REPORT 2 OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH (A-09)
Male Breast Cancer
(Resolution 105, A-08)
(Reference Committee E)

EXECUTIVE SUMMARY

Objectives. Male breast cancer (MBC) is extremely rare, with an incidence in the general U.S. population of less than 1%. Mammography in men is therefore utilized as a diagnostic tool to evaluate breast symptoms rather than as a tool for widespread screening for MBC. However, there is some disagreement about the role of mammography in diagnosing both malignant and benign male breast disease. This report reviews MBC and its risk factors, current national guidelines for screening and diagnosis, and the roles of mammography and genetic testing in surveillance and management.

Data Sources. Literature searches were conducted in the PubMed database for English-language articles published between 2000 and 2009 using the search terms "male mammography," "male breast AND cancer," and "male AND *BRCA*." Additional articles were identified by review of the literature citations in articles identified using PubMed. The Web sites of Gene Reviews, the U.S. Preventive Services Task Force, the National Comprehensive Cancer Network, the American Cancer Society, the National Cancer Institute, and BreastCancer.org were also consulted for information.

Results. MBC accounts for less than 1% of all male cancers. It tends to be diagnosed at later stages than breast cancer in females, likely because of low awareness on the part of the patient and low suspicion by the physician. Despite its rarity, men with certain risk factors are more likely to develop MBC. Risk factors include genetic predisposition, alterations to the estrogen-testosterone ratio, radiation exposure, and occupational hazards. Guidelines for men with genetic predisposition, such as a known *BRCA* mutation or a strong family history of breast cancer, recommend surveillance methods that include clinical breast examination, breast self-examination, mammography, and genetic testing. While clinical breast examinations are effective at evaluating breast symptoms, mammography also may be beneficial in separating malignant from benign breast disease. *BRCA* mutations are linked to a number of other cancers in men, each with respective screening and surveillance recommendations.

Conclusions. MBC is rare, but heightened awareness of the increased risk in certain men by both physicians and patients, and adherence to guidelines recommended for the surveillance of men at increased risk, may result in earlier detection. Our American Medical Association supports efforts to educate men and their families about the risk of MBC, supports guidelines for the surveillance of men at increased risk for MBC, and supports insurance coverage for MBC surveillance and diagnostic methods.

REPORT OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH

CSAPH Report 2-A-09

Subject: Male Breast Cancer
(Resolution 105, A-08)

Presented by: Carolyn B. Robinowitz, MD, Chair

Referred to: Reference Committee E
(Martin G. Guerrero, MD, Chair)

Resolution 105, introduced by the International College of Surgeons - U.S. Section at the 2008 American Medical Association (AMA) Annual Meeting and referred to the Board of Trustees, asks:

> That our AMA endorse the wide spread dissemination of information regarding the risk to males as well as females for the development of breast carcinoma when genetic testing has shown prevalence in the family (*BRCA* especially); and
>
> That our AMA endorse that payment for annual or periodic mammography in the high risk male be covered by Medicare and insurance companies.

Each year, far fewer men than women are diagnosed with breast cancer. In the United States in 2008, approximately 180,000 women were diagnosed with breast cancer, while only approximately 2,000 men received this diagnosis. Despite the lower incidence of male breast cancer (MBC), its case-fatality rate is similar to that of female breast cancer (FBC).[1] Mammography has long been the standard screening method for FBC, with defined guidelines on the age at which to begin screening, the frequency of screening, and modifications to the screening protocol for patients at increased risk for developing breast cancer.[2-4] The rarity of MBC has resulted in comparatively few clinical studies assessing the risk factors, detection methods, and treatment of the disease.[5] Instead, diagnosis and management of patients with MBC has been derived from studies on FBC.[6] Mammographic screening of all men for MBC, analogous to widespread population screening for FBC, is impractical because of the low number of men afflicted.[6,7] Mammography is therefore more often utilized as a diagnostic tool in men with breast symptoms.[8] However, some disagreement exists about the role of mammography in diagnosing both malignant and benign male breast disease.[8-14] Clinical breast examinations are effective in detecting breast lesions in males,[14] but it has been argued that mammography should be employed as a standard diagnostic tool in men presenting with breast symptoms and in men who are at increased risk for developing MBC.[8] This report reviews MBC and its risk factors, guidelines for screening and diagnosis, and the roles of mammography and genetic testing in surveillance and management.

Action of the AMA House of Delegates 2009 Annual Meeting: Council on Science and Public Health Report 2 Recommendations Adopted, and Remainder of Report Filed.

METHODS

Literature searches were conducted in the PubMed database for English-language articles published between 2000 and 2009 using the search terms "male mammography," "male breast AND cancer," and "male AND *BRCA*." Additional articles were identified by review of the literature citations in articles identified using PubMed. The Web sites of Gene Reviews, the U.S. Preventive Services Task Force (USPSTF), the National Comprehensive Cancer Network (NCCN), the American Cancer Society, the National Cancer Institute, and BreastCancer.org were also consulted for information.

BACKGROUND

Male breast tissue is predominantly made up of rudimentary ductal elements, surrounded by stroma, adipose, and subcutaneous tissue.[15,16] Lobular tissue, which in women is responsible for lactation, is not normally present unless the male has been exposed to increased concentrations of estrogen.[15,16] Accordingly, 85% to 90% of MBC is invasive ductal carcinoma,[5,15] while lobular carcinoma is extremely rare.[5,17] Ductal carcinoma in situ (DCIS) is the most common type of in situ (noninvasive) tumor in men.[6] Approximately 65% to 90% of MBC tumors are both estrogen- and progesterone-receptor positive, similar to the proportion of estrogen- and progesterone-receptor positive breast tumors in postmenopausal women.[5,15,18] In about half of MBC diagnoses, the cancer has metastasized to the axillary lymph nodes.[5,19]

MBC is rare, with an incidence in the general population of approximately 1 in 100,000.[19] It accounts for less than 1% of all cancers in males.[6] MBC most commonly presents as a painless unilateral breast mass or thickening, sometimes accompanied by nipple discharge, retraction, or skin ulceration.[5,15,16,19] The average age of MBC patients at diagnosis is 68 to 71 years,[6,16,19] more than 10 years later than the average age at which FBC is diagnosed.[5] More than 50% of male breast tumors have advanced to stage II or beyond by the time of diagnosis, compared to approximately 35% of female breast tumors.[15,20] The later stage at diagnosis implies a delay in diagnosis of MBC that has been blamed on the rarity, and hence low index of suspicion, of MBC by both physicians and patients.[5,15] The five-year survival rates for men with stages I-IV breast tumors are 96%, 84%, 52%, and 24%, respectively; the rates do not differ significantly from five-year survival rates for FBC.[20]

Management options for MBC patients are based mainly on information from the treatment of FBC.[7] Radical mastectomy, for many years the standard treatment for localized MBC, has now been replaced by less invasive procedures like modified radical or simple mastectomy.[5,15] For invasive MBC, sentinel-node biopsy is usually performed to establish axillary node status.[5,21] Postoperative radiotherapy is often delivered, as it seems to prevent local recurrences, although it is unknown whether radiotherapy affects survival rates in MBC.[5,6,15,19] Most cases of MBC respond favorably to hormonal manipulation since the majority are estrogen-receptor positive. The anti-estrogen tamoxifen improves survival rates in estrogen-receptor positive FBC. Although no clinical trials have assessed the use of tamoxifen in MBC, men who have been treated with it show improved disease-free and survival rates.[15,22] For this reason, tamoxifen has an important role in the treatment of most MBC cases.[6] Chemotherapy also appears to benefit survival and prevent recurrence, although data are not well-established.[15,23] A 2004 retrospective study showed that additional adjuvant therapy in the form of radiation, hormones, and chemotherapy, either alone or in combination, more than doubled the survival rate in men with breast cancer.[5,24]

RISK FACTORS FOR MBC

BRCA1/2

The *BRCA1* and *BRCA2* protein products play a key role in DNA repair and cell cycle checkpoint control.[25,26] They are classified as "tumor-suppressor genes"; i.e., they maintain genomic stability and control of cell proliferation.[25] Mutations in the *BRCA1* or *BRCA2* genes result in the cells' inability to repair DNA damage, allowing for the accumulation of genetic instabilities that can alter cell cycle checkpoint control.[25,26] Dysfunctional checkpoint control enables cells to proliferate, resulting in tumor growth.[25] Thus, carriers of *BRCA* mutations are at an increased risk for tumor development. Accordingly, *BRCA* mutation carriers show higher risk for breast (in both females and males), ovarian, prostate, colorectal, and pancreatic cancers.[27]

More than 1000 mutations in both *BRCA1* and *BRCA2* have been described.[28] The genes are inherited in an autosomal dominant pattern; i.e., the male or female offspring of a mutation carrier have a 50% chance of inheriting the mutation.[29] Studies examining the prevalence of *BRCA* mutations in the general population have reported ranges of 0.06% to 0.32% for *BRCA1*, and 0.12% to 0.69% for *BRCA2*.[2,30,31] People of Ashkenazi Jewish descent are more likely to carry certain *BRCA* mutations. Approximately 2.5% of Ashkenazi Jewish individuals carry one or more of three specific *BRCA* mutations, increasing the occurrence of hereditary forms of breast and other cancers in this population.[2]

The strongest risk factor for MBC is the presence of an inherited *BRCA2* mutation. The lifetime risk for breast cancer in a male *BRCA2* mutation carrier is approximately 5% to 7%, 80 to 100 times higher than for the general population.[27,28] It is estimated that 4% to 40% of MBC patients carry a mutation in *BRCA2*.[20,32-34] However, a precise estimate is limited because few studies have included populations of males who were not already diagnosed with breast cancer. The association between *BRCA1* mutations and MBC is not as strong as that seen for *BRCA2* mutations. The lifetime risk for breast cancer in a male *BRCA1* mutation carrier is just over 1%, and it is estimated that a *BRCA1* mutation is present in up to 4% of MBC cases.[25,35,36]

Estrogen Exposure and Androgen Insufficiency

Alterations to the estrogen-testosterone ratio in males is among the risk factors for developing breast cancer.[5,15] The hormonal condition most strongly associated with breast cancer is Klinefelter syndrome, characterized by the addition of at least one X chromosome to the normal XY complement.[5,15] Males with Klinefelter syndrome have testicular dysgenesis, gynecomastia (the benign enlargement of the male breast), low testosterone concentrations, and increased gonadotropins,[15,37] leading to a 50-fold increase in risk for breast cancer.[37] It is thought that males with Klinefelter syndrome account for 3% of all MBC cases.[5,37] Other testicular abnormalities that result in testosterone deficiency, including undescended testes, congenital inguinal hernia, injury, orchitis, and orchidectomy, are associated with an increased risk for MBC.[5,7,15]

Obesity, which increases the estrogen-testosterone ratio, is a risk factor for MBC. Men with a body-mass index of greater than 30 have an almost doubled risk.[15,38] Increased estrogen levels are also frequently seen in males with liver cirrhosis, increasing MBC risk 9- to 13-fold.[6,39] Bilateral breast cancers have been reported in men exposed to exogenous estrogens, such as those treated for prostate cancer and transsexuals taking estrogen.[15] Although decreased levels of testosterone and increased levels of estrogen appear to increase the risk for MBC, no studies have shown significantly lower levels of testosterone or consistently higher levels of estrogen in males with breast cancer.[15]

Radiation Exposure

Medical procedures requiring radiation include radiography, fluoroscopy, computed tomography scans, interventional radiology, and bone densitometry. Radiation doses from single exposures are low, but for those who receive repeated examinations over time, or who are treated with therapeutic doses, cumulative radiation exposure can reach levels beyond what is considered safe.[40] Exposure to therapeutic ionizing radiation is associated with an increased risk for breast cancer in women, and a small number of studies suggest a similar situation for men.[7,15] MBC has occurred following treatment of unilateral gynecomastia and thymic enlargement with radiotherapy. It is estimated that the treatment, no longer used, increased risk for MBC by almost twofold. In men who receive anti-androgenic factors to treat prostate cancer, gynecomastia commonly occurs and is treated with low dose radiotherapy.[15,41] However, there are no data on long-term risk for MBC in these patients.[15] Accidental exposure to radiation has also been linked to male cancers. In a large study of male Japanese atomic bomb survivors, a dose-response relationship was observed between radiation exposure and risk for MBC, with risk increasing eightfold per sievert of radiation exposure.[7,42]

Occupational Risks

Men who work in high-temperature environments, such as blast furnaces, steel works, and rolling mills have a higher risk for breast cancer, probably due to testicular failure resulting from long-term exposure to high ambient temperatures.[15,38] In a 1988 Swedish study, those who worked in the soap and perfume industry showed an almost eightfold increase in risk for MBC, likely because during the 1950s and 1960s this industry made estrogen-containing cosmetic creams, increasing workers' exposure to exogenous estrogens. Occupational carcinogen exposure, such as that found in gasoline and exhaust fumes, has also been implicated in increasing risk for breast cancer.[15,43]

Risk factors for MBC are summarized in Table 1.

SCREENING AND DIAGNOSIS OF MBC

The rarity of MBC has precluded the large clinical trials that are often necessary for formal recommendations and guidelines on screening and diagnosis. Thus, extrapolation from FBC studies, along with retrospective analyses of smaller MBC studies, has formed the basis for the few and very specific recommendations that exist for MBC.

Recommendations for FBC screening are well-established. For asymptomatic women with a negative physical examination who are between the ages of 20 and 40 years, the NCCN recommends a clinical breast examination every one to three years, along with periodic breast self-examination.[44] After age 40 years, both the NCCN and the USPSTF recommend screening mammograms every one to two years;[3,44] the NCCN further recommends clinical breast examinations every one to two years and encourages periodic breast self-examination.[44] Annual screening mammography in asymptomatic women over age 40 years is generally covered by major insurance carriers in the United States and by Medicare.[45] The low incidence of MBC in the general population (approximately 1 in 100,000) renders mammographic screening of all men impractical.[6,7] Thus, there are no guidelines or formal recommendations for screening mammography, nor are there recommendations for clinical breast examination or breast self-examination in asymptomatic men.

For individuals at increased risk for developing breast cancer, there are clear surveillance and screening guidelines. These were developed based on large studies of FBC, but also apply to men

considered to be at increased risk for MBC. For both men and women, the "increased risk" category includes those with a strong family history of breast cancer (both FBC and MBC), a genetic predisposition (mutations identified that are known to increase risk of breast cancer, such as *BRCA1/2*), and prior personal history of breast cancer (particularly MBC).[4,44] Other risk factors in men, including increased estrogen exposure or androgen insufficiency, radiation exposure, and occupational exposure, are not included in formal guidelines, likely because of the paucity of large risk factor studies that are often needed for guideline development.

For men in the increased risk category, monthly breast self-examinations, semi-annual clinical breast examinations, and baseline mammography followed by annual mammography if gynecomastia and/or breast density are seen on baseline are recommended.[2,4] For women in the high risk category, the guidelines are more aggressive. Breast self-examination, semiannual clinical breast examination, annual mammography, and MRI screening at age 25 years or younger are recommended, as well as discussion of prophylactic mastectomy, salpingo-oophorectomy, and chemoprevention options.[2,4] Guidelines also recommend that both men and women in the increased risk category be tested for genetic mutations (if mutation status is unknown), be advised of the risk to other relatives, and consider genetic testing for at-risk relatives.[4,46,47] Guidelines for surveillance and screening of men at increased risk are outlined in Table 2.

Although mammography is recommended by the NCCN for the surveillance and management of males at increased risk for MBC,[4] its role in males with no apparent risk factors is less clear. The majority of breast symptoms in males are caused by benign abnormalities such as gynecomastia.[14] The diagnostic challenge facing physicians is to correctly separate the small number of patients with malignant disease from the greater number with benign disease.[8] This task can be more difficult when there is no family history of breast cancer and no other risk factors for MBC, such as hormonal or occupational exposure. Several retrospective studies have found that a thorough clinical evaluation, including physical examination and fine-needle aspiration or core biopsy, is effective at distinguishing breast cancer from benign disease, and that mammographic data add little diagnostic information.[9,10,12,14] Others argue that mammography adds accuracy to the evaluation of breast symptoms.[8] In one study, the sensitivity and specificity of mammography was 92% and 90%, respectively; i.e., mammography detected malignancy in 92% of known malignant cases, and ruled out malignancy in 90% of known benign cases.[8] Mammography demonstrates considerable efficacy in distinguishing breast cancer from gynecomastia, and also appears to reduce the number of false-positive biopsies that would be generated by clinical examination alone.[11,13] In some cases, gynecomastia can partially or completely obscure the detection of an underlying malignancy by clinical examination.[7,48] Algorithms for deciding when mammography is indicated in males with breast symptoms but with no apparent risk factors for MBC have been suggested, although they have not been validated.[13,16,49]

Coverage for diagnostic mammography in males is not always specifically addressed in insurance company coverage policies. More often, coverage policies refer to women when addressing mammography. Medicare and most insurers cover or partially cover the cost of a diagnostic mammogram if the physician recommends the procedure based on clinical evaluation.[50,51] The detection of a mass in the male breast would likely meet such a criterion. Medicare and some insurers recognize that in certain cases a family history of breast cancer may necessitate diagnostic mammography.[50,52]

BRCA GENETIC TESTING

For both men and women who are diagnosed with breast cancer and appear to have a strong family history of cancers that are consistent with *BRCA* mutations, such as breast (especially MBC),

ovarian, prostate, and pancreatic cancers, a genetic consultation, including genetic testing when appropriate, is recommended.[2,4,46,47] Consultations are conducted by clinical geneticists and/or genetic counselors. A clinical geneticist provides clinicians and patients with risk assessment, diagnosis, and recommendations for disease management and prevention. Genetic risk assessment is based on family history and pedigree analysis, physical examination, and ordering and interpreting of laboratory diagnostics such as genetic tests. Genetic counselors will also assess family history and any known mutations in the family to provide education, support, and communication of cancer risk to patients and family members, and will guide patients and family members through the genetic testing process. Genetic testing for *BRCA* mutations is commercially available, and can help guide surveillance and prevention strategies tailored to individual risk.[29] *BRCA* genetic testing is partially covered by some insurance companies if certain criteria, such as a known *BRCA* mutation in the family, a strong history of *BRCA*-suggestive cancer in the family, or being of Ashkenazi Jewish descent, are met.[53]

When there is already an identified *BRCA* mutation in a family, it is recommended that adult relatives be tested for that same mutation.[2] More extensive mutation analysis (testing for more than one mutation or sequence analysis) may be recommended in certain cases, such as in individuals of Ashkenazi Jewish heritage and when *BRCA* mutations may be present in both maternal and paternal lines.[2] Males found to carry a mutation should be placed in the increased risk category and should adhere to the surveillance program recommended for those at increased risk.[4]

In families for which there is no identified *BRCA* mutation but that nonetheless display cancers indicative of *BRCA* mutations, genetic testing is recommended.[4] Testing should ideally occur first in the individual who has already had cancer indicative of a *BRCA* mutation.[2] That individual will likely undergo comprehensive testing that includes sequence and large rearrangement analysis of both *BRCA1* and *BRCA2*. This method may identify the specific inherited mutation that other family members carry, simplifying the subsequent testing process in these individuals.[2] For male patients diagnosed with MBC but having no family history of *BRCA*-related cancers, comprehensive testing is recommended.[2]

Not surprisingly, *BRCA* mutations are found more often in men with a first-degree relative diagnosed with breast cancer.[33] This highlights the importance of attention to family history by both physicians and patients, and of communication among family members. The decision to undergo genetic testing has implications for both the individual being tested and for other family members.[29] The identification of a mutation in an individual automatically implicates one of the parents as the transmitter of the mutation, and identifies the individual's siblings as having a 50% chance of also carrying the mutation.[29] The individual receiving genetic test results has the onus of delivering cancer risk information to the rest of the family.[29] In some families with a cancer history, male members are less likely to be informed of test results received by female relatives,[54-56] and are less likely to be included in family conversations about familial cancer risk.[57,58] Counseling by a genetics professional is recommended to help families communicate and understand individual risk.[29]

There has been reluctance on the part of some patients to undergo genetic testing due to concerns about discrimination. In one study, half of patients who were offered *BRCA* testing declined the test because of fears that a positive result would impact insurance coverage.[59] The Genetic Information Nondiscrimination Act (GINA), signed into law in 2008, makes it illegal for employers or health insurers to discriminate based on a person's genetic information.[60] While GINA offers significant protection from genetic discrimination, it does not protect against the use of genetic information by life, disability, or long term-care insurers.[61] Patients concerned about

genetic discrimination should be encouraged to speak with a genetic counselor or medical geneticist, who can explain the protections afforded by GINA.

BRCA AND OTHER CANCERS IN MEN

While the *BRCA* mutations have been linked to other cancers in men, data are limited and sometimes conflicting. Evidence suggests an increased risk for prostate, pancreatic, and colon cancers. There are also reported links between *BRCA* mutations and risk for leukemia, melanoma, and gastric, liver, bone, and brain cancers, but the links are not well-established.[25]

BRCA2 is associated with an increased risk for prostate cancer and for its rapid progression.[62,63] *BRCA2* carriers face a three- to sevenfold increase in risk for prostate cancer, with men under age 65 years facing the greatest risk.[27,62,63] Risk appears to be mutation-specific.[27] Interestingly, one *BRCA2* mutation proves to be protective against prostate cancer.[27] The association between *BRCA1* and prostate cancer is unclear, although some have reported modest increases in risk.[25] Men with known *BRCA* mutations or with a family history consistent with the presence of a *BRCA* mutation should adhere to screening guidelines for prostate cancer. Guidelines include a prostate-specific antigen test and a digital rectal examination annually after age 40 years.[4,64] Men with a diagnosis of prostate cancer and a family history suggestive of a *BRCA* mutation should be genetically tested.[27]

Approximately 4% to 7% of pancreatic cancer patients are believed to be carriers of *BRCA1* or *BRCA2* mutations.[27] *BRCA* mutation carriers display an increased risk for pancreatic cancer, approximately threefold for *BRCA1* carriers and sixfold for *BRCA2* carriers.[65,66] Also, *BRCA2* carriers seem to have a younger average age of onset.[27,28] For patients with a known *BRCA* mutation or with a suggestive family history, surveillance is indicated, although recommendations for screening methods vary.[25]

Several studies have reported an increased risk of colon cancer among *BRCA1* carriers,[25,65,67] the risk is thought to be increased by approximately twofold. The link between *BRCA2* and colon cancer risk is unclear. There are no specialized guidelines for colorectal cancer surveillance in *BRCA* carriers, probably because of the limited data on the role of *BRCA* in risk. Recommendations for patients with a known *BRCA* mutation or with a suggestive family history are the same as those for the general population, including regular colonoscopy, sigmoidoscopy, or fecal occult blood testing beginning at age 50 years and continuing until age 75 years.[68]

AMA POLICY ON MALE BREAST CANCER

AMA policy is strongly supportive of breast cancer screening methods in women, including mammography and breast self-examination (H-525.993, H-55.993, H-55.984, H-525.986, AMA Policy Database). It also supports education of women on routine screening (H-55.985), and encourages adequate insurance coverage and reimbursement for screening (D-525.998, H-330.985, H-185.965). However, AMA policy does not mention breast cancer in men, nor does it address the use of mammography or other methods to detect MBC.

CONCLUSION

MBC is rare, but heightened awareness of the increased risk in certain men by both physicians and patients may result in earlier detection. Guidelines for surveillance in men at increased risk suggest a management course similar to that recommended for women at increased risk, and include semi-annual clinical breast examinations, monthly breast self-examinations, baseline mammography and

annual follow-up mammography when indicated, and consideration of genetic testing when appropriate. The utility of mammography for evaluation of breast symptoms in the absence of other risk factors for MBC is not entirely clear, but evidence suggests that it may increase diagnostic accuracy.

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following statements be adopted in lieu of Resolution 105 (A-08) and that the remainder of this report be filed:

1. That our American Medical Association (AMA) recognize that breast cancer is a condition that affects males as well as females. (New HOD Policy)

2. That our AMA recognize that men who carry a known *BRCA* mutation, have a strong family history of cancer (especially male breast cancer), have a personal history of breast cancer, or have an altered estrogen-testosterone ratio are at increased risk of developing male breast cancer. (New HOD Policy)

3. That our AMA support the utilization of heightened surveillance methods when indicated, and consideration of genetic testing when appropriate, in men who are at increased risk of developing breast cancer. (New HOD Policy)

4. That our AMA support physician and patient education about the risks, signs, and symptoms of male breast cancer, and genetic consultation for males at increased risk and for their family members. (New HOD Policy)

5. That our AMA support Medicare and insurance coverage for male breast cancer surveillance and diagnostic methods, including clinical breast examination, mammography, genetic consultation, and genetic testing, when indicated. (New HOD Policy)

Fiscal Note: Less than $500 to update policy.

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TABLE 1. RISK FACTORS FOR MBC[2,5-7,15,25-43]

Known presence of *BRCA* mutation
History of *BRCA*-suggestive cancer, either in self or family
Estrogen exposure/androgen insufficiency
Klinefelter syndrome
Testicular abnormality
Obesity
Liver cirrhosis
Exogenous estrogen therapy
Radiation exposure
Occupational exposure
High ambient temperature
Estrogen exposure
Carcinogen exposure

TABLE 2. SCREENING AND SURVEILLANCE RECOMMENDATIONS FOR MEN AT INCREASED RISK* FOR DEVELOPING BREAST CANCER
Adapted from NCCN, USPSTF, ASCO and GeneTests recommendations[2,4,44,46,47]

Monthly breast self-examination
Semi-annual clinical breast examination
Baseline mammography followed by annual mammography if gynecomastia and/or breast density seen on baseline
Consider genetic testing, inform family members of risk and genetic testing options

*The increased risk category includes men with a strong family history of breast cancer (both FBC and MBC), a genetic predisposition, and prior personal history of MBC.