Patient counseling for breast cancer screening: Taking changes to USPSTF recommendations into account

The US Preventive Services Task Force now recommends mammography screening every other year starting at age 40 to decrease the risk of dying from breast cancer, but questions remain regarding biennial versus annual screening as well as disparities in risk factors and outcomes among Black people

Versha Pleasant, MD, MPH

Breast cancer represents the most commonly diagnosed cancer in the nation.[1] However, unlike other cancers, most breast cancers are identified at stage I and have a 90% survival rate 5-year prognosis.[2] These outcomes are attributable to various factors, one of the most significant being screening mammography—a largely accessible, highly sensitive and specific screening tool.[3] Data demonstrate that malignant tumors detected on screening mammography have more favorable profiles in tumor size and nodal status compared with symptomatic breast cancers,[4] which make it critical for early diagnosis. Most importantly, the research overwhelmingly demonstrates that screening mammography decreases breast cancer–related mortality.[5-7]

Dr. Pleasant is Clinical Assistant Professor and Director, Breast Health and Cancer Genetics Clinic, Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor.

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The USPSTF big change: Mammography starting at age 40 for all recommended

Despite the general accessibility and mortality benefits of screening mammography (in light of the high lifetime 12% prevalence of breast cancer in the United States[8]), recommendations still conflict across medical societies regarding optimal timing and frequency.[9-12] Previously, the US Preventive Services Task Force (USPSTF) recommended that screening mammography should occur at age 50 biennially and that screening between ages 40 and 49 should be an individualized decision.[13,14] In the draft recommendation statement issued on May 9, 2023, however, the USPSTF now recommends screening every other year starting at age 40 to decrease the risk of dying from breast cancer.[15]

This change represents a critically important shift. The new guidance:

- acknowledges the increasing incidence of early-onset breast cancer[8,16]
- reinforces a national consciousness toward screening mammography in decreasing mortality,[17] even among a younger age group for whom the perception of risk may be lower.

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The USPSTF statement represents a significant change in how patients should be counseled. Practitioners now have more direct guidance that is concordant with what other national medical organizations offer or recommend, including the American College of Obstetricians and Gynecologists (ACOG), the American College of Radiology (ACR), and the National Comprehensive Cancer Network (NCCN).

However, while the USPSTF statement can and should encourage health care practitioners to initiate mammography earlier than prior recommendations, ongoing discussion regarding the optimal screening interval is warranted. The USPSTF recommendations state that mammography should be performed biennially. While the age at initiation represents a step in the right direction, this recommended screening interval should be reevaluated.

FAST TRACK

The arguments against more frequent screening include the possibility of false positives that require callbacks and biopsies, which may be more frequent among those who undergo annual mammography

Annual vs biennial screening?

The debate between annual and biennial screening mammography is not new. While many randomized trials on screening mammography have evaluated such factors as breast cancer mortality by age or rate of false positives,[18] fewer trials have evaluated the optimal screening interval.

One randomized trial from the United Kingdom evaluated 99,389 people aged 50 to 62 from 1989 to 1996 who underwent annual screening (study arm) versus 3 years later (control).[19] Findings demonstrated a significantly smaller tumor size in the study arm (P=.05) as well as an increased total cancer detection rate. However, the authors concluded that shortening the screening interval (from 3 years) would not yield a statistically significant decrease in mortality.[19]

In a randomized trial from Finland, researchers screened those aged older than 50 at biennial intervals and those aged younger than 50 at either annual or triennial intervals.[20] Results demonstrated that, among those aged 40 to 49, the frequency of stage I cancers was not significantly different from screen-detected cancers, interval cancers, or cancers detected outside of screening (50%, 42%, and 44%, respectively; P=.73). Furthermore, there was a greater likelihood of interval cancers among those aged 40 to 49 at 1-year (27%) and 3-year (39%) screening intervals compared with those aged older than 50 screened biennially (18%; P=.08 and P=.0009, respectively).[20]

These randomized trials, however, have been scrutinized because of factors such as discrepancies in screening intervals by country as well as substantial improvements made in screening mammography since the time these trials were conducted.[5] Due to the dearth of more contemporary randomized controlled trials accounting for more up-to-date training and technology, most of the more recent data has been largely observational, retrospective, or used modeling.[21] The **TABLE** outlines some of the major studies on this topic.

False-positive results, biopsy rates. The arguments against more frequent screening include the possibility of false positives that require callbacks and biopsies, which may be more frequent among those who undergo annual mammography.[22] A systematic review from the Breast Cancer Surveillance Consortium demonstrated a 61.3% annual (confidence interval [CI], 59.4%–63.1%) versus 41.6% biennial (CI, 40.6%–42.5%) false-positive rate, resulting in a 7% (CI, 6.1%–7.8%) versus 4.8% (CI, 4.4–5.2%) rate of biopsy, respectively.[23] This false-positive rate, however, also may be increased in younger patients aged 40 to 49 and in those with dense breasts.[22,24] These callbacks and biopsies could induce significant patient stress, pain, and anxiety, as well as carry financial implications related to subsequent diagnostic imaging.

Overdiagnosis. There is also the risk of overdiagnosis, in which an indolent breast cancer that otherwise would not grow or progress to become symptomatic is identified. This could lead to overtreatment. While the exact incidence of overdiagnosis is unclear (due to recommendations for universal treatment of ductal carcinoma in situ), some data suggest that overdiagnosis could be decreased with biennial screening.[25]

While discomfort could also be a barrier, it may not necessarily be prohibitive for some to continue with future screening mammograms.[22] Further, increased radiation with annual mammography is a concern. However, modeling studies have shown that the mortality benefit for annual mammography starting at age 40 outweighs (by 60-fold) the mortality risk from a radiation-induced breast cancer.[26]

TABLE Major research comparing annual vs biennial screening mammography

Authors, year	Country	Study design	Key findings
Supportive of annual screening mammography[a]			
Hunt et al, 1999[30]	United States	Retrospective review	Annual had: • Smaller tumor size • Lower percentage of lymph node metastasis • Lower prevalence of stage II cancer or higher • Lower recall rates • More favorable prognosis
White et al, 2004[31]	United States	Observational	Annual had lower likelihood of late-stage disease in those aged 40–49
Hendrick et al, 2011[5]	United States	Modeling	Greater mortality reduction from annual
Bennett et al, 2011[34]	England, Wales, Northern Ireland	Descriptive	Fewer interval cancers with shorter interval screening (0 to <12 months vs 12 to <24 and 24 to <36 months)
Miglioretti et al, 2015[32]	United States	Prospective cohort	Annual had smaller tumor size with more favorable prognostic characteristics for premenopausal patients
Moorman et al, 2021[21]	United States	Retrospective cohort	Annual had: • Lower chances of late-stage diagnosis • Fewer interval cancers • Smaller mean tumor diameter
Mao et al, 2021[33]	Sweden	Modeling from Swedish SCReening of Young women (SCRY) study	Annual had improved effectiveness of interval and screening-detected cancers (12 months compared with 18 or 21 months)
Seely et al, 2022[35]	Canada	Comparative	Annual had fewer interval cancers for people with dense breasts
Supportive of biennial screening mammography[b]			
Mandelblatt et al, 2009[28] and 2016[25]	United States	Modeling	Biennial had: • Similar benefit with less harm • Fewer false positives • Fewer overdiagnoses
Hubbard et al, 2011[23]	United States	Prospective cohort	Biennial reduced cumulative false-positive results after 10 years but possible small increase in likelihood of late-stage cancer diagnosis
Kerlikowske et al, 2013[24]	United States	Prospective cohort	Biennial for those aged 50–74: • Similar risk of advanced-stage disease • Lower risk of false positive
Canelo-Aybar et al, 2022[29]	International	Systematic review	Biennial had more benefit for those aged 50–69

[a]Compared with biennial screening (unless otherwise specified).
[b]Compared with annual screening.

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Benefit from biennial screening

Some research suggests overall benefit from biennial screening. One study that used Cancer Intervention and Surveillance Modeling Network (CISNET) breast cancer microsimulation was adapted to measure the incidence, mortality, and life-years gained for Canadian patients.[27] This model demonstrated that mortality reduction was linked to greater lifetime screens for breast cancer, but this applied primarily to patients aged 50 and older. Overall, a larger impact was observed by initiating screening at age 40 than by decreasing screening intervals.[27]

Using modeling, Mandelblatt and colleagues demonstrated that biennial screening could capture most of the benefit of annual screening with less harm.[28] In another study in 2016, Mandelblatt and colleagues used updated and revised versions of these simulation models and maintained that biennial screening upheld 79.8% to 81.3% of the benefits of annual screening mammography but with fewer overdiagnoses and false-positive results.[25] The authors concluded that while biennial screening is equally effective for average-risk populations, there should be an evaluation of benefits and harms based on the clinical scenario (suggesting that annual screening for those at age 40 who carried elevated risk was similar to biennial screening for average-risk patients starting at age 50).[25]

Another study that served to inform the European Commission Initiative on Breast Cancer recommendations evaluated randomized controlled trials and observational and modeling studies that assessed breast screening intervals.[29] The authors concluded that each screening interval has risks and benefits, with data suggesting more benefit with biennial screening for people aged 50 to 69 years and more possible harm with annual screening in younger people (aged 45–49).[29]

Benefit from annual screening

However, these data conflict with other studies that demonstrate the benefit of annual compared with biennial screening mammography. One large retrospective review of prospectively collected data evaluated outcome differences based on mammography frequency.[30] For those undergoing annual versus biennial screening, the median tumor size was 11 mm (versus 15 mm), the percentage of lymph node metastasis was 14% (versus 24%), and cancer stage II or higher was 17% (versus 29%). The study overall demonstrated that annual screening resulted in lower recall rates ($P<.0001$) and detection of smaller tumors that carried a more favorable prognosis ($P<.04$).[30]

Another observational study from 2004 that assessed data from 7 different mammography registries nationwide noted that, among those aged 40 to 49, patients who underwent biennial screening had an increased likelihood of late-stage disease compared with those with annual screening (28% vs 21%, respectively; odds ratio [OR], 1.35; 95% CI, 1.01–1.81), although this discrepancy was not observed in people aged 50 or older.[31]

A study that critiqued the previous 2012 version of the USPSTF guidelines used CISNET modeling, which demonstrated a 39.6% mortality reduction with annual screening for those aged 40 to 84 versus 23.2% for biennial screening for those aged 50 to 74.[5]

More recent data also reflect these findings. A retrospective cohort study that evaluated patients aged 40 to 84 diagnosed with breast cancer found that those who previously underwent annual versus biennial screening mammography had lower incidences of late-stage diagnoses (24.0% vs 43.8%, respectively; $P=.02$), fewer interval cancers (10.5% vs 37.5%; $P<.001$), and smaller mean (SD) tumor diameter (1.4 [1.2] cm vs 1.8 [1.6] cm; $P=.04$).[21] Postmenopausal patients in this cohort also demonstrated similar findings when comparing mammogram frequency. Although not significant, biennial (or greater) frequency of screening mammography also resulted in an increased likelihood of axillary lymph node dissection and chemotherapy.

Similarly, authors of another large prospective cohort study concluded that breast cancers diagnosed in premenopausal patients were more likely to be larger with less

FAST TRACK

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favorable prognostic characteristics (tumor size >15 mm, relative risk [RR], 1.21 [95% CI, 1.07–1.37]; *P*=.002); any less favorable prognostic characteristics (RR, 1.11 [95% CI, 1.00–1.22]; *P*=.047), and higher stage (stage IIB or higher, RR, 1.28 [95% CI, 1.01–1.63]; *P*=.04) for those who underwent biennial screening compared with breast cancers diagnosed by annual screening.[32] However, this trend was not observed in postmenopausal patients not taking hormone therapy.[32]

Some international studies also show more favorable outcomes with annual screening mammography. A Swedish study evaluated mammography screening intervals of 21 months compared with 18 or 12 months in patients aged 40 to 49.[33] Data showed an improved effectiveness of 1.6% to 9.8% for interval cancers and 2.9% to 17.4% for both interval and screening-detected cancers by reducing the screening frequency to 12 months, with authors suggesting a further reduction in breast cancer–related mortality rates for this age group.[33]

Results from another descriptive study from Europe also showed increasing interval breast cancer rates with increasing screening intervals.[34] After a negative screen, the interval cancer rates and regional ranges for 0 to less than 12 months, 12 to less than 24 months, and 24 to less than 36 months per 1,000 screened were 0.55 (0.43–0.76), 1.13 (0.92–1.47), and 1.22 (0.93–1.57), respectively.[34]

Finally, a study conducted in Canada evaluated interval breast cancers among people with dense breasts screened between 2008 and 2010.[35] Those with screening programs with policies that offered annual screening reported fewer interval cancers (interval cancer rate, 0.89 per 1,000; 95% CI, 0.67–1.11) compared with those who had policies that used biennial screening (interval cancer rate, 1.45 per 1,000 [annualized]; 95% CI, 1.19–1.72), which was 63% higher (*P*=.002). For those for whom radiologists recommended screening, interval cancer was lower for annual (0.93 per 1,000; 95% CI, 0.71–1.16) versus biennial screening (1.70 per 1,000 [annualized]; 95% CI, 0.70–2.71) (*P*=.061).[35]

Black patients have a worse breast cancer prognosis

Additional consideration should be given to populations with worse survival outcomes at baseline for whom screening mammography could play a significant role. In particular, Black people have similar rates of breast cancer compared with White people (127.8 cases per 100,000 vs 133.7 cases per 100,000, respectively) but have a 40% increased breast cancer–related mortality.[8] The USPSTF recognizes this disparity and mentions it in their recommendations, encouraging health care clinicians to engage in shared decision making with Black patients and asserting that more research is needed on screening mammography in Black communities.[15]

While the age modification to the new guidelines better addresses the disparities that impact the Black community (such as increased likelihood of early-onset breast cancer[36] and increased rate of breast cancer diagnosis at first mammogram[37]), the next obvious question is: Can groups with higher breast cancer mortality such as Black communities afford to undergo mammography every 2 years (as opposed to every year)?

Although some data specifically have evaluated the age of initiation and frequency of screening mammography among Black patients,[38,39] little data have specifically assessed outcomes for annual versus biennial screening among Black people. Despite these research gaps, risk factors among the Black community should be considered. There is an increased risk of triple-negative breast cancer that can contribute to higher mortality among Black communities.[40] Black people also tend to be diagnosed with more aggressive subtypes overall,[41,42] are more likely to have dense breasts,[43,44] have a higher likelihood of advanced stages at the time of diagnosis compared with White people,[8,45] and have a greater chance of diagnosis of a second primary or contralateral breast cancer[46-48]—all risk factors that support the importance of regular and early-screening mammography.

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There is an increased risk of triple-negative breast cancer that can contribute to higher mortality among Black communities

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How I counsel my patients

As Director of the Cancer Genetics and Breast Health Clinic, I am a gynecologist who primarily evaluates patients at increased risk for breast cancer (and other cancers). As an initial step, I strongly encourage all patients (especially Black patients and those of Ashkenazi Jewish ancestry as per the American College of Radiology recommendations[9]) to undergo risk assessment at age 25 to determine if they may be at increased risk for breast cancer. This first step may include genetic testing if the patient meets NCCN testing criteria based on personal or family history. If results are positive for a germline pathogenic variant, the timing and nature of breast screening would be based on NCCN recommendations for that particular variant (with possible modification of age of initiation based on family history). If testing is negative, lifetime risk assessment would then be performed using risk calculators—such as Tyrer-Cuzick—to determine if the patient meets criteria for intensive surveillance with supplemental breast magnetic resonance imaging. If the patient is subsequently determined to be at average risk after these assessments, I recommend they undergo screening mammography annually starting at age 40. However, it must be recognized that risk may change over time. A patient's risk can continue to be assessed over a lifetime—with changing family history, personal risk factors, and new discoveries in genetics.

FAST TRACK

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Summary

Ultimately, it is reassuring that the USPSTF guidelines have been updated to be concordant with other national medical society recommendations. They reflect the increasing nationwide trends that clearly demonstrate the high overall prevalence of breast cancer as well as the increasing incidence of early-onset breast cancer.

The updated guidelines, however, do not reflect the entirety of breast cancer trends in this country. With breast cancer being the most commonly diagnosed cancer in the United States, it is imperative to consider the data that demonstrate improved prognostics with annual compared with biennial mammography. Furthermore, the guidelines only begin to explore the disparities that Black patients face regarding breast cancer–related mortality. The risks of younger age at diagnosis, greater likelihood of aggressive subtypes, increased risk of second primary and contralateral breast cancer, and later stage at diagnosis must be seriously evaluated when counseling this patient population.

While the USPSTF recommendations for age at initiation reflect national statistics, recommendations by the ACR and NCCN more appropriately recognize that the benefits of annual screening outweigh the potential risks. Annual screening frequency should be adopted when counseling patients, particularly for the Black community. ●

References

1. Cancer stat facts: Common cancer sites. National Cancer Institute: Surveillance, Epidemiology, and End Results Program. Accessed November 7, 2023. https://seer.cancer.gov/statfacts/html/common.html#:~:text=An%20estimated%20297%2C790%20women%20and,overall%20with%20288%2C300%20expected%20cases
2. Survival rates for breast cancer. American Cancer Society. March 1, 2023. Accessed November 16, 2023. https://www.cancer.org/cancer/breast-cancer/understanding-a-breast-cancer-diagnosis/breast-cancer-survival-rates.html
3. Ambinder EB, Lee E, Nguyen DL, et al. Interval breast cancers versus screen detected breast cancers: a retrospective cohort study. *Acad Radiol*. 2023;30(suppl 2):S154-S160.
4. Allgood PC, Duffy SW, Kearins O, et al. Explaining the difference in prognosis between screen-detected and symptomatic breast cancers. *Br J Cancer*. 2011;104:1680-1685.
5. Hendrick RE, Helvie MA. United States Preventive Services Task Force screening mammography recommendations: science ignored. *AJR Am J Roentgenol*. 2011;196:W112-W116.
6. Oeffinger KC, Fontham ETH, Etzioni R, et al; American Cancer Society. Breast cancer screening for women at average risk: 2015 guideline update from the American Cancer Society. *JAMA*. 2015;314:1599-1614.
7. Hendrick RE, Baker JA, Helvie MA. Breast cancer deaths averted over 3 decades. *Cancer*. 2019;125:1482-1488.
8. Breast cancer facts & figures 2022-2024. American Cancer Society. 2022. Accessed September 7, 2023. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/breast-cancer-facts-and-figures/2022-2024-breast-cancer-fact-figures-acs.pdf
9. New ACR breast cancer screening guidelines call for earlier and more-intensive screening for high-risk women. American College of Radiology. May 3, 2023. Accessed October 8, 2023. https://www.acr.org/Media-Center/ACR-News-Releases/2023/New-ACR-Breast-Cancer-Screening-Guidelines-call-for-earlier-screening-for-high-risk-women
10. American Cancer Society recommendations for the early detection of breast cancer. American Cancer Society. January 14, 2022. Accessed October 30, 2023. https://www.cancer.org/cancer/types/breast-cancer/screening-tests-and-early

-detection/american-cancer-society-recommendations-for-the-early-detection-of-breast-cancer.html
11. Breast cancer screening and diagnosis. National Comprehensive Cancer Network. Published Version 1.2023. June 19, 2023. Accessed September 21, 2023. https://www.nccn.org/professionals/physician_gls/pdf/breast-screening.pdf
12. ACOG Committee on Practice Bulletins—Gynecology. ACOG Practice Bulletin No 179. Breast cancer risk assessment and screening in average-risk women. *Obstet Gynecol*. 2017;130:e1-e16.
13. Final recommendation statement. Breast cancer: screening. US Preventive Services Task Force. January 11, 2016. Accessed September 1, 2023. https://www.uspreventiveservicestaskforce.org/uspstf/recommendation breast-cancer-screening
14. Siu AL; US Preventive Services Task Force. Screening for breast cancer: US Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2016;164:279-296.
15. Breast cancer: screening. US Preventive Services Task Force. May 9, 2023. Accessed October 7, 2023. https://www.uspreventiveservicestaskforce.org/uspstf/document/draft-evidence-review/breast-cancer-screening-adults
16. Breast cancer in young women. Centers for Disease Control and Prevention. June 21, 2023. Accessed October 30, 2023. https://www.cdc.gov/cancer/breast/young_women/index.htm
17. Arleo EK, Hendrick RE, Helvie MA, et al. Comparison of recommendations for screening mammography using CISNET models. *Cancer*. 2017;123:3673-3680.
18. Nelson HD, Tyne K, Naik A, et al; US Preventive Services Task Force. Screening for breast cancer: an update for the US Preventive Services Task Force. *Ann Intern Med*. 2009;151:727-737, W237-W242.
19. Breast Screening Frequency Trial Group. The frequency of breast cancer screening: results from the UKCCCR randomised trial. United Kingdom Co-ordinating Committee on Cancer Research. *Eur J Cancer*. 2002;38:1458-1464.
20. Klemi PJ, Toikkanen S, Räsänen O, et al. Mammography screening interval and the frequency of interval cancers in a population-based screening. *Br J Cancer*. 1997;75:762-766.
21. Moorman SEH, Pujara AC, Sakala MD, et al. Annual screening mammography associated with lower stage breast cancer compared with biennial screening. *AJR Am J Roentgenol*. 2021;217:40-47.
22. Nelson HD, Pappas M, Cantor A, et al. Harms of breast cancer screening: systematic review to update the 2009 US Preventive Services Task Force recommendation. *Ann Intern Med*. 2016;164:256-267.
23. Hubbard RA, Kerlikowske K, Flowers CI, et al. Cumulative probability of false-positive recall or biopsy recommendation after 10 years of screening mammography: a cohort study. *Ann Intern Med*. 2011;155:481-492.
24. Kerlikowske K, Zhu W, Hubbard RA, et al; Breast Cancer Surveillance Consortium. Outcomes of screening mammography by frequency, breast density, and postmenopausal hormone therapy. *JAMA Intern Med*. 2013;173:807-816.
25. Mandelblatt JS, Stout NK, Schechter CB, et al. Collaborative modeling of the benefits and harms associated with different US breast cancer screening strategies. *Ann Intern Med*. 2016;164:215-225.
26. Miglioretti DL, Lange J, van den Broek JJ, et al. Radiation-induced breast cancer incidence and mortality from digital mammography screening: a modeling study. *Ann Intern Med*. 2016;164:205-214.
27. Yaffe MJ, Mittmann N, Lee P, et al. Clinical outcomes of modelling mammography screening strategies. *Health Rep*. 2015;26:9-15.
28. Mandelblatt JS, Cronin KA, Bailey S, et al; Breast Cancer Working Group of the Cancer Intervention and Surveillance Modeling Network. Effects of mammography screening under different screening schedules: model estimates of potential benefits and harms. *Ann Intern Med*. 2009;151:738-747.
29. Canelo-Aybar C, Posso M, Montero N, et al. Benefits and harms of annual, biennial, or triennial breast cancer mammography screening for women at average risk of breast cancer: a systematic review for the European Commission Initiative on Breast Cancer (ECIBC). *Br J Cancer*. 2022;126:673-688.
30. Hunt KA, Rosen EL, Sickles EA. Outcome analysis for women undergoing annual versus biennial screening mammography: a review of 24,211 examinations. *AJR Am J Roentgenol*. 1999;173:285-289.
31. White E, Miglioretti DL, Yankaskas BC, et al. Biennial versus annual mammography and the risk of late-stage breast cancer. *J Natl Cancer Inst*. 2004;96:1832-1839.
32. Miglioretti DL, Zhu W, Kerlikowske K, et al; Breast Cancer Surveillance Consortium. Breast tumor prognostic characteristics and biennial vs annual mammography, age, and menopausal status. *JAMA Oncol*. 2015;1:1069-1077.
33. Mao Z, Nyström L, Jonsson H. Breast cancer screening with mammography in women aged 40-49 years: impact of length of screening interval on effectiveness of the program. *J Med Screen*. 2021;28:200-206.
34. Bennett RL, Sellars SJ, Moss SM. Interval cancers in the NHS breast cancer screening programme in England, Wales and Northern Ireland. *Br J Cancer*. 2011;104:571-577.
35. Seely JM, Peddle SE, Yang H, et al. Breast density and risk of interval cancers: the effect of annual versus biennial screening mammography policies in Canada. *Can Assoc Radiol J*. 2022;73:90-100.
36. Liu Q, Yao S, Zhao H, et al. Early-onset triple-negative breast cancer in multiracial/ethnic populations: distinct trends of prevalence of truncation mutations. *Cancer Med*. 2019;8:1845-1853.
37. Wilkerson AD, Obi M, Ortega C, et al. Young Black women may be more likely to have first mammogram cancers: a new perspective in breast cancer disparities. *Ann Surg Oncol*. 2023;30:2856-2869.
38. Chen T, Kharazmi E, Fallah M. Race and ethnicity-adjusted age recommendation for initiating breast cancer screening. *JAMA Netw Open*. 2023;6:e238893.
39. Chapman CH, Schechter CB, Cadham CJ, et al. Identifying equitable screening mammography strategies for Black women in the United States using simulation modeling. *Ann Intern Med*. 2021;174:1637-1646.
40. Howard FM, Olopade OI. Epidemiology of triple-negative breast cancer: a review. *Cancer J*. 2021;27:8-16.
41. Stringer-Reasor EM, Elkhanany A, Khoury K, et al. Disparities in breast cancer associated with African American identity. *Am Soc Clin Oncol Educ Book*. 2021;41:e29-e46.
42. Newman LA. Parsing the etiology of breast cancer disparities. *J Clin Oncol*. 2016;34:1013-1014.
43. Moore JX, Han Y, Appleton C, et al. Determinants of mammographic breast density by race among a large screening population. *JNCI Cancer Spectr*. 2020;4:pkaa010.
44. McCarthy AM, Keller BM, Pantalone LM, et al. Racial differences in quantitative measures of area and volumetric breast density. *J Natl Cancer Inst*. 2016;108:djw104.
45. Chen L, Li CI. Racial disparities in breast cancer diagnosis and treatment by hormone receptor and HER2 status. *Cancer Epidemiol Biomarkers Prev*. 2015;24:1666-1672.
46. Terman E, Sheade J, Zhao F, et al. The impact of race and age on response to neoadjuvant therapy and long-term outcomes in Black and White women with early-stage breast cancer. *Breast Cancer Res Treat*. 2023;200:75-83.
47. Watt GP, John EM, Bandera EV, et al. Race, ethnicity and risk of second primary contralateral breast cancer in the United States. *Int J Cancer*. 2021;148:2748-2758.
48. Giannakeas V, Lim DW, Narod SA. The risk of contralateral breast cancer: a SEER-based analysis. *Br J Cancer*. 2021;125:601-610.

Also see the November issue of OBG MANAGEMENT for "**2023 USPSTF mammography age to start screening in average-risk patients: What's new is old again**" by Mark D. Pearlman, MD