

Putting Prevention into Practice

An Evidence-Based Approach

Risk Assessment, Genetic Counseling, and Genetic Testing for *BRCA*-Related Cancer in Women

KAREN LEE, MD, MPH, Medical Officer, U.S. Preventive Services Task Force Program, Agency for Healthcare Research and Quality

CARLO ROSSI, MDCM, Preventive Medicine Resident, Uniformed Services University of the Health Sciences

► See related U.S. Preventive Services Task Force Recommendation Statement at <http://www.aafp.org/afp/2015/0115/od1.html>.

This PPIP quiz is based on the recommendations of the USPSTF. More information is available in the USPSTF Recommendation Statement and the supporting documents on the USPSTF website (<http://www.uspreventiveservices.org>). The practice recommendations in this activity are available at <http://www.uspreventiveservices.org/Page/Topic/recommendation-summary/brca-related-cancer-risk-assessment-genetic-counseling-and-genetic-testing>.

This series is coordinated by Sumi Sexton, MD, Associate Medical Editor.

A collection of Putting Prevention into Practice published in *AFP* is available at <http://www.aafp.org/afp/ppip>.

CME This clinical content conforms to AAFP criteria for continuing medical education (CME). See CME Quiz Questions on page 79.

Author disclosure: No relevant financial affiliations.

Case Study

L.M. is a 37-year-old nonsmoking woman who is not taking any medications and has no significant past medical problems. Three of her female relatives have a history of breast cancer: her mother (diagnosed at 49 years of age, before menopause), her paternal grandmother (diagnosed at 72 years of age), and her maternal aunt (recently diagnosed at 39 years of age). L.M. is concerned that breast cancer runs in her family, and is interested in genetic testing for breast cancer.

Case Study Questions

1. Based on the recommendations of the U.S. Preventive Services Task Force (USPSTF), which one of the following is the most appropriate initial clinical approach for this patient?
 - A. Genetic testing for breast cancer is recommended only for women in specific ethnic groups in which certain gene mutations may be more common.
 - B. Blood tests that detect breast cancer gene mutations are available, but there is insufficient evidence to recommend their use.
 - C. L.M. does not require genetic testing because of her age and lack of symptoms.
 - D. L.M.'s family history may be associated with an increased risk of *BRCA* mutations, and warrants further risk assessment.
2. After further discussion, L.M. agrees that she is a candidate for further risk assessment. Which one of the following best applies to L.M.'s situation?
 - A. Genetic counseling is not needed before genetic testing because of her family history of breast cancer.
 - B. Offer routine genetic testing, regardless of her family history.
 - C. Use the National Cancer Institute Breast Cancer Risk Assessment Tool to determine if she would benefit from further risk assessment.
 - D. Initial genetic testing should begin with a family member with confirmed breast or ovarian cancer, if available.
3. L.M. completes a risk assessment and scores above the threshold for recommending genetic testing. After counseling, she decides to get tested. Which of the following statements are correct?
 - A. There is strong evidence that intensive cancer screening improves clinical outcomes in women who are *BRCA* mutation carriers.
 - B. There is strong evidence that tamoxifen and raloxifene reduce the incidence of invasive breast cancer in women who are *BRCA* mutation carriers.
 - C. Risk-reducing surgeries, such as mastectomy and salpingo-oophorectomy, reduce the risk of breast or ovarian cancer in women who are *BRCA* mutation carriers.
 - D. Women who undergo genetic testing should receive posttest genetic counseling.

Answers appear on the following page.

Answers

1. The correct answer is D. The USPSTF recommends that primary care clinicians screen women who have family members with breast, ovarian, tubal, or peritoneal cancer with one of several screening tools designed to identify a family history that may be associated with an increased risk of potentially harmful mutations in breast cancer susceptibility genes (*BRCA1* or *BRCA2*). Women with positive screening results should receive genetic counseling and, if indicated after counseling, genetic testing (B recommendation). Family history factors associated with increased risk of *BRCA* mutations include breast cancer before 50 years of age, bilateral breast cancer, family history of breast and ovarian cancer, and breast cancer in male family members. Multiple cases of breast cancer or more than one member with multiple *BRCA*-related cancer diagnoses within a family may also increase risk. Families of Ashkenazi Jewish ethnicity may have a higher risk. Although certain *BRCA* mutations may be more common in specific ethnic groups, these recommendations are not restricted based on ethnicity. There is adequate evidence that current genetic sequencing tests can accurately detect *BRCA* mutations. Screening for potentially harmful *BRCA* mutations should be considered once a woman has reached the age of consent (18 years).

2. The correct answer is D. In most cases, the preferred initial strategy for *BRCA* mutation testing is to test a family member who has breast or ovarian cancer, although it is reasonable to test if no affected relative is available. Women who have one or more family members with a known potentially harmful *BRCA1* or *BRCA2* mutation should be offered genetic counseling and testing. Primary care clinicians may use one of several brief familial risk stratification tools to determine the need for in-depth genetic

counseling, but the USPSTF did not find sufficient evidence to recommend one tool over another. However, clinicians should not use general breast cancer risk assessment tools (such as the National Cancer Institute Breast Cancer Risk Assessment Tool) because they are not designed to determine which women should receive genetic counseling or testing. The USPSTF does not recommend routine genetic counseling or testing in women whose family history is not associated with increased risk of *BRCA* mutations (D recommendation).

3. The correct answers are C and D. In cohort studies of high-risk women and women who are *BRCA* mutation carriers, risk-reducing surgeries substantially reduced the risk of breast or ovarian cancer. Women who undergo genetic testing should receive genetic counseling by trained health professionals, including trained primary care clinicians, before and after testing. There is insufficient evidence on the effect of intensive screening for *BRCA*-related cancer on clinical outcomes in women who are *BRCA* mutation carriers. Medications such as tamoxifen and raloxifene have been shown to reduce the incidence of invasive breast cancer in high-risk women in the general population, but they have not been studied specifically in women who are *BRCA* mutation carriers.

The views expressed in this work are those of the authors, and do not reflect the official policy or position of the Uniformed Services University of the Health Sciences, the Department of Defense, or the U.S. government.

SOURCES

U.S. Preventive Services Task Force. Risk assessment, genetic counseling, and genetic testing for *BRCA*-related cancer in women: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2014;160(4):271-281.

Nelson HD, Pappas M, Zakher B, Mitchell JP, Okinaka-Hu L, Fu R. Risk assessment, genetic counseling, and genetic testing for *BRCA*-related cancer in women: a systematic review to update the U.S. Preventive Services Task Force recommendation. *Ann Intern Med.* 2014;160(4):255-266. ■