Risk Factor Analysis of Hereditary Breast and Ovarian Cancer

This is the largest long-term study of women who carry a mutation in one of the two breast cancer genes (BRCA1/BRCA2). This study was started in 1995 by Dr. Steven Narod and now has upwards of 9,000 participants from across Canada, the United States, Europe, and Asia. Its purpose is to better understand the prevention and treatment of hereditary breast and ovarian cancers. We hope to gain a better understanding of the interaction between various hormonal, reproductive, and lifestyle factors that may be associated with the development of breast and ovarian cancer in high-risk families. Click here to view the Investigators Brochure.

Learn more about some of the important findings that have come from Dr. Narod’s studies.

Who Can Participate?

- Participation in this study is completely voluntary.
- Women who have learned that they have a mutation in either the BRCA1 or BRCA2 gene are eligible to participate in this study, whether or not they have a personal history of cancer.
- Participants must be 25 years of age or older.

Why Should You Participate?

The risk of breast and ovarian cancer in carriers of BRCA1 or BRCA2 mutations is believed to be influenced by several genetic and non-genetic factors. A bigger study population will produce more accurate results, giving you an opportunity to make better decisions regarding your health.

What Does Participation Entail?

To participate, all we need you to do is to fill a questionnaire that asks questions about your health, menstrual cycle, lifestyle, etc. every two years. You may stop participation at any time. We estimate that the questionnaire could take about 30 minutes to complete.

How Do I Participate?

Ready to make more informed decisions and help future generations of BRCA1/2 carriers?

You can sign up to receive a study package on this website. [Click here to download a request form in Word]

You may also call or email us to request a package or to receive more information before making your decision.
FINDINGS: Familial Breast Cancer Research Unit

**Pregnancy:**
Carriers of the BRCA1 and BRCA2 gene mutations who have children are significantly more likely to develop breast cancer by age 40 than carriers who have not had any children. Each pregnancy is associated with an increased cancer risk. An early first pregnancy does not mean protection for carriers of BRCA1 or BRCA2 mutations.¹

**Breastfeeding:**
Women who have a BRCA1 mutation and breast-fed for a cumulative total of more than 1 year had a statistically significant reduced risk of breast cancer.²

**Oral Contraceptives:**
Oral-contraceptive use may reduce the risk of ovarian cancer in women with mutations in the BRCA1 or BRCA2 gene.³

Among BRCA1 mutation carriers, women who first used oral contraceptives before 1975, who used them before age 30, or who used them for 5 or more years may have an increased risk of early-onset breast cancer. Oral contraceptives do not appear to be associated with risk of breast cancer in BRCA2 carriers, but data for BRCA2 carriers is limited.⁴

**Fertility Drugs:**
The use of fertility medications does not adversely affect the risk of breast cancer among BRCA mutation carriers. However, the impact of fertility drug use among BRCA mutation carriers has not been studied closely due to the small number of carriers who have used fertility drugs. Any findings should be interpreted with caution. Further studies are required in this field.⁵

**Tubal Ligation:**
Tubal ligation is a suitable option to reduce the risk of ovarian cancer in women with BRCA1 mutations who have completed childbearing.⁶

**Oophorectomy:**
The high incidence of ovarian cancer suggests that oophorectomy (surgical removal of the ovaries) should be recommended in female BRCA1 and BRCA2 mutation carriers with a diagnosis of breast cancer, especially those with stage I disease. Breast cancer systemic therapy did not significantly alter the risk of ovarian cancer.⁷
Oophorectomy is an effective means of reducing the risk of breast cancer in carriers of BRCA1 mutations. The data suggests oophorectomy is protective in BRCA2 carriers as well, but this needs to be confirmed in other studies.\(^8\)

Oophorectomy is associated with a reduced risk of ovarian and fallopian tube cancer in high-risk women, although there is a substantial residual risk for peritoneal cancer in BRCA1 and BRCA2 mutation carriers following prophylactic salpingo-oophorectomy (a type of preventive surgery performed by removing the fallopian tubes and ovaries).\(^9\)

**Tamoxifen:**
Tamoxifen, a drug used in the treatment of breast cancer, has been shown to reduce the risk of contralateral (affecting both breasts) breast cancer in women with mutations in the BRCA1 or BRCA2 gene. The protective effect of tamoxifen seems independent of that of removal of the ovaries.\(^10\)

The protective effect of tamoxifen was not seen among women who had their ovaries removed but this subgroup was small. In contrast, a strong protective effect of tamoxifen was apparent among women who were premenopausal or who had undergone natural menopause.\(^11\)

The risk of contralateral breast cancer in women with a BRCA mutation is approximately 40% at 10 years after the first breast cancer diagnosis, and is reduced in women who take tamoxifen or who undergo an ovary-removal surgery.\(^12\)

**Screening and Preventive Practices:**
We found no association between ever having screening mammography and risk of breast cancer. Prospective studies are needed to confirm the results.\(^13\)

**Other:**
Early chest X-rays may be a risk factor for breast cancer in BRCA1 carriers.\(^14\)

**Prostate Cancer:**
Men with BRCA2 mutations have been found to be at increased risk of developing prostate cancer. It may be important to develop targeted chemotherapies to treat prostate cancer in men with a BRCA2 mutation.\(^15\)

Relevant Publications


