Burden of suffering
Breast cancer is the most frequently diagnosed cancer and is the second leading cause of cancer death among women in the United States. Projected for 1996 are 184,300 new cases of breast cancer and 44,300 breast cancer deaths. The five-year survival rate is 84% for Caucasian, non-Hispanic women and 69% for African-American women.(1) Risk factors for breast cancer include age, family history (FH), and familial cancer syndrome (FCS), as well as hormonal factors such as early menarche, late menopause, late parity, and nulliparity; however, the majority of women with breast cancer have no known risk factors. Risk factors, pathogenesis, prognosis, and course differ significantly in premenopausal and postmenopausal breast cancer.(2)

Description of preventive measures
Mammography is one of several screening tools for detecting early breast cancer. Other measures, such as clinical and self-breast examinations, will be addressed in future practice policy statements. During mammography, the breast should be compressed and two views taken. Plain film or xeromammography are appropriate.(3) Sensitivity is dependent on the quality of the equipment, competence of the radiology staff, and the density of the breast tissue.

Since implementation of the Mammography Quality Standards Act in 1994, all U.S. mammography centers must be certified by the Food and Drug Administration.

Evidence of effectiveness
Estimates of mammography sensitivity range from 75% to 90% with specificity from 90% to 95%. The positive predictive value of mammography for breast cancer ranges from 20% in women under age 50 to 60% to 80% in women age 50-69. Randomized clinical trials (RCTs) have demonstrated a 30% reduction in breast cancer mortality in women 50-69 years who are screened annually or biennially with mammograms. (4) The data on women under age 50 are less clear. Conclusions regarding the value of mammography in these women are
hampered by inadequately designed studies, including failure of randomization and inadequate sample size, low compliance in the intervention group, and high screening rates (cross-over) in the control groups. (5,6) A few studies have suggested adverse effects on mortality in the early years after screening implementation, but both the occurrence and potential etiology of these effects are poorly understood. (6,7) Even with meta-analysis, the combined sample sizes are too small to reach conclusions regarding the efficacy of screening women under age 50. (8) Likewise, data are sparse regarding efficacy of screening mammograms in women older than age 69. Constantly updated analyses of research on the effectiveness of mammograms for particular groups are available through the National Cancer Institute by calling 1-800-4-CANCER.

Public policy considerations
Currently, compliance with mammography guidelines is low, especially among women over age 60, those with low socioeconomic status, and ethnic minority women. Estimates vary widely; 10%-60% of women report having had mammograms in the preceding year, depending on the population and geographic area under consideration. (9) Low utilization of mammography has been blamed on financial/insurance barriers, lack of education, and most importantly, lack of encouragement by a physician. (10) Both primary care physicians and specialist physicians should encourage their patients to have routine mammography: a recommendation from a physician is the most important motivator for patients. Medical offices can improve patient compliance by using reminder systems, ancillary health personnel for health education, and a comprehensive approach to preventive services. Cost-effectiveness estimates of mammography screening--based on methodology, population, and interval--vary widely; it is estimated that breast cancer screening costs $3,400 to over $83,000 per life-year saved. (11) The potential cost-effectiveness of screening is higher when screening older populations, partly because the incidence of breast cancer increases with age.

Recommendations of other groups
The American Cancer Society, American College of Radiology, and the American College of Obstetricians and Gynecologists recommend screening mammography for women age 40-49 every 1-2 years and annually after age 50. The American College of Physicians recommends biennial screening for women age 50-74 years. The American Academy of Family Physicians, which recommends mammography screening for women over age 50, is currently updating its guidelines. The Canadian Task Force on the Periodic Health Examination recommends annual mammography for women age 50-69 and
recommends against mammography screening for women age 40-49. Similarly, the U.S. Preventive Services Task Force recommends mammography screening every 1-2 years for women age 50-69.

**Rationale**
Population-based mammography screening aims to reduce morbidity and mortality from breast cancer by early detection and treatment of occult malignancies. There is ample evidence from a variety of well-conducted RCTs that annual or biennial mammography is effective in reducing breast cancer mortality in women 50-69 years. The college provides no recommendations for women under 50 years because of lack of evidence of the efficacy of screening in this group and differences between premenopausal and postmenopausal women in breast density, breast cancer incidence, sensitivity and specificity of mammography, incidence of false-positive results, tumor growth, mortality rates, and the suggestion of increased mortality with mammography screening. Although data are sparse regarding the efficacy of mammography screening in women over age 69, similarities between women age 50-69 and older women in terms of breast density, sensitivity and specificity of mammography, tumor growth, mortality rates, and response to treatment, coupled with the higher incidence of breast cancer in this age group, point to a need to screen older women whose health would permit breast cancer treatment. (12) Lack of outcomes evidence makes it difficult to develop specific recommendations for high-risk women.

**American College of Preventive Medicine Recommendation For Mammography Screening**

**Low-risk women (no family history, familial cancer syndrome, or prior cancer)**
There is inadequate evidence for or against mammography screening of women under age 50. Women between ages 50 and 69 should have annual or biennial, high-quality, two-view mammography. Women aged 70 or older should continue undergoing mammography screening provided their health status permits breast cancer treatment.

**Higher-risk women**
Women with a family history of premenopausal breast cancer in a first-degree relative or those with a history of breast and/or gynecologic cancer may warrant more aggressive screening. Women with these histories often begin screening at an earlier age, although there is no direct evidence of effectiveness to support this practice. The future availability of genetic screening may define new recommendations for screening high-risk women. (13,14)
The college recommends further research to clarify the risk/benefit ratio of mammography screening for breast cancer in women under age 50, particularly to identify women in this age group who benefit most from screening. To compensate for inadequate sample size, another well-designed RCT, a meta-analysis using individual (rather than summary) data, or a well-designed population-based cohort or case-control study is needed. Further studies should address whether menopausal status rather than age is a better predictor of the utility of mammography screening and whether recommendations should be modified for women taking hormone replacement therapy.

REFERENCES


Adult Immunizations

Cervical Cancer Screening

Childhood Immunization

Screening Asymptomatic Women for Ovarian Cancer

Screening for Prostate Cancer

Screening for Skin Cancer

Skin Protection from Ultraviolet Light Exposure

Strengthening Motor Vehicle Occupant Protection Laws

Tobacco-Cessation Patient Counseling