at increased risk may need a different screening plan, sometimes including breast MRI. A clinician can help assess individual risk and explain the benefits and limits of screening.

Symptoms

Early breast cancer may not cause symptoms. A new breast change does not necessarily mean cancer, but it should be assessed rather than watched indefinitely.

Possible symptoms include:

Inflammatory breast cancer is an uncommon, fast-growing form that may cause rapid swelling, warmth, redness, heaviness, or skin that resembles an orange peel. It may not form a distinct lump. These changes need prompt medical assessment, particularly if they do not improve as expected with treatment for another suspected condition.

Breast pain alone is more often caused by noncancerous conditions. Even so, new, persistent, or localized pain should be discussed with a healthcare professional.

- A new lump, firm area, or thickening in the breast or underarm
- A change in breast size, shape, or appearance
- Skin dimpling, puckering, swelling, or thickening
- Red, darkened, flaky, or irritated breast or nipple skin
- A nipple that turns inward when this is new
- Nipple discharge that is not breast milk, especially bloody discharge
- Ongoing pain in one area of the breast
- Swollen lymph nodes near the underarm or collarbone

Causes and risk factors

Breast cancer develops after genetic changes allow breast cells to grow abnormally. Usually, there is no single identifiable cause. Having one or more risk factors does not mean that a

person will develop breast cancer, and some people diagnosed with it have no clear risk factors.

Age is an important risk factor. Risk generally rises as people get older. Other established factors include:

Most breast cancers are not caused by an inherited gene variant. Genetic counseling may be appropriate when cancer occurs at a young age, affects both breasts, is triple-negative, or appears alongside certain cancers in close relatives. A genetic counselor can explain what testing may and may not reveal and how results could affect relatives.

Some risk factors cannot be changed. Others may be reduced, but no lifestyle choice can guarantee prevention. Regular physical activity, limiting alcohol, and maintaining a weight that supports overall health may lower risk for some people.

- A personal history of breast cancer or certain high-risk breast changes
- A strong family history of breast, ovarian, pancreatic, or prostate cancer
- Inherited gene variants, including certain changes in BRCA1 , BRCA2 , PALB2 , and other genes
- Previous radiation treatment to the chest, especially at a young age
- Dense breast tissue, which can increase risk and make mammograms harder to interpret
- Longer lifetime exposure to estrogen, such as starting menstrual periods early or reaching menopause later
- Use of some forms of menopausal hormone therapy
- Alcohol use
- Limited physical activity and excess body weight after menopause

Diagnosis

Evaluation usually begins with a medical history and breast examination. The clinician will ask when the change began, whether it has changed, and whether there is a personal or family history of cancer.

Diagnostic imaging is different from routine screening. A diagnostic mammogram takes detailed X-ray images of the area of concern. Ultrasound can show whether a lump is solid or filled with fluid. MRI may be used in selected situations, such as defining the extent of a known cancer or evaluating people at high risk.

Imaging can suggest whether an area looks suspicious, but it cannot usually confirm cancer.

Confirmation requires a biopsy , which removes cells or tissue for examination under a microscope. A core needle biopsy is commonly used because it collects small tissue samples while usually avoiding surgery.

If cancer is found, the pathology report describes important features:

Stage describes the cancer's extent. It considers tumor size, nearby lymph nodes, and whether cancer has spread to distant organs. Imaging such as CT, bone scan, or PET is not needed for every early breast cancer. It is generally used when symptoms, examination findings, or cancer features suggest possible spread.

For some hormone receptor-positive, HER2-negative cancers, a genomic tumor test may help estimate the chance of recurrence and whether chemotherapy is likely to add benefit. This tests activity within the tumor and is different from inherited genetic testing.

- Type: Where the cancer began and whether it is invasive
- Grade: How abnormal the cells look and how quickly they may grow
- Hormone receptor status: Whether estrogen or progesterone may help the cancer grow
- HER2 status: Whether the cells make excess HER2 protein or have extra copies of the HER2 gene
- Margins: Whether cancer cells reach the edge of surgically removed tissue

Treatment and management

Treatment is based on the cancer's type, stage, biomarkers, genetic findings, previous health conditions, and the person's priorities. Care may involve a breast surgeon, medical oncologist, radiation oncologist, plastic surgeon, genetic counselor, and other specialists.

Surgery removes cancer from the breast. Breast-conserving surgery, also called lumpectomy, removes the tumor with a border of surrounding tissue. Mastectomy removes most or all breast tissue. For many early cancers, lumpectomy followed by radiation and mastectomy offer similar long-term cancer outcomes, but not every option is suitable for every tumor.

Nearby lymph nodes may also be checked. A sentinel lymph node biopsy removes the first few nodes most likely to contain cancer. This can provide staging information while reducing the need for more extensive node surgery.

Breast reconstruction can be performed during mastectomy or later. Options may use implants or tissue from another part of the body. Some people choose not to have reconstruction and may use a breast form or remain flat. These are personal decisions.

Radiation therapy uses high-energy beams to destroy remaining cancer cells. It is commonly

recommended after breast-conserving surgery and may be used after mastectomy when the risk of cancer remaining in the chest wall or lymph nodes is higher.

Systemic treatments travel through the bloodstream and can treat cells beyond the breast. They may be given before surgery to shrink a tumor or after surgery to lower the chance of recurrence.

Systemic treatment may include:

Treatment before surgery is called neoadjuvant therapy. It may make surgery easier and show how the cancer responds. Treatment after surgery is called adjuvant therapy.

Side effects vary. They may include fatigue, nausea, hair loss, menopausal symptoms, joint discomfort, nerve problems, or changes in blood counts. Supportive medicines, physical therapy, nutrition guidance, counseling, and palliative care can help. Palliative care focuses on comfort and quality of life and can be provided alongside cancer treatment at any stage.

Fertility can be affected by some treatments. People who may want biological children should ask about fertility preservation before treatment begins whenever possible.

- Endocrine therapy , which blocks estrogen or lowers estrogen levels in hormone receptor-positive cancer
- Chemotherapy , which damages rapidly dividing cells
- HER2-targeted therapy for cancers with excess HER2
- Immunotherapy for selected cancers, including some triple-negative breast cancers
- Other targeted medicines chosen according to tumor features or inherited gene changes

Complications

Breast cancer can return near the original area or in another part of the body. The chance of recurrence depends on the cancer's stage, biology, response to treatment, and other factors.

Treatment can also cause short- or long-term complications. Surgery or radiation may lead to shoulder stiffness, numbness, pain, or lymphedema , which is swelling caused by a buildup of lymph fluid. Endocrine treatment may affect bone health or cause menopausal symptoms. Some chemotherapy and targeted treatments can affect nerves, the heart, or other organs.

Emotional effects are also common. Fear of recurrence, changes in body image, sleep problems, sexual concerns, and financial strain may continue after active treatment. These concerns are valid reasons to seek help from the cancer care team, a counselor, rehabilitation specialist, social worker, or support service.

Follow up

Follow-up care checks for recurrence, manages treatment effects, and supports general health. The schedule depends on the cancer and treatment received.

For many people treated for early-stage breast cancer, follow-up includes symptom review, physical examination, and mammography of remaining breast tissue. Routine CT scans, PET scans, bone scans, or blood tumor-marker tests are generally not used when there are no symptoms or examination findings suggesting recurrence.

Keep an updated treatment summary and list of medicines. Tell the care team about new breast or chest-wall changes, a persistent new lump, unexplained bone pain, ongoing cough, unusual shortness of breath, severe headaches, weakness, or unexplained weight loss. These symptoms often have causes other than cancer, but they deserve assessment.

Contact the oncology team promptly about fever during chemotherapy, rapidly worsening swelling or redness, a painful swollen arm, uncontrolled vomiting, or side effects that make it difficult to drink or take medicines.

Seek emergency care for severe trouble breathing, chest pain, coughing up blood, fainting, uncontrolled bleeding, or sudden weakness, facial drooping, confusion, or difficulty speaking.

Follow-up also includes routine primary care. Vaccinations, bone health, heart health, physical activity, and screening for other cancers remain important. Ask which clinician will manage each part of care.

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