

Breast Cancer

Description/Etiology

Breast cancer (BC), a group of diseases characterized by the development of malignant tumors in the breast tissue, is classified at diagnosis as noninvasive (e.g., ductal or lobular carcinoma in situ) or invasive (e.g., infiltrating ductal or lobular carcinoma). Subtypes of invasive BC include medullary, mucinous, tubular ductal, inflammatory, and Paget's disease. Most cases of BC originate from the ducts and are invasive. (For more information regarding BC, see the series of related *Quick Lessons* and *Evidence-Based Care Sheets*).

The etiology of BC is unknown. Although it is believed that estrogen is associated with the development of BC in some cases, it is not considered causal. BC is usually detected with a screening mammogram or when a patient seeks medical attention for a palpable breast mass. BC screening involves use of diagnostic imaging (e.g., mammogram, ultrasonography, breast MRI) which can identify abnormal regions in the breast that require biopsy for histologic analysis. The American Cancer Society (ACS) recommends annual screening mammography (SM) for average-risk women beginning at age 45, with the option of beginning screening at 40 years of age. Other organizations, including the U.S. Preventive Services Task Force, have developed age-specific recommendations that conflict with the ACS guidelines. Women who are at increased risk for BC (e.g., previous History of BC, mutations in the BRCA1 or BRCA2 genes) require more frequent SM. (For more information, see *Evidence-Based Care Sheet: Breast Cancer Screening: Clinician Adherence to Mammography Guidelines*).

ICD-9
174

ICD-10
C50

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Histologic analysis of biopsied breast tissue (usually obtained via stereotactic core needle biopsy) is needed for identification of cancer cell type, staging, and treatment planning. Factors that significantly affect prognosis include lump size, axillary node involvement, tumor differentiation, DNA content, estrogen and progesterone receptor status, and human epidermal growth factor 2 (HER2) receptor status. Prognosis is also influenced by patient age, time since BC diagnosis, stage of tumor at diagnosis, the presence of comorbid illness, race/ethnicity, and socioeconomic factors. The most significant complication of BC is metastasis, which can be local, regional, or distant. Metastasis usually occurs through the lymphatic system and is considered treatable but in most cases is incurable. BC recurs in more than half of patients with invasive disease despite successful initial therapy. BC should be differentiated from benign breast disorders, proliferative breast diseases, and other malignant diseases such as sarcoma, lymphoma, and tumors that have metastasized to the breast.

Treatment of BC can involve surgery (e.g., lumpectomy and mastectomy with or without lymph node dissection), systemic therapy (e.g., chemotherapy, biologic therapy, hormonal therapy), and/or radiation therapy. Combination therapy is usual and treatment protocols are based on results of disease staging. Lifetime surveillance for reoccurrence follows acute treatment.

Facts and Figures

BC is almost exclusively a disease of women, and only 1% of BC cases occur in men (for information on BC in men, see *Quick Lesson About ... Breast Cancer in Men*). Worldwide, more than 1.2 million women are diagnosed with BC each year. In the U.S., BC is the most common cancer in women other than skin cancer and the second leading cause of death

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after lung cancer. According to the American Cancer Society, in 2018 an estimated 266,120 new cases of invasive BC and approximately 63,960 new cases of non-invasive BC will be diagnosed in the U.S. and an estimated 40,920 women will die of the disease. One woman in eight will develop BC. In the U.S., incidence and mortality of BC are highest in White and Black women. Overall rates of survival at 5 years, 10 years, and 15 years are 89%, 83%, and 78%, respectively. Mammography detects 80–90% of cases of BC.

Risk Factors

Risk factors for BC include older age, family history of BC, nulliparity or age > 30 years at first full-term pregnancy, early menarche, late menopause, high breast tissue density, obesity, alcohol consumption, hormone replacement therapy (HRT), use of oral contraceptives, shift work, history of radiation therapy for pediatric or young adult cancer, and physical inactivity. Inherited mutations in the *BRCA1* or *BRCA2* genes (commonly called BC susceptibility genes), which are present in < 1% of the general population and more common in women of Ashkenazi Jewish descent, are associated with 5–10% of BC cases and with a lifetime BC risk up to 87%; in women with *BRCA1* or *BRCA2* mutations, prophylactic bilateral mastectomy reduces the likelihood of developing BC by more than 90%. Other inherited mutations associated with increased BC risk include the *p53* mutation associated with Li-Fraumeni syndrome and the *CHEK2* and *PTEN* mutations associated with Cowden syndrome.

Signs and Symptoms/Clinical Presentation

Signs and symptoms of BC can be absent except for abnormal mammography, or can include a lump that is usually nontender, fixed, and hard with irregular borders; dimpling or an orange-peel appearance of the skin; inverted nipples; ulcerating or fungating skin lesions; skin edema; and lymph node enlargement in the axilla and supraclavicular areas. Patients with a rare BC subtype such as inflammatory carcinoma can have red, dusky skin that is painful, abnormally firm and enlarged breasts, nipple discharge, and scaly lesions on the nipple/areola that burn and itch.

Assessment

› Patient History

- Risk factor assessment should include asking about a personal or family history of BC, known genetic mutation, and use of HRT

› Laboratory Tests

- Histologic examination of biopsied breast tissue will identify the type of cancer cells, if present
- CBC can identify anemia (indicated by low Hgb), infection (indicated by elevated WBC), and decreased immune function (indicated by low platelet count and/or WBC) resulting from chemotherapy and/or radiation therapy

› Other Diagnostic Tests/Studies

- Ultrasound, X-ray, CT scan and MRI scan of the breast will identify abnormal regions that require biopsy for histologic analysis, if present
- PET scan and bone scan will identify metastasis and advanced bone disease, if present
- Surgical lymphatic mapping and sentinel lymph node dissection will identify lymph node metastasis, if present
- Immunohistochemistry testing on biopsied tumor specimen will identify estrogen and progesterone receptor cells, if present
- Fluorescent in situ hybridization (FISH) will identify a positive HER-2 tumor status, if present

Treatment Goals

› Promote Optimal Physiologic Function and Reduce Risk of Complications

- Monitor vital signs, all physiologic systems, and laboratory/other diagnostic study results; report abnormalities and provide prescribed treatment
- Frequently assess for pain; administer prescribed analgesics or oversee patient-controlled analgesia (PCA); reassure patient and family that pain can be controlled
 - Notify the treating clinician of unresolved pain, and request referral to a pain management clinician if warranted
- Follow facility pre- and posttreatment protocols if patient becomes a candidate for surgery, chemotherapy, and/or radiation therapy; reinforce pre- and posttreatment education and verify completion of facility informed consent documents
- Administer or monitor the administration of prescribed chemotherapy, as ordered; assess for side effects and provide prescribed treatment
- Provide good hygiene and assess skin integrity in area of radiation therapy; apply prescribed topical agents, as ordered
- Assess for signs and symptoms of complications and adverse effects of treatment, including the following:
 - Postsurgical: lymphedema, seromas, wound infection, limited shoulder motion

- Chemotherapy: nausea, vomiting, alopecia, leukopenia, bladder irritation, stomatitis, fatigue, menstrual abnormalities
 - Radiation therapy: skin breakdown and inflammation, brachial plexopathy, rib fracture, arm edema, pulmonary fibrosis
 - Hormonal therapy (e.g., with tamoxifen): hot flashes, menstrual irregularities, vaginal discharge, hypercalcemia, skin rashes
 - Educate about prescribed arm, shoulder, and hand exercises; strategies for protection of the affected area; care of drains and implanted port, if present
 - Monitor I & O; assess for low intake related to decreased appetite, vomiting, diarrhea, and nosebleed and provide prescribed treatment
 - Monitor weight and encourage maintenance of a healthy body weight
 - Request referral to a registered dietician for patient evaluation, nutritional education and dietary supplementation
 - Encourage rest and provide a quiet environment; reposition for comfort, as necessary
- › **Support Emotional Well-Being and Educate**
- Assess anxiety level and coping ability of patient and family; provide emotional support and promote a positive self-image for women who have experienced hair loss, radical surgery, and/or dramatic change in lifestyle caused by BC-related functional limitations
 - Educate and encourage discussion regarding BC, risks and benefits of treatment and pain management options, changes in body image and function, what to expect during recovery from treatment, and individualized prognosis
 - As appropriate, request referral to a
 - mental health clinician, facility chaplain, or the patient’s clergyperson for counseling on strategies for coping with having a life-threatening illness and end-of-life issues
 - social worker for identification of local resources for in-home care, wigs, support groups, financial planning, transportation, hospice and Internet resources
 - survivorship program (see *Food for Thought*, below)

Food for Thought

- › In a 2016 study publication exploring the effectiveness of a BC survivorship program researchers concluded that BC survivors who attended a survivorship program were more likely to feel that their concerns regarding long term effects from BC were satisfactorily addressed and that attendees were more likely to be compliant with follow-up care than those who did not attend a survivorship program (Dietrich et al., 2016)
- › Researchers investigating quality of life (QOL) issues including 230 BC survivors found that BC survivors had poorer QOL outcomes compared to healthy women and the most common survivorship problems included induced cessation of menstruation (73.3%), body and joint pain (63.5%), loss of sexual desire (60%), fatigue (60%), and restriction of shoulder movement (59.6%) and concluded that these symptoms should be managed with priority in supportive care of BC survivors (Kaur et al., 2018)

Red Flags

- › For the remainder of their lives, patients with BC must be watchful of disease recurrence and immediately report the development of new back pain, weakness, shortness of breath, and/or confusion to the treating oncology clinician
- › Chemotherapy has the potential to produce multiple severe side effects and adverse reactions; knowledge of all prescribed agents must precede administration of the agents and providing care for a patient who is receiving chemotherapy

What Do I Need to Tell the Patient?

- › Advise patient to seek immediate medical attention for new or worsening signs and symptoms (e.g., lymph node enlargement, edema, dimpling or an orange-peel appearance of the skin) and for complications or side effects of treatment (e.g. vomiting, skin breakdown, diarrhea)
 - › Reinforce the importance of performing breast self-examination, adhering to the schedule for continued medical surveillance recommended by the treating clinician and about opportunities for enrolling in a clinical trial, if appropriate
 - › Encourage discussion of quality-of-life issues and documentation of advanced directives
 - › Encourage attending a support group for contact with others who face similar health challenges
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