Supplemental Cancer Screening for Women With Dense Breasts: Guidance for Health Care Professionals
Suneela Vegunta, MD, NCMP, FACP; Juliana M. Kling, MD, MPH, NCMP, FACP; and Bhavika K. Patel, MD

Abstract
Mammography is the standard for breast cancer screening. The sensitivity of mammography in identifying breast cancer, however, is reduced for women with dense breasts. Thirty-eight states have passed laws requiring that all women be notified of breast tissue density results in their mammogram report. The notification includes a statement that differs by state, encouraging women to discuss supplemental screening options with their health care professionals (HCPs). Several supplemental screening tests are available for women with dense breast tissue, but no established guidelines exist to direct HCPs in their recommendation of preferred supplemental screening test. Tailored screening, which takes into consideration the patient’s mammographic breast density and lifetime breast cancer risk, can guide breast cancer screening strategies that are more comprehensive. This review describes the benefits and limitations of the various available supplemental screening tests to guide HCPs and patients in choosing the appropriate breast cancer screening.

CASE VIGNETTE
A 53-year-old postmenopausal woman with a body mass index of 23.1 presents to her primary care physician after recently completing screening mammography with tomosynthesis. The patient is nulliparous with no family history of breast cancer and has never used menopausal hormone therapy. She received a letter regarding her mammogram results, which stated that the mammogram was negative for breast cancer and she has heterogeneously dense breasts. Because density could obscure detection of small masses, she is advised to discuss mammography results with her physician and to undergo consultation regarding supplemental screening. How would you counsel this patient as her physician?

Breast cancer is the most common cancer of women worldwide. Mammography is the standard imaging tool for breast cancer screening, leading to early detection of breast cancer and a 30% reduction in mortality rate. Mammography is the only screening test that has shown an effect in breast cancer mortality reduction. Mammography has been reported to have a sensitivity of 80% to 95% and a specificity of 88% to 98% for women without dense breast tissue; however, the sensitivity can be as low as 30% to 48% in women with extremely dense tissue. The goal of breast cancer screening is early detection to enable less aggressive breast cancer therapies that reduce morbidity and mortality rates. In situ and invasive disease can be detected with radiologic findings on mammography.

The radiographic description of breast density provides an estimate of the amount of radiopaque breast tissue of epithelial and stromal elements compared with the amount of radiolucent fatty tissue. Fat appears dark on a mammogram; fibroglandular tissue appears white. Breast density is assessed by subjective visual evaluation on mammography, leading to interobserver and intraobserver variability. The Breast Imaging—Reporting
and Data System developed by the American College of Radiology (ACR) has the standardized verbiage used by radiologists to classify breast density.\(^8,9\) This system divides it into 4 categories according to the amount of fibroglandular tissue: entirely fatty (a), scattered fibroglandular (b), heterogeneously dense (c), and extremely dense (d).\(^10\) In approximately 50% of mammography reports in the United States, breast tissue is reported as heterogeneously dense or extremely dense.\(^10\)

Breast density fluctuates throughout a woman’s menstrual cycle\(^11\) and is not related to breast size, nor can it be gauged by physical examination.\(^12\) Some associations with increased breast density include the BRCA1 and BRCA2 inherited genetic variants, hormone therapy, younger age,\(^13-19\) and lower body mass index; insulinemic diet (foods that cause greater insulin production) during puberty\(^20\); and alcohol consumption.\(^13\)

Breast density decreases with advancing age; the greatest decrease occurs around menopause and is mostly due to involution of glandular tissue.\(^14\) Tamoxifen, aromatase inhibitor, and gonadotropin-releasing hormone agonist therapies are associated with reduced breast density, an effect related to their influence on estrogen levels and related effects on the breast.\(^15,16\)

Dense breast tissue can obscure underlying breast lesions that have mammographic attenuation similar to dense fibroglandular tissue, called the masking effect.\(^21,22\) In addition, breast density is considered a modest independent risk factor for breast cancer, with a 5.65-fold increased risk of interval breast cancers compared with women with nondense breasts. Interval cancers are defined as those cancers detected by a woman with symptoms and within 12 months of a normal mammogram. These interval cancers typically have a worse prognosis than screen-detected cancers.\(^23\)

Given the limitations of standard mammography for women with dense breasts, the new state-mandated dense breast notifications (DBNs) are intended to motivate patients to discuss personal risk and supplemental screening tests with their health care professionals (HCPs). Supplemental imaging tools for dense breasts have been found to augment breast cancer detection rates by identifying mammographically occult cancers in women with dense breast tissue.\(^21,24-29\) Health care professionals need to be knowledgeable about the supplemental screening options available in their community, including such details as insurance coverage and screening intervals, for shared decision-making that acknowledges the patient’s preferences and values. In this article, we provide background of the DBN laws, benefits and limitations of the supplemental screening modalities, breast cancer risk assessment, and tools available to facilitate a practical, shared decision-making model in primary care.

We undertook a literature search with the terms breast cancer, supplemental breast cancer screening, tomosynthesis, breast ultrasound, breast MBI, and breast MRI using PubMed and Scopus, published in English from January 1997 through March 2020. We reviewed more than 600 articles of all publication types (eg, peer-reviewed research, systematic reviews, literature reviews, editorials, preprints). They included all relevant articles with reference to the guidelines of major societies, such as ACR, American Cancer Society, National Comprehensive Cancer Network, and American College of Obstetricians and Gynecologists, and citations within the reviewed articles were identified. In total, 161 articles in English,
with clinical data of breast density screening and supplemental imaging modalities, are referenced in this manuscript.

**BACKGROUND OF DBN**

The initial passage of a mandate for DBN occurred in Connecticut in 2009. Since then, 38 states started to mandate DBN, and 5 states also mandate supplemental screening for women with dense breast tissue. On March 27, 2019, the US Food and Drug Administration proposed a rule (Federal Register, Mammography Quality Standards Act, May 7, 2019) that requires all mammography facilities to use standard reporting language to ensure that their reports include information about qualitative assessment of breast density, how breast density may mask cancer on a mammogram, and a reminder to patients with dense breasts to talk with their HCP if they have questions. This rule helps set minimum reporting standards for all states. Every year, 40 million US women in the age group of 40 to 74 years undergo breast cancer screening with mammography. Of these women, 43% have dense breast tissue. The DBN translates into nearly 28 million women obtaining additional breast density information.30 Currently, no breast density notification mandate exists outside the United States.

A study published in the Journal of the American College of Radiology suggested that DBN helps disseminate information about the limited sensitivity of mammography for women with dense breasts and helps initiate the conversation between patient and HCP about supplemental dense breast screening options.31 Studies have shown that the resulting rate of women pursuing supplemental imaging after DBN continues to be variable.32-37 Reasons may be multifactorial, including incomprehensible language that requires a high literacy level, lack of clear explanation,38 lack of cultural sensitivity,39,40 and failure to incorporate the preferences and values of the patient.41,42 Studies have confirmed that the quality of communication may vary on the basis of racial ethnicity learning to increased health care disparities.42-47 In fact, in many instances, the DBN did not specify the type of supplemental test that is recommended and whether it will be covered by insurance carriers, causing confusion among patients and HCPs.

**SUPPLEMENTAL SCREENING OPTIONS**

Several supplemental screening modalities in combination with mammography are more effective than mammography alone for detection of additional breast cancer among women with dense breasts (Table 1).48-75 One category includes functional imaging, which has the benefit of detection of vascular, molecular, and metabolic changes in breast tissue despite anatomic limitations in the tissue. Several newer technologies and modifications to existing technology are in the pursuit of the ideal supplemental screening test. These technologies and modifications are outside the scope of this article.

**Digital Breast Tomosynthesis**

Tomosynthesis, also known as 3-dimensional (3D) mammography, is a technique whereby the X-ray tube moves in an arc over the breast, allowing acquisition of images from multiple angles while the breast is compressed. These additional thin-section images are typically reconstructed into 1-mm slices to create a 3D image.76 The thin images reduce the overlap of tissues and help with the separation of the breast lesions from the superimposed breast tissue to improve lesion conspicuity.24,77 Studies have shown an additional 1.2 to 2.7 cancers detected per 1000 screening examinations for 3D mammography compared with standard 2-dimensional digital mammography.67,78,79

Unlike most advanced imaging techniques, digital breast tomosynthesis (DBT) is distinctive because it leads to increased sensitivity with an absolute reduction in recall rates of 0.8% to 3.6%. A reduction in false-positive recall rates of 29% has been noted especially for women younger than 50 years with dense breasts.25,24,77,80 As of 2016, the National Comprehensive Cancer Network has updated its guidelines to consider annual DBT screening starting at
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Ultrasonography (anatomic)</th>
<th>DBT (anatomic)</th>
<th>MBI (functional)</th>
<th>MRI (functional)</th>
<th>CEM (functional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental CDR per 1000</td>
<td>1.2-2.7</td>
<td>1.2-2.7</td>
<td>6.5-6.9</td>
<td>9.7-16.5</td>
<td>13.1-15.5</td>
</tr>
<tr>
<td>Specificity, %</td>
<td>42-82</td>
<td>69-86</td>
<td>83</td>
<td>75.7-97.4</td>
<td>93.7-94.1</td>
</tr>
<tr>
<td>Radiation exposure</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Advantages</td>
<td>No exposure to ionizing radiation</td>
<td>Reduced recall rate</td>
<td>Sestamibi well tolerated</td>
<td>Most sensitive test</td>
<td>Less costly than MRI</td>
</tr>
<tr>
<td></td>
<td>Widely accessible</td>
<td>Coverage by most insurance carriers</td>
<td>Alternative for women with MR contraindication</td>
<td>No ionizing radiation</td>
<td>Less time-consuming than MRI</td>
</tr>
<tr>
<td></td>
<td>Reduces interval cancers in dense breasts</td>
<td></td>
<td>Lower dose models and biopsy capability under development</td>
<td>Reduced interval cancers</td>
<td>More accessible</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Development of advanced MR techniques underway</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drawbacks</td>
<td>High recall rates</td>
<td>Sensitivity modest in extremely dense breasts</td>
<td>4 times more radiation than standard mammography</td>
<td>Relatively costly Gadolinium contrast agent required</td>
<td>Early research and data studies with low number of participants</td>
</tr>
<tr>
<td></td>
<td>Low positive predictive value</td>
<td>Modest increase in cost and time than standard mammography</td>
<td>40-min image acquisition time</td>
<td>Cannot be used in morbidly obese patients and those with severe claustrophobia</td>
<td>IV iodine contrast agent (potential allergy)</td>
</tr>
<tr>
<td></td>
<td>Large number of images to review</td>
<td></td>
<td></td>
<td></td>
<td>Not widely available</td>
</tr>
</tbody>
</table>

*BC, breast cancer; CDR, clinical data repository; CEM, contrast-enhanced mammography; DBT, digital breast tomosynthesis; IV, intravenous; MBI, molecular breast imaging; MR, magnetic resonance; MRI, magnetic resonance imaging.

*A primary screening tool at Mayo Clinic.
the age of 40 years for women with an average risk of breast cancer. At Mayo Clinic, breast DBT is considered a screening mammogram test and is recommended universally, regardless of breast density.

**Breast Ultrasonography**

Supplemental screening with breast ultrasonography is widely accessible in the United States, does not have ionizing radiation, and allows real-time biopsy of a lesion when necessary. Accordingly, whole-breast ultrasonography (WBUS) has become a common supplemental screening test recommended by many HCPs. Both handheld ultrasonography and WBUS are comparable in sensitivity and specificity for women with dense breast tissue and normal mammography results. Handheld ultrasonography has the drawback of scan reproducibility and requires a highly trained specialist. Alone, ultrasonography lacks the spatial resolution of mammography and does not help in the diagnosis of most microcalcifications. Yet, it effectively differentiates tissues of varying densities (fluid vs soft tissue).

The cancers missed on mammography but detected by ultrasonography are reported to be mostly small, node-negative, and invasive breast cancers. About 1.8 to 4.6 additional breast cancers were detected per 1000 women when WBUS was used for screening asymptomatic women with dense breasts and normal mammography results. More than 70% of these cancers were less than 10 mm, 90% were stage 0 or 1, and 94% were invasive. Interval cancer rates have been shown to be reduced after ultrasound screening started to be used as a supplemental study. These findings suggest that incorporation of screening ultrasonography performed by a trained specialist with a normal screening mammography result is one of the effective supplemental strategies for women with dense breasts or other intermediate risk factors.

Screening ultrasonography, however, can lead to false-positive results when it is added to mammography. Screening studies have shown a 12% to 15% increase in recall rates with a reported low positive predictive value (9.4%), where false-positive ultrasonography results led to many unnecessary biopsies.

Overall, supplemental screening ultrasonography of women with dense breasts allows detection of more breast cancers at an earlier stage, facilitating less radical treatment options and improved survival rates. The ACR recommends ultrasonography as an optional tool for screening of an asymptomatic woman with dense breast tissue at average to intermediate risk for breast cancer and as a supplemental screening tool for high-risk women who cannot tolerate breast magnetic resonance imaging (MRI). Providers are advised to counsel women about potential limitations before recommending this as a supplemental screening tool. These limitations include the limited positive predictive value, which may result in unnecessary procedures that have benign results, and a relatively high recall rate, which can lead to additional short-term imaging follow-up.

**Molecular Breast Imaging**

Molecular breast imaging (MBI) is a functional nuclear imaging test that uses a tumor-avid radioactive tracer, technetium Tc 99m sestamibi. Among the benefits of functional imaging, markers are used to detect vascular, molecular, and metabolic changes in breast tissue despite anatomic limitations in the breast. Tissues containing cancer cells, which rapidly grow and divide, show increased angiogenesis and mitochondrial concentration resulting in greater uptake of technetium. The US Food and Drug Administration has approved MBI for supplemental screening of women who have dense breasts and normal mammography results. A prospective clinical study by Rhodes et al. supported by similar studies later, showed that the addition of supplemental MBI detected an incremental 7.5 to 8.8 cancers per 1000 women screened, with only a small decrease in specificity. Mammmography with supplemental MBI has shown an additional recall rate of 5.9% to 8.4% and a false-positive rate of 18%.
Currently, women who have findings of dense breasts on mammography have the option for MBI if they do not meet the criteria for MRI of the breast or they meet the criteria but have contraindications to or do not prefer magnetic resonance screening (Figure). Molecular breast imaging is not recommended for BRCA carriers and patients who have other genetic conditions with radiation sensitivity. Despite promising results clinically, there have been concerns about the higher radiation dose of MBI relative to mammography. Dose reduction algorithms and techniques are currently underway and have been promising. The relatively lower cost and the absence of nephrotoxic effects caused by the contrast agent make MBI a reasonable option for patients seeking supplemental breast cancer screening. Currently, only selected insurance carriers provide coverage for MBI. In addition, abnormalities detected with MBI require further imaging because MBI image-guided biopsy capabilities, although under development, are not available for clinical use. The appropriate screening interval for MBI is unclear, although institutions with the technology are recommending a biennial screening interval to minimize radiation exposure.

Magnetic Resonance Imaging

In the high-risk population, MRI has higher sensitivity than mammography or ultrasonography alone for breast cancer detection. The ACR recommends MRI in conjunction with mammography for screening of high-risk women who have a lifetime risk of breast cancer that exceeds 20% on the basis of the Tyrer-Cuzick risk assessment model, also called the International Breast Cancer Intervention Study (IBIS) Tool.

Women who are carriers of the BRCA1 and BRCA2 gene variant, Li-Fraumeni syndrome, or Cowden syndrome and those who received mantle radiation for Hodgkin lymphoma should be considered at high risk. Other genetic mutations, such as TP53, PTEN, SKT11, CDH1, MSH1, MSH2, MLH1, PSM2, EPCAM, PALB2, CHEK2, and ATM, have also been associated with an increased lifetime risk of breast cancer, and therefore these patients should be considered for annual MRI and mammography. Several other genes that may increase the risk of breast cancer, such as BARD1, BRIP1, MRE11, RAD50, NBS1, RAD51, MUTYH, NF1, and NBN, have been identified. However, additional studies are needed to better characterize their penetrance and risk. Conversations about annual MRI and mammography should be conducted with these women.
The ACR recently expanded its recommendations for annual supplemental MRI for women with a personal history of breast cancer diagnosed at 50 years of age or younger and for women with the diagnosis of breast cancer who have dense breasts.\textsuperscript{107} For these women with a history of breast cancer, MRI has a considerably higher sensitivity than mammography alone: a cancer detection rate of 10 to 29 cancers per 1000 patients and a reduced interval cancer rate.\textsuperscript{108-111} Breast MRI can allow increased detection of clinically important mammographically and sonographically occult cancers. In a systematic review of studies of women who underwent MRI after mammography with normal results, the sensitivity was reported as 71% to 100\textsuperscript{112-116} and the specificity as 78% to 94%; the positive predictive value of performed biopsies was 22% to 63%.\textsuperscript{50,114,116,117} The MRI study led to an additional 8.2 to 15.9 cancers detected per 1000 examinations, and in women with extremely dense tissue, MRI has led to lower interval cancer rates.\textsuperscript{50,51,54,113,115,118-121}

Most women enrolled in these studies had other risk factors in addition to denser breasts. In a prospective trial of women with average breast cancer risk, supplemental breast MRI showed an incremental cancer detection rate of 15.5 per 1000 screened patients and across all breast density groups.\textsuperscript{50}

Data are still lacking to support annual MRI screening of women who are at intermediate risk, defined as a 15% to 20% lifetime risk.\textsuperscript{92} At this time, such MRI studies probably will not be reimbursed by insurance, and patients can incur considerable out-of-pocket expenses; however, this may change with more evidence. In a 2017 study, a magnetic resonance screening study by Kuhl et al\textsuperscript{50} reported an additional 22.6 cancers per 1000 screenings in the prevalent screening round, with subsequent incident rounds showing a clinical data repository of 6.9 per 1000.

In a study assessing the reasons for nonparticipation in MRI scans offered to high-risk women, participants stated that MRI is inconvenient, can induce claustrophobia,\textsuperscript{122} and provokes anxiety about its test results.\textsuperscript{35} Magnetic resonance imaging is not widely available, is costly, and is time-consuming.\textsuperscript{92,123} In addition, some patients cannot undergo breast MRI because of an incompatible implantable device.\textsuperscript{124} The annual exposure to gadolinium (the contrast agent used in MRI) and its cumulative toxicity, especially for younger women, have raised concerns.\textsuperscript{50,122,126} Studies are underway to evaluate the long-term implications of MRI with gadolinium.

As with the other imaging modalities discussed, false-positive MRI test results can lead to unnecessary tests with additional costs and anxiety.\textsuperscript{127} Therefore, when appropriate, patient-provider discussions about annual breast MRI screening should take place. Ongoing studies are evaluating advanced MRI techniques, sequences, improved spatial resolution, and decreased scan times to reduce false-positive results and to improve the true value of screening MRI\textsuperscript{127-129} for average-risk women with dense breasts.\textsuperscript{130}

**Contrast-Enhanced Mammography**

Contrast-enhanced mammography (CEM) is a new and emerging diagnostic imaging tool. In the United States, however, CEM has limited availability. Standard low-energy and recombined, subtracted mammography images are obtained in standard views after injection of iodinated contrast material. Similar to MRI, CEM provides high-resolution anatomic and physiologic contrast-enhanced information to evaluate tumor neovascularity.\textsuperscript{131,132} Compared with 2-dimensional mammography alone for women, CEM has shown superior diagnostic accuracy.\textsuperscript{74} Compared with MRI, CEM shows similar sensitivity and better specificity at a considerably lower cost and is expected to be applied more widely because of its many potential clinical uses.\textsuperscript{133} Large-scale multi-institutional prospective trials and CEM-guided biopsy technology need to be investigated further.\textsuperscript{60,134-136} At this time, CEM is not used as a supplemental screening tool in otherwise average-risk women with dense breasts, except under off-label or research purposes.
<table>
<thead>
<tr>
<th>TABLE 2. Risk Prediction Models</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristic</strong></td>
</tr>
<tr>
<td><strong>General description</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Drawbacks</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Patient exclusions</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Risk assessment information</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

BC, breast cancer; BCRAT, Breast Cancer Risk Assessment Tool; DCIS, ductal carcinoma in situ; FH, family history; LCIS, lobular carcinoma in situ; MRI, magnetic resonance imaging; RR, relative risk.
Breast Cancer Risk Assessment Calculators
An assessment of a woman’s lifetime risk of breast cancer may help guide discussions about the appropriate breast cancer screening options for her. Depending on a woman’s lifetime risk of breast cancer, her risk can be stratified into high (>20%), intermediate (15% to 20%), and average (<15%). The American Cancer Society has recommended models that incorporate histories of first- and second-degree relatives (eg, BRCAPRO computer program, Tyrer-Cuzick, Claus) to identify high-risk women who qualify for additional annual screening MRI scans. Women at high risk should be encouraged to undergo annual supplemental breast MRI screening in addition to regular annual screening mammography either together or in 6-month intervals, irrespective of breast density.

A few models include modifiable lifestyle risk factors, such as alcohol intake, body mass index, hormone therapy, and exercise, that improve the breast cancer risk predictive capability. Risk assessment tools do not always identify the same at-risk groups, and because they use different risk factors that are weighted differently, they can give different risk estimates for the same woman. Risks are usually predicted for 5 years, 10 years, or lifetime.

The Gail model, also called the National Cancer Institute Breast Cancer Risk Assessment Tool, is popular and widely used in the United States. Most clinicians use the Gail model to identify patients at high risk and to provide counseling about chemoprevention. It should not be used for risk assessment for MRI screening eligibility. Currently, no single validated risk model incorporates all the risk factors and performs consistently well for women of all races. No single model is appropriate for all subgroups, and the need still exists to develop an improved model with better predictive capability. Investigators of risk models are attempting to include breast density as a risk factor in their algorithms because it improves the risk predictive capability and discriminatory power of these models. 

For instance, the modified Tyrer-Cuzick risk assessment model version 8 includes breast density, which improves its sensitivity. Until a better model is available, it is reasonable for HCPs to be familiar with 1 or 2 family-based risk factor models, such as Tyrer-Cuzick or BRCAPRO, to estimate a woman’s lifetime risk for breast cancer.

DISCUSSION
Supplemental breast cancer screening methods are intended to detect additional breast cancers in women with dense breasts and normal mammography results. Breast tissue composition and breast cancer risk differ among women, making individualized breast cancer screening important. Screening mammography is known to reduce breast cancer mortality rates. Women should be informed that dense breast tissue is common and can be seen in nearly 50% of women. Women with dense breasts should have a thorough discussion with their HCPs about the risks and benefits of supplemental dense breast screening. Depending on availability and the patient’s preference, common supplemental screening considerations can include MBI, MRI, and WBUS.

When considering a population-based supplemental screening modality, the HCP needs to recognize that the technique should be widely available, easily accessible, and relatively inexpensive; should show high specificity and high sensitivity; and should be associated with minimal radiation exposure. Health care professionals need to be aware of the cost-effectiveness, local availability, and insurance coverage of various supplemental screening procedures to limit substantial out-of-pocket expense for patients.

The ideal supplemental screening method may vary for the individual patient on the basis of availability and risk factors. Direct comparisons of the different supplemental screening tests are limited in light of varying costs and practicality of the randomized trials. Additional studies that focus on the outcomes, including breast cancer mortality and interval breast cancer rates, are needed.
Although the available medical society guidelines attempt to help HCPs determine which women would benefit from supplemental screening and which supplemental imaging test is most appropriate, clear directions and recommendations are limited. The lack of consensus guidelines from societies leads to confusion among HCPs and patients alike.

CONCLUSION
Health care professionals are positioned to have patient-provider discussions about mammographic breast density and breast cancer risk factors. As such and where appropriate, HCPs can serve as a key resource to counsel interested patients about supplemental screening modalities known to improve breast cancer detection for women with dense breasts. This discussion should include the benefits of early detection of otherwise mammographically occult breast cancer, which are weighed against the harms of supplemental screening, such as false-positive results that can lead to increased patient recalls, patient anxiety, and false-positive biopsy findings. In addition to shared decision-making, HCPs should take this opportunity to counsel their patients on risk-reducing lifestyle modifications, such as maintenance of an ideal body weight through diet and regular exercise and a limitation of alcohol intake.

CASE VIGNETTE, CONTINUED
The patient has a 2.8% 10-year risk and a lifetime risk of 10.2% of breast cancer, based on the Tyrer-Cuzick risk assessment model. Her risk was slightly below the average. She completed screening mammography with tomosynthesis, with no report of abnormalities. The patient has a 2.8% 10-year risk and a lifetime risk of 10.2% of breast cancer, based on the Tyrer-Cuzick risk assessment model. Her risk was slightly below the average. She completed screening mammography with tomosynthesis, with no report of abnormalities.

ACKNOWLEDGMENTS
We thank Sandhya Pruthi, MD, Professor, General Internal Medicine, Mayo Clinic, Rochester, Minnesota, for her valuable suggestions.

REFERENCES


SUPPLEMENTAL BREAST CANCER SCREENING


125. Rundle VM. Safety of the gadolinium-based contrast agents for magnetic resonance imaging, focusing in part on their accumulation in the brain and especially the dentate nucleus. Invest Radiol. 2016;51(5):273-279.


Tosteson ANA. An abbreviated MRI protocol for breast cancer screening in women with dense breasts: promising results, but further evaluation required prior to widespread implementation. JAMA. 2020;323(8):719-721.


