UT Southwestern
Harold C. Simmons
Comprehensive Cancer Center

NCI CCC
A Comprehensive Cancer Center Designated by the National Cancer Institute

What you should know about Hereditary Breast and Ovarian Cancer (HBOC)

Approximately 5-10% of breast cancer is inherited. Most hereditary breast cancers are caused by mutations in the BRCA1 and BRCA2 genes, but there are other genes that can cause inherited breast cancers.

The risk for cancer associated with BRCA1 and BRCA2 gene mutations

In women: A woman who has a BRCA1 or BRCA2 mutation has an increased risk of developing both breast and ovarian cancer. Women with a BRCA1 mutation have a 57-65% risk of breast cancer, and women with a BRCA2 mutation have a 45-49% risk of breast cancer. The risk for developing ovarian cancer with a BRCA1 mutation is about 40% and with a BRCA2 mutation is about 18%. For women with a breast cancer diagnosis and a BRCA1 or BRCA2 mutation, there is about a 40-60% chance of developing cancer in the other breast within 20 years.

In men: Men who have a BRCA2 mutation have an approximate 6% risk for developing breast cancer. Men with a BRCA1 mutation have a 1% risk for breast cancer. Men who have either a BRCA1 or BRCA2 mutation have a 16-34% risk to develop prostate cancer by age 80. Prostate cancer in men with a BRCA1 or BRCA2 mutation often occurs at a younger age, and may be more aggressive than in men without a mutation.

For both men and women: Men and women who have a BRCA1 or BRCA2 mutation may also be at increased risk for colon cancer, thyroid cancer, melanoma, and pancreatic cancer.

The risks to family members

Both BRCA1 and BRCA2 genes are inherited in an autosomal dominant fashion. This means that the children, brothers, sisters, and parents of a person with a mutation have a 50% chance of having the mutation. A person with a mutation may develop one cancer, more than one cancer, or no cancer in their lifetime. Most BRCA gene mutations are inherited from a parent, and are rarely caused by a new mutation.

Managing the Risk

For breast cancer:

- Surgery to remove the breast before cancer develops reduces the risk of developing breast cancer by about 90%.
- Surgery to remove the ovaries before age 40 may decrease the risk of breast cancer by greater than 50%.
- Screening by yearly mammograms and breast MRI; clinical breast exams every 6 months; and monthly self-breast examinations can detect 90-95% of breast cancer in an early stage.
- Chemoprevention drugs such as Tamoxifen can decrease the risk of breast cancer by 50%
- Regular exercise can decrease the risk for breast cancer.

For Ovarian cancer:

- Removing the ovaries before cancer develops decreases the risk for ovarian cancer by 99%.

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