Familial Breast or Ovarian Cancer Syndromes

This pathway is for assessing risk for women without breast or ovarian cancer but with a positive family history.

See also Ovarian Cancer Diagnosis

Background

About breast or ovarian cancer syndromes

About breast or ovarian cancer syndromes

About 5% of all breast cancer is hereditary, mainly caused by mutations of BRCA1 and BRCA2 genes. Mutations in these genes also cause about 15% of all high grade serous ovarian cancer.

Searching for a familial mutation has to start in an affected family member because the BRCA genes have more than 3,000 different mutations identified to date.

Each child of a BRCA carrier has a 1 in 2 chance of inheriting the mutation.

BRCA mutations:

- Are more likely if there is a personal or family history of early onset breast or ovarian cancer, bilateral breast cancer, male breast cancer, and/or breast and ovarian cancer.
- Occur in about 1 in every 500 to 800 people (equally in both males and females).
- Result in an increased lifetime risk of developing breast and ovarian cancer:
  - In women, breast cancer risk is up to 60% (compared with 10% in the general population).
  - In women, ovarian cancer risk is up to 40% (compared with 1.6% in the general population).
  - In men, breast cancer risk is up to 7% (compared to < 1% in the general population).

Assessment

1. Clarify whether the patient has any current symptoms. If so, see the Breast Symptoms pathway or the Ovarian Cancer Symptoms pathway.
2. Take a personal history.

Personal history

- Ashkenazi Jewish ancestry (i.e., from Central and Eastern Europe)
- Personal history of breast cancer or other breast pathology

3. Establish whether there is a significant family history of breast or ovarian cancer.

Taking a family history

Consider relatives on each side of the family separately. An accurate family history includes:

- asking the woman about any primary breast or ovarian cancer in all first-degree and second-degree relatives on both sides of the family.
- for identified cases, noting:
  - age of diagnosis.
  - side of family.
  - relationship to patient.
- checking for:
  - males affected by breast cancer.
  - first degree blood relatives with BRCA1 or BRCA2 gene mutations.
- reviewing the family history regularly – it may change with time.

Definitions	
First degree relatives	• Mother • Father • Daughter • Son • Sister • Brother
Second degree relatives	• Grandparent • Grandchild • Aunt • Uncle • Niece and nephew • Half-sister and half-brother
Third degree relatives	• Great grandparent • Great grandchild • Great aunt • Great uncle • First cousin • Grand-nephew and

	grand-niece
Paternal history	Two or more relatives diagnosed with breast cancer on father's side of family
BRCA1	Breast Cancer Type 1 Susceptibility Protein
BRCA2	Breast Cancer Type 2 Susceptibility Protein

4. Determine family risk category:
   - Category 1 – average risk (population risk)

     Category 1 average risk (population risk)

     Covers more than 95% of the female population:

     - No confirmed family history of breast cancer.
     - One first-degree relative aged ≥ 50 years, diagnosed with breast cancer.
     - One second-degree relative of any age diagnosed with breast cancer.
     - Two second-degree relatives on the same side of the family aged ≥ 50 years, diagnosed with breast cancer.
     - Two first or second-degree relatives diagnosed with breast cancer, aged < 50 years, but on different sides of the family (i.e. one on each side of the family).

     Risk of breast cancer up to age 75 is between 1 in 8 and 1 in 11 (9 to 12%), the same or only slightly higher than that of the normal female population.
   - Category 2 – moderately increased risk

     Category 2 moderately increased risk

     Covers less than 4% of the female population:

     - One first-degree relative aged < 50 years diagnosed with breast cancer.
     - Two first degree relatives, on the same side of the family at any age, diagnosed with breast or ovarian cancer.
     - Two second-degree relatives, on the same side of the family, at least one aged < 50 years, diagnosed with breast cancer.
     - Risk of breast cancer up to age 75 is between 1 in 4 and 1 in 8 (12 to 25%), moderately increased compared to that of the normal female population.
   - Category 3 – potentially high risk

     Category 3 potentially high risk

Covers less than 1% of the female population. Risk may be higher or lower if genetic test results are known.

- One first degree relative aged < 70 years diagnosed with ovarian cancer.
- Two first-degree or second-degree relatives on the same side of the family diagnosed with breast or ovarian cancer plus one or more of the following on the same side of the family:
    - Additional relative(s) with breast cancer or ovarian cancer
    - Breast cancer diagnosed before the age of 40
    - Bilateral breast cancer
    - Breast and ovarian cancer in the same woman
    - Jewish ancestry
    - Breast cancer in a male relative
    - A relative that has tested positive for a high risk gene mutation, e.g., mutation in genes such as BRCA1 or BRCA2
    - One first or second-degree relative diagnosed with breast cancer at age
    - Aged ≤ 45 years, plus another first or second-degree relative on the same side of the family aged ≤ 45 years with sarcoma (bone/soft tissue).
    - Member of a family in which the presence of a high-risk breast cancer gene mutation has been established
- Risk of breast cancer up to age 75 is between 1 in 2 and 1 in 4 (greater than 25%), potentially higher than that of the normal female population.

Management

Discuss general preventative strategies and encourage enrolment in national screening programmes e.g., Breast Screening. Provide patient with information resources (below).

General preventive strategies

Healthy diet
Minimal alcohol intake
Regular exercise

Category 1 management – average risk (population risk)

Category 1 management

For patients aged 45 to 69 years – mammograms via BreastScreen Aotearoa, every 2 years.

Reassure patient that their family history poses either no additional risk or a very low additional risk. They can be managed the same as patients with no family history.

Educate patient about breast awareness.

Category 2 management – moderately increased risk

Category 2 management

For patients aged 40 to 50 years – annual mammogram, starting 5 years before youngest first degree relative.

From aged 40 to 45 years, request annual screening via Northland DHB At-risk Screening.

From aged 45 to 50 years, alternate-year screening via BreastScreen Aotearoa.

For patients aged 50 to 74 years:

mammograms every 2 years via BreastScreen Aotearoa.

annual breast examination within primary care.

Educate patient about breast awareness.

If in doubt about risk or if patient requests genetic counselling, request genetic health assessment. Patient can self-refer.

Category 3 management – potentially high risk

Category 3 management

Request non-acute breast assessment.

Secondary care processes:

Perform assessment to confirm risk category.

If appropriate, the clinic will request genetic health assessment. Genetic test results may modify the risk category of patient.

Determine ongoing screening imaging requirements to be arranged by the clinic.

Request

If potentially high risk for breast or ovarian cancer, request non-acute breast assessment.

For patients with moderate risk:

consider genetic health assessment for patients with moderate risk if:

- patient desires genetic counselling.

- in doubt about risk category.

request annual breast screening imaging from aged 40 to 50 years.

MRI scan surveillance is only possible through specialists in the hospital setting.

Information

- For health professionals
  - eviQ – Referral guidelines for cancer genetics (registration (free) required)
  - Genetics in Family Medicine: The Australian Handbook for General Practitioners - Cancer in the Family
  - New Zealand Breast Cancer Foundation:
    - Genes and family History
    - Genetic Counselling & Testing
  - NSW Government Health Centre for Genetics Education:
    - Breast and Ovarian Cancer and Inherited Predisposition
    - Cancer, Genes and Inherited Predisposition Overview
- For patients
  - Center for Genetics Education – Breast and Ovarian Cancer and Inherited Predisposition
  - Genetic Alliance – A Guide to Family Health History
  - HealthInfo – Breast Cancer
  - New Zealand Breast Cancer Foundation
  - Cancer Society of New Zealand
  - Genetic Health Service New Zealand