EXECUTIVE SUMMARY

Objectives. In November 2009, the United States Preventive Services Task Force (USPSTF) updated its guidelines on routine screening for breast cancer. The updated recommendations are different from those of several other guideline-making groups and have contributed to the continuing debate about when routine screening mammography should begin and what its frequency should be. This report will highlight current screening mammography guidelines, explore the established benefits and harms of mammography, review the process by which the USPSTF developed its updated recommendations on screening mammography, and update the AMA’s current policy recommendations.

Data Sources. Literature searches were conducted in the PubMed database for English-language articles published between 2000 and 2012 using the search terms “screening mammography,” and “mammography AND USPSTF,” and “mammography AND 40.” To capture reports that may not have been indexed on PubMed, as well as news articles and press releases, periodic Google searches were conducted using the search terms “mammography,” “mammography AND USPSTF,” and “mammography AND 40.” Additional articles were identified by review of the literature citations in articles found in the PubMed and Google searches. Specific information on the USPSTF was obtained from its website.

Results. Screening mammography reduces mortality from breast cancer, including in women younger than age 50 years. However, screening mammography carries harms such as false-positive results that can lead to additional imaging and invasive biopsy procedures, and overdiagnosis that could lead to treatment in patients who may not benefit from it. The USPSTF considered the balance of benefits and harms using a commissioned targeted systematic evidence review of randomized clinical trials and a decision analysis that compared the expected health outcomes of starting and ending mammography at different ages and using annual and biennial screening strategies; it concluded (in part) that routine screening should begin at age 50 years and continue biennially until age 74 years. Several medical specialty societies, patient advocacy groups, and individuals offered either support for or opposition to the recommendations. Some groups have concurrently called for reform in the guideline development process.

Conclusions. Mammography is a proven method for detecting breast tumors, with demonstrated reductions in mortality for women who undergo regular screening. Associated harms exist, which underlie differences in recommendations regarding the frequency and age at which to begin and end screening. Groups developing guidelines have placed different emphasis on these harms, resulting in varied conclusions about whether benefits outweigh harms, and whether that balance changes in different age groups. Mammography screening guidelines themselves regularly undergo review and update processes; the Council believes that it is appropriate for AMA policies referencing such guidelines to be reviewed and updated as well, and offers revisions to AMA policy H-525.993 [Mammography Screening in Asymptomatic Women Forty Years and Older]. The foundation of the Council’s recommendation is the notion that every woman age 40 years and older who wants a routine screening mammogram and whose physician believes it is clinically appropriate should receive one, regardless of her insurance coverage status.
REPORT OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH

CSAPH Report 6-A-12

Subject: Screening Mammography
(Resolution 509, A-10, Resolve 1)

Presented by: Lee R. Morisy, MD, Chair

Referred to: Reference Committee E
(Frederick R. Ridge, Jr., MD, Chair)

INTRODUCTION

Resolution 509-A-10, introduced by the Illinois Delegation, asked that our American Medical Association (AMA): (1) recommend that physicians and patients continue to follow the guidelines of the American Cancer Society regarding screening mammography and patient breast self-examination; and (2) encourage government panels and task forces dealing with specific disease entities to have representation by physicians with expertise in those diseases. Resolve 1 was referred for decision; Resolve 2 was adopted.

The Board of Trustees considered Resolve 1 and referred it to the Council on Science and Public Health, asking for a report back on the issue of screening mammography, especially with regard to screening women ages 40-49 years. Accordingly, this report will highlight current screening mammography guidelines, explore the established benefits and harms of mammography, review the process by which the United States Preventive Services Task Force (USPSTF) developed its updated recommendations on screening mammography, and update the AMA’s current policy recommendations.

METHODS

Literature searches were conducted in the PubMed database for English-language articles published between 2000 and 2012 using the search terms “screening mammography,” and “mammography AND USPSTF,” and “mammography AND 40.” To capture reports that may not have been indexed on PubMed, as well as news articles and press releases, periodic Google searches were conducted using the search terms “mammography,” “mammography AND USPSTF,” and “mammography AND 40.” Additional articles were identified by review of the literature citations in articles found in the PubMed and Google searches. Specific information on the USPSTF was obtained from its website.

BACKGROUND

From 2002-2009, the USPSTF recommendations on breast cancer screening supported routine screening mammography, with or without a clinical breast exam, every 1-2 years for women age 40 years and older. These recommendations were similar to the recommendations of several other medical professional societies and cancer advocacy groups, including the American Cancer Society.
In November 2009, the USPSTF updated its guidelines on screening for breast cancer. These guidelines recommend against routine screening mammography in women aged 40-49 years, and recommend biennial screening mammography in women aged 50-74 years. The USPSTF concluded that the evidence was insufficient to recommend for or against routine screening mammography in women older than age 74 years. In December 2009, the USPSTF updated the language of its recommendation regarding women under age 50 years to clarify its original and continued intent. That recommendation now states: “The decision to start regular, biennial screening mammography before the age of 50 years should be an individual one and take patient context into account, including the patient’s values regarding specific benefits and harms.”

The USPSTF also updated recommendations on clinical breast examination (CBE), self-breast examination (SBE), digital mammography, and magnetic resonance imaging (MRI), however this report will focus on the recommendations for screening mammography.

RELEVANT AMA POLICY


With regard to recommendations directly addressing screening mammography in women between the ages of 40-49 years, AMA policy is the following:

H-525.993 Mammography Screening in Asymptomatic Women Forty Years and Older

1. Our AMA strongly endorses the positions of the American College of Obstetrics and Gynecology, the American Cancer Society, and the American College of Radiology that all women have screening mammography as per current guidelines. 2. Our AMA favors participation in and support of the efforts of the professional, voluntary, and government organizations to educate physicians and the public regarding the value of screening mammography in reducing breast cancer mortality. 3. Our AMA advocates remaining alert to new epidemiological findings regarding age-specific breast cancer mortality reduction following mammography screening. 4. Based on recent summary data our AMA recommends annual screening mammograms and continuation of clinical breast examinations in asymptomatic women 40 years and older. 5. Our AMA encourages the periodic reconsideration of these recommendations as more epidemiological data become available. 6. Our AMA supports seeking common recommendations with other organizations. 7. Our AMA reiterates its longstanding position that all medical care decisions should occur only after thoughtful deliberation between patients and physicians. (CSA Rep. F, A-88; Reaffirmed: Res. 506, A-94; Amended: CSA Rep. 16, A-99; Appended: Res. 120, A-02)

The original iteration of this policy was adopted in 1988, based on the recommendations in Council on Scientific Affairs Report F-A-88. The report recommended supporting annual screening mammography in women age 50 and older, and mammography screening every 1-2 years in
women aged 40-49 years. The policy was updated in 1999 by CSA Report 16-A-99, which recommended supporting annual screening mammography in asymptomatic women age 40 years and older. In 2002, with the adoption of Resolution 120-A-02, the policy was further amended to endorse the screening guidelines of ACOG, ACS, and ACR.

CURRENT MAMMOGRAPHY SCREENING GUIDELINES

Many organizations have developed or endorsed guidelines regarding screening mammography. The Table below summarizes the recommendations of several groups in this country, as well as those from the Canadian Task Force for Preventive Health Care and Britain’s National Health Service.

The USPSTF recommends routine screening mammography beginning at age 50 years and continuing biennially through age 74 years; the American Academy of Family Physicians (AAFP) endorses the recommendations of the USPSTF. For women aged 40-49 years, the USPSTF (with AAFP endorsing) and the American College of Physicians (ACP) recommend individual patient assessment for breast cancer risk, along with patient education about the benefits and limitations of mammography, as the basis for a decision to screen.

ACOG, ACR, ACS, and NCCN recommend annual routine screening mammography beginning at age 40 years. ACOG, ACS, and NCCN include in their guidelines a recommendation to discuss with women the predictive value of mammography and its limitations. ACOG states that based on individual risk, biennial screening may be appropriate for some women. ACOG, ACR, ACS, and NCCN guidelines do not specify an age at which screening should end. While NCCN states that the appropriate upper age limit has not yet been determined, ACR recommends continuation until life expectancy reaches less than five to seven years, and ACS recommends continuation as long as the patient is in good health. ACOG notes that women 75 years or older should, in consultation with their physicians, decide whether or not to continue mammographic screening.

<table>
<thead>
<tr>
<th>Organization (year recommendation updated)</th>
<th>Age at which routine screening should begin</th>
<th>Frequency</th>
<th>Age at which routine screening should end</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAFP (2009)</td>
<td>50</td>
<td>Biennial</td>
<td>75</td>
</tr>
<tr>
<td>ACOG (2011)</td>
<td>40 (with discussion)</td>
<td>Annual (Biennial may be appropriate for some)</td>
<td>Not specified</td>
</tr>
<tr>
<td>ACR/SBI (2010)</td>
<td>40</td>
<td>Annual</td>
<td>Life expectancy &lt;5-7 years</td>
</tr>
<tr>
<td>ACS (2003)</td>
<td>40 (with discussion)</td>
<td>Annual</td>
<td>As long as patient is in good health</td>
</tr>
<tr>
<td>NCCN (2011)</td>
<td>40 (with discussion)</td>
<td>Annual</td>
<td>Not yet established</td>
</tr>
<tr>
<td>USPSTF (2009)</td>
<td>50</td>
<td>Biennial</td>
<td>75</td>
</tr>
<tr>
<td>CTFPHC (2011)</td>
<td>50</td>
<td>Triennial</td>
<td>75</td>
</tr>
<tr>
<td>NHS (2011)</td>
<td>50 (expanding to 47)</td>
<td>Triennial</td>
<td>70 (expanding to 73)</td>
</tr>
</tbody>
</table>

Table: Screening mammography recommendations of several groups. Abbreviations are as follows: AAFP: American Academy of Family Physicians; ACOG: American Congress of Obstetricians and Gynecologists; ACR: American College of Radiology; SBI: Society of Breast Imaging; ACS: American Cancer Society; NCCN: National Comprehensive Cancer Network; USPSTF: United States Preventive Services Task Force; CTFPHC: Canadian Task Force for Preventive Health Care; NHS: National Health Service (Britain)

a. The AAFP endorses the USPSTF’s recommendations
b. ACR and SBI have joint recommendations.
c. Recommendation includes the discussion of the predictive value and limitations of mammography.
A survey of the International Breast Cancer Screening Network shows that 5 of 19 member countries recommend screening beginning at age 40 years, with most screening biennially. The recommendations of the different countries are, by and large, based on the same data, but reflect a difference of opinion in data interpretation.

It is important to note that the guidelines discussed in this report are for routine screening mammography, i.e., mammography for women who are at average risk for breast cancer. They are not appropriate for women at increased risk due to underlying genetic mutations (such as BRCA1 or BRCA2), family history, previous chest radiation, or other risk factors; guidelines for women at increased risk are substantially different.

BENEFITS AND HARMS OF SCREENING MAMMOGRAPHY

Breast cancer is the most common cancer in women in the U.S., with more than 200,000 women receiving a diagnosis of invasive breast cancer each year and nearly 40,000 dying. The average woman’s lifetime risk of developing breast cancer is 1 in 8, or 12%, however factors such as age, family or personal history of cancer, dense breasts, and previous exposure to chest radiography can increase risks. In the U.S., digital mammography has rapidly replaced the older method of film mammography. Though mammography is the most reliable breast cancer screening tool for the general population, it carries potential harm along with its benefits. Recommendations regarding screening frequency and age of initiation are based on the balance of benefits and harms.

Benefits of screening mammography

Mortality reduction. There is wide agreement that screening mammography leads to a reduction in breast cancer mortality, although disagreements exist about how to calculate such reductions. Randomized controlled trials (RCTs) have estimated the reduction in mortality across all age groups to be approximately 15-30%, while observational and modeling studies have estimated mortality reduction across all age groups to be higher, with a range of 30% to more than 40%. In RCTs, mortality reduction is based on the number of women invited to screen, rather than those who have actually undergone screening in the trial. This “number invited to screen” includes those women who are part of the screening arm of the trial but who decline screening. Those who fit into this category and who also die of breast cancer will be counted in the larger number of women in the screening arm that died of breast cancer. Based on this method, noncompliance to the screening protocol potentially underestimates the mortality reduction derived from screening. Similarly, women who are assigned to the control, non-screening arm sometimes seek mammography on their own, skewing the potential mortality reduction downward.

There have been few RCTs designed to determine mortality reduction from mammography screening in specific age groups; estimates have been derived from subanalyses of trials designed for other outcomes. Pooled data from RCT subanalyses show mortality reduction from mammography screening to be greatest in women aged 60-69 years (approximately 32%). For women aged 39-49 years and 50-59 years, pooled data show mortality reduction to be 15% and 14%, respectively. Although these values appear to indicate a similar mortality reduction for both of these age groups, it should be noted that estimated reductions are based on relative risk (risk of breast cancer mortality in women of a particular age group who undergo mammography versus those in the same age group who do not undergo mammography). Because a woman’s risk for breast cancer increases sharply with age, absolute mortality risk reduction (reduction in the overall risk of breast cancer mortality) from screening is greater for women aged 50-59 years than that for women aged 40-49 years. Mortality reduction estimates for women age 70 years and older are lacking because of insufficient data.
Subanalyses of trials designed to estimate benefit across larger age groups, as well as more recent retrospective studies, have shown benefits for women aged 40-49 years who undergo screening mammography.\textsuperscript{21,26,30} Between 40-49 years of age, tumors detected by mammography are smaller with less nodal metastasis (compared to those tumors detected without mammography), and 5-year and disease-free survival are improved.\textsuperscript{33} Additionally, a 2010 study showed that mammography in women younger than age 50 years with a family history of breast cancer increases cancer detection, reduces risk of advanced stage disease, and is associated with lower mortality and higher 10-year survival from invasive cancer.\textsuperscript{34}

Based on analyses of breast cancer mortality reduction before and after the implementation of screening programs, some argue that the observed reduction is only partially due to screening, with the rest due to improved therapy and management of breast cancer disease and to changes in staging techniques.\textsuperscript{25,35,36} However, this is refuted by others. In regions without formal screening but with access to improved treatments, the mortality rate did not decrease until screening was introduced.\textsuperscript{37,38}

It is possible that the mortality reduction associated with screening mammography could be greater. Only approximately 65% of women age 40 years or older report having undergone screening mammography within the last two years.\textsuperscript{39} Increasing adherence to recommendations could potentially increase the number of women in whom cancer is detected early, leading to greater mortality reduction.\textsuperscript{2,39}

**Harms of screening mammography**

Although there is broad agreement that screening mammography reduces mortality from breast cancer, it is not a perfect tool. Along with the intended early detection of invasive breast cancer, mammography carries with it potential harms, such as false-positive results, overdiagnosis, and exposure to radiation.

**False-positive results.** A false positive is defined as an abnormal screening mammography result that does not end in a diagnosis of invasive carcinoma or ductal carcinoma in situ (DCIS) within one year of the screening examination.\textsuperscript{40} The reported specificity of mammography is 94-97%.\textsuperscript{20,41} In other words, 94-97% of mammograms correctly rule out the presence of disease in disease-free individuals. Though this specificity appears to be high, it must be considered in the context of the number of mammograms performed. More than 33 million screening mammograms are performed in the U.S. each year.\textsuperscript{42} Taking into account the annual incidence of breast cancer (approximately 124 cases per 100,000 women),\textsuperscript{43} the reported specificity implies that every year, approximately 1-2 million women receive an abnormal mammography result that will turn out not to be breast cancer. Many of these women will undergo further imaging and invasive procedures.\textsuperscript{44} A 2011 study, designed to address limitations in previous estimates of false-positive rates,\textsuperscript{45-48} found that after 10 years of annual screening, the probability of receiving a recall (recommendation for immediate follow-up imaging) is 61.3%; this probability drops to 41.6% for 10 years of biennial screening.\textsuperscript{44} These estimates are similar whether screening begins at age 40 or 50 years. Older studies report that false-positive mammograms occur in 21-49% of all women after 10 mammography examinations, and in up to 56% for women aged 40-49 years.\textsuperscript{18} The probability of a false-positive biopsy recommendation (recommendation for biopsy, fine-needle aspiration, or surgical consult after imaging work-up) is 7-9% after 10 years of annual screening and 4-6% after 10 years of biennial screening.\textsuperscript{46} While biennial screening appears to decrease the probability of a
false-positive mammography result, it may be associated with an increase in the probability of a late-stage cancer diagnosis.\textsuperscript{44}

Many women who have been recalled for further screening become distressed, and some report persistent anxiety despite eventual negative results.\textsuperscript{18,49} Others report only transient anxiety.\textsuperscript{18,37} False-positive results appear to affect breast cancer-specific distress, anxiety, apprehension, and perceived risk rather than general depression and anxiety.\textsuperscript{18,50}

False-positive results can also affect adherence to screening recommendations. In a 2011 study, women who received a false-positive result were less likely to return for routine screening compared with women who received negative results.\textsuperscript{51} However, reattendance improved with the number of completed screening participations, suggesting that abnormal results in younger women (who have completed relatively few screens) are more likely to negatively impact reattendance than in women who have undergone several routine screens.\textsuperscript{51}

Variation in screening mammography specificity has been noted among physicians and facilities. For example, recall rates are lower and specificity rates higher among radiologists who have more years of experience interpreting mammograms.\textsuperscript{52,53} Higher specificity is seen at facilities that offer screening mammography alone (versus those that offer both screening and diagnostic mammography), have a breast-imaging specialist interpreting mammograms, and conduct audit reviews two or more times each year.\textsuperscript{54} AMA policy (H-525.985 Safety and Performance Standards for Mammography; see Appendix I) supports high quality standards of performance for those administering and interpreting mammograms, including “evidence of appropriate training and competence for professionals.”

\textbf{Overdiagnosis.} Overdiagnosis is the detection of cancer that would not have clinically surfaced in a person’s lifetime, usually because of lack of progressive potential.\textsuperscript{24} Overdiagnosis is easily confused with false-positive results, i.e., a positive screening result that is subsequently determined not to be cancer. In contrast, an overdiagnosis represents a case in which the pathological criteria for cancer has been fulfilled.\textsuperscript{55} Stable disease including some DCIS, indolent cancers, and slow-growing tumors are thought to be most commonly overdiagnosed by mammography.\textsuperscript{55,56} Some reports have concluded that a small percentage of mammography-detected cancers may spontaneously regress, although others have criticized this assertion.\textsuperscript{56-58}

Evidence for overdiagnosis comes from RCTs designed to demonstrate the benefit of mammography. In these trials, women are randomly assigned to screening mammography and non-screening mammography arms; since the assignments are random, the number of breast cancers that develop over time should be the same in each group.\textsuperscript{59} In the group receiving screening mammography, the number of women receiving breast cancer diagnoses will initially be higher than in the non-screening group, since the mammograms will detect tumors too small to be detected otherwise. With time, as the small tumors in women in the non-screening group grow and become detectable, the number of breast cancer diagnoses should become similar to those in the screening group. However, some trials have shown that breast cancer diagnoses in the screening group are persistently higher, even after many years. This persistent difference represents overdiagnosis.\textsuperscript{59}

Quantification of overdiagnosis is difficult; it is not ethnically possible to set up prospective clinical trials to determine which cancers will remain indolent if left untreated.\textsuperscript{60} Therefore, the proportion of mammography-detected breast cancers that are estimated to be overdiagnosed is widely variable, ranging between 1-30%; estimates are derived from screening programs in several countries that are statistically difficult to combine.\textsuperscript{18} Observational and modeling studies have attempted to
narrow the range. For example, a 2012 study used data from different geographic regions in
Norway, where screening mammography began at staggered times over a nine-year period. By
comparing breast cancer incidence in regions with a screening program to incidence in regions that
had yet not implemented screening, the study estimated that 15-25% of mammography-detected
breast cancers were overdiagnoses. Within different age groups, modeling studies have shown
only small differences in the rate of overdiagnosis. In general, the risk for overdiagnosis
increases with age, likely because in older age groups, rates of competing causes of mortality
increase. The difficulty in accurately estimating rates of overdiagnosis has led to arguments that
the estimates are artificially high, and are complicated by follow-up times, lead-time, and changes
in breast cancer incidence over several years.

Overdiagnosis is regarded by some as the most serious harm associated with mammography; at
the time of diagnosis, clinicians cannot know who has been overdiagnosed, so all are treated for
potentially lethal cancer. These patients will not benefit from treatment and almost certainly
will be harmed.

A perceived benefit of mammography screening is that it reduces the need for mastectomies and
increases the potential for breast-conserving treatment. However, a 31% increase in breast
surgery and 20% increase in mastectomy for women exposed to screening has been reported. A
2011 Norwegian study corroborated these findings, and concluded that overdiagnosis is likely to
have contributed to the increases in surgical intervention. Other studies have reported no
increase in the rate of mastectomy.

Radiation exposure. Little evidence exists to suggest that low-dose radiation exposure from
mammography is a significant risk. Widely-ranging cumulative radiation doses of 0.3-43.4 Gy
are thought to significantly increase the risk for breast cancer; the average dose for a bilateral,
two-view mammogram is 7 mGy or less, and for women aged 40-49 years, annual
mammography screening for 10 years (with potential additional imaging) exposes the individual to
approximately 60 mGy. The number of radiation-induced breast cancer deaths associated with
biennial screening between the ages of 50-74 years has been modeled at 1.6 per 100,000 women
screened. This model also predicts that extending the biennial screening period to women between
the ages of 40-74 years results in 3.7 radiation-induced breast cancer deaths per 100,000 women.
These rates are considered negligible, with screening benefits far outweighing the risk of radiation
exposure. For comparison, the ratio of breast cancer deaths prevented by mammography to the
number of deaths induced by radiation exposure is 684:1 for women aged 50-74 years, and 349:1
for women aged 40-74 years.

Special consideration of the effects of radiation exposure should be given to women who have
previously undergone diagnostic chest radiographs or had therapeutic radiation for other cancers.
These women are at increased risk for cancer since cumulative radiation exposure is increased.

THE USPSTF AND ITS RECOMMENDATIONS FOR SCREENING MAMMOGRAPHY

Background

The mission of the USPSTF is to review the scientific evidence for clinical preventive services and
develop evidence-based recommendations for primary care physicians as well as the broader
health care community. Congress codified the USPSTF as an independent body in 1998. Though
the Agency for Healthcare Research and Quality (AHRQ) is mandated to convene the USPSTF, its
sole role is to support the USPSTF by providing meeting space, organizing conference calls,
managing contracts for systematic reviews, and providing staffing.\footnote{71} No individual at AHRQ has a vote in the recommendations, or otherwise influences the priorities or decisions of the USPSTF.\footnote{71}

The USPSTF comprises 16 members who serve terms of 4-6 years; members are appointed by the AHRQ director based on recommendations developed by the USPSTF Chair and Vice-Chair following a public nomination process.\footnote{71} Members are experts in primary care and preventive health-related disciplines, and collectively possess expertise in evidence-based clinical research, screening, clinical epidemiology, behavioral science, health services research, outcomes and effectiveness in clinical preventive medicine, and decision modeling.\footnote{71} The USPSTF does not deliberately seek out task force members who are experts on specific topics; experts bring substantial knowledge regarding guideline development processes but also may retain inherent biases.\footnote{72,73} It is sometimes difficult for experts to fairly assess and critique studies that they or their colleagues have conducted, contradict beliefs entrenched since training, and recommend against services that may benefit themselves or their specialties.\footnote{72} Also, many experts in specific topic areas lack training in epidemiology and biostatistics.\footnote{72} The USPSTF is considered unique in that it convenes primary care providers and scientists with skills in objectively critiquing studies without preconceived views or a stake in the outcome.\footnote{72}

The USPSTF follows a detailed protocol for guideline development.\footnote{74} For each topic under consideration, an AHRQ evidence-based practice center conducts a systematic review of the evidence, which enables a subcommittee of the USPSTF to develop estimates of the magnitude and certainty of benefits and harms. These estimates are extensively reviewed by the full USPSTF in order to reach consensus and vote on recommendations. Cost and cost-effectiveness are not considered in the guideline development process.\footnote{71} A full explanation of the USPSTF’s evidence grading and subsequent recommendation system is published on the USPSTF website.\footnote{74}

Subspecialist experts in the disease at hand, as well as partner organizations, are asked to review and comment on USPSTF work at three points in the recommendation development process: 1. the initial analytic framework and key questions that drive the systematic review; 2. the systematic review itself; and 3. the draft recommendation statement. USPSTF partner organizations that are also members of the AMA Federation of Medicine are AAFP, ACOG, ACP, the American College of Preventive Medicine (ACPM), the American Academy of Pediatrics, and the American Osteopathic Association.

Recommendations for screening mammography

Plans for the update of the 2002 USPSTF recommendations on screening mammography began in late 2006. In 2007, the USPSTF commissioned two reviews: a targeted systematic evidence review of the benefits and harms of screening\footnote{75} and a decision analysis based on modeling techniques that compared the expected health outcomes of starting and ending mammography at different ages and using annual and biennial screening strategies.\footnote{24} The systematic review excluded studies other than RCTs and systematic reviews or those without breast cancer mortality as an outcome.\footnote{18,75} The systematic review included analyses of evidence regarding CBE, SBE, digital mammography, and MRI, but this section will focus on the evidence analyzed to develop recommendations on screening mammography.

In its 2009 update, the USPSTF recommended against routine screening mammography for women aged 40-49 years, and instead recommended an individualized decision to screen during this time period. This recommendation is partially based on findings in the commissioned systematic review.\footnote{18} The systematic review was carried out by the Oregon Evidence-based Practice Center, funded by AHRQ. Prior to its finalization, the draft report was reviewed by 15 experts not
affiliated with the USPSTF. These reviewers included one oncologist, an expert in modeling, two radiologists, one breast surgeon, and three physician/epidemiologists. The names of the reviewers are included in the full systematic review available on the National Library of Medicine website.

Mortality reduction was considered an important outcome in the formation of the recommendations. The systematic review estimated the mortality reduction for women aged 39-49 years, 50-59 years, and 60-69 years to be 15%, 14%, and 32% respectively. These estimates are similar to those established in the USPSTF’s 2002 systematic review, but include new data from an update of a previously completed trial, and another clinical trial completed after the review period. Since these mortality reduction estimates are based on relative risk, the USPSTF considered calculations of the number needed to invite for screening to prevent one death from breast cancer, which more clearly explains mortality reduction. The “number needed to screen” calculation is based on absolute risk, so it takes into account the background risk for breast cancer. This number can more clearly reflect the benefit of mammography in each age group since it includes the increasing absolute risk of breast cancer with advancing age. The number needed to invite for screening (to prevent one death) is 1904 for women aged 40-49 years, 1339 for women aged 50-59 years, and 377 for women aged 60-69 years.

In addition to the mortality reduction benefit associated with mammography, the USPSTF considered harms. In some studies, the probability of receiving a false-positive mammography result is slightly higher in women aged 40-49 years. A false-positive mammography result often leads to additional imaging, and after several years participating in a screening program, nearly 10% of women receive a false-positive biopsy recommendation. Though the range of reported overdiagnosis is large, between 1-30%, and therefore difficult to estimate precisely, it is a risk that many agree is serious, since it leads to treatment that may not be necessary. Radiation exposure was not considered to be a serious risk of screening mammography, except for the small percentage of the population previously exposed to chest radiography and therapeutic radiation.

The USPSTF-commissioned decision analysis compared the expected health outcomes of starting and ending mammography at different ages and using annual and biennial screening strategies. For the screening models compared, biennial screening retains 70-99% of the reduction in mortality that occurs with annual screening, depending on the age range for screening. The models predict that beginning screening at age 40 years yields an additional 3% mortality benefit compared with beginning screening at age 50 years. This additional mortality benefit is the same with either annual or biennial screening beginning at age 40 years. Extending screening to age 79 years yields an additional 8% or 7% mortality benefit compared with screening programs ending at age 69 years, for annual and biennial screening, respectively. If the two strategies are compared, these data indicate that greater mortality reduction could be achieved by continuing screening past age 69 years rather than by initiating it at age 40 years. However, if life-years gained is considered, models show that initiating screening in younger women rather than extending screening in older women results in more benefit; this is not surprising since younger women have longer life expectancies than older women. Annual screening between the 29 year period comprising ages 40-69 years yields a median of 33 life-years gained per 1000 women screened, whereas annual screening between the 29 year period comprising ages 50-79 years yields a median of 24 life-years gained per 1000 women screened. Biennial screening with these parameters yielded 25 and 23.5 life-years gained in the two groups, respectively.

The decision analysis also compared the harms associated with different screening models. Annual screening between ages 40-69 years yields 2,250 false positive results for every 1000 women screened over the 29 year period, almost twice as many as that of a biennial screening period.
Consequently, many more women who are screened annually will undergo biopsy compared with those who are screened biennially. The models also predict an increase in the risk of overdiagnosis as age increases. Overall, initiating screening at age 40 years (compared to age 50 years) had a smaller effect on overdiagnosis than extending screening beyond age 69 years. Overdiagnosis risk was smaller with biennial screening, but by less than half.

The USPSTF studied the balance of benefits and harms of mammography, as well as the results of the systematic review and the decision analysis study, to develop its final recommendations. It concluded that compared with initiating screening at age 50 years, screening mammography provides a small benefit when performed annually in women aged 40-49 years, but is more likely to be accompanied by false-positives and overdiagnosis, resulting in a smaller net benefit. The ages at which the balance of benefits and harms becomes acceptable to individuals and society are not clearly resolved by available evidence. Because of the small net benefit, the USPSTF concluded that mammography in women aged 40-49 years should not be automatic, but should instead be initiated as a result of an individual decision based on the woman’s specific clinical situation, preferences, and values regarding the potential benefits and harms.

REACTION TO USPSTF RECOMMENDATIONS

The 2009 USPSTF screening mammography recommendations were met with opposition by several medical specialty societies, public advocacy groups and individuals in the medical community. ACR stated that the USPSTF recommendations were “ill-advised” and would result in “countless unnecessary breast cancer deaths each year.” ACOG, ACS, the Radiological Society of North America, the Society of Breast Imaging, the American Society of Breast Disease, and other groups also publicly stated opposition to the recommendations. Most reiterated support of guidelines that recommend routine screening mammography beginning at age 40 years. Several publications addressing perceived flaws in the interpretation of data by the USPSTF have appeared in peer-reviewed journals.

Among the criticisms of the USPSTF process was reliance on only RCTs in the evidence review, with the exclusion of additional observational studies showing higher mortality benefit and reduced numbers needed to screen. Several studies, including some RCTs, did not meet the USPSTF’s strict inclusion criteria; others received only a grade of “fair” for their shortcomings. Another criticism was the use of the “number needed to invite for screening” value, rather than the number actually screened. The USPSTF reported that the level of participation in the trials was high, and that data from trials with lower participation rates was graded as lower quality. The USPSTF also reported that the use of only participating women, rather than those who were merely invited to screen, yielded only a slightly higher benefit.

In contrast to the opposition, several organizations, including those representing primary care physicians and public health providers, expressed public support for the 2009 USPSTF recommendations. In a letter to members of Congress, 11 health care organizations, including the AAFP, ACP, and ACPM defended the recommendations. The AAFP also joined with four of its affiliate groups to urge the Secretary of the Department of Health and Human Services to reject calls to remove the USPSTF recommendations from the AHRQ website. Advocacy groups, including the National Breast Cancer Coalition, Breast Cancer Action, and the National Women’s Health Network also publicly supported the USPSTF recommendations.

Media coverage of the USPSTF recommendations was often controversy-oriented. A recent study reported that more than half of media reports about the recommendations took an unsupportive stance; nearly 70% of reports included the belief that “delayed screening leads to
more breast cancer and related deaths” or concern over “cost and government rationing of health
care.” Nineteen percent of the reports took a supportive stance, based on beliefs that “the
recommendations were based on science” and that there is “potential harm in mammography.”
Not surprisingly, laywomen who had, or currently have, breast cancer were angered by the
recommendations, strongly believing that mammography saved their lives. The opinions of
women who have not experienced breast cancer also were strongly influenced by media coverage,
with women who had viewed commentary that was critical of the USPSTF guidelines more likely
to overestimate individual risk for breast cancer and feel uncomfortable about delaying
mammography until age 50 years, compared to those who viewed commentary that supported the
USPSTF guidelines.

At the time that the recommendations were released, the country was deeply involved in the debate
about health care reform. Since the USPSTF is convened by a government agency (AHRQ),
several media outlets and others expressed serious concern that the recommendations would be
binding in government health care policy. Several journal publications expressed the opinion that
USPSTF is an “opponent of screening” and that its recommendations were intended to restrict
patient access to mammography.26,38,86 Others joined in suggesting that the recommendations
would directly affect costs and insurance coverage for breast cancer screening, and calls were made
for Congress to intervene. In response, in early December 2009, the Senate passed 2 amendments
to its proposed health care reform legislation: one requiring the federal government to effectively
ignore the new recommendations, and the other guaranteeing no-cost breast screening for women
in their 40s. These provisions were signed into law in 2010 as part of the Affordable Care Act.

INDIVIDUAL AND RISK-BASED SCREENING

The USPSTF is not the first group recommending an individualized, risk-based approach to
mammography screening in women aged 40-49 years,8 but the attention paid to the mammography
recommendation has highlighted consideration of that approach. Individualized screening refers to
screening mammography at an age and frequency decided upon by both physician and patient,
based on the physician’s assessment of patient clinical factors that influence breast cancer risk and
the patient’s values regarding the balance of benefits and harms of screening mammography.

Data suggest that women themselves want to be involved in the decision to initiate screening
mammography, and often request specific information prior to their first mammogram, including
information about benefits and harms.101 Women acknowledge anxiety about false positives, but
show little awareness of overdiagnosis.102 Physicians have an ethical obligation to educate women
with balanced information appropriate to the desire expressed by each patient for such
information.102 Model physician-patient dialogue and patient decision aids have been developed as
resources to support the shared decision-making underlying the individualized screening
approach.103-105

Some argue that the individualized risk-based screening approach will fall short in effectively
detecting early cancer. A large percentage of cancers are diagnosed in women with no apparent
risk factors, suggesting that relying on the identification of personal or family risk factors to
indicate the need for mammography will miss many cancers that could have been detected by
mammography.106,107 Also, randomized data are lacking to support a risk-based approach between
the ages of 40-49 years since no RCTs have stratified participants by risk.106 However, there are
hints that a risk based approach may be effective. In a recent single arm (non-controlled) study,
women ages 40-50 years at intermediate risk for breast cancer (those with at least one first-degree
relative with breast cancer) who were screened annually had smaller tumors that were less likely to
be node-positive when compared to control groups from other studies.34 Additionally, a meta-
analysis and systematic review examining several risk factors found that breast cancer in a first-degree relative and extremely dense breasts were associated with increased risk in women ages 40-49 years. An accompanying modeling study found that for women with either one of those two risk factors, biennial screening mammography beginning at the age of 40 years has the same balance of benefits and harms as that for biennial screening mammography beginning at age 50 years in women without those risk factors.

The individualized approach relies heavily on the identification of red flags in a patient’s family history, yet many patients do not receive adequate familial cancer risk assessment in the primary care setting. Further, a patient’s family history will change over time as family members’ health status changes. Clinically relevant family history changes substantially during early and middle adulthood (between the ages of 30-50 years), particularly for breast cancer. If a patient’s family history is not updated adequately during those years, risk factors that would indicate a need for more intensive screening will be missed. Some physicians also do not follow recommendations for referral of women for high-risk cancer genetic counseling, suggesting that estimation of breast cancer risk by these physicians is faulty. This behavior may reflect a misunderstanding of what constitutes “high risk,” since definitions are variable.

GUIDELINE REFORM

The controversy stemming from the 2009 USPSTF recommendations has brought attention to the process of guideline development. ARHQ’s National Guideline Clearinghouse contains close to 2,700 clinical practice guidelines, and the number of groups issuing guidelines has proliferated, along with substantially different development methodologies. The Clearinghouse was originally created by AHRQ in partnership with the AMA and the American Association of Health Plans (now America’s Health Insurance Plans). With the growth in the number of guidelines being developed, physicians, consumer groups, and other stakeholders have expressed concern about the quality of the processes used to develop guidelines, and the resulting questionable validity of many guidelines. Concerns stem from limitations in the scientific evidence base, a lack of transparency in the methodologies used by guideline-developing groups, conflict of interest among guideline-developing group members and funders, and uncertainty regarding how to reconcile conflicting guidelines. Additionally, significant variability in the recommendations of guidelines can lead to confusion and frustration on the part of health care providers and patients.

Specific to mammography guidelines, a recent study suggests that guideline development reform is needed. The study assessed the quality of guidelines that provide recommendations on mammography screening in asymptomatic women aged 40-49 years, and concluded that both the evidence reviews underlying the guidelines, as well as the guidelines themselves, were of vastly different quality. Based on quality assessment instruments, the study assigned an overall assessment for use in clinical practice to each of the guidelines. Of the 11 guidelines studied, only three received “strongly recommend” or “recommend” assessments. The remaining guidelines were found to have deficiencies in their development processes, and were given “unsure” or “would not recommend” assessments.

In response to concerns that the guideline development process is widely variable, thus leading to guidelines that are variable in quality, the Institute of Medicine (IOM) recently undertook a project to define standards for guideline development. The standards, released in Spring 2011, promote the development of unbiased, valid, and trustworthy guidelines that incorporate a grading system for characterizing the quality of evidence and strength of clinical recommendations. Standards are focused on establishing transparency, managing conflicts of interest, composition of the development group, systematic review use, evidence strength, articulation of recommendations,
CONCLUSIONS

Mammography is a proven method for detecting breast tumors, with demonstrated reductions in mortality for women who undergo regular screening. The potential for harm exists, which underlies differences in recommendations regarding the frequency and age at which to begin and end screening. Groups developing guidelines have placed different emphasis on these harms, resulting in varied conclusions about whether benefits outweigh the harms, and whether that balance changes in different age groups. The USPSTF carefully considered the balance of harms and benefits while studying this issue, commissioning a systematic evidence review and a modeling study to inform its recommendations. It has endured criticism from those who disagree with its recommendations but has stood by them. The USPSTF and others, some of whom disagree with the USPSTF recommendations, have stated that this issue is a case in which qualified and competent physicians and researchers can review and interpret the same evidence but come to different conclusions.76,84

The Council is respectful of the time, expertise, and thought that guideline-developing groups, many of whom are represented in the AMA House of Delegates (HOD), have devoted to the topic of mammography screening. Importantly, all are working toward one goal, to optimize the health outcomes for those with breast cancer and to minimize harms to those without. Previous consideration of this subject in the context of Resolution 509-A-10 revealed deep disagreements within the HOD, but the Council notes that agreements exist as well: that mammography is the best existing tool for the routine detection of breast cancer and that it has its shortcomings. The Council also strongly believes that every woman age 40 years or older who wants a screening mammogram and whose physician recommends one should receive one, regardless of her insurance coverage status.

AMA POLICY CONSIDERATIONS

The Council has given much thought to the mammography screening policies of the AMA. Most remain valid and important, even in light of the recent controversy following the USPSTF recommendations. Mammography screening guidelines themselves regularly undergo review and update processes, and the Council believes that it is appropriate for AMA policies referencing such guidelines to be reviewed and updated as well. Indeed the very policy under consideration, Policy H-525.993 [Mammography Screening in Asymptomatic Women Forty Years and Older], encourages periodic review of its recommendations. There are several parts to this policy, which the Council addresses in turn below.

Part 1 of H-525.993 states: “Our AMA strongly endorses the positions of the American College of Obstetrics and Gynecology, the American Cancer Society, and the American College of Radiology that all women have screening mammography as per current guidelines.” Given the role of the AMA in representing hundreds of different medical societies, the Council does not believe it is appropriate to single out support for the guidelines of particular societies. This is not a comment on the content of such guidelines, rather it reflects the equity of all members of the HOD and respect for their professional expertise.

Part 2 of H-525.993 states: “Our AMA favors participation in and support of the efforts of the professional, voluntary, and government organizations to educate physicians and the public regarding the value of screening mammography in reducing breast cancer mortality.” The Council...
strongly supports educating physicians and the public about mammography, including its value and its limitations.


Part 4 of H-525.993 states: “Based on recent summary data our AMA recommends annual screening mammograms and continuation of clinical breast examinations in asymptomatic women 40 years and older.” The Council recognizes the difficulty faced by guideline-making groups when balancing the proven and quantifiable mortality reduction of screening mammography with the nearly impossible task of quantifying harms, including overdiagnosis and anxiety/mental anguish associated with false-positives. Not having undergone the rigorous processes of guideline-making groups (and not equipped to do so), the Council cannot in good faith recommend a frequency and specific age at which screening mammography should begin, nor does it believe that the AMA, representing the divergent views of many guideline-making groups who are also members of the HOD, should do so. However, the Council strongly supports the autonomy of physicians and their responsibility to care for patients in a manner in which they believe is appropriate; this includes beginning annual mammography at age 40 years when it is believed to be clinically appropriate. Support for clinical breast examination is included in a separate policy, H-525.985 [Safety and Performance Standards for Mammography].

Part 5 of H-525.993 states: “Our AMA encourages the periodic reconsideration of these recommendations as more epidemiological data become available.” The Council agrees.

Part 6 of H-525.993 states “Our AMA supports seeking common recommendations with other organizations.” The Council is aware that differing recommendations can cause confusion and frustration for physicians and patients, and therefore believes that common recommendations are in the best interest of the clinical practice and patients. The Council cites as a best practice the “Consensus Points on Screening Mammography,” (see Appendix II) jointly developed by the ACP and ACR to assist physicians and patients in their discussions of mammography. For common recommendations to retain value, it is important that they be based on an approach that is unbiased, valid, and trustworthy.

Part 7 of H-525.993 states: “Our AMA reiterates its longstanding position that all medical care decisions should occur only after thoughtful deliberation between patients and physicians.” The Council strongly agrees and notes that this is the foundation of recommendations that advocate an individualized approach to screening mammography between the ages of 40-49. Specific to the USPSTF, AMA policy H-410.967 [Guide to Clinical Preventive Services] states that the USPSTF guidelines “…should not take the place of clinical judgment and the need for individualizing care with patients; physicians should weigh the utility of individual recommendations within the context of their scope of practice and the situation presented by each clinical encounter.”

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following statement be adopted in lieu of Resolve 1, Resolution 509-A-10, and the remainder of the report be filed:

That Policy H-525.993 “Mammography Screening in Asymptomatic Women Forty Years and Older” be amended by insertion and deletion as follows:
Screening Mammography: Screening in Asymptomatic Women Forty Years and Older

Our AMA:

1. Our AMA a. recognizes the mortality reduction benefit of screening mammography and supports its use as a tool to detect breast cancer, while also recognizing that there are small, but not inconsequential, harms associated with it, including false positive results and overdiagnosis.

b. Recognizes that as with all medical screening procedures, there are small, but not inconsequential, associated risks including false positive and false negative results and overdiagnosis. Strongly endorses the positions of the American College of Obstetrics and Gynecology, the American Cancer Society, and the American College of Radiology that all women have screening mammography as per current guidelines.

2. Our AMA c. favors participation in and support of the efforts of the professional, voluntary, and government organizations to educate physicians and the public regarding the value of screening mammography in reducing breast cancer mortality, as well as its limitations.

3. Our AMA d. advocates remaining alert to new epidemiological findings regarding screening mammography age-specific breast cancer mortality reduction following mammography screening as well as associated harms. Based on recent summary data, our AMA recommends annual screening mammograms and continuation of clinical breast examinations in asymptomatic women 40 years and older. 5. Our AMA and encourages the periodic reconsideration of these recommendations as more epidemiological data become available.

4. Based on recent summary data, our AMA recommends annual screening mammograms and continuation of clinical breast examinations in asymptomatic women 40 years and older.

5. Our AMA e. believes that beginning at the age of 40 years, all women should be eligible for screening mammography. Physicians should regularly discuss with their individual patients whether screening mammography is appropriate for them. This discussion should include reminders about the benefits and harms of mammography, an update of the patient’s family history, consideration of other breast cancer risk factors, and the mammography recommendations of various medical organizations, in particular where those recommendations differ between organizations.

f. encourages physicians to regularly discuss with their individual patients the benefits and risks of screening mammography, and whether screening is appropriate for each clinical situation given that the balance of benefits and risks will be viewed differently by each patient.

e.g. encourages physicians to inquire about and update each patient’s family history to detect red flags for hereditary cancer and to consider other education on the identification of risk factors for breast cancer, including the value of taking a thorough family history to detect red flags for hereditary cancer, so that recommendations for screening will be appropriate.

f. h. supports insurance coverage for screening mammography.

6. Our AMA e. i. supports seeking common recommendations with other organizations, informed and respectful dialogue as guideline-making groups address the similarities and differences among their respective recommendations, and adherence to standards that ensure guidelines are unbiased, valid, and trustworthy.
7. Our AMA reiterates its longstanding position that all medical care decisions should occur only after thoughtful deliberation between patients and physicians. (Modify HOD Policy)

Fiscal note: Less than $500
REFERENCES


34. FH01 collaborative teams. (2010) Mammographic surveillance in women younger than 50 years who have a family history of breast cancer: tumour characteristics and projected effect on mortality in the prospective, single-arm, FH01 study. Lancet Oncol 11:1127-1134.


Appendix I. Relevant AMA Policies on Screening Mammography

**H-55.993 Early Detection of Breast Cancer**
(1) The AMA supports public education efforts to help women recognize their important role in breast self-examination and to encourage them to report immediately to their physicians any changes that they notice. (2) The AMA encourages physicians to educate their patients in the process of breast cancer detection, emphasizing the technique of self-examination of their breasts. (3) Physicians requesting mammographic examinations should refer their patients to radiologists who use properly functioning equipment that provides the best image resolution at the lowest level of radiation exposure. (4) Physicians are encouraged to recognize the importance of mammography as an effective screening device to detect early breast cancer. (5) The AMA encourages pharmaceutical companies to include in the packaging of their contraceptives, and all female hygiene products, materials which promote the package and correct techniques of breast self-examination, and which stress the importance of physician breast examinations and appropriate use of screening mammography. (CSA Rep. A, I-83; Reaffirmed: CLRPD Rep. 1, I-93; Res. 501, I-95; Reaffirmed and Modified: CSA Rep. 8, A-05)

**H-55.984 Screening and Treatment for Breast and Cervical Cancer**
The AMA: (1) supports increased funding for comprehensive programs to screen low income women for breast and cervical cancer and to assure access to definitive treatment; and (2) encourages state and local medical societies to monitor local public health screening programs to assure that they are linked to treatment resources in the public or private sector. (Res. 411, A-92; Reaffirmed: CSA Rep. 8, A-03)

**H-55.985 Screening and Education Programs for Breast and Cervical Cancer Risk Reduction**
Our AMA supports (1) programs to screen all women for breast and cervical cancer and that government funded programs be available for low income women and (2) the development of public information and educational programs with the goal of informing all women about routine cancer screening in order to reduce their risk of dying from cancer. (Res. 418, I-91; Reaffirmed: Sunset Report, I-01; Reaffirmed: CSAPH Rep. 1, A-11)

**D-525.998 Mammography Screening for Breast Cancer**
In order to assure timely access to breast cancer screening for all women, our AMA shall advocate for legislation that ensures adequate funding for mammography services. (Res. 120, A-02)

**H-525.993 Mammography Screening in Asymptomatic Women Forty Years and Older**
1. Our AMA strongly endorses the positions of the American College of Obstetrics and Gynecology, the American Cancer Society, and the American College of Radiology that all women have screening mammography as per current guidelines. 2. Our AMA favors participation in and support of the efforts of the professional, voluntary, and government organizations to educate physicians and the public regarding the value of screening mammography in reducing breast cancer mortality. 3. Our AMA advocates remaining alert to new epidemiological findings regarding age-specific breast cancer mortality reduction following mammography screening. 4. Based on recent summary data our AMA recommends annual screening mammograms and continuation of clinical breast examinations in asymptomatic women 40 years and older. 5. Our AMA encourages the periodic reconsideration of these recommendations as more epidemiological data become available. 6. Our AMA supports seeking common recommendations with other organizations. 7. Our AMA reiterates its longstanding position that all medical care decisions should occur only after thoughtful deliberation between patients and physicians. (CSA Rep. F, A-88; Reaffirmed: Res. 506, A-94; Amended: CSA Rep. 16, A-99; Appended: Res. 120, A-02)
H-525.985 Safety and Performance Standards for Mammography
Our AMA actively encourages the development of new activities, and supports the coordination of ongoing activities, to ensure the following: (1) that the techniques used in performing mammograms and in interpreting mammograms meet high quality standards of performance, including evidence of appropriate training and competence for professionals carrying out these tasks; (2) that the equipment used in mammography is specifically designed and dedicated. The performance of mammography imaging systems is assessed on a regular basis by trained professionals; (3) that the American College of Radiology Breast Imaging Reporting and Database System is widely used throughout the United States and that mammography outcome data in this database are used to regularly assess the effectiveness of mammography screening and diagnostic services as they are provided for women in the United States; and (4) regular breast physical examination by a physician and regular breast self-examination should be performed in addition to screening mammography. (BOT Rep. JJ, A-91; Reaffirmed: Sunset Report, I-01; Reaffirmed: CSAPH Rep. 1, A-11)
Appendix II. ACP–ACR Consensus Points on Screening Mammography

1. Screening mammography has been shown to decrease the number of deaths from breast cancer in women ages 40-74.

2. The benefits and harms associated with screening vary by age, and women will view these benefits and harms differently. Thus, all women should discuss the benefits and harms of breast cancer screening with their primary care provider.

3. Breast cancer incidence increases steadily with age. There is no abrupt change in incidence at age 50. Additionally, the outcomes of screening (recall rates, biopsy recommendation rates, and cancer detection rates) also change steadily with increasing age, without any sudden change at the age of 50.

4. Younger women have a lower risk of breast cancer but more potential years of life saved by detection and successful treatment.

5. Since women over the age of 74 were not included in the randomized, controlled trials, there is no proof that screening saves lives in older women. Decisions about screening in this age group should be individualized and made between a woman and her primary care provider.

6. The majority of breast cancers occur in women without major risk factors.

7. There are false positive screening studies at all ages that result in women being recalled for additional evaluation that ultimately shows no evidence of cancer. With increasing age, there is a gradual decrease in the percentage of false positives as the incidence of breast cancer increases.

8. It is important to note that mammography does not find all cancers, and some cancers that are detected may not be found early enough to result in a cure. If a woman discovers a lump, even after having had a negative mammogram, she should bring it to her doctor’s attention. If a clinician remains concerned about a clinically evident finding, even after a negative mammogram, the finding should be evaluated further.

9. The primary benefit of screening mammography is a reduction in mortality from breast cancer.

10. The potential harms associated with screening mammography include:

   a. Transient discomfort from the study

   b. Recall for a false positive mammogram resulting in anxiety and inconvenience; the majority of these are resolved by additional mammographic views and/or ultrasound

   c. The need for biopsy of a lesion that is ultimately proven to be benign

   d. Treatment of a cancer that would not have become clinically significant. At present, we are unable to distinguish cancers that have lethal potential from those
that do not, whether or not they are clinically evident or detected by screening mammography. Consequently, all women being evaluated for breast cancer, no matter how it was detected, should be informed that it is possible they may undergo treatment for a cancer that might not have lethal potential.

11. Third-party payers should cover screening mammography for all women ages 40 and above who elect to be screened.