What is hereditary breast and ovarian cancer (HBOC)?

HBOC is an inherited genetic condition that increases a person’s risk of getting breast cancer (especially before age 50) and ovarian cancer. Most cases are caused by certain mutations in the BRCA1 or BRCA2 (BReast CAncer) genes, which also increase a person’s risk for pancreatic cancer, prostate cancer, and melanoma. However, mutations in other genes can increase risk for breast or ovarian cancer, and these mutations continue to be discovered and integrated into genetic testing (see sidebar, reverse page).

Most female breast and ovarian cancers are not related to HBOC. In fact, only about 3% of female breast cancers and 10% of ovarian cancers are caused by BRCA1 and BRCA2 mutations. But identifying patients at risk and helping them understand, get tested for, and potentially address a diagnosis of HBOC can save lives.

What risk factors indicate that a person is likely to have HBOC?

Health care providers should encourage all patients to collect their family history of cancer in order to assess their need for additional screening. Patients are more likely to have HBOC if they have a personal or family health history of any of the following:

- A known BRCA1, BRCA2, or other HBOC-related mutation in the family
- Breast cancer diagnosed at age 45 or younger in women
- Breast cancer diagnosed at age 46–50 in women with at least one close blood relative with breast, ovarian, prostate, or pancreatic cancer at any age or limited family health history
- Triple-negative breast cancer at any age
- Two primary breast cancers, with the first diagnosis prior to age 50
- Breast cancer at any age in men
- Epithelial ovarian, fallopian tube, or primary peritoneal cancer
- Ashkenazi (Eastern European) Jewish ancestry
- Lobular breast cancer with personal or family history of diffuse gastric cancer
- Breast cancer at any age and any of the following:
  - A close blood relative with breast cancer diagnosed at age 50 or younger
  - A close male blood relative with breast cancer
  - A close blood relative with epithelial ovarian, fallopian tube, or primary peritoneal cancer
  - A close blood relative with pancreatic cancer at any age
  - A close blood relative with metastatic or high grade prostate cancer
  - At least two first-, second-, or third-degree blood relatives with breast cancer or prostate cancer at any age
  - Three or more diagnoses of breast cancer in patient and family and/or close blood relatives
- Pancreatic cancer (personal history or first-degree relative only)
- Prostate cancer that is metastatic or has a Gleason score 7 or higher at any age
How much does risk increase for individuals diagnosed with HBOC?

1. Women with BRCA1 or BRCA2 mutations have a 69% to 72% risk of breast cancer by age 80, compared with a 13% lifetime risk for women in the general population.1,2,3

2. Women with BRCA1 or BRCA2 mutations have a 17% to 44% risk of ovarian cancer by age 80, compared with a 1% lifetime risk for women in the general population.1,2

3. Increased risk for tubal, peritoneal, prostate, pancreatic, and male breast cancers.

4. Increased risk for early-onset (before age 50) breast or ovarian cancer.

How much does risk increase for individuals diagnosed with HBOC?

BEYOND BRCA1 & BRCA2

BRCA1 and BRCA2 are the most common genetic mutations that increase an individual’s risk of breast and ovarian cancer. But mutations in other genes can also cause breast or ovarian cancer. That’s why doctors often use a multigene panel for testing, which looks for mutations in many genes at once, including BRCA1 and BRCA2. To learn more, visit the National Cancer Institute’s Genetics of Breast and Gynecologic Cancers (PDQ®)–Health Professional Version page.

How much does risk increase for individuals diagnosed with HBOC?

Additional tools

For additional tools and resources, including those listed below, please visit: conversationsaboutcancer.org/provider/hboc

- Fact sheet: Understanding risk factors for hereditary breast and ovarian cancer (HBOC)
- Fact sheet: Screening for hereditary breast and ovarian cancer (HBOC)
- Fact sheet: Preventive options for individuals diagnosed with BRCA1 or BRCA2 mutations
- Other resources, including videos, conversation simulations, and more


The “Helping Families Communicate About Hereditary Breast or Ovarian Cancer” project is supported by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award totaling $450,000 with 100 percent funded by CDC/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by CDC/HHS, or the U.S. Government.