CHAPTER 10

BREAST CANCER

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BREAST CANCER

Breast cancer is the most common type of cancer in women (excluding basal and squamous skin cancers) and the second leading cause of cancer death in women. It is estimated that one in nine women will be diagnosed with breast cancer during their lifetime. Although breast cancer is thought of as a woman's disease, approximately 1% of all breast cancers are diagnosed in men every year.[1]

A breast tumor is formed when DNA in the cells of the breast tissues are genetically altered and begin uncontrolled growth and replication. Not all breast tumors are malignant. Benign tumors are not cancerous, will not spread to other parts of the body, and are not life threatening. Malignant or cancerous breast tumors are capable of invading and destroying adjacent tissues and spreading to distant parts of the body and are life threatening.[2,3]

There are several types of breast cancer: ductal carcinoma, lobular carcinoma, inflammatory breast cancer, and Paget's disease. Ductal carcinoma starts in the lining of the milk ducts and accounts for 86% of all breast cancers. Medullary, tubular, adenocystic, and papillary cancers are all types of ductal carcinoma. Lobular carcinoma originates in the lobules where breast milk is produced and accounts for 12% of all breast cancers.[4,5]

Both ductal and lobular carcinoma can be further categorized as "in situ" (noninvasive) or "infiltrating" (invasive). Infiltrating cancers grow outside of the lobules or ducts where they originated, invading surrounding tissue. When breast cancer spreads to other parts of the body it is classified as metastatic. Some cases of ductal carcinoma in situ (DCIS) and lobular carcinoma in situ (LCIS) may eventually become invasive.[6] Women who have had invasive cancer, DCIS, or LCIS are at increased risk of developing a second breast cancer.[7]

Inflammatory breast cancer is often mistaken for an infection. The first symptoms of inflammatory breast cancer are redness and warmth of the breast skin, with or without a distinct lump. In inflammatory breast cancer, cancer cells are found in the lymph vessels of the skin, blocking drainage of fluids from the skin. Inflammatory breast cancer accounts for 2%–4% of all breast cancers and usually has a poorer outcome than other types of breast cancer.[8]

Paget's disease involves the nipple. Often mistaken for eczema, the nipple appears to be scaly and itchy. Paget's disease may be associated with ductal carcinoma, and it may or may not invade the tissues under the nipple.[9]

Risk Factors

Certain risk factors may increase the chance of developing breast cancer including the following:

Table 10.1
Female Breast Cancer Incidence and Mortality Rates By Race in Maryland and the United States, 1999

Incidence 1999	Total	Whites	Blacks	Other
New Cases (#)	3,714	2,752	822	96
Incidence Rate	137.0	139.5	127.7	92.8
U.S. SEER Rate	139.1	143.0	123.9	NA
Mortality 1999	**Total**	**Whites**	**Blacks**	**Other**
MD Deaths (#)	782	567	211	**
MD Mortality Rate	28.5	27.4	35.5	**
U.S. Mortality Rate	27.0	26.3	35.8	NA

Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.
**Rates based on cells with 25 or fewer non-zero cases are not presented per DHMH/MCR Data Use Policy.
Source: Maryland Cancer Registry, 1999; Maryland Division of Health Statistics, 1999; SEER, National Cancer Institute, 1999.

Age

The main risk factor for developing breast cancer is increasing age.

Hormonal Factors

Women with early onset of menstruation, late age at first birth, and/or late menopause are more likely to develop breast cancer. These factors suggest circulating hormone levels contribute to the risk of getting breast cancer.

Personal History

Women who have had proliferating forms of benign breast disease such as atypical hyperplasia and lobular carcinoma in situ are at increased risk of developing breast cancer. Women who have had ductal carcinoma in situ or a previous invasive breast cancer are also at increased risk of developing a second breast cancer.

Family History

Women with a family history of breast cancer are at increased risk of developing breast cancer, especially women whose mother or sister had breast cancer. About 5% to 10% of women who develop breast cancer have a strong inherited predisposition to breast cancer. Mutations in two genes (BRCA1 and BRCA2) explain about half of these inherited forms of breast cancer. Women with mutations in these genes are at risk for other cancers as well, especially ovarian cancer. Certain ethnic groups, such as individuals of Ashkenazi Jewish descent, have a higher prevalence of mutations in these genes compared to the general population. The prevalence of mutations in BRCA1 and BRCA2 among Ashkenazi women is approximately 1.5% to 2.0%. Genetic testing can be done to determine if individuals carry mutations in these genes.

Radiation Exposure

Exposure to ionizing radiation is a risk factor for developing breast cancer, particularly when exposure occurs in adolescence or early adulthood. For example, women who were treated with radiation for Hodgkin's disease have a higher risk of developing breast cancer.

Alcohol

Alcohol intake is associated with a small increased risk of breast cancer. Studies have shown that one to two drinks daily are associated with an increased risk of breast cancer.

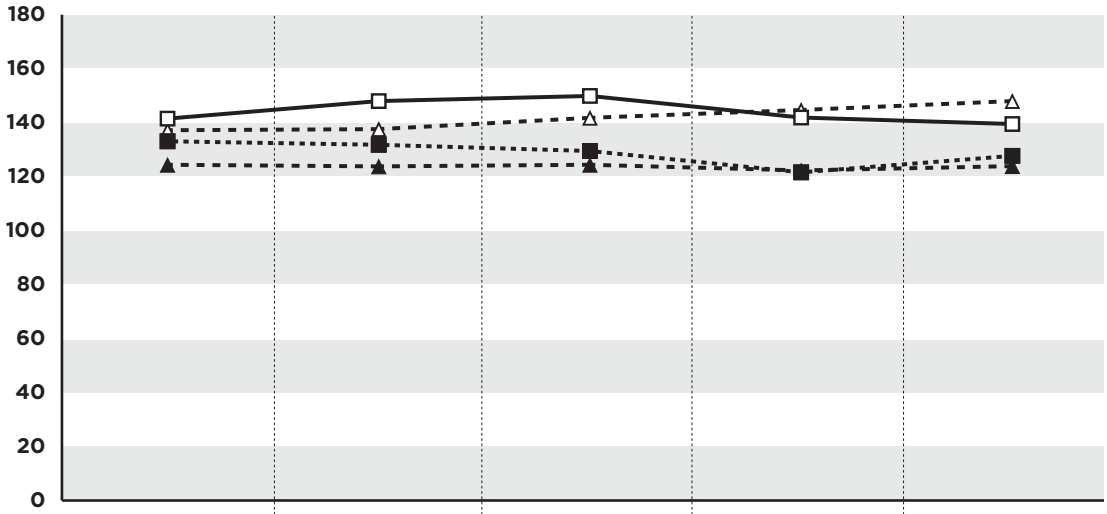
Diet and Obesity

Obesity is a risk factor for breast cancer, especially after menopause.[10] An ongoing trial, the Women's Health Initiative, has a low-fat dietary intervention arm that will assess the impact of a low-fat diet on cancer, heart disease, and other health outcomes. Studies suggest that exercise, particularly among young adults, may be associated with a reduced breast cancer risk.[11]

Hormonal Therapy

Postmenopausal hormone replacement therapy with estrogen and/or a combination of estrogen and prog-

Figure 10.1
Breast Cancer Incidence by Race in Maryland and the United States, 1995–1999



	1995	1996	1997	1998	1999
MD WHITE	141.5	148.0	149.9	141.9	139.5
MD BLACK	133.1	131.8	129.5	121.6	127.7
U.S. WHITE	137.2	137.6	141.8	144.7	143.0
U.S. BLACK	124.4	123.8	124.4	122.3	123.9

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
Source: Maryland Cancer Registry, 1995–1999; SEER, National Cancer Institute, 1995–1999.

estin is associated with an increased risk of breast cancer.[12,13] Increased risk of breast cancer is observed after about five years of use. The risk may be higher with combined estrogen and progestin therapy than with estrogen alone. Oral contraceptive use is not associated with a long-term increased risk of breast cancer.

Burden of Breast Cancer in Maryland

Breast cancer is the most commonly diagnosed cancer among women, and accounts for about 32% of all cancers diagnosed among women in Maryland.[14] Data from the Maryland Cancer Registry (MCR) show that 3,714 women were diagnosed with breast cancer in 1999 (Table 10.1). The overall age-adjusted breast cancer incidence rate for Maryland in 1999 was 137.0 per 100,000 women. Maryland's overall age-adjusted breast cancer incidence rate as well as the specific rates for white and black women are similar to the SEER rates for the nation (Figure 10.1). Since 1992, when the MCR first compiled Maryland cancer incidence data, breast cancer rates have shown year-to-year fluctuations but no clear trend has emerged.

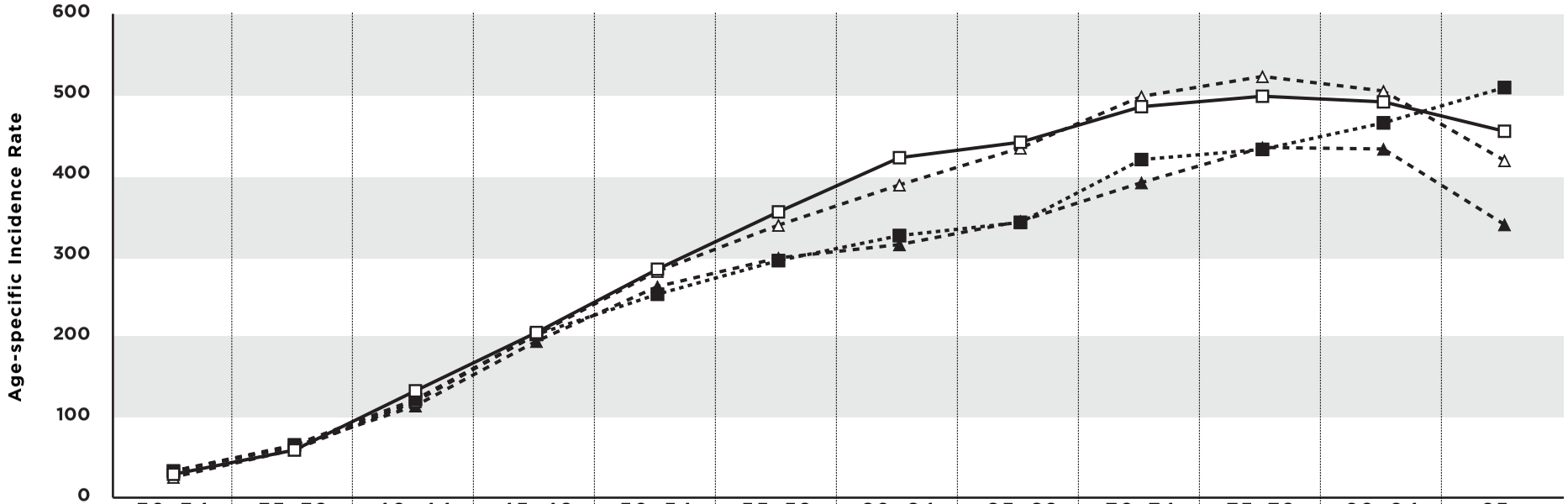
The risk of breast cancer increases with age, with incidence rates increasing with age for both white and black women. However, white women have consistently higher age-specific incidence rates than black women (Figure 10.2).

Although black women have lower breast cancer incidence rates than white women, black women have a disproportionate amount of late stage breast cancer. Between 1992 and 1997, 6.7% of the breast cancers diagnosed among blacks in Maryland were distant stage and 51.7% were local stage, compared to 4.2% distant stage and 61.6% local stage for whites (Figure 10.3). SEER data show the same patterns.

The Maryland Cancer Registry does not currently calculate survival rates, but SEER data show that the overall five-year survival rate for breast cancer between 1992 and 1998 was 86%. For white women the five-year survival rate was 87% and for black women it was 73%. Black women have lower five-year survival rates than white women for each stage of breast cancer and each age group. The five-year survival rate for distant stage breast cancer is 24% for white women and 15% for black women and the five-year survival rate for local stage breast cancer is 97% for white women and 89% for black women.[15]

Breast cancer is the second leading cause of cancer

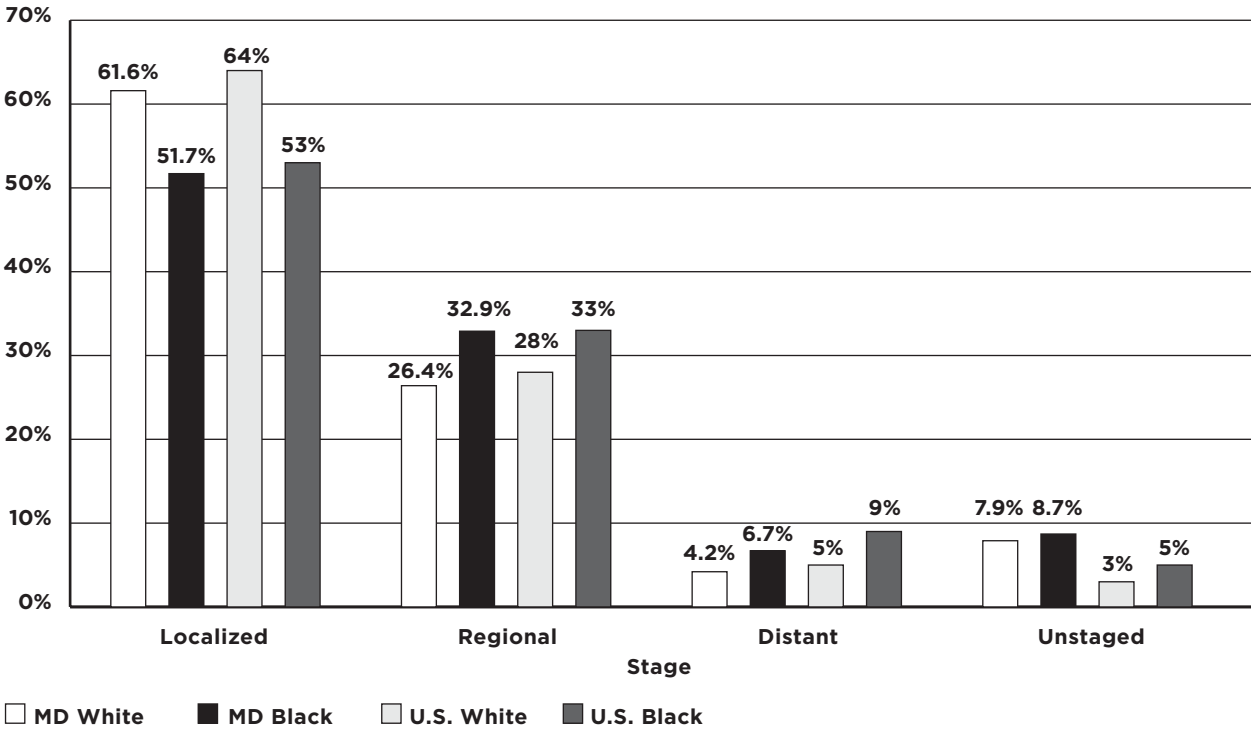
Figure 10.2
Breast Cancer Age-Specific Incidence Rates by Race in Maryland and the United States, 1995–1999



	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
MD WHITE	29.0	59.1	132.5	204.8	283.3	354.4	421.6	440.8	484.9	497.8	490.8	454.4
MD BLACK	33.1	65.4	121.8	202.4	252.3	294.0	325.0	341.4	419.3	431.9	464.8	508.6
U.S. WHITE	25.5	59.6	119.3	202.5	280.8	338.0	387.9	433.6	497.6	522.4	504.3	418.1
U.S. BLACK	32.7	63.4	114.0	194.0	261.8	297.3	313.9	342.9	390.7	434.3	432.4	338.7

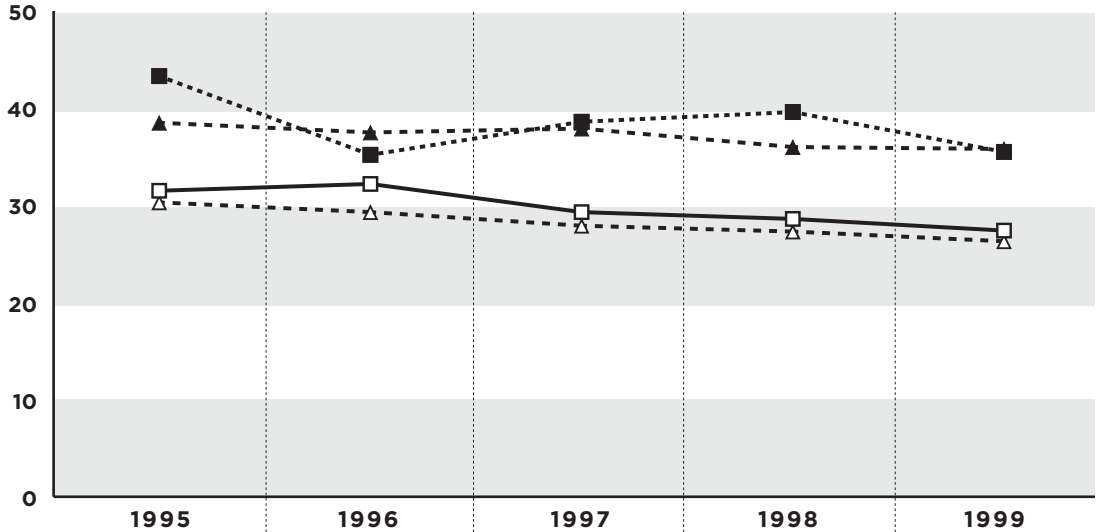
Rates are per 100,000 and age-adjusted to the 2000 U.S. population.
Source: Maryland Cancer Registry, 1995–1999; SEER, National Cancer Institute, 1995–1999.

Figure 10.3
Breast Cancer Stage of Disease at Diagnosis by Race in Maryland and the United States, 1992–1997



Source: Maryland Cancer Registry, 1992–1997; SEER, National Cancer Institute, 1992–1997.

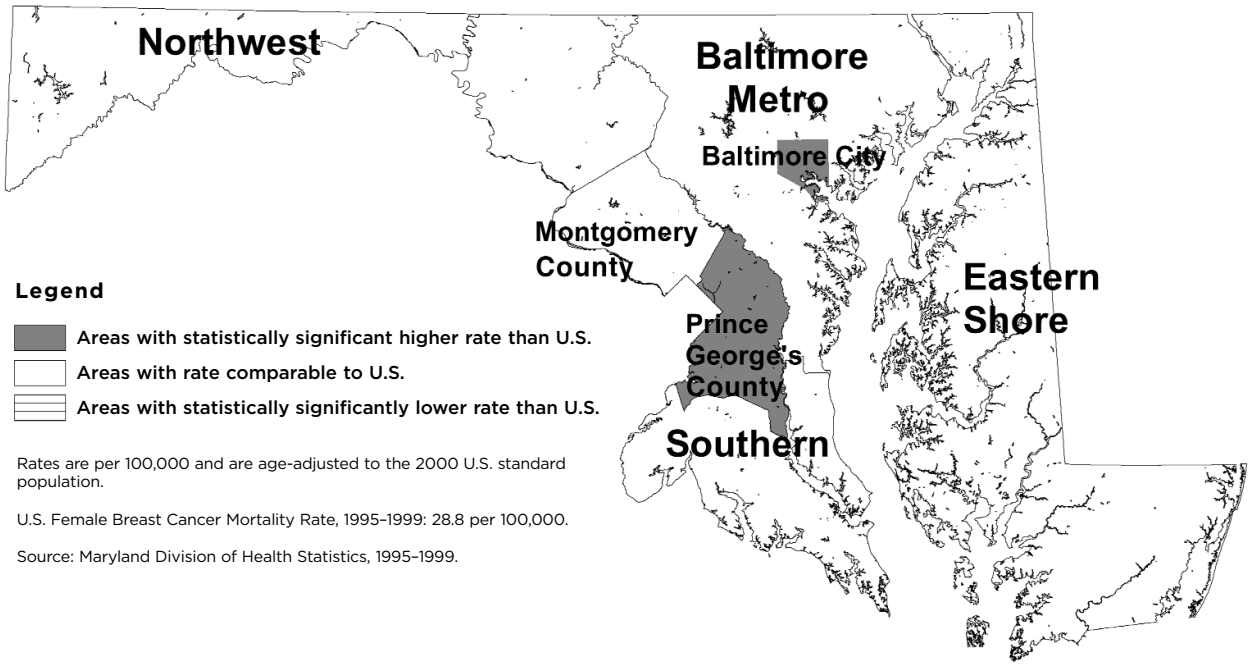
Figure 10.4
Breast Cancer Mortality Rates by Race in Maryland and the United States, 1995–1999



	1995	1996	1997	1998	1999
MD WHITE	31.5	32.2	29.3	28.6	27.4
MD BLACK	43.3	35.2	38.6	39.6	35.5
U.S. WHITE	30.3	29.3	27.9	27.3	26.3
U.S. BLACK	38.5	37.5	37.9	36.0	35.8

Rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.
Source: Maryland Division of Health Statistics, 1995–1999; SEER, National Cancer Institute, 1995–1999.

Figure 10.5
Maryland Female Breast Cancer Mortality Rates by Geographical Area: A Comparision to Rates in the United States, 1995–1999



death for women in Maryland,[16] accounting for about 17% of all cancer deaths among women in Maryland.[17] In 1999, there were 782 Maryland deaths from breast cancer. Maryland's female age-adjusted breast cancer mortality rate was 28.5 per 100,000 in 1999, which is significantly higher than the national rate of 27.0 per 100,000 (Table 10.1). Historically, Maryland has had high breast cancer mortality rates and currently has the fifth highest breast cancer mortality rate in the nation.[18] The overall decrease in breast cancer mortality is due to decreases in breast cancer rates among white women. The 1999 Maryland age-adjusted breast cancer mortality rate for black women was 35.5 per 100,000 while for white women it was 27.4 per 100,000.

Maryland's mortality rate has been declining since 1995 (Figure 10.4). Black women have significantly higher breast cancer mortality rates compared to white women, both nationally and in Maryland.[19] Breast cancer mortality rates for black women have remained high while rates for white women have declined. Since Maryland has a larger proportion of African Americans compared to the nation, the breast cancer mortality rate will likely remain high in Maryland until the gap between white and black breast cancer mortality rates narrows.

Baltimore City and Prince George's County have significantly higher breast cancer mortality rates than the United States (Figure 10.5). These two jurisdictions have a majority African-American population. All other jurisdictions have breast cancer mortality rates that are comparable to U.S. rates.

As stated, breast cancer mortality rates for black women are higher than those for white women in Maryland and the United States. This trend also applies to all age groups. Figure 10.6 examines these rates from ages 35 to 85.

Disparities

- Although black women have a lower incidence of breast cancer, they have a higher breast cancer mortality rate.
- Black women have a greater proportion of late stage breast cancer than white women.
- For each breast cancer stage and age group, black women have lower five-year survival rates than white women.

Primary Prevention

Breast cancer prevention includes a broad range of activities, from lifestyle efforts such as maintaining an ideal weight, to consideration of chemoprevention or prophylactic surgery for specific high-risk individuals. Obesity is a risk factor for breast cancer, especially after menopause,[20] and rates of being overweight and obese have dramatically increased in the state over the past 10 years. Approximately 20% of individuals in Maryland are obese and over half are overweight. Reducing and preventing obesity throughout adulthood is a high priority as it would help reduce the risk of breast cancer while improving general health, as obesity is a major cause of diabetes, heart disease and other cancers. Interventions to prevent and reduce obesity would include increasing low physical activity levels, which are also associated with the risk of breast cancer. These interventions would have a far-reaching impact for the entire population.

A review and meta-analysis of data from 47 studies concluded that breast-feeding is protective against breast cancer.[21] There is an approximate 4.3% decrease in the risk of developing breast cancer for each year of breast-feeding. The protective effect of breast-feeding was found to be separate from the protective effect of childbearing. Each birth reduces breast cancer risk by about 7%, independent of breast-feeding.

Women and their primary care providers should assess breast cancer risk and develop the most appropriate strategy to manage the risk.

Genetic testing may be useful for women making decisions regarding chemoprevention, prophylactic surgery, or treatment (e.g., lumpectomy vs. mastectomy). Genetic counseling programs are located in the Baltimore and Washington, D.C. areas but are less available for residents in Western Maryland or on the Eastern Shore.

A randomized controlled trial has shown that the drug tamoxifen reduces the risk of developing breast cancer by 50% in women who are at increased risk for the disease. Tamoxifen also reduces the risk of bone fractures. However, tamoxifen also has adverse effects including an increased risk of endometrial cancer, thrombotic events (deep venous thrombosis, pulmonary embolism, stroke), menopausal symptoms, and cataracts. Women at increased risk of breast cancer (at least a 1.67% five-year breast cancer risk) should be counseled regarding the potential risks and benefits of taking tamoxifen for chemoprevention.[22,23]

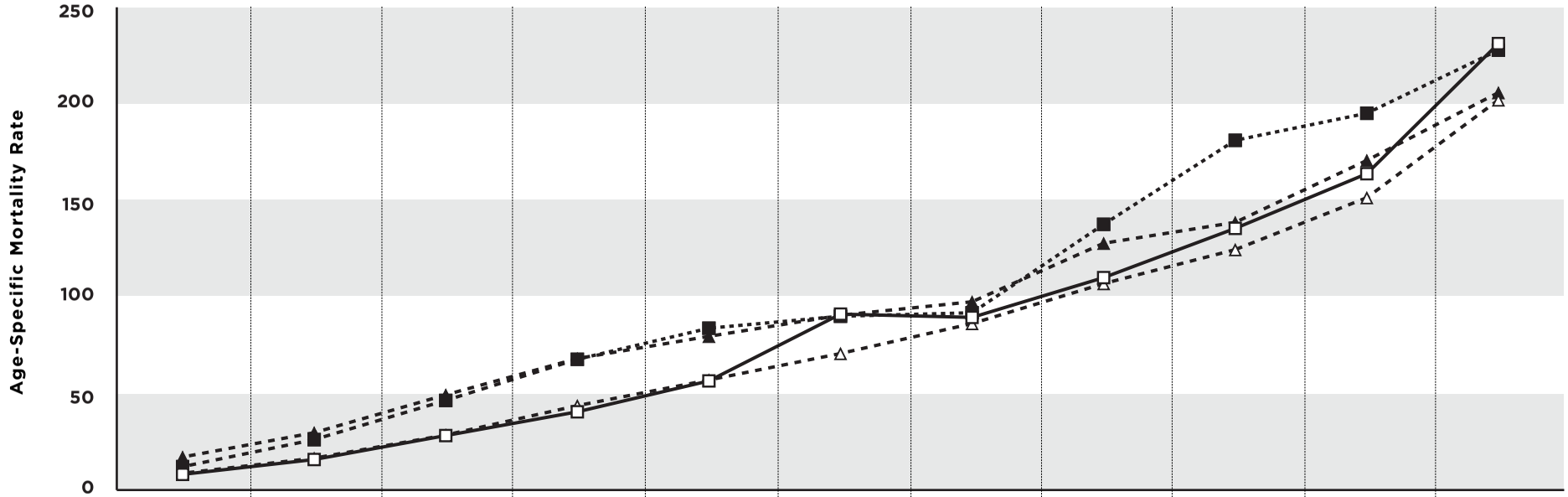
Raloxifene is a drug similar to Tamoxifen, but one that does not have the same estrogen-like effect on the uterus. Studies among women at low risk of developing breast cancer (i.e. women with osteoporosis) have shown a decreased risk of developing breast cancer with this drug treatment. Raloxifene has not been tested in women at increased risk of developing breast cancer. Raloxifene is approved for use only among post-menopausal women. A clinical trial (STAR) comparing the efficacy of tamoxifen and raloxifene in reducing the risk of breast cancer among high-risk post-menopausal women is currently underway.[24]

Aromatase inhibitors prevent production of estrogen among post-menopausal women by blocking the action of the enzyme aromatase, a compound necessary for estrogen synthesis.[25] This class of drugs has not been tested as preventive agents. The evidence that they may reduce the occurrence of new breast cancer comes from a breast cancer treatment trial called ATAC (Arimidex, Tamoxifen, Alone or in Combination). The study showed that showed anastrozole (an aromatase inhibitor) alone reduced the incidence of new breast cancer among women with a history of hormone-receptor positive breast cancer compared to tamoxifen.[26,27,28] Side effects occur at about the same rate as tamoxifen but are different than tamoxifen's, with fewer occurrences of hot flashes, vaginal bleeding, weight gain, strokes, and blood clots. However, aromatase inhibitors were associated with higher rates of muscular skeletal complaints and fractures.[29,30] A prevention trial in Europe (IBIS2) is planning to test the efficacy of an aromatase inhibitor as a chemopreventive agent among high risk women.

The U.S. Preventive Services Task Force (USPSTF) recommends that clinicians discuss chemoprevention with women at high risk for breast cancer and at low risk for adverse effects of chemoprevention. Clinicians should inform patients of the potential benefits and harms of chemoprevention. The USPSTF recommends against routine use of tamoxifen or raloxifene for the primary prevention of breast cancer for women at low or average risk. [31]

Bilateral prophylactic mastectomy is associated with a reduction in the risk of breast cancer by as much as 90% among women with an increased risk of breast cancer due to a strong family history of breast cancer. Because of the physical and psychological effects of bilateral mastectomy and the irreversibility of the procedure, decisions regarding this option must be care-

Figure 10.6
Breast Cancer Age-Specific Mortality Rates by Race in Maryland and the United States, 1995–1999



	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
MD WHITE	8.1	15.8	28.2	40.5	56.5	91.1	89.4	110.0	135.5	163.8	231.2
MD BLACK	12.1	26.1	46.4	67.7	83.8	90.0	91.8	137.6	181.1	195.1	227.8
U.S. WHITE	8.7	16.5	28.5	43.7	57.0	70.7	86.2	106.9	124.5	151.4	202.0
U.S. BLACK	17.1	29.7	49.3	68.1	79.6	90.5	97.5	127.8	138.6	170.7	205.8

Rates are per 100,000 and are age-adjusted to the 2000 U.S. population.
Source: Maryland Division of Health Statistics, 1995–1999; SEER, National Cancer Institute, 1995–1999.

fully considered on an individual basis in association with risk assessment and counseling.[32]

Screening and Evidence of Benefit

Mammography and clinical breast examination are the primary methods of screening for breast cancer. A mammogram is a special X-ray of the breast that can often find tumors that are too small to be felt. The ability of mammography to detect cancer depends on factors such as the size of the tumor, the age of the woman, breast density, and the skill of the radiologist.

Uncertainty in the degree of benefit from routine mammography has been raised because of design flaws in the randomized clinical trials. This emphasizes the need to develop better methods to detect breast cancer in its early stage to improve health outcomes. There is general consensus among medical organizations regarding breast cancer screening guidelines for women aged 40 and older. The majority of organizations recommended screening with mammography, with or without clinical breast examination, every one to two years for women aged 40 and older.

The USPSTF found fair evidence that mammography screening every 12–33 months significantly reduces mortality from breast cancer. Evidence is strongest for women aged 50–69, the age group generally included in screening trials. For women aged 40–49, the evidence that screening mammography reduces mortality from breast cancer is weaker, and the absolute benefit of mammography is smaller than it is for older women. Most studies indicate a mortality benefit for women undergoing mammography at ages 40–49, but the delay in observed benefit in women younger than 50 makes it difficult to determine the incremental benefit of beginning screening at age 40 rather than at age 50.[33]

The absolute benefit is smaller because the incidence of breast cancer is lower among women in their 40s than it is among older women. The USPSTF concluded that the evidence is also generalizable to women aged 70 and older (who face a higher absolute risk for breast cancer) if their life expectancy is not compromised by co-morbid disease. The absolute probability of the benefits of regular mammography increase along a continuum with age, whereas the likelihood of harms from screening (false-positive results and unnecessary anxiety, biopsies, and cost) diminish from ages 40–70. The balance of benefits and potential harms, therefore, grows more favorable as women age. The precise age at which the potential benefits of mammography justify the possible harms is a subjective choice. The USPSTF did not find sufficient evidence to specify the optimal screening interval for women aged 40–49.

During a clinical breast examination (CBE), the health care provider carefully feels the breasts and under the arms to check for lumps or other unusual changes. The USPSTF found that the evidence is insufficient to recommend for or against routine CBE alone to screen for breast cancer.[34] Several other organizations, including the American Cancer Society and the Susan G. Komen Breast Cancer Foundation, recommend a clinical breast examination every three years between the ages of 20 and 40 and an annual CBE after age 40.

When a woman examines her own breasts it is called breast self-examination (BSE). Many organizations such as the Susan G. Komen Breast Cancer Foundation recommend monthly breast self-examination beginning at age 20. The USPSTF found that the evidence is insufficient to recommend for or against teaching or performing routine breast self-examination.[35]

Diagnostic Tools

The primary role of ultrasound is the evaluation of palpable or mammographically identified masses. A review of the literature and expert opinion by the European Group for Breast Cancer Screening concluded that there is little evidence to support the use of ultrasound in population breast cancer screening at any age.[36]

Magnetic Resonance Imaging (MRI) has been used to evaluate palpable breast masses and to discriminate between cancer and scar tissue.[37] The use of MRI for the early detection of breast cancer is still under investigation.

Ductal lavage is a relatively new procedure used to collect and analyze breast ductal epithelial cells.[38,39] It involves insertion of a catheter into the breast ducts surrounding the nipple and is used as a risk assessment tool to detect atypical cells. It is similar to, but more efficient than nipple aspiration, an open biopsy showing atypia, and four-quadrant needle aspiration, and probably confers the same increase in relative risk as these methods. The sensitivity and specificity of this procedure for detecting cancer or high-risk breast lesions are unknown as is the significance of finding atypical cells in the fluid. Until the risks and benefits of the procedure are established, ductal lavage should not

be considered for general population screening. Ductal lavage, however, may be useful as a risk assessment tool in tailoring a risk reduction program for individual high-risk patients if the procedure is shown to be valid and reliable.

Sentinel Lymph Node Biopsy (SLNB) is a recently developed surgical procedure that uses radiolabeled dye to locate the first lymph node, or groups of lymph nodes (sentinel node), to which cancer has likely spread. Prior to the use of SLNB, a woman with breast cancer would have an axillary node dissection, which is a more extensive dissection that removes many lymph nodes. Axillary node dissection results in an increased risk of lymphedema (a lifelong condition), limited range of motion (sometimes requiring physical therapy), and dyesthesia along the upper inner arm.

Results of the biopsy of sentinel nodes are highly predictive for the presence or absence of axillary node metastases.[40,41,42,43,44,45,46] A sentinel node that is negative for malignant cells is indicative of negative axillary node involvement, and the patient may be spared the need for full axillary lymph node dissection.[47,48,49,50,51,52] False negative rates range from about 2% to 11%.[53,54,55,56] It is currently unclear whether removing lymph nodes improves survival, so missing positive nodes may result in the understaging of cancer rather than premature deaths.[57,58,59] Current clinical trials sponsored by NCI are underway to determine whether sentinel node biopsy can replace axillary node dissection when sentinel nodes are negative and, when the nodes are positive, if survival is different for women receiving axillary node dissection compared to those who do not.[60,61]

There is a large "learning curve" for performing sentinel node biopsy.[62,63,64] The American Society of Breast Surgeons recommends that a surgeon perform at least 20 sentinel node procedures in conjunction with axillary dissection or at least 20 sentinel node procedures with mentoring by a credentialed sentinel node surgeon to minimize false negatives.[65]

Mammography Screening Rates

Mammography screening rates[66] in Maryland and the U.S. have shown a steady increase.

The percent of Maryland women aged 40 and older reporting a mammogram within the previous two years increased from 75% in 1990 to about 82% in 2000. Maryland's rates have been consistently higher than the national rates for women aged 40 and older reporting a mammogram within the previous two years; the national average was about 58% in 1990, increasing to 76% in 2000. Mammography screening rates are similar among white and black women in Maryland.

Screening Behaviors, Beliefs, and Barriers

In 1996, ten focus groups consisting of Maryland women over the age of 50 who did not obtain regular mammograms were conducted. The following were key findings:[67]

- Most women understood the need for regular/preventive health care and medical check-ups, but were not meticulous about getting them unless they had a specific problem or illness.
- Nearly all women knew the term mammogram, understood the procedure, and had obtained at least one mammogram. None of the women had annual mammograms.
- Most women knew that regular mammograms were recommended, but some were not sure if "regular" meant every year, every two years, etc.
- The most common reason for not getting a mammogram was negative experiences by the respondents or their friends or family members, particularly the discomfort or pain caused by the procedure. Other barriers include the ability of a mammogram to accurately detect breast cancer, the cost of a mammogram for high- and low-income women, and fear of radiation.
- Participants could not identify a single motivating factor for getting a mammogram. Some said that if a friend or family member got a mammogram and was diagnosed with cancer and then encouraged the respondent to have a mammogram, they would be motivated. Some said their physician provided the motivation for their first mammogram, others said that repeated reminders from the doctor do them little or no good.
- Women get the greatest amount of health information from magazines in the popular press. African-American women in Baltimore mentioned churches as an important source of information. Participants preferred to get information from friends or family members rather than celebrities.

In a study comparing breast screening rates in three racial groups (black, Hispanic, and white women), the important predictors of the use of breast cancer screening procedures for each group were having had a routine examination in the past year, having seen an obstetrician, gynecologist, or other specialist during the last routine exam, and having more than a high school education.[68]

Another study found that compliance with screening recommendations was greater among those women who received a reminder letter for mammography.[69] A physician reminder letter combined with telephone counseling from a health educator significantly increased women's use of mammograms in a low-income population in a managed care setting.[70]

Compared to standard care, telephone counseling was more than twice as effective at increasing mammography adherence, and in-person counseling resulted in almost three times the mammography adherence. Both telephone and in-person counseling are successful in changing perceived susceptibility, knowledge, barriers, and benefits.[71] Compared to standard care alone, telephone counseling promoted a significantly higher proportion of women having mammograms on schedule than did tailored print materials, but only after the first year of the intervention. Telephone counseling was more effective than tailored print materials at promoting the regular scheduling of screening among women who were did not adhere to a schedule the previous year.[72]

Ideal Model for Breast Cancer Control

There are four main steps within the ideal breast cancer control process: Prevention, Early Detection, Treatment, and Survivorship (Figures 10.7–10.10). Each step in the model identifies the key actions that should be taken by the general public, patients, primary care providers, medical specialists, and medical institutions. The models also show areas where more research is needed. The overarching issues in each model are a need for cultural sensitivity throughout the process, the use of multidisciplinary teams, and the availability of state-of the-art diagnosis and treatment options to be administered by trained providers for all patients regardless of income, race, geographic region, or ability to pay.

The members of the Breast Cancer Committee identified the following barriers to care in each of the steps in the ideal breast cancer control process:

Prevention and Early Detection Gaps or Barriers

- The Maryland Breast and Cervical Cancer Program has enough funds to screen 10%–15% of uninsured or underinsured women in the state for breast cancer. There are significant numbers of women who are uninsured or underinsured who cannot afford breast cancer screening.
- Accessibility to screening services may be limited because of hours of operation, availability of public transportation, or a lack of knowledge among patients and providers about the availability of existing services, especially for the socioeconomically disadvantaged.
- Cultural and language barriers prevent women from seeking screening and treatment. Few hospitals and even fewer physicians have staff who are able to speak to patients in their native language and must resort to using family members or friends as translators.
- There is a lack of written material in languages other than English and Spanish, and there is a lack of written materials at a reading level that is easy for all patients to understand.
- There are an increasing number of providers who refuse Medicare of Medicaid patients because of limited reimbursement rates.
- There is limited participation in breast cancer prevention clinical trials.

Treatment Gaps or Barriers

- Not all women in the state are receiving optimum care. Use of needle biopsies, rather than excisional biopsies, as the first step after a suspicious mammogram needs to occur across all regions of the state. Patterns of care throughout the state need to be assessed and results of clinical trials need to be monitored to apply new treatment interventions. As a result, sentinel node biopsy may replace axillary lymph node dissection for many women.
- There is a lack of information about treatment options and programs to pay for certain components of treatment.
- There is a need for improvement in the coordination of care among the many physicians treat-

ing a woman with breast cancer. Patients being treated for breast cancer are under the care of several different physicians, including radiologists, surgeons, and oncologists, as well as their primary care provider.

- Funds available in the Breast and Cervical Cancer Diagnosis and Treatment Program are insufficient to serve all uninsured or underinsured women diagnosed with breast cancer in Maryland.
- Few patients are offered psychosocial support or evaluation and insurance carriers may limit access to psychologists and psychiatrists. Additionally, co-pays for counseling are usually greater than for other medical specialists. Publicly funded mental health clinics are underfunded, have limited hours and staff, and limited space for new patients.
- There is limited participation in breast cancer treatment clinical trials.

Survivorship Gaps or Barriers

- Patients and providers may lack knowledge about the long-term effects of breast cancer treatment. As the cohort of survivors who were treated with chemotherapy age, research into the long-term effects of chemotherapy and other treatments needs to be supported.
- Culturally sensitive materials regarding survivorship issues in languages other than English need to be developed and made available to the public.
- There is a lack of coordination of care among specialists and primary providers following treatment. This may result in important aspects of care being lost in the gaps.
- Fears of insurance discrimination and employment termination are real for women who have been diagnosed with breast cancer and women with a family history of breast cancer who wish to undergo genetic testing.
- There is a lack of support systems for breast cancer patients. Support systems allow breast cancer patients the opportunity to talk about their disease to others and can provide a wealth of practical information and emotional support. Support groups are lacking in many minority and rural communities. Where support groups do exist, accessibility may be limited due to a lack of transportation.
- There is a need for respite care programs and reimbursement for hospice care services.

Current Efforts in Maryland

The Maryland Department of Health and Mental Hygiene (DMHH) Breast and Cervical Cancer Program (BCCP) is a statewide program that provides breast and cervical cancer screening services to uninsured or underinsured, low-income (less than 250% of the federal poverty level) women 40–64 years of age. Across the state, the DHMH awards funds to each jurisdiction to coordinate the provision of breast and cervical cancer outreach, patient and public education, and screening, referral, follow-up, and case management services for its residents. During 2001, the BCCP provided 12,610 mammograms to Maryland women. The proportion of African-American and Hispanic clients that have received services under the BCCP is greater than the proportion of these groups in the Maryland population.

The DHMH formed a Breast Cancer Medical Advisory Committee, which developed guidelines titled "Minimal Clinical Elements for Breast Cancer Screening." The Minimal Clinical elements provide guidance for public health programs that screen for breast cancer.

Funding from the Cigarette Restitution Fund Program has been awarded to the University of Maryland Medical System/University Care to provide breast and cervical cancer screening for low-income, uninsured or underinsured women who live in Baltimore City. Several other local jurisdictions also offer breast cancer education and screening services under this program. As of January 2004, 1216 women had been screened for breast cancer through these local programs and over 8,608 had received breast and cervical cancer educational services.

Several hospitals offer free breast cancer screening to high risk or symptomatic women who do not qualify for state programs. Funding for these programs is usually from donations and private foundations and tends to vary from one year to the next. Patients needing a work-up or treatment are referred to the Maryland Breast and Cervical Cancer Diagnosis and Treatment Program.

The Maryland Breast and Cervical Cancer Diagnosis and Treatment Program is state-funded and reimburses participating medical providers for breast and cervical cancer diagnostic and treatment services for Maryland residents who are diagnosed with either breast or cervical cancer, meet income guidelines (250% of the poverty level), and are either uninsured or underinsured for these services. This program is not restricted by age.

Figure 10.7
Ideal Breast Cancer Control Model
Step: Prevention

General Public	High Risk Subgroups (e.g., women with suspected inherited cancer syndromes and high-risk benign breast disease)	Primary Care Providers	Medical Specialists
Is aware of general healthy guidelines for breast cancer prevention: diet, physical activity, and weight. Is aware of her personal risk of breast cancer. Is aware of age and risk-based recommendations for prevention and early detection of breast cancer.	Receives information about her risk of developing breast cancer. Receives information about genetic counseling and testing if in an appropriate risk group. Receives information about management options to lower the risk of breast cancer (e.g., lifestyle, chemoprevention, and all available proven preventive options).	Is aware of and institutes broad prevention interventions (obesity, physical activity, healthy diet). Is able to apply and interpret validated risk assessment models (e.g., the Gail model). Is able to identify genetically susceptible high-risk women and refer them for genetic counseling and testing. Is able to determine high-risk women who should be counseled regarding chemoprevention. Knows the risks and benefits of chemoprevention (e.g., with tamoxifen) and assesses who may benefit.	Provides genetic counseling and testing for individuals regardless of race, ethnicity, and socioeconomic status. Knows risks and benefits of genetic testing, is able to interpret test results, and provides counseling on risk management. Is able to identify women at increased risk who may benefit from chemoprevention, discusses risks and benefits, and provides appropriate follow-up. Provides access to clinical prevention trials.

Medical Institutions (e.g., hospitals)	Research
Provides access to counseling and management for at-risk populations. Educates trainees and medical staff in breast cancer risk assessment.	Conducts research to determine what level of risk is most appropriate to define "high-risk"; what percentage of women are "under treated" with respect to prevention; and what percentage are "overtreated" (e.g., inappropriate preventive mastectomies. Determines the level of knowledge of risk assessment, prevention, and detection guidelines. Conducts research on best method of risk communication for race/ethnic/socioeconomic subgroups. Determines the accessibility of risk assessment programs for those at increased risk by race/ethnicity and SES status. Conducts research on appropriate models for risk counseling and management in order to increase access to care. Conducts new research on potential prevention interventions associated with low incidence of side effects. Determines level of knowledge of genetics of cancer and prevention interventions among specialists and primary care providers. Conducts research to develop culturally appropriate education methods and materials on risk communication. Assesses institutional support for cancer prevention. Assesses insurance reimbursement for providers/institutions for preventive services.

Source: Developed by the Breast Cancer Committee of the Maryland Comprehensive Cancer Control Plan.

Figure 10.8
Ideal Breast Cancer Control Model
Step: Early Detection

Women in Need	Primary Care Providers	Radiologists
Is aware of screening guidelines. Is provided with culturally diverse materials on early detection. Is aware of, and has access to, screening sites. Is aware of sites offering low- or no-cost screening. Actively seeks out screening. Receives answers to insurance questions and has barriers to screening reduced. If in a high-risk subgroup, is aware of, and follows through, with increased monitoring based on own individual profile.	Is aware of current screening guidelines. Discusses screening guidelines with patient (e.g., risks and benefits). Recommends appropriate screening to patient. Performs a CBE or refers patient to another provider for a CBE. Refers patient to a surgeon when CBE result is a palpable mass that is of concern to the patient or provider. Refers patient for mammography. Receives result of mammogram. Refers patient to a surgeon when mammogram result is suspicious or suggestive of malignancy. Reinforces that routine screening is needed.	Facility is certified by the FDA. Performs mammogram. Repeats mammogram if results are unsatisfactory. Reports results using the Bi-RADS reporting system, including recommendations for follow-up. Performs or arranges for additional diagnostic procedures (e.g., spot compression, ultrasound, and aspiration). Has dialogue with PCP when results are suspicious. Notifies PCP and patient of result of mammogram and other diagnostic tests.

The Women's Breast and Cervical Cancer Health Program provides Medicaid coverage to women screened under the BCCP who have been diagnosed with either breast or cervical cancer. Women in this program are eligible for full Medical Assistance while they are undergoing treatment for breast or cervical cancer.

The Maryland State Medical Society provides skills-based clinical breast examination training to primary care providers throughout the state. Physician educators along with patient surrogates train a small group of providers in the MammaCare method. Since 1996, 1,111 Maryland primary care providers have been trained.

The American Cancer Society (ACS) provides advocacy, educational, and support services for breast cancer patients. Support groups include: I Can Cope, the Cancer Survivor's Network, Reach to Recovery, and Look Good-Feel Better. Assistance with transportation for cancer treatments can be obtained in some areas of the state through the Road to Recovery program. The ACS publishes numerous educational brochures and books, sends speakers to community meetings, and promotes breast cancer screening through its Tell-A-Friend program. ACS also provides free wigs, turbans, prostheses, a cancer information center, a website, and patient navigators for breast cancer patients. The ACS has awarded grants in the amount of $1,040,200 to two local Maryland institutions for breast cancer research.

The Susan G. Komen Breast Cancer Foundation is a national grant-making and educational foundation dedicated to the eradication of breast cancer as a life-threaten-

Surgeons	Research
Carries out diagnostic procedures (e.g., biopsy).	Researches new techniques for screening and diagnosis.
Uses minimally invasive techniques for diagnosis.	Conducts behavioral research on motivation and acceptance of screening.
Evaluates all palpable, solid, non-cystic masses, regardless of mammographic findings.	Develops culturally appropriate educational materials, including low literacy.
Discusses diagnostic test results with patient and discusses either need for surveillance or treatment options.	Researches barriers to screening.
Performs appropriate TNM staging of the breast cancer.	

Source: Developed by the Breast Cancer Committee of the Maryland Comprehensive Cancer Control Plan.

ing disease by advancing research, education, screening, and treatment. Over the last three years, the Maryland affiliate of the Susan G. Komen Breast Cancer Foundation has awarded grants totaling over $1.5 million to community groups in the state. These grants support educational outreach programs, foreign language interpreters, the publication of written and video materials, clinical trials nurses, and a limited number of clinical breast examinations and mammograms. In addition to awarding grants, the Maryland affiliate sponsors an annual educational symposium, publishes a resource guide for breast cancer patients, publishes a biannual newsletter, participates in health fairs, makes referrals to various resources, sponsors an annual grant-writing workshop and other educational programs.

Additionally, there are numerous breast cancer support groups throughout the state.

Numerous laws related to breast cancer have been passed in Maryland. These laws require health insurers and health maintenance organizations to:

- provide coverage for routine mammography screening and prohibit a deductible from being charged for routine mammography screening.
- provide coverage for reconstructive breast surgery following a mastectomy, if the patient requests it. It specifies that coverage is to include surgery on a non-diseased breast to establish symmetry with the diseased breast.
- provide coverage for patient costs incurred as a result of treatment provided in a clinical trial

Figure 10.9
Ideal Breast Cancer Control Model
Step: Treatment

Patients	Treatment Team (surgical, medical and radiation oncologist)	
Understands the value of, and has access to, a multi-disciplinary team for treatment. Has access to culturally appropriate information on breast cancer treatment. Is aware and informed of the various options for breast cancer treatment. Is provided support by family members, breast cancer support groups, and others.	Is aware of state-of-the-art treatment algorithms for breast cancer treatment (e.g., NCCN). Participates in a multi-disciplinary team for the treatment of breast cancer. Discusses the treatment plan with the Treatment Team and provides data for outcomes measurement. Discusses options for breast cancer treatment with the patient and provides culturally appropriate written material on breast cancer treatment to the patient.	Follows state-of-the-art treatment algorithms (NCCN). Stage 1 or greater breast cancer evaluated by an oncologist. In situ cancer evaluated by an oncologist at the discretion of the surgeon. Refers patient to clinical trials, if appropriate.

Figure 10.10
Ideal Breast Cancer Control Model
Step: Long-Term Survivorship

General Public	Patients	Primary Care Providers and Medical Specialists
Understands that one can survive breast cancer. Understands the long-term issues affecting breast cancer survivors (e.g., lymphedema, cognitive effects from chemotherapy, radiation and cardiac effects). Is educated that all women who are getting older are at risk for breast cancer, and thus survivorship.	Asks questions related to survivorship. Is knowledgeable about those issues. Creates a survivorship plan with a lifelong treatment plan outlining who will follow the patient.	Understands long-term effects of breast cancer treatment (e.g., cardiac, HRT, and recurrence). Works with the patient and a multi-disciplinary team to create a follow-up and survivorship plan (e.g., which provider is responsible for what kind of follow-up).

Medical Institutions (e.g., hospitals)	Research
Promotes use of multi-disciplinary teams for breast cancer treatment. Is committed to a high-functioning cancer tumor committee within the institution. Establishes and provides fellowship programs in breast disease. Advocates and applies for competitive research grants, particularly those that place emphasis on community hospitals and access to clinical trials. Is culturally appropriate in its approach to patients.	Evaluates the utilization of new treatment procedures in the Maryland Cancer Registry (e.g., sentinel lymph node biopsy). Researches factors contributing to late stage breast cancers in Maryland.

Source: Developed by the Breast Cancer Committee of the Maryland Comprehensive Cancer Control Plan.

Medical Institutions (e.g., hospitals)	Research
Offers programs like a navigator and buddy/match program, support groups, (e.g., Reach to Recovery.) Offers one place to call for survivorship referral.	Conducts research on the long-term effects of adjuvant therapy on survivorship (e.g., lymphedema, cognitive effects from chemotherapy, and radiation and cardiac effects). Conducts research on how to alleviate the fear of recurrence. Conducts research on how to prevent recurrence. Conducts research on issues faced by young survivors.

Source: Developed by the Breast Cancer Committee of the Maryland Comprehensive Cancer Control Plan.

for: (1) a life-threatening condition or (2) prevention, early detection, and treatment studies on cancer. In conjunction with the above-mentioned coverage, a carrier must provide coverage for costs incurred by patients for FDA-approved drugs and devices, whether or not the FDA has approved the drug or device for treating the enrollee's particular condition.

- pay for a minimum of 48 hours of inpatient care following a mastectomy. For patients having outpatient surgery or who remain in the hospital less than 48 hours insurance companies must pay for a minimum of one home visit within 24 hours following discharge.
- provide coverage for a breast prosthesis that has been prescribed by a physician for an enrollee or insured who has undergone a mastectomy and has not had breast reconstruction.
- reimburse patients (up to $350) for the cost of a hair prosthesis when the loss of hair is due to chemotherapy or radiation treatments for cancer.

These laws are for physicians:

- Physicians who treat breast cancer patients are required to provide them with a written summary (to be provided by DHMH) describing various breast cancer treatments.
- Physicians who perform breast implantations are required to provide patients with a standardized written summary (provided by DHMH) describing the advantages, disadvantages, and risks associated with breast implantation.

Healthy People 2010 Objectives

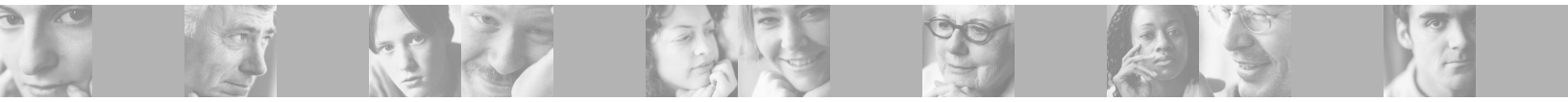
The following are the Healthy People 2010 objectives[73] related to breast cancer:

Objective:
Reduce the female breast cancer death rate to 22.3 per 100,000.

The U.S. baseline was 27.9 per 100,000 in 1998 (age-adjusted to the 2000 U.S. standard population).

Objective:
Increase the proportion of women aged 40 years and older who have received a mammogram within the preceding 2 years to 70%.

The U.S. baseline was 67% of women aged 40 years and older received a mammogram within the preceding 2 years in 1998 (age-adjusted to the 2000 U.S. standard population).



Breast Cancer
Goals, Objectives, and Strategies

Goals:

1. Reduce the incidence of breast cancer in Maryland.
2. By 2008, reduce the proportion of late stage breast cancers diagnosed in all women and reduce the rates of late diagnosis in African-American women to that of white women.
3. Ensure that all women who develop breast cancer are diagnosed with Stage 1 disease with <1 cm tumors.
4. Research factors contributing to high incidence and mortality rates in Maryland and develop appropriate interventions (e.g., conduct a case-control study to compare Maryland's Delmarva region to low mortality regions in the United States and examine for possible explanatory factors).
5. Ensure access to prevention, screening, treatment, and follow-up care for all Maryland residents.
6. Preserve the Cigarette Restitution Fund (CRF) for addressing health issues in Maryland.

Targets for Change

By 2008, reduce the female breast cancer mortality to a rate of no more than 23.2 per 100,000 females in Maryland.

The Maryland baseline was 27.7 per 100,000 in 2000 (age-adjusted to the 2000 U.S. standard population).

Source: Maryland Department of Health Statistics.

By 2008, increase the number of women age 40 and older that received a mammogram in the past two years to 85%.

The Maryland baseline was 82% in 2000.

Source: BRFSS.

Objective 1:
Determine why Maryland has high breast cancer incidence and mortality rates compared to other states in the nation.

Strategies:

1. Conduct research to determine what factors are associated with increased incidence, late stage diagnosis, and mortality in Maryland.
2. Intervene on those factors associated with high incidence, high mortality, and late stage breast cancer that can be modified.
3. Maintain and expand the Maryland Cancer Registry in order to identify problems, conduct research, and evaluate the effectiveness of interventions.
4. Explore the possibility of providing open access to the CRF for research and interventions to all health related organizations in the state.

Objective 2:
Continue to monitor breast cancer prevention research and promote activities to prevent breast cancer.

Strategies:

1. Assess existing interventions and conduct multifaceted interventions to reduce obesity and increase physical activity, known factors associated with the risk of breast cancer. Interventions should cover all age groups, including children as well as adults.
2. Create a primary prevention committee within the State Council on Cancer Control to ensure that cancer prevention issues receive appropriate attention.
3. Develop and conduct interventions to promote other factors associated with a lower risk of developing breast cancer, such as breast-feeding.

4. Provide risk-based literature that is culturally and ethnically appropriate.
5. Provide access to breast cancer prevention trials to all Maryland residents.

Objective 3:
Increase breast cancer risk assessment and risk-appropriate strategies.

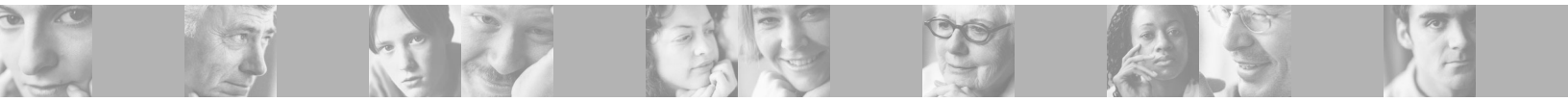
Strategies:
1. Conduct research to determine what individuals and providers know about breast cancer risk assessment and management and their current practices related to risk assessment and management.
2. Educate providers and women about assessing breast cancer risk and risk-appropriate management options.
3. Determine mechanisms to promote the practice of breast cancer risk assessment.
4. Conduct research to determine the prevalence of high-risk groups.
5. Evaluate and ensure access to counseling and care for high-risk groups (regardless of race, ethnicity, SES, etc.), including genetic counseling and testing, counseling regarding chemoprevention and access to medications, and other risk management options such as prophylactic surgery.
6. Provide culturally appropriate risk assessment materials to providers for their practices.
7. Create centers throughout the state so that all residents have access to information on breast cancer risk, prevention interventions, and specialized services for high-risk groups (regardless of race, ethnicity, SES, etc.).

Objective 4:
Ensure continued access to early detection and treatment of breast cancer.

Strategies:
1. Continue federal and state funding for the breast cancer early detection and treatment program.
2. Develop culturally appropriate education and outreach activities appropriate to the various and diverse population groups in the state.
3. Provide all residents with access to breast cancer treatment trials.

Objective 5:
Increase the number of providers that perform minimally invasive biopsy techniques.

Strategies:
1. Evaluate patterns of care across regions and racial groups.
2. Educate providers and patients regarding minimally invasive biopsy techniques.
3. Facilitate utilization of minimally invasive techniques.



Objective 6:
Promote optimum state-of-the art breast cancer care for all breast cancer patients regardless of regional, racial, age, or other disparities.

Strategies:

1. Utilize the Maryland Cancer Registry Data to evaluate patterns of care by region, race, and age and to provide performance evaluation to providers.
2. Educate providers to improve their patients' access to care.
3. Educate the public and providers on standards of care.
4. Develop culturally sensitive materials about breast cancer treatment options.
5. Encourage insurance companies to compensate providers for case management services.

Objective 7:
Increase the number of individuals with Ductal Carcinoma in Situ (DCIS) and early stage breast cancer that receive treatment appropriate for their diagnosis.

Strategies:

1. Implement state-of-the-art treatment for women with DCIS and early stage breast cancer in order to avoid both over-treatment and under-treatment of breast cancer.
2. Promote research to more accurately identify patients with early stage disease that will most likely progress, in order to better tailor therapy.
3. Determine if risks/benefits, including long-term risks, of therapy are adequately discussed with patients.
4. Develop risk/benefit fact sheets for patients with DCIS and early stage breast cancer.

Objective 8:
Provide breast cancer survivors with information regarding the long-term effects of treatment.

Strategies:

1. Conduct research to determine the long-term effects of treatment.
2. Conduct research to determine providers' knowledge of long-term treatment effects and practices regarding discussion of effects with patients.
3. Develop "standards of care" for long-term survivors and educate patients and providers regarding these standards.
4. Educate patients and providers about long-term effects of breast cancer treatment.
5. Develop and evaluate models for long-term care incorporating prevention of new cancers, recurrence of breast cancer, prevention and screening for other cancers, and potential long-term effects of treatment.

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