New Risk Model Aims to Reduce Breast Cancer Disparities in Black Women

The new tool may help younger Black women decide when to start breast cancer screening.

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Researchers have developed a new tool to estimate the risk of breast cancer in US Black women. The team that developed the tool hopes it will help guide more personalized decisions on when Black women—especially younger women—should begin breast cancer screening.

Compared with white women, Black women in the United States are younger at diagnosis, on average, and are more likely to be diagnosed with aggressive or advanced forms of breast cancer. They also are more likely to die from breast cancer than women of all other racial and ethnic groups.

These disparities, or inequalities, are thought to reflect the interplay of many factors, from tumor biology to matters like income, diet, access to quality health care, and other factors related to systemic and structural racism.

Called the Black Women's Health Study Breast Cancer Risk Calculator, the new tool uses information on a woman's medical, reproductive, and family history to estimate her chance of developing breast cancer over the next 5 or 10 years. This information is gathered from an online questionnaire that a woman and her health care provider can complete together.

Like other questionnaire-based breast cancer risk models, the new model is only moderately good at predicting whether or not an individual woman will go on to develop breast cancer, the researchers cautioned.

But it "could help guide decisions about whether Black women should consider screening for breast cancer [starting] at age 40 versus 50, or even earlier [than 40] if they have very high risk," said Anne Marie McCarthy, Ph.D., of the Perelman School of Medicine at the University of Pennsylvania, who was not involved in the research.

"A major goal is for younger Black women to have a chance to have breast cancer detected and treated at early stages, so that fewer will die of the disease," said Julie Palmer, Sc.D., of Boston University School of Medicine, who led the effort to develop the new model.

Published October 8 in the Journal of Clinical Oncology, the NCI-funded effort builds on previous

models that estimate breast cancer risk in Black women, in large part by including additional risk factors.

Most existing models for calculating a woman's risk of breast cancer were developed and tested with data mainly from White women and don't work as well for Black women, Dr. Palmer said. "But for a long time, there weren't enough data out there to develop and test a robust model for predicting breast cancer in Black women."

"This [tool] helps address a critical gap in breast cancer risk prediction," said Emily Conant, M.D., chief of breast imaging at the Hospital of the University of Pennsylvania, who was not involved with the work.

Developing the Risk Calculator

There is a lot of confusion about when women should be assessed for their risk of breast cancer and when they should begin screening for the disease, Dr. Conant explained. Existing guidelines from medical groups vary in the age at which they recommend starting screening: Some advise starting at age 50, while others recommend beginning at age 45 or 40.

All guidelines, however, emphasize the need for patients and their health care providers to talk through these issues—known as shared decision-making—especially for women younger than 50.

The new risk model is intended to help inform these discussions for Black women and their providers, Dr. Palmer and her colleagues explained.

To develop the model, they used data from US Black women who had participated in three large population-based studies of breast cancer. About half of the women in each study self-identified as Black. The studies, which compared women who developed breast cancer with those who did not, collected information on risk factors, such as a family history of other cancer types and whether a woman breastfed her children.

The team then tested the model's performance using 15 years of health data from nearly 52,000 participants in the Black Women's Health Study, an ongoing study co-led by Dr. Palmer.

Overall, the ability of the new model to predict the likelihood that an individual Black woman would develop breast cancer was similar to that of the most commonly used models for predicting breast cancer risk in White women. The new model performed best for Black women under age 40. And these younger women are most in need of a personalized tool to guide decisions about screening, Dr. Palmer said.

In addition to estimating an individual woman's 5- and 10-year risk of developing breast cancer, the online risk calculator provides information on the average risk for US Black women of the same age.

"Women with a family history of breast cancer are especially concerned about risk, and this model

could be used to help put their risk in context," said Ruth Pfeiffer, Ph.D., a risk prediction expert in NCI's Division of Cancer Epidemiology and Genetics (DCEG), who helped develop the new model.

The model could also be used to identify Black women who are eligible to participate in studies of ways to prevent breast cancer in women at very high risk of the disease, Dr. Palmer said.

When these studies are launched, "we want to make sure that good tools [to identify potential participants of all races and ethnicities] are available to researchers developing those studies, so that those most likely to benefit have a fair chance to be included," she explained.

In addition, Dr. Palmer and her colleagues wrote, the model could guide decisions on whether to refer some Black women for genetic testing that looks for inherited changes known to increase the risk of breast cancer.

Room for Improvement

Unfortunately, "many primary care doctors don't use questionnaires that predict breast cancer risk because they have so many demands on their time," Dr. Palmer said. "But breast cancer is life changing for young women who get the disease, and many young Black women are diagnosed with and die from it before they reach the ages at which screening is typically recommended," she continued. "We're hoping that primary care practices will start using the new tool to identify those who might benefit from earlier screening."

In the future, Dr. McCarthy said, an online version of a questionnaire such as the one used in the new study might be built into an electronic health record. Then, to save time, a woman could fill out the questionnaire online before her appointment and the doctor could easily review the results in her record.

"We still have a long road ahead to develop better models for all women," Dr. Pfeiffer said. "Right now, the big hope for [improving] risk prediction is to incorporate information on genetic markers that are associated with increased risk."

Along those lines, DCEG is conducting the Confluence Project in collaboration with multiple breast cancer consortia to analyze genomic data from 300,000 women with breast cancer and 300,000 without, including women of different races and ethnicities. A parallel effort is the NCI-funded Breast Cancer Genetic

Study in African-Ancestry Populations. Data from the two studies will be used to develop and validate risk scores based on inherited genetic changes that can then be integrated into this model as well as into future models that will be developed through a more recent NCI-funded project.

Risk models could also be improved by including information on the amount of dense breast tissue an individual woman has, which is a known risk factor for breast cancer, Dr. Conant said. However, that would require having at least one previous mammogram.

Achieving Equity in Breast Cancer

Dr. Palmer and others agree that screening is just one part of addressing disparities in breast cancer. “Patient navigation programs, as well as cultural competency training for providers, can lead to more equitable access to optimal cancer care for Black women, a major factor in mortality disparities,” she said.

Other researchers are also using modeling to help develop more equitable care. A recent study used computer models to try to identify equitable screening mammography strategies for Black women in the United States. The findings suggest that screening Black women with mammograms every 2 years starting at age 40 is the best strategy for reducing disparities in breast cancer deaths.

But ideally, researchers agreed, decisions on when to start screening should be made on a more individual basis rather than based only on someone’s age.

Dr. Pfeiffer noted that two large ongoing studies are comparing the effectiveness of breast cancer screening based on current guidelines versus a woman’s individual risk. They are the Women Informed to Screen Depending on Measures of Risk (WISDOM) study in the United States, which is funded in part by NCI, and the international My Personalized Breast Screening study.

“This [new model] is one step toward personalized cancer prevention, which includes detecting disease early to improve health outcomes,” Dr. Pfeiffer said. We talk about tailoring cancer treatment, but we should tailor prevention, too.”

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