**BRIP1**

The *BRIP1* gene is a tumor suppressor gene. Tumor suppressor genes slow down cell division, repair DNA mistakes, or tell cells when to die. When they don't work properly, cells can grow out of control, which can lead to cancer. The primary role of *BRIP1* is the unwinding of damaged DNA so that it can be repaired.

Like most genes, each person has two copies of the *BRIP1* gene: one inherited from each parent. A mutation in a single *BRIP1* gene inherited from either parent is known to increase risk of breast and ovarian cancer over a lifetime.

In very rare cases, a person can inherit two *BRIP1* mutations, one from each parent. This causes a blood condition called Fanconi anemia, which is associated with bone marrow failure, physical disabilities, and childhood cancers.

**How common are mutations in the *BRIP1* gene?**
Mutations in the *BRIP1* gene are rare—the exact frequency is not yet known. Studies to establish the frequency of *BRIP1* mutations are ongoing.

**How mutations in this gene impact risk**

**Women**

If a woman has a mutation in the *BRIP1* gene, her chances of developing breast and ovarian cancer are greater than that of the average US woman. This does not mean that she has a diagnosis of cancer or that she will definitely develop cancer in her lifetime.

<table>
<thead>
<tr>
<th>Cancer by age 80</th>
<th>Average US woman¹</th>
<th>With <em>BRIP1</em> mutation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>10%</td>
<td>Elevated (12-32%)²³</td>
</tr>
<tr>
<td>Ovarian</td>
<td>1%</td>
<td>Elevated (5-14%)⁴⁵</td>
</tr>
</tbody>
</table>

*Elevated: Risk is increased, but further research may clarify the exact risk figure.*

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Men
If a man has a mutation in the *BRIP1* gene, his chance of developing cancer is not known to be increased.

**Screening guidelines**
Below is a summary of screening guidelines from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) established by experts at the National Comprehensive Cancer Network. They are for women who have a mutation in the *BRIP1* gene, except as noted. If you have a mutation in this gene, your healthcare provider may use these NCCN Guidelines® to help create a customized screening plan for you.

**Women**

**Breast cancer**
- There are currently no breast cancer screening guidelines specific to women with *BRIP1* mutations from the NCCN. Therefore, these NCCN Guidelines® are for women who have the same breast cancer risk as the average US woman. However, your healthcare provider may recommend additional breast cancer screening and risk reduction options, such as earlier and more frequent screening, screening using breast MRI, and medications to reduce the risk of breast cancer.
  - **Starting at age 25:** Breast awareness - Women should be familiar with their breasts and promptly report changes to their healthcare provider.
  - **Between ages 25-39:** Breast exam, risk assessment, and risk reduction counseling by your provider every 1-3 years.
  - **Starting at age 40:** Breast exam, risk assessment, and risk reduction counseling by your provider and mammogram every year. Your provider may discuss screening with tomosynthesis.

**Ovarian cancer**
- **Starting at age 45-50, or earlier based on family history of ovarian cancer:** Your healthcare provider may discuss a risk-reducing salpingo-oophorectomy (the surgical removal of the ovaries and fallopian tubes) with you to lower the risk of developing ovarian cancer.

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Useful resources
FORCE
Providing support, education, research, and resources for survivors and people at increased risk of cancer due to an inherited mutation or family history of cancer.
www.facingourrisk.org

Bright Pink
Focused on the prevention and early detection of breast and ovarian cancer in young women, while providing support for high-risk individuals.
www.brightpink.org

Susan G. Komen
Dedicated to reducing deaths from breast cancer by funding breast cancer research, ensuring access to care through community programs worldwide and supporting public health policies that help people facing breast cancer.
www.komen.org/

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