

Supplementary Online Content

Oeffinger KC, Fontham ETH, Etzioni R, et al. Breast cancer screening for women at average risk: 2015 guideline update from the American Cancer Society. *JAMA*. doi:10.1001/jama.2015.12783.

eMethods

This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods

Process for American Cancer Society Update of Breast Cancer Screening Guideline 2015

Formulate questions and define approach to evidence review.

- Guideline Development Group (GDG) develops Critical and Important Outcomes and Key Questions using PICOTS (Population, Intervention, Comparison, Outcomes, Timing, Setting) framework.
- GDG selects independent evidence review team through a Request for Proposal process.
- An independent group of twenty-two professionals including research methodologists, experts in cancer screening, and clinicians in relevant specialties such as radiology and oncology, were invited to serve as expert advisors to the GDG.
- Expert advisors provide comments, and evidence review team and GDG refine research protocol.

Produce evidence report.

- The Duke University Evidence Synthesis Group performs a systematic evidence review of the scientific literature, including synthesis of the evidence and rating the quality of evidence using Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group criteria.
- GDG provides comments on an initial draft report; expert advisors and GDG review second draft evidence report.
- Evidence review team revises and produces final report.
- To address identified gaps, GDG commissions supplemental analysis on intervals from Breast Cancer Surveillance Consortium (BCSC) and SEER disease burden data from ACS Surveillance and Health Services Research Program.
- GDG member and staff perform supplemental literature searches on clinical breast examination and modeling studies of effects on quality-adjusted life years.

Develop and grade recommendations.

- GDG considers evidence and deliberates based on GRADE domains (balance between desirable and undesirable outcomes, values and preferences, and confidence in the magnitude of the effects on outcomes).
- GDG rates proposed recommendations as “strong” or “qualified” according to GRADE criteria.
- The ACS Mission Outcomes Committee and Board of Directors review and approve proposed recommendations.
- Stakeholder organizations and expert advisors review proposed recommendations; GDG determines any modifications and response.

Disseminate guideline recommendations.

- Recommendations and rationale and evidence report are published in a peer-reviewed journal.
- Full evidence report is posted on ACS website, at www.cancer.org.

- Communication plan is implemented to promote understanding and minimize confusion.
- ACS information and education resources and practice tools are revised to present, explain, and facilitate new recommendations.

Guideline Development Group Voting Process

Development of recommendation wording and grading was an iterative process and took place in one face-to-face meeting and teleconferences of the GDG subgroup charged with leading this guideline update and in teleconferences and email voting surveys (some blind and some open, with consent of the members) of the full committee. Full agreement was reached on the basic elements of all recommendations with the exception of one dissenting opinion about beginning screening at age 45 vs. age 40. For some recommendations, subsequent discussion and multiple rounds of voting were held to resolve disagreements about wording and achieve greater clarity. At least 9 of 11 GDG members agreed to the final wording of each recommendation.

Organizations Invited to Review the Breast Cancer Screening Guideline

1. Agency for Health Care Research and Quality (AHRQ)
2. American Academy of Family Physicians (AAFP)
3. American College of Preventive Medicine (ACPM)
4. American College of Obstetricians and Gynecologists (ACOG)
5. American College of Physicians (ACP)
6. American College of Radiology (ACR)
7. American College of Surgeons Commission on Cancer (CoC)
8. American Society for Radiation Oncology (ASTRO)
9. American Society of Clinical Oncology (ASCO)
10. American Society of Clinical Pathologists (ASCP)
11. American Society of Preventive Oncology (ASPO)
12. Centers for Disease Control and Prevention, Division of Cancer Prevention and Control (CDC)
13. College of American Pathologists (CAP)
14. International Society of Breast Pathology (ISBP)
15. Living Beyond Breast Cancer (LBBC)
16. National Accreditation Program for Breast Centers (NAPBC)
17. National Committee for Quality Assurance (NCQA)
18. National Comprehensive Cancer Network (NCCN)
19. National Consortium of Breast Centers (NCBC)
20. Nurse Practitioners in Women's Health (NPWH)
21. Oncology Nursing Society (ONS)
22. Radiological Society of North America (RSNA)
23. Society of Breast Imaging (SBI)
24. Society of General Internal Medicine (SGIM)
25. Susan G. Komen for the Cure
26. US Preventive Services Task Force (USPSTF)

Additional Disclosures

The following disclosures of non-financial (personal, intellectual, and practice-related) relationships and situations were made by the authors, as a part of the conflict disclosure and management requirements for all participants in American Cancer Society guideline development. (All financial conflict of interest disclosures are included in the Acknowledgement Section at the end of the article.)

Kevin C. Oeffinger reports having served as a member of the American Cancer Society Board of Directors through December 2013 and as a member of the Children's Oncology Group Survivorship and Outcomes Steering Committee. He also reports conducting NIH-supported research investigating optimal cancer screening approaches (including breast cancer screening) for childhood, adolescent, and young adult cancer survivors and serving as an author of two systematic reviews on this topic. In those papers, the authors recommend breast cancer screening with annual mammography and breast MRI starting at age 25 or 8 years after radiation for women previously treated with chest radiation prior to age 30.

Elizabeth T. H. Fontham reports having served as an officer of the American Cancer Society Board of Directors, being a member of the ACS Mission Outcomes Committee, and having been a co-author of other cancer screening guideline recommendations.

Ruth Etzioni reports having served as a member of prostate cancer screening guideline panels of the American Urological Association and the National Comprehensive Cancer Network. She also reports having published several papers on the topic of overdiagnosis in breast cancer screening in recent years and being the recipient of an NIH grant on this topic.

Abbe Herzig reports being employed by 3M Health Information Systems and having been previously employed by Consumer Reports. She served previously as a consumer representative on the ACS cervical cancer screening guideline. She reports having publically expressed opinions on breast cancer screening and individual decision-making in her role at Consumer Reports and as a breast cancer survivor.

James S. Michaelson reports having provided and being compensated for expert testimony in a number of malpractice cases involving delay in the treatment of breast cancer and other cancers, receiving grant support (to the Massachusetts General Hospital) from Nikon for the imaging of cancer specimens, and having published a number of papers on mammography and cancer survival.

Ya-Chen Tina Shih reports being a member of the National Cancer Policy Forum of the Institute of Medicine and co-editor of *Value in Health*, the journal of the International Society for Pharmacoeconomics and Outcomes Research; and being principal investigator of an NCI-funded R21 grant to examine the impact of technology diffusion on cost-effectiveness of mammographic screening.

Louise C. Walter reports having been a member of a previous ACS guideline committee; serving as a member of the Senior Adult Oncology Guidelines Panel of the National Comprehensive Cancer Network; and having published multiple papers on the importance of individualized cancer screening decisions in older adults, though not having taken public positions for or against particular screening guidelines.

Timothy R. Church reports having served as the site principal investigator for National Cancer Institute-funded cancer screening trials: Prostate Lung Colorectal and Ovarian Cancer Screening Trial, National Lung Screening Trial, National Colonoscopy Study.

Samuel J. LaMonte reports having served as an American Cancer Society national volunteer.

Andrew M.D. Wolf reports having served as chairman of a previous ACS guideline development committee (prostate cancer screening) and having written a 2012 JAMA editorial in favor of shared decision-making for prostate cancer screening and criticizing the United States Preventive Services Task Force recommendation.

Kimberly Andrews reports having been a co-author of previous ACS screening guideline articles.

Otis W. Brawley is a practicing medical oncologist who treats breast cancer patients and is widely published in the area of cancer control, health disparities, and medical ethics. He has been the author of previous ACS screening guideline articles. He has conducted research in cancer screening and control and has been the author of many publications concerning cancer screening and control. His screening work is not limited to breast cancer; indeed he has written a number of papers and gave a number of interviews commenting on and critiquing screening studies and guidelines beyond cancer.

Carol DeSantis reports having been a co-author of previous ACS screening guideline articles.

Deana Manassaram-Baptiste reports that she is the spouse of an interventional radiologist in private practice group that does receive income from screening and diagnostic breast imaging.

Debbie Saslow reports having been an author of previous ACS guideline articles.

Robert A. Smith reports having been the author of previous ACS screening guideline articles. He has conducted research and been the author of many publications evaluating the benefits and harms of screening, as well as of commentaries and public statements addressing critical issues in cancer screening and the rationale for ACS recommendations. In 2014-15 he served on the IARC Handbooks of Cancer Prevention Working Group on breast cancer screening. He served in 2015 as an unpaid advisor on General Electric Health Care's Breast Medical Advisory Board, to provide advice on appropriate implementation of technology in low- and middle- income countries.

Richard C. Wender reports having been an author of previous ACS screening guideline articles. He has given multiple interviews to the press about many aspects of cancer screening and other aspects of cancer care. He is responsible for the cancer screening cancer control work of the ACS. He serves on the executive committee of the Commission on Cancer and Chair of the National Colorectal Cancer Roundtable. He is on the CDC Breast and Cervical Screening Program Advisory Committee.