IMPLICATIONS OF A *BRCA1* OR *BRCA2* GENE CHANGE

INFORMATION FOR MEN

CANCER GENETICS

Cancer is a common disease, affecting 1 in 2 people at some point in their lifetime. It is not usually inherited. However, if we see:

More cancer in a family than we would expect to see by chance

Cancer at a very young age

Multiple cancers in one individual,

There may be an underlying predisposition to cancer running in that family. It is important to identify such families so that people who are at a higher risk of cancer than the general population can be offered appropriate screening or intervention.

In families with increased incidences of breast, ovarian and prostate cancer, we can investigate the possibility of an inherited change in either the BRCA1 or BRCA2 genes in the family.

WHAT ARE THE BRCA1 AND BRCA2 GENES?

BRCA stands for **Br**east **Ca**ncer Gene. Everyone has two copies of the BRCA1 gene and two copies of the BRCA2 gene. When working properly, they help to prevent cancer.

However, a change can occur in one copy of a BRCA gene that stops the gene from working properly. Individuals with this type of gene change have an increased risk of developing cancer.

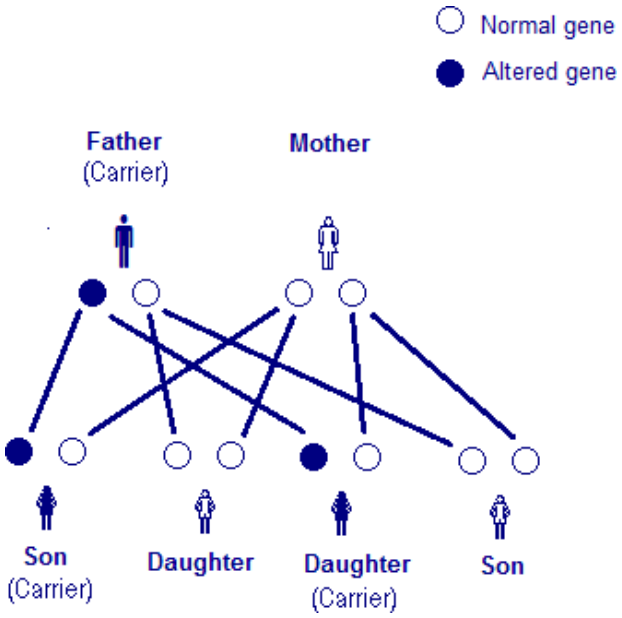
The main cancers linked to changes in BRCA1 and BRCA2 are breast and ovarian cancer in women, and breast and prostate cancer in men.

HOW ARE BRCA1 AND BRCA2 INHERITED?

Genes are the unique set of instructions inside our bodies which help make each of us an individual. We each have two copies of every gene (one from our father and one from our mother).

BRCA1 and BRCA2 gene changes are both inherited in an autosomal dominant manner. This means that only one copy of the gene needs to be changed for an individual to be at a greater risk of developing cancer. Both men and women can inherit and pass on a BRCA1 or BRCA2 gene change.

The diagram below shows how BRCA1 and BRCA2 are inherited. If a parent carries a change in one of their BRCA genes, then their child (male or female) has a 50% (1 in 2) chance of inheriting the gene change and being at an increased risk of developing cancer.



BRCA GENES AND BREAST CANCER RISK

The risk of developing breast cancer in men depends on whether the gene change is in BRCA1 or BRCA2.

- If a change is identified in BRCA1, men have between 0.1% to 1% (between 1 in 1000 and 1 in 100) lifetime risk of developing breast cancer.

- If a change is identified in BRCA2, men have a 5-10% (5-10 in 100) lifetime risk of developing breast cancer.

Men in the general population have a lifetime risk of 0.1% (1 in 1000) of developing breast cancer.

BEING CHEST AWARE

Men found to carry a BRCA gene change are advised to be chest aware. It is important to report any changes, such as the ones listed below, to your GP.

Symptoms to watch out for:

- Lump in the upper chest or under the armpit
- Nipple discharge or pain

- Inverted nipple
- Change in skin texture – such as puckering or dimpling.

Breast cancers can occur in the upper chest area, not just around the nipple.

Not all chest lumps or changes are cancerous and your GP will be able to help determine if you need any further investigations.

BRCA GENES AND PROSTATE CANCER

The risk of developing prostate cancer depends on whether the gene change is in BRCA1 or BRCA2.

- If a change is identified in BRCA1, men have around 10% (approximately 1 in 10) risk of getting prostate cancer. This is around the same level as the general population.

- If a change is identified in BRCA2, men have up to a 20-25% (approximately 1 in 4) lifetime risk of developing prostate cancer.

SCREENING FOR PROSTATE CANCER

The two main ways of screening for prostate cancer are digital rectal examination and PSA (Prostate Specific Antigen) testing.

PSA testing is done via a blood test. The test looks for increased amounts of PSA in the blood, which could be an indication of prostate cancer.

However, other conditions which are not cancer (e.g. prostate enlargement, prostatitis, urinary infection) can also cause higher levels of PSA in the blood.

It is also possible for a man with prostate cancer not to have an increased level of PSA.

Screening is usually offered from age 50 for BRCA1 gene carriers and age 40 for BRCA2 gene carriers. If you are a carrier of BRCA2 current recommendations are for your GP to arrange a PSA test once at age 40 then again at 45 and again at 50.

PROSTATE CANCER SYMPTOMS

It is important to report any changes, such as the ones listed below, to your GP.

Symptoms to watch out for:

- Pain when passing urine
- Blood in the urine
- Difficulty passing urine
- Change in frequency or urgency of urination.

WHERE CAN I FIND MORE INFORMATION?

Macmillan Cancer Support

Telephone number: 0808 808 0000

Website: www.macmillan.org.uk

Breast Cancer Care

Telephone number: 0808 800 6000

Website: www.breastcancercare.org.uk

Prostate Cancer UK

Telephone number: 0800 074 8383

Website: prostatecanceruk.org

The risk figures used in this leaflet have been taken from “A beginners guide to BRCA1 and BRCA2” published by the Royal Marsden Hospital 2016.

Your local genetics services:

South East of Scotland Clinical Genetic Service:	MMC, Western General Hospital Crewe Road South, Edinburgh EH4 2XU Telephone: 0131 537 1116
North of Scotland Genetics Service:	Department of Clinical Genetics Ashgrove House, Foresterhill Aberdeen AB25 2AZ Telephone: 01224 552120
East of Scotland Genetics Service:	Human Genetics Unit Level 6, Ninewells Hospital Dundee DD1 9SY Telephone: 01382 632035
West of Scotland Genetics Service:	Level 2A Laboratory Medicine The Queen Elizabeth University Hospital 1345 Govan Road, Glasgow G51 4TF Telephone: 0141 354 9201