Genetic testing for inherited cancer

Summary
- A predisposition to certain cancers can be inherited via altered genes.
- Genes are only shared by blood relatives, so you can’t be at risk of familial cancer from your adoptive parents or in-laws.
- If you believe you are at risk of familial cancer, see your doctor for further information and advice.

A predisposition to certain cancers can be inherited via altered genes. Genetic testing aims to detect a genetic alteration that might increase the chances of a person developing a particular cancer. This testing is available to some families with a high risk of a genetic predisposition to certain cancers.

Inherited cancer explained
Genes control the growth, division and life span of every cell in the body. Your genes come in pairs – one inherited from your mother and the other from your father.

Some people inherit altered genes that may predispose them to developing particular cancers. For example, a woman who has inherited a single altered copy of one of the specific breast cancer genes (known as BRCA1 and BRCA2) has a higher risk of breast and ovarian cancer than a woman who inherited two normal copies of both genes. However, only around five out of every hundred cases of breast cancer may be due to an inherited genetic predisposition.

Risks of inherited cancers
A small number of families have a greater risk of certain cancers such as breast, ovarian and bowel cancers because they carry a changed gene. A Familial Cancer Centre can advise you about your risk of developing cancer, provide genetic counselling and medical advice and, in some situations, genetic testing.

Breast and ovarian cancer
Families who may be at potentially high risk of breast or ovarian cancer include those with three or more relatives with breast or ovarian cancer.

Families with two or more relatives who have breast or ovarian cancer are also considered to be at potentially high risk, if the affected relatives fall into any of the following categories:
- cancer in both breasts
- onset of breast cancer before the age of 40
- ovarian cancer at any age
- breast and ovarian cancer in the same relative
- breast cancer in a male relative
- Jewish ancestry
- breast cancer has pathological features that suggest the presence of an inherited predisposition

Bowel cancer
Families who may be at potentially high risk of bowel cancer include those with three or more relatives on the same side of the family with bowel cancer.

Families with two or more relatives with bowel cancer are also considered to have an increased risk if there is:
- more than one bowel cancer in the same relative
• onset of bowel cancer before the age of 50
• a relative with endometrial or ovarian cancer
• a relative with bowel cancer and with a large number of bowel polyps.

**Other types of cancers**
For other types of cancers, people are considered to be at increased risk if they have:

• several relatives who have the same type of cancer
• a relative who has been found to carry a particular altered gene.

**Genetic testing**
Genetic testing is available to a small number of families at the highest risk of having an inherited predisposition to cancer. Generally, it is necessary to test a person who has had cancer first to identify the genetic change causing cancer in the family. If a genetic change is found, it confirms that the cancers in that family are due to an inherited predisposition to cancer.

Blood relatives who have no signs of cancer can then choose to have testing to find out if they have inherited the altered gene that has been identified and could increase their risk of developing specific types of cancer. If they have inherited a predisposition to cancer, the Familial Cancer Centre will develop a personal program designed to manage their risk.

If a genetic change cannot be found in a person affected by cancer, it remains possible that there is still a genetic predisposition to cancer in the family. Unfortunately not all genetic changes can be detected. The Familial Cancer Centre would advise family members about the chance of developing cancer and what they can do to reduce the risk.

Genetic testing is arranged by the Familial Cancer Centre and is offered only with counselling both before and after the test to discuss its limitations as well as potential benefits.

**See your doctor first**
If you believe you are at risk of familial cancer, see your doctor. If your doctor believes there may be some concern, an appointment can be made with a Familial Cancer Centre. These centres have professional staff including geneticists, genetic counsellors, gastroenterologists, surgeons and oncologists (cancer specialists). The clinic staff can answer any questions, discuss medical options and discuss if genetic testing is possible.

**Where to get help**
• Your family doctor (GP)
  • [Monash Health Familial Cancer Centre](Tel. (03) 9342 7151)
  • [Royal Melbourne Hospital Familial Cancer Centre](Tel. (03) 8559 5322)
  • [Peter MacCallum Cancer Institute Familial Cancer Centre](Tel. (03) 9496 3027)
  • [Austin Health Clinical Genetics Service](Tel. (03) 9496 3027)
  • [Cancer Council Victoria Information and Support Service](Tel. 13 11 20)
  • [Cancer Australia - Breast cancer risk calculator](betterhealth.vic.gov.au)