Patient Information: *GATA2* gene

Why have I been given this information sheet?
You have been given this information sheet because you had genetic testing. This tested a sample of your blood cancer. Your cancer sample has shown an alteration in a gene called *GATA2*. This information sheet will help you understand what this means.

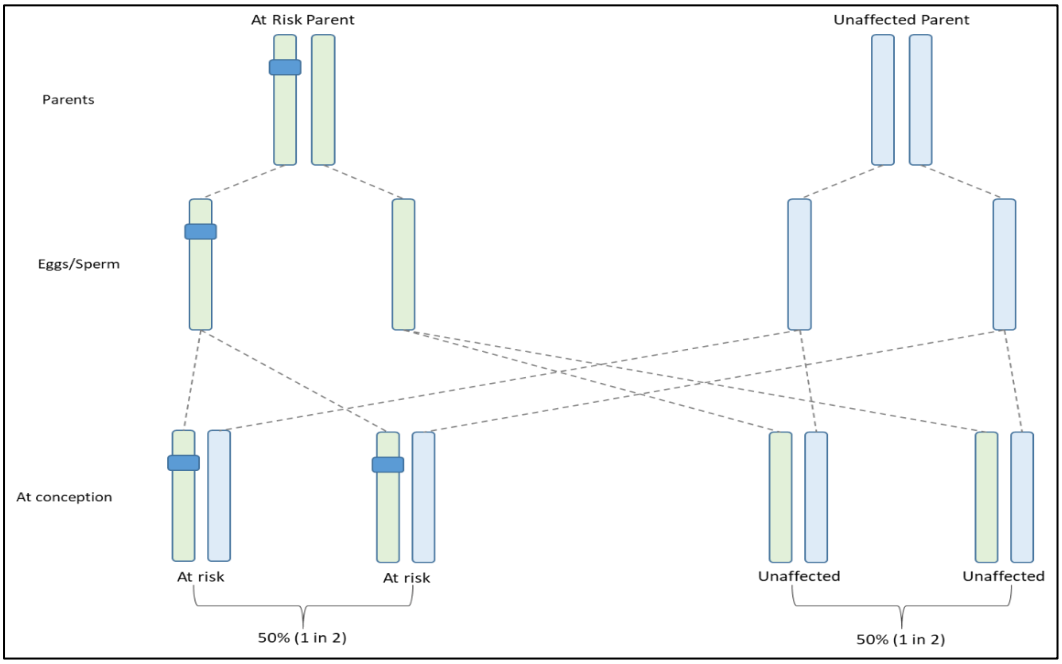
This gene alteration may partly explain why you have blood cancer. It may be used to help guide your treatment plan. The *GATA2* gene alteration may only be present in your cancer cells. It is also possible that it is a gene alteration you were born with. In this case, there may be an inherited cause for your cancer. You have the option of further tests to try to clarify this. If you are found to have an inherited gene alteration you will be referred to your local Clinical Genetics service. They will help you understand what this means for you and your family.

How often is blood cancer hereditary?
Most blood cancers do not have an inherited cause. Occasionally, blood cancer is linked to family history. Even if there is only one person in the family with blood cancer, it can sometimes still have an inherited cause. We know of some gene alterations linked to an increased risk of blood cancer. Different words are used to describe these. These include "mutation," "disease-causing alteration", or "pathogenic variant." The most up to date scientific term is "pathogenic variant." This describes a gene alteration that is linked to an increased health risk.

What are the risks associated with inherited pathogenic variants in *GATA2*?
People who inherit a pathogenic variant in *GATA2* have an increased risk of problems in the lymphatic system. This is part of the immune system and means they are more susceptible to infections. It can cause a condition called MonoMAC (monocytopenia and mycobacterial infection). They may develop lymphoedema (limb swelling) due to a build-up of lymph fluid. Sometimes a condition called pulmonary alveolar proteinosis develops. This is a problem in the lungs, which makes breathing difficult. Referral to a specialist service for infectious disease, skin, hearing and lungs may be needed, depending on symptoms.

People who inherit a pathogenic variant in *GATA2* have an increased risk of failure in the bone marrow (where blood cells are made). They have an increased risk of blood cancers, especially Myelodysplasia (MDS) and acute myeloid leukaemia (AML). This can happen in childhood or adulthood. Not everyone with a *GATA2* pathogenic variant develops these. We are not able to tell people their exact risks yet. The risks linked to this gene are not the same in all families.

Information for family members when a *GATA2* pathogenic variant is hereditary
We have two copies of the *GATA2* gene. The children of someone with a *GATA2* pathogenic variant have a 50% (1 in 2) chance of inheriting it. This is shown in the diagram below.



If your relatives are worried, they can ask for advice from their local genetics service. Testing is usually offered to close relatives first. This means parents, siblings and children. Testing is then offered to the wider family once we know which side it has come from, or which relatives are at risk.

What can you do about risks linked to an inherited *GATA2* pathogenic variant?
Children can be seen by a Paediatrican for a health check. Adults may be referred to specialist services depending on what health problems they have.

It is important know what symptoms to look out for. Signs of blood cancer are often non-specific. They include tiredness, weight loss and fever. They also include excess bruising and bleeding. It is important to tell your GP about your genetic test result when you report any symptoms. Everyone can reduce their cancer risk by having a healthy diet and weight. Not smoking and drinking less alcohol also help.

Genetic testing in family members
Having a predictive genetic test for the inherited *GATA2* variant found in your family is a personal choice. There is no routine monitoring that can detect blood problems early in people with a *GATA2* variant. Not everyone wants to know about their cancer risk. The first step to genetic testing is a referral to a local genetics service. A GP can make this referral. A genetics appointment can be used to talk it through. After discussion people can make their own choice. Genetic testing may be used to help find out if a relative could be a match as a bone marrow donor.

Insurance
In the UK, there is a Code on Genetic Testing and Insurance. Insurance companies can only ask for the results of a predictive genetic test in limited circumstances. More information is on the Association of British Insurers website: https://www.abi.org.uk/. If you are taking out insurance, we suggest using an accredited insurance broker. This is important for life, critical illness, or income protection. Carefully read the small print when taking out insurance.

Resources and support
Having a genetic test can sometimes increase anxiety. If you have concerns, you can talk to your healthcare team. If you have already been referred to the Clinical Genetics service, you can contact your genetics doctor or genetic counsellor.

Information, practical & emotional support for families affected by any type of leukaemia, Myelodyplastic Syndrome (MDS) or Myelodyplastic Neoplasm (MPN)
https://leukaemiacare.org.uk

Reliable information and caring support about Myelodyplastic Syndrome (MDS) or Chronic Myelomonocytic Leukaemia (CMML):
https://mdspatientsupport.org.uk

National Insitute of Health (USA) factsheet:
www.niaid.nih.gov/sites/default/files/GATA2-Factsheet.pdf