

Cancer in the family

Cancer sometimes runs in families, but not to the extent that many people think.

Nobody really understands why cancers occur in some people and not others. But it is clear that the risk of getting cancer is influenced by a combination of factors such as what we eat, how we live our lives, the environment around us and our genetic background. Only about 5 to 10 people out of 100 who get cancer have a strong genetic indicator, which would suggest a high likelihood of getting the condition.

That may not seem true. Everybody knows families where quite a few people have had cancer. But families tend to eat similar foods, live similar lifestyles and live in similar environments – it is not only the genes that are causing problems.

Cancers that do run in families and might have a genetic alteration underlying them tend to be:

- Cancers that usually affect several relatives from the same side of the family.
- Cancers that are found fairly early in life.
- Where some people in the family may have had two or more separate cancers, of either the same or a different type.

The most common types of cancer that run in families are:

- Breast and ovarian cancer, which often go together in families.
- Bowel cancer, which can go together with certain cancers elsewhere in the body.

Breast and ovarian cancer

More than 90 women out of 100 with breast or ovarian cancer did not get the condition through inheriting the genes associated with breast and ovarian cancer.

You might think there is a strong genetic indicator that there is a high likelihood of the condition occurring in your family if:

- Two or more close relatives (grandmother, mother, aunt, sister, niece) on the same side of the family developed breast cancer before the age of 50, or ovarian cancer before the age of 40, and
 - > There is an additional relative or relatives who had breast or ovarian cancer.
 - > A family member had cancers in both breasts.
 - > A female relative had both breast and ovarian cancer.
 - > A male in the family had breast cancer.
 - > You have Jewish ancestry.

Obviously, you would also take note if someone in the family has been told they have an altered breast or ovarian cancer gene.

The main genes involved with breast cancer and ovarian cancer are well known – they are BRCA1 and BRCA2. Note that everybody has these genes, which normally protect against cancer. Problems only arise if one of these genes is altered so that it doesn't work properly anymore and no longer stops the cancer developing. One way of thinking about this is that the cancer protection gene has become faulty.

Women with an altered BRCA1 gene have an increased risk of developing both breast cancer and ovarian cancer. This risk is thought to be between 40 and 80 in every 100 cases for breast cancer and between 10 and 60 in every 100 cases for ovarian cancer.

Women with an altered BRCA2 gene have similar increased risks. They also have an increased risk of pancreatic cancer.

Men with an altered BRCA1 gene have an increased risk of breast and prostate cancer. Men with an altered BRCA2 gene have an increased risk of breast, prostate and pancreatic cancer.

Note that inheriting a faulty gene only means inheriting a high likelihood of getting cancer – it does not mean inheriting cancer. A large proportion of those who inherit the faulty gene will not develop the cancer.

Testing can look for alterations in BRCA1 and BRCA2. But genetic counselling should come first, as there are many things to discuss beforehand; testing is expensive and interpreting the test result is sometimes difficult.

People who have breast or ovarian cancer in the family and whose doctor thinks they are at **high risk** of having one of these conditions, should discuss a referral to a familial cancer clinic. There, the family history will be examined carefully and options such as genetic testing will be discussed.

People who have breast or ovarian cancer in the family and whose doctor thinks they are at **moderate risk** of having one of these conditions, should ask for a referral to a familial cancer clinic to talk about the best way to reduce their risk of cancer.

Bowel cancer

More than 95 people in 100 with bowel cancer have not inherited it.

You may think you have a high likelihood of getting bowel cancer if:

- Two or more close relatives (grandparents, parents, brothers, sisters, aunts and uncles) on the same side of the family developed bowel cancer;
and
 - > Bowel cancer was diagnosed before the age of 50.
 - > A family member had two or more bowel cancers.
 - > There are certain other cancers in the family (see HNPCC).
 - > A close family member (grandparent, parent, brother, sister, aunt and uncle) with bowel cancer also had a large number of benign growths or polyps, in the bowel.

Obviously, you would also take note if someone in the family has been told they have an altered bowel cancer gene.

Among those who do have a genetic indicator that points to a high likelihood of getting the condition, there are three main conditions to consider – hereditary non-polyposis colorectal cancer (HNPCC), familial adenomatous polyposis (FAP) and MUTYH-associated polyposis (MAP). HNPCC and FAP show an autosomal dominant pattern of inheritance. MAP shows an autosomal recessive pattern of inheritance (see fact sheet 2 on '*How do genetic conditions occur?*').

People with HNPCC also have an increased risk of developing cancer of the uterus, ovary, stomach and other sites.

People with FAP or MAP also have an increased risk of developing cancers in the duodenum (which connects the stomach and the bowel) and other sites.

Testing can look for alterations in the HNPCC, FAP and MAP genes. But genetic counselling should usually come first, as there are many things to discuss beforehand; testing may be expensive and interpreting the test result is sometimes difficult.

People who have bowel cancer in the family and whose doctor thinks they are at **high risk** of having one of these conditions, should discuss a referral to a familial cancer clinic.

People who have bowel cancer in the family and whose doctor thinks they are at **moderate risk** of having one of these conditions, should have a regular examination of the bowel with a colonoscope.

Contacts and further information

- All states and the ACT have familial cancer services. Contact them through your local state or territory health department.
- Your local genetic service, which you can contact through your nearest community health centre, public hospital or health department.
- The National Breast Cancer Centre at <http://www.nbcc.org.au>
- Australian Cancer Network at <http://www.cancer.org.au>
- The Centre for Genetics Education at <http://www.genetics.edu.au>
- Australasian Genetic Alliance at <http://www.australasiangeneticalliance.org.au>
- HealthInsite at <http://www.healthinsite.com>
- MedicineNet at <http://www.medicinenet.com>
- MyDr at <http://www.mydr.com.au>
- For other related fact sheets, you can contact the Gene Technology Information Service on **free call Australia-wide 1800 631 276** or email gtis-australia@unimelb.edu.au or visit Biotechnology Australia's website at <http://www.biotechnology.gov.au>