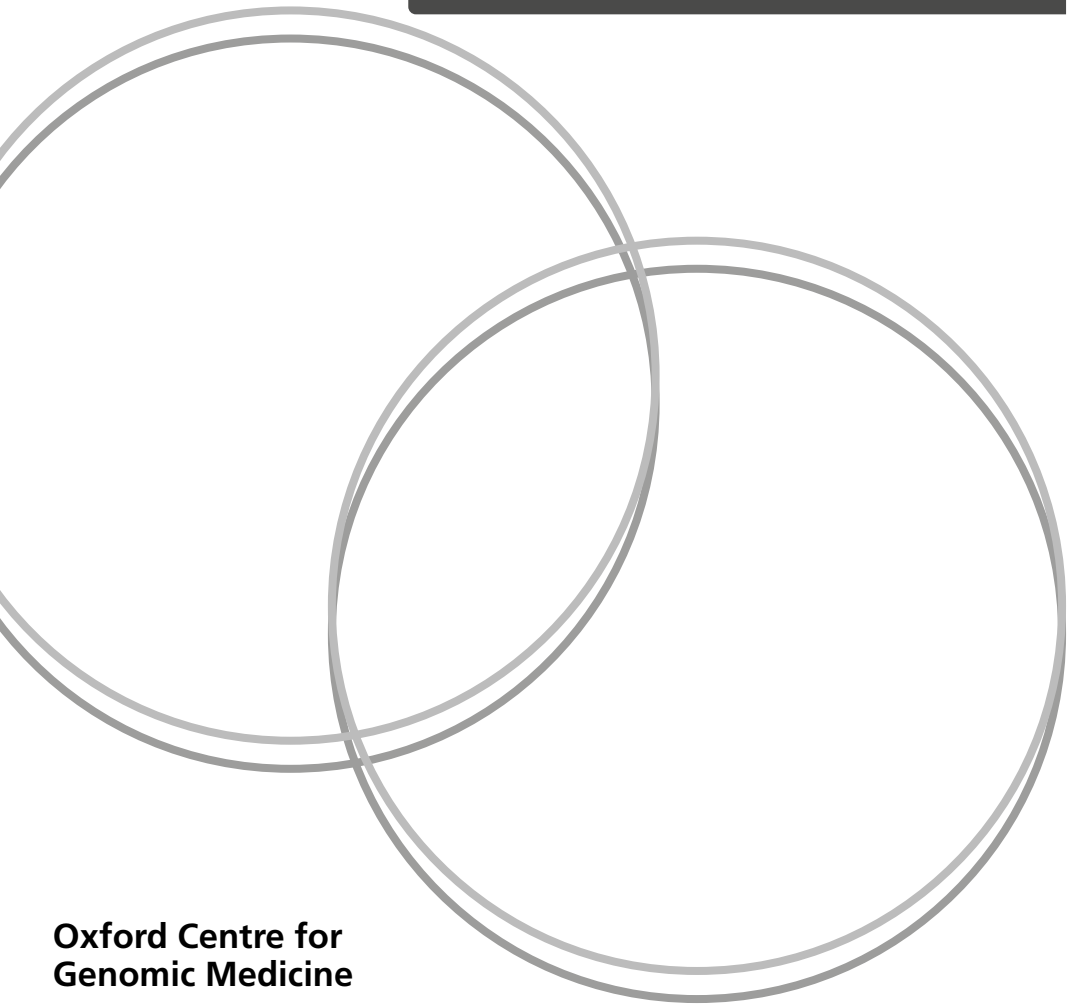
Oxford University Hospitals
NHS Foundation Trust

# *BRCA1* and *BRCA2* for men

**Information for men from families with a known alteration in the BRCA1/2 gene**



Oxford Centre for
Genomic Medicine

# Introduction

*BRCA1* and *BRCA2* are two genes which can sometimes be linked to breast, ovarian and prostate cancer in families. These genes are often considered most relevant for women. However, men can also carry alterations in these genes. This leaflet gives information specifically for men at risk of cancers related to BRCA1 or 2.

# What are genes?

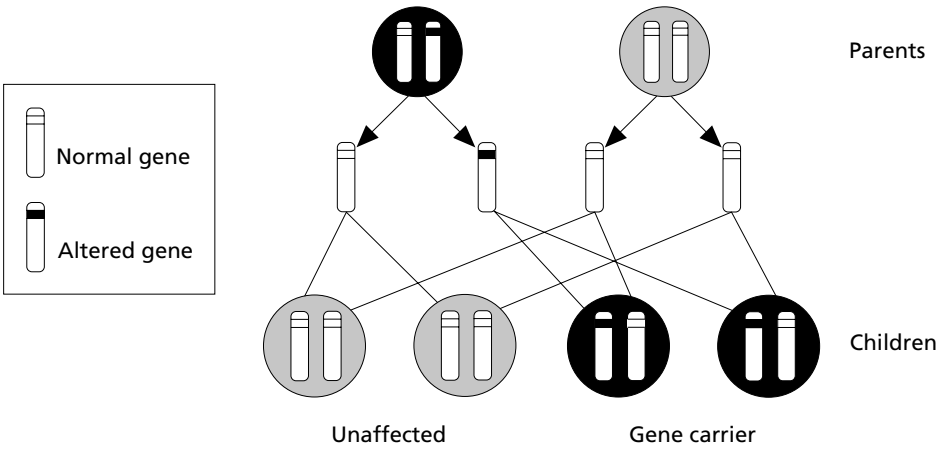
Genes are instructions which tell our bodies how to work. We each have about 20,000 genes. Most of our genes come in matching pairs. We get one copy from our mother and one copy from our father. Each gene has a specific job.

# What do *BRCA1* and *BRCA2* do?

The *BRCA1* and *2* genes are important in controlling how our cells grow and in repairing damage in our cells. By doing this job, the genes help to protect us from getting cancer. If the gene is altered, it will not be able to do its job properly. Women with BRCA1 or 2 gene alterations have a higher risk of developing breast and ovarian cancers. Men with *BRCA2* gene alterations are at a higher risk of developing prostate and breast cancers.

# How are *BRCA1* and *BRCA2* inherited?

People who have a *BRCA* alteration have one altered and one working copy of the gene. Each time they have a child; there is a 1 in 2 (50%) chance that they will pass on the working copy and a 1 in 2 (50%) chance that they will pass on the altered copy. This is shown in the following picture.




Although the cancers which are most often linked with *BRCA1* and *BRCA2* generally occur in females (breast and ovarian cancer), both women and men can carry an altered copy of the gene.

# How do I know if I have a *BRCA* gene alteration?

If someone in your family is known to have a *BRCA* alteration, you could have a blood test to see if you also carry it. The text usually takes around 4-6 weeks to be completed.

We would arrange an appointment for you to discuss the implications of testing. It is sometimes useful to think about how you and other family members might feel about the results and how you might cope with this. It can also be helpful to consider what screening you may have if you carry the alteration.

Some people worry that genetic testing can affect their ability to obtain life insurance. An agreement with the Association of British Insurers means this shouldn't be the case at the moment but this may change in the future.

# What does it mean for men who carry a *BRCA* alteration?

The implications for men who carry a *BRCA* gene alteration depends on whether the alteration is in *BRCA1* or *BRCA2*.

Men who carry a *BRCA1* gene alteration, may have a slightly higher risk of male breast cancer but still less than 1% or 1 in 100 men who carry BRCA1 develop breast cancer.

The risk for for prostate cancer is similar to that for men in the general population.

Men who carry a *BRCA2* gene alteration have a higher lifetime risk of developing prostate cancer. Around 1 in 4 (25%) of men who carry a harmful alteration in *BRCA2* develop prostate cancer at some point. Most of these prostate cancers occur over the age of 45. Men who carry a *BRCA2* alteration also have a higher chance of getting breast cancer. The chance of this is around 1 in 10 - 1 in 20 (5-10%).

# Is there any screening available?

There are screening tests available for prostate cancer but there is some question about how reliable they are.

Prostate screening involves a blood test to measure the level of a marker called PSA (prostate specific antigen). The doctor may also examine the prostate by inserting a finger into the back passage to check that the prostate is not enlarged. PSA levels may be raised in prostate cancer, but these tests will not detect all cases of prostate cancer. PSA levels can also be raised in men who do not have cancer. Often, a man with a raised PSA level does not have prostate cancer but this can cause unnecessary investigations and anxiety. If a man has a raised PSA, he may need another PSA test, an examination or a biopsy.

If you carry a *BRCA1* gene alteration you could discuss prostate screening with your GP if you wish. As the risk is higher for men with *BRCA2* alterations, we recommend screening for prostate cancer with a PSA test from the age of 40, however, research is still underway to determine the best screening advice for men with *BRCA* alterations.

There is no useful screening for male breast cancer, but if you are concerned about any changes to the chest area, you should see your GP initially to get them checked.

# What symptoms should I be aware of?

Problems with passing urine can indicate a problem with the prostate. If you notice a persistent change in the flow, urgency or frequency of urination or have difficulty, pain or blood when passing urine, you may wish to speak to your GP. Most of the time, these symptoms will not be due to prostate cancer.

# What about my children?

If you do not carry the gene alteration found in your family, your children cannot inherit it. If you do carry it, they will have a 50% chance of inheriting it. They may wish to have a genetic test when they are adults to inform them about their risk and suitable screening.

Many men worry particularly about their daughters. You may find the 'Hereditary Breast and Ovarian Cancer' leaflet helpful as it gives more information for women. As their risk of developing cancer below the age of 25-30, we would not usually begin any screening for them until at least this age.

Some men choose to delay testing until their children are in their 20's, when it is more relevant for them. It can be difficult to talk to your sons, daughters or other relatives about this. We can discuss this with you further if you would find that helpful.

# Research studies

There is a research study that men who carry a *BRCA* alteration can take part in.

The EMBRACE study is looking at other factors which may affect why some people with *BRCA* alterations develop cancer and others do not.

Your genetic counsellor or clinical geneticist can give you more information about this study. It will not affect your care if you choose not to take part.

# Further Information

You may also find the leaflet on ‘Hereditary Breast and Ovarian Cancer’ useful. Please ask us if you would like a copy.

**www.cancerresearchuk.org**

**www.macmillan.org.uk**

## Further information

If you would like an interpreter, please speak to the department where you are being seen.

Please also tell them if you would like this information in another format, such as:

- Easy Read
- large print
- braille
- audio
- electronic
- another language.

We have tried to make the information in this leaflet meet your needs. If it does not meet your individual needs or situation, please speak to your healthcare team. They are happy to help.

Author: This leaflet is based, with permission, on a leaflet produced by the West Midlands Regional Genetic Department.
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