

National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines on Breast Cancer (2024)

About the Guideline

- These guidelines were developed by a multi-disciplinary panel of representatives from NCCN member institutions with breast cancer expertise in the fields of medical oncology, surgical oncology, radiation oncology, pathology, reconstructive surgery, and patient advocacy.
- All recommendations in this guideline are NCCN Category 2A unless otherwise indicated within the guideline.
- The NCCN Categories of Evidence are as follows:
 - Category 1: Based on high-level evidence with uniform NCCN consensus.
 - Category 2A: Based on lower-level evidence with uniform NCCN consensus.
 - Category 2B: Based on lower-level evidence with NCCN consensus.
 - Category 3: Based on any level of evidence with major disagreement among the panel that the intervention is appropriate.

Overview

- Breast cancer is the most common malignancy in females and second leading cause of cancer deaths in females.
- Major risk factors include female sex and increased age (only 1% of breast cancers occur in males).
- Staging:
 - All breast cancer patients should be assigned a stage (clinical and pathologic).
 - Staging allows for the identification of all treatment options.
 - See complete guideline for full staging information.
- This guideline provides updated guidelines for the management of carcinoma in situ, invasive breast cancer, Paget disease, Phyllodes tumor, inflammatory breast cancer (IBC), and breast cancer during pregnancy.

Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work in an acute care setting.

Pathology Assessment

- The College of American Pathologists' protocols provide consistent and unambiguous pathology reporting guidelines that are essential in the analysis of breast cancer specimens.
- For ductal carcinoma in situ (DCIS): estrogen receptor (ER) status must be determined.
- For invasive breast cancer: both ER and progesterone receptor (PR) status is determined.
- For newly diagnosed invasive breast cancer and first recurrence: human epidermal growth factor receptor 2 (HER2) tumor status should be determined.
- Sentinel lymph node biopsy (SLNB) should be performed and is the preferred method of axillary lymph node staging if the patient is an SLNB candidate.
 - Axillary staging may be optional in patients with favorable tumors, if selection of adjuvant systemic and/or radiation therapy won't be affected, in patients 70 years or older, or those with serious comorbid conditions.

Breast Magnetic Resonance Imaging (MRI)

Annual MRI screening is recommended in patients with a personal history of breast cancer who either have dense breast tissue or were diagnosed with cancer at the age of 50 years or younger. It's important to note that false-positive findings are common with breast MRI screening and surgical decisions shouldn't be made based on MRI results alone. Breast biopsy is recommended to identify disease.

Screening MRI in patients at increased breast cancer risk is indicated in the following:

- To determine the extent of cancer in the ipsilateral breast, or as screening of the contralateral breast at the time of initial diagnosis.
- To evaluate before and after preoperative systemic therapy to determine extent of disease, response of treatment, and potential for breast-conservation therapy.
- To identify clinically occult disease in patients with axillary nodal metastases, with Paget disease, or with invasive lobular carcinoma not clearly defined on mammography, ultrasound, or physical exam.

General Treatment Approach

- The treatment approach for breast cancer varies.
- Decisions about the type of treatment take into consideration the following factors:
 - Tumor histology
 - Clinical and pathologic characteristics of tumor
 - Lymph node involvement
 - Hormone receptor status
 - HER2 status
 - Presence of metastatic disease
 - Comorbidities
 - Age
 - Menopausal status (in females)
- **Local disease:** surgery and/or radiation therapy (RT).
- **Systemic disease:**
 - Chemotherapy
 - Endocrine therapy
 - Biologic therapy
 - Or a combination of the three

General Principles of Endocrine Therapy

- **Candidates for ovarian suppression and endocrine therapy:**
 - Premenopausal
 - Endocrine sensitive tumors with high recurrence risk
- **Hormone receptor-positive (HR+) tumors:** breast tumors may be positive for estrogen receptors (ER+), progesterone receptors (PR+) or both (ER+/PR+).
 - ER+ tumors: ER testing should be used to determine if a patient is a candidate for endocrine therapies.
 - PR+ tumors (ER-negative): relatively uncommon but may be considered for endocrine therapies.
- **Ovarian function suppression (OFS):**
 - Types
 - Gonadotropin-releasing hormone (GnRH) agonists
 - Radiation therapy

- Bilateral oophorectomy
- Begin OFS with start of chemotherapy; if no chemotherapy planned, then begin OFS alone for 1-2 cycles or with tamoxifen until estradiol reaches postmenopausal range then consider aromatase inhibitor (AI). May also initiate OFS concurrently with RT or once completed.
- Duration of OFS: 5 years, with minimum of 2 years

General Principles of Radiation Therapy

- Whole breast radiation therapy (WBRT) reduces the risk of local recurrence and may improve overall survival.
 - In patients with higher risks such as age less than 50 years, high grade disease, or focally positive margins, an additional boost dose of radiation to the tumor bed may reduce local relapse.
- Post-mastectomy radiation (including breast reconstruction) should target the ipsilateral chest wall and complete mastectomy area with or without drain sites.
 - Post-mastectomy radiation is not recommended in patients with negative nodes, tumors 5 cm or less in size, and clear margins.
- Regional nodal radiation to supra/intra-clavicular and axillary nodes based on patient anatomy.
- RT is based on maximal disease stage at diagnosis with preoperative or adjuvant systemic therapy.
- RT with systemic therapy
 - RT commonly follows chemotherapy (when indicated)
 - CMF (cyclophosphamide/methotrexate/fluorouracil) is the only regimen that can be given concurrently with RT.
 - Capecitabine is typically given after completion of RT.
 - Olaparib should be given after RT is completed.
 - Sequential or concurrent endocrine therapy with RT is acceptable.
 - Abemaciclib should be started after completion of surgery/RT/chemotherapy, concurrently with endocrine therapy.
 - Adjuvant HER2-targeted therapy with or without endocrine therapy may be delivered concurrently with RT.
- Accelerated Partial Breast Irradiation (APBI)/Partial Breast Irradiation (PBI)
 - Similar local control to WBRT in low-risk early-stage breast cancer
 - Recommended for patients without BRCA 1/2 mutations.
 - Patients 50 years or over may have APBI/PBI if they have:
 - Invasive ductal carcinoma 2 cm or less with negative margins, no LVI, and ER-positive tumors **OR**
 - Low/intermediate DCIS 2.5 cm or less with negative margins.

General Principles of Breast Surgery

- **Breast-conserving surgery (BCS)** removes the cancer while leaving as much normal breast tissue as possible. Also called lumpectomy, quadrantectomy, partial mastectomy or segmental mastectomy.
 - Amount of tissue removed depends on tumor size and location and breast size.
 - Surrounding healthy tissue and lymph nodes may also be removed.
 - Radiation is typically needed following BCS. Endocrine therapy and/or chemotherapy as clinically indicated.

- **Breast reconstruction following mastectomy**
 - Reconstruction is an option for women undergoing surgical treatment and includes the use of implants, autogenous tissues (fat, muscle, skin, and vessels from donor sites such as the abdomen, buttock, back), or both.
 - Type of reconstruction is based on patient preference, body habitus, smoking history, comorbidities, plans for irradiation, and experience of the reconstruction team.
 - Refer patients to a reconstructive plastic surgeon for education regarding options and timing.
 - The type of reconstruction chosen should not interfere with tumor treatment.

Specific Treatment Approaches

Noninvasive Carcinomas (Stage 0)

- Ductal carcinoma in situ (DCIS), Tis, N0, M0, encapsulated or solid papillary carcinoma (SPC)
 - Workup includes:
 - History and physical
 - Diagnostic bilateral mammography
 - Pathology review
 - ER status
 - Breast MRI for select patients when additional information is warranted.
 - Genetic testing if the patient is at risk for hereditary breast cancer.
 - Treatment goal is to prevent progression to invasive breast cancer.
 - Surgery:
 - Breast conserving surgery (BCS) without lymph node surgery with either:
 - Whole breast radiation therapy (WBRT) to remove possible microscopic disease, with or without radiation boost to tumor site **OR**
 - Accelerated partial breast irradiation/partial breast radiation (APBI/PBI)
 - BCS alone if risk of disease recurrence is low.
 - Total mastectomy with sentinel lymph node biopsy (SLNB), with possible breast reconstruction. Axillary lymph node dissection (ALND) isn't recommended unless there is invasive cancer or ALN metastatic disease.
 - Endocrine therapy
 - Duration for 5 years with ER-positive DCIS if:
 - Treated with BCS and RT
 - Treated with excision alone
 - Treatment options
 - Tamoxifen for premenopausal females
 - Tamoxifen or aromatase inhibitor (AI) for postmenopausal patients (with additional benefits for patients younger than age 60 or with risks for thromboembolism)
 - Surveillance and follow-up
 - History and physical exam every 6 to 12 months for 5 years, then annually
 - First mammogram 6 to 12 months after breast conservation therapy and every 12 months thereafter.

Localized Breast Cancer (Invasive, non-inflammatory, non-metastatic [M0])

- Workup includes:
 - History and physical
 - Diagnostic bilateral mammogram

- Breast ultrasound as necessary
- Breast MRI (optional)
- Pathology review
- ER/PR status and HER2 status
- Additional:
 - Genetic counseling and testing if patient at risk for hereditary breast cancer, has triple-negative breast cancer (TNBC) at any age, or is a candidate for adjuvant olaparib.
 - Fertility and sexual health counseling
 - Distress assessment
 - Pregnancy test for patients of childbearing age
- Laboratory and other diagnostic tests:
 - Complete blood count (CBC)
 - Liver function testing
 - Additional imaging studies only if signs and symptoms of metastatic disease are present and for patients who are clinically high risk:
 - Computerized tomography (CT) scan of the chest, abdomen, and pelvis as clinically indicated
 - Bone scan
 - Positron emission tomography (PET) scan for patients who present with locally advanced disease (T3, N1-3, M0)
- Treatment:
 - If preoperative systemic therapy is not considered:
 - BCS followed by RT, *or*
 - Total mastectomy with surgical axillary staging and reconstruction followed by RT
 - Adjuvant systemic therapy
 - Sentinel lymph node mapping and resection
 - Radiation therapy based on number of positive axillary nodes: whole breast, chest wall, regional nodal irradiation, accelerated partial breast irradiation (APBI)

Systemic Therapy (Stage I, IIA, IIB, or IIIA)

- Preoperative therapy
 - Can improve surgical outcomes.
 - Effectiveness depends upon the extent of disease and is not appropriate for all breast cancer patients.
 - Includes the following: chemotherapy, endocrine therapy, HER2-targeted therapy.
 - Tumor response should be routinely assessed during preoperative therapy.
- Workup prior to preoperative systemic therapy:
 - Axillary assessment with exam
 - Consider ultrasound
 - Percutaneous biopsy of suspicious nodes (with marker placement on the most suspicious node)
 - Lab tests: CBC, metabolic panel, liver function tests, alkaline phosphatase
 - Additional tests to consider as clinically appropriate:
 - Chest CT with/without contrast
 - Abdomen/pelvic CT with contrast or MRI with contrast
 - Bone scan or sodium fluoride PET/CT
 - Fluorodeoxyglucose (FDG)-PET/CT

- Optional breast MRI
- **Preoperative systemic adjuvant therapy**
 - Hormone receptor (HR) positive/HER2 negative:
 - Premenopausal: one or a combination of the following based on tumor size and recurrence score
 - Adjuvant endocrine therapy
 - Adjuvant chemotherapy
 - Ovarian suppression/ablation
 - Postmenopausal: adjuvant endocrine therapy and/or chemotherapy based on tumor size, staging and metastasis
 - HR negative/HER2 positive:
 - Adjuvant chemotherapy with trastuzumab for up to 1 year **OR**
 - Adjuvant chemotherapy with trastuzumab and pertuzumab
 - HR negative/HER2 negative: adjuvant chemotherapy based on tumor size
- **Adjuvant systemic therapy after preoperative systemic therapy includes:**
 - HR positive/HER2 negative – adjuvant endocrine therapy with olaparib if *BRCA1/2* mutation; select patients may be eligible for abemaciclib
 - HR negative/HER2 positive – 1 year HER2-targeted therapy with trastuzumab with or without pertuzumab or ado-trastuzumab emtansine alone for 14 cycles
 - HR positive/HER2 positive – endocrine therapy with up to 1 year of HER2-directed therapy and trastuzumab with or without pertuzumab
 - HR negative/HER2 negative – pembrolizumab (if given preoperatively) or capecitabine (6-8 cycles) or olaparib for 1 year if *BRCA1/2* mutation
- **Adjuvant endocrine therapy**
 - ER/PR status must be determined for all invasive breast cancers. The majority of HR-positive breast cancer patients should receive adjuvant endocrine therapy.
 - Postmenopausal women: tamoxifen
 - Premenopausal women: tamoxifen, with or without ovarian suppression/ablation
 - Therapy can be extended with an aromatase inhibitor after the 5 years of treatment if the patient becomes postmenopausal, **or** an aromatase inhibitor can be used with or without ovarian suppression/ablation.
 - Tamoxifen: for patients with ER-positive breast cancer; given after chemotherapy in patients receiving both adjuvant chemotherapy and endocrine therapy; 5 years most beneficial.
- **Adjuvant cytotoxic chemotherapy**
 - Preferred regimens are as follows:
 - Dose-dense DOXOrubicin and cyclophosphamide (AC) followed by dose-dense PACLitaxel
 - Dose-dense AC followed by every 2 weeks PACLitaxel
 - DOCEtaxel with AC
 - If triple negative breast cancer and residual disease remains, consider capecitabine.
 - Additional regimens/chemotherapy can include:
 - AC alone; AC followed by DOCEtaxel every 3 weeks, or weekly PACLitaxel
 - EpiRUBicin and cyclophosphamide
 - Cytoxan, methotrexate, and fluorouracil
 - Chemotherapy should be given first followed by endocrine therapy.
 - Consider scalp cooling to reduce chemotherapy-induced alopecia.

- **Surgical treatment and adjuvant therapy after preoperative systemic treatment**
 - BCS with surgical axillary staging and reconstruction followed by adjuvant systemic therapy and WBRT
 - If BCS not possible, then mastectomy and surgical axillary staging with or without reconstruction followed by adjuvant systemic therapy with or without post-mastectomy RT.
- The postsurgical treatment regimen depends on the individual's risk for recurrence.
- Perform post treatment cardiotoxicity monitoring for patients who received left-sided radiation therapy, anthracyclines, or HER2-targeted therapy.

Invasive Breast Cancer Stage III

- Workup includes:
 - History and physical
 - CBC
 - Liver function tests
 - Chest imaging
 - Bilateral diagnostic mammography
 - Breast ultrasonography
 - Pathology review
 - ER/PR status and HER2 status
- Additional:
 - Genetic counseling
 - Fertility counseling
 - Distress assessment
 - Pregnancy test for females of childbearing age
- Optional:
 - Breast MRI
 - Abdominal imaging
 - PET/CT scan if clinically indicated
- Operable locally advanced breast cancer (T3, N1, M0):
 - Confined to breast and regional lymph nodes.
- Inoperable, and locally advanced breast cancer (clinical stage IIIA, IIIB or IIIC):
 - Preoperative systemic therapy: anthracycline-based chemotherapy, with or without a taxane
 - HER2 positive: include preoperative trastuzumab
 - Surgery: total mastectomy with lymph node dissection (possible delayed breast reconstruction); lumpectomy and axillary dissection
 - Chest wall, breast, and supraclavicular node irradiation; this treatment is warranted due to the high risk of recurrence.
 - Adjuvant therapy: completion of preoperative chemotherapy with subsequent endocrine therapy and trastuzumab therapy (if applicable)

Posttherapy Follow-Up (Stages I, II, and III)

- History and physical exams 1 to 4 times per year for 5 years, then annually
- Periodic screening for changes in family history and genetic testing indications and referral to genetic counseling as indicated
- Post-surgical management includes education, monitoring, and referral for lymphedema management.

- Breast imaging:
 - Annual mammography, beginning 6 months or more after completion of BCT
 - For patients who have had BCS and RT, annual mammography is recommended, but annual screening should not begin until 6 to 12 months after completion of radiation.
 - Routine imaging of reconstructed breast is not indicated.
- Yearly gynecologic exams for patients taking tamoxifen (intact uterus) related to the risk of endometrial cancer with usage
- Symptom management for patients on adjuvant endocrine treatment
- Lymphedema assessment, education, and management
- Avoidance of breastfeeding during endocrine or chemotherapy treatment
- Baseline and periodic bone density exam for patients on aromatase inhibitors and for patients who experience ovarian failure. Avoid the use of hormones to treat osteoporosis or osteopenia (bisphosphonates are the preferred intervention).
- Maintenance of exercise regimen, an active lifestyle, and ideal body weight

Stage IV Metastatic or Recurrent Breast Cancer

- Workup includes:
 - History and physical
 - CBC, liver function tests, alkaline phosphatase
 - Chest CT with and without contrast
 - Bone scan or sodium fluoride PET/CT
 - X-rays of any painful weight-bearing bones abnormal on bone scan
 - CT or MRI of the abdomen/pelvis
 - Brain MRI with contrast if patient has central nervous system symptoms
 - Spine MRI with contrast with back pain or symptoms of cord compression
 - FDG-PET/CT (consider 18F-fluorestradiol (FES)-PET/CT for ER-positive disease)
 - Biopsy documentation of first recurrence (if applicable)
 - Evaluation of ER/PR and HER2 status
 - Germline *BRCA1/2* mutations should be assessed with recurrent or metastatic breast cancer to identify candidates for poly adenosine diphosphate ribose polymerase (PARP)-inhibitor therapy.
 - Genetic counseling
- Discuss goals of therapy.
- For patients who present with metastatic disease or the first recurrence of disease, a biopsy is performed and ER/PR/HER2 status is repeated (for the recurrence).
 - Management of local disease includes the following:
 - Mastectomy patients with local recurrence:
 - If prior RT, surgical resection of the recurrence if feasible with surgical axillary staging (if no prior ALND) and repeat radiation.
 - If no prior RT, surgical resection if feasible with surgical axillary staging and postmastectomy radiotherapy (PMRT).
 - Breast-conserving therapy patients:
 - If prior RT, total mastectomy with axillary lymph node staging (if no prior ALND) and repeat RT if feasible
 - If no prior RT, repeat BCS with axillary lymph node staging (if no prior ALND) and RT
 - Systemic chemotherapy or endocrine therapy with minimal side effects may be used as treatment, but neither is curative.

- Single agent chemotherapy: anthracyclines, taxanes, antimetabolites, or nontaxane microtubule inhibitors
- HER2-targeted therapy (pertuzumab plus trastuzumab)
- Consider endocrine therapy for patients with hormone receptor negative disease.
- Offer bisphosphonates as supportive therapy for bone metastasis.
- Distant sites of recurrence:
 - Surgery, radiation, or regional chemotherapy (intrathecal) for brain metastases, leptomeningeal disease, choroid metastasis, pleural effusions, pericardial effusions, or spinal cord compression
- Monitoring of metastatic disease:
 - Use of Response Evaluation Criteria in Solid Tumors (RECIST) and the World Health Organization (WHO) criteria for reporting response, stability, and disease progression. The same method of assessment should be consistently used.
 - Periodic assessment of symptoms, physical exam, routine lab tests, imaging, and blood biomarkers as appropriate.
 - Response to treatment can be classified as follows:
 - Response/continued response to treatment
 - Stable disease
 - Uncertainty regarding disease status
 - Progression of disease
 - Clinician must decide if the benefits of disease control outweigh the risks of treatment toxicity.
- Systemic treatment of recurrent unresectable (local or regional) or stage IV disease:
 - Treat with multiple types of systemic therapy to palliate advanced breast cancer.
 - Continue therapy until disease progression or unacceptable toxicity.
 - Assess risks and benefits of additional systemic therapy, patient status and patient preferences using a shared decision-making process.
 - As disease progresses, consider discontinuing cytotoxic therapy and continue supportive care.

Special Considerations (General)

- **Paget disease** is a rare disease involving neoplastic cells in the epidermis of the nipple and areola. Tumors can also be present inside the same breast. These breast tumors are either DCIS or invasive breast cancer. If the biopsy is positive, a breast MRI is warranted to define disease extent.
 - Management: mastectomy or BCS following WBRT, adjuvant chemotherapy, hormone therapy, and endocrine therapy
- **Phyllodes tumor** is a rare tumor that can be benign, borderline, or malignant, which can enlarge rapidly.
 - Treatment: local surgical excision, lumpectomy, or partial mastectomy (full mastectomy if clear margins cannot be obtained)
- **Inflammatory breast cancer (IBC)**
 - Rare, aggressive form of breast cancer (1% to 6% in the United States)
 - Involves erythema and dermal edema (peau d'orange) of 1/3 or more of the skin of the breast
 - Usually hormone receptor negative and HER2 positive

- Workup includes history and physical, CBC, metabolic panel, LFTs, alkaline phosphatase, pathology review, determination of ER/PR status and HER2 status, fertility counseling if premenopausal, genetic counseling if patient is at risk, diagnostic bilateral mammogram with possible ultrasound and MRI (optional), chest CT, abdomen/pelvic CT, bone scan
- Treatment: combined approach, with initial treatment involving preoperative systemic therapy with anthracycline-based regimen with or without taxanes completed prior to mastectomy, and targeted therapy involving mastectomy, and radiation
- **Axillary breast cancer**
 - Occult breast cancer with axillary metastasis
 - Treatment is based on node involvement.
 - Treatment can include any combination of the following: mastectomy, systemic chemotherapy, endocrine therapy, and/or trastuzumab.
- **Breast cancer during pregnancy**
 - Breast cancer occurring concurrently during pregnancy is a rare event.
 - Diagnosis is often delayed due to the patient and physician not suspecting the occurrence.
 - Mammogram and ultrasound can be safely completed during pregnancy with proper shielding.
 - The most common surgical treatment is modified-radical mastectomy; however, breast-conserving surgery is an option if radiation can be postponed until the postpartum period.

Special Considerations for Breast-Conservation Therapy Requiring RT

Contraindications for breast-conservation therapy (BCT), defined as breast-conserving surgery following RT:

- Absolute contraindications (mastectomy is recommended)
 - Inflammatory breast cancer or invasive breast cancer with extensive skin or dermal lymphatic involvement
 - Diffuse suspicious or malignant microcalcifications
 - Inability to clear multiple positive margins after one or more re-excision attempts
 - Homozygous *ATM* mutation
 - Multicentric disease with any of the following:
 - Receipt of neoadjuvant chemotherapy or endocrine therapy
 - Age less than or equal to 40
 - Triple negative breast cancer (ER-, PR-, and HER2-negative)
 - More than 2 lesions involving more than 2 quadrants by MRI evaluation
 - Any individual lesion 5 cm or more in size
 - *BRCA* mutation carrier
 - Multicentric pure DCIS
 - Inability to achieve negative margins
 - cN2-N3
 - Any reason that precludes the delivery of adjuvant WBRT with boost
 - Patients diagnosed with gestational breast cancer who cannot receive RT within 12-16 weeks.
- Relative contraindications (mastectomy should be considered, but BCT may be appropriate)
 - Patients with a known genetic predisposition to breast cancer
 - Pathologic p53 mutation (Li-Fraumeni syndrome)
 - Active connective tissue disease involving the skin (e.g., scleroderma or lupus)
 - History of prior radiation therapy to the affected area

Special Considerations for Breast Cancer in Males (Sex Assigned at Birth)

- Genetic testing is recommended for all males with breast cancer.
- Decisions about breast conservation versus mastectomy in males should be made according to similar criteria as for females.
- Sentinel lymph node biopsy (SLNB) should be performed in clinically node-negative axilla.
- Chemotherapy with/without HER2-targeted therapy should be recommended. Adjuvant endocrine therapy includes tamoxifen for 5-10 years or a GnRH analog plus an aromatase inhibitor.
 - Bone density should be assessed at baseline and every 2 years in males with breast cancer who receive adjuvant GnRH analog therapy.

Fertility and Birth Control

- Advise all premenopausal patients about the potential impact of chemotherapy on fertility. Refer patients who wish to have children in the future to a fertility specialist prior to chemotherapy and/or endocrine therapy. Discuss fertility preservation options including oocyte and embryo cryopreservation.
- Chemotherapy may cause amenorrhea during or after treatment, however most patients younger than 35 years of age resume their menstrual cycle within 2 years of chemotherapy treatment.
- Patients should avoid pregnancy while on any systemic therapy.
- Hormone-based birth control is discouraged regardless of the HR status of the patient's cancer.
 - Alternative methods of birth control include intrauterine devices (IUDs), barrier methods, tubal ligation, or vasectomy for the partner.
- Ovarian suppression with GnRH agonist therapy during chemotherapy in premenopausal patients may preserve ovarian function and reduce chemotherapy-induced amenorrhea.
- Breastfeeding after breast-conservation cancer treatment isn't contraindicated. Breastfeeding isn't recommended during active treatment with chemotherapy and endocrine therapy or within 6 months of completing trastuzumab or pertuzumab.

Surveillance/Follow-Up

- History and physical exam 1-4 times annually as clinically appropriate for 5 years, then annually
- Genetic screening periodically for changes in family history and genetic testing indications and referral to genetic counseling as indicated
- Post-surgical management includes education, monitoring, and referral for lymphedema management.
- Breast imaging:
 - Mammography every 12 months, beginning 6 months or more after completion of BCT
 - Routine imaging of reconstructed breast is not indicated.
- Screening for metastases:
 - In the absence of clinical signs and symptoms suggesting recurrent disease, there is no indication for laboratory or imaging studies for metastasis screening.
- Post treatment monitoring:
 - Cardiotoxicity monitoring for patients who received left-sided radiation therapy, anthracyclines, or HER2-targeted therapy
 - Provide guidance on risk of comorbidities.
- Endocrine therapy:

- For patients on tamoxifen, gynecologic screening conducted as age appropriate; routine annual pelvic ultrasound is not recommended.
- Patients on aromatase inhibitor (or with ovarian failure secondary to treatment) should have bone mineral density at baseline and periodically.
- Lifestyle: active lifestyle, healthy diet, limited alcohol intake, and maintaining an ideal body weight (20-25 body mass index) help optimize breast cancer outcomes.

Reference

National Comprehensive Cancer Network. (2024). NCCN clinical practice guidelines in oncology breast cancer, version 2.2024.
<https://www.nccn.org/guidelines/guidelines-detail?category=1&id=1419>