Hereditary Breast and Ovarian Cancer (HBOC) syndrome

BRCA1 and BRCA2 gene mutations

Mutations in *BRCA1* or *BRCA2* predispose to breast cancer and ovarian cancer as well as prostate cancer *(BRCA1)* and other cancers *(BRCA2)*. The risk of developing cancer that is associated with a *BRCA1* or *BRCA2* cancer-predisposing mutation is significantly higher than that in the general population.

Action: Identify patients at risk for HBOC and refer for genetic counseling.
The USPSTF recommends that women whose family history is associated with an increased risk for deleterious mutations in *BRCA1* or *BRCA2* genes be referred for genetic counseling and evaluation for BRCA testing[1]. Grade: B Recommendation.

BRCA1 or *BRCA2* hereditary breast/ovarian cancer is suspected in an individual who has one or more of the following:

- A personal history of early-onset (before age 50 years) breast cancer or early-onset breast and ovarian cancer at any age and/or
- Bilateral (or multifocal) disease
- A family history of breast cancer or breast and ovarian cancer consistent with autosomal dominant inheritance
- A personal or family history of male breast cancer
- Eastern European or Ashkenazi Jewish background

The Genetics of HBOC: *BRCA1* and *BRCA2* genes

BRCA1 and *BRCA2* account for approximately 85% of hereditary breast and ovarian cancer. *BRCA* genes are inherited in an autosomal dominant pattern. Inheritance can be through the maternal or paternal side of the family. Inheritance through the paternal side may be masked due to the low frequency of breast cancer in male carriers. Each child of an individual with a *BRCA* mutation has a 50% chance of inheriting the mutation. Mutations in *BRCA1* or *BRCA2* genes are passed to children in germ cells at the time of conception. The first person to test in a family should be someone with cancer who meets the above criteria.

Benefits of genetic testing in high risk families

- more accurate diagnosis
- risk assessment of family members
- specific targeting of clinical screening and surveillance protocols to gene carriers
- family members who did not inherit the mutation do not need an intensive surveillance program.

Resources

- USPSTF
- GeneTests: Hereditary Breast/Ovarian Cancer Syndrome