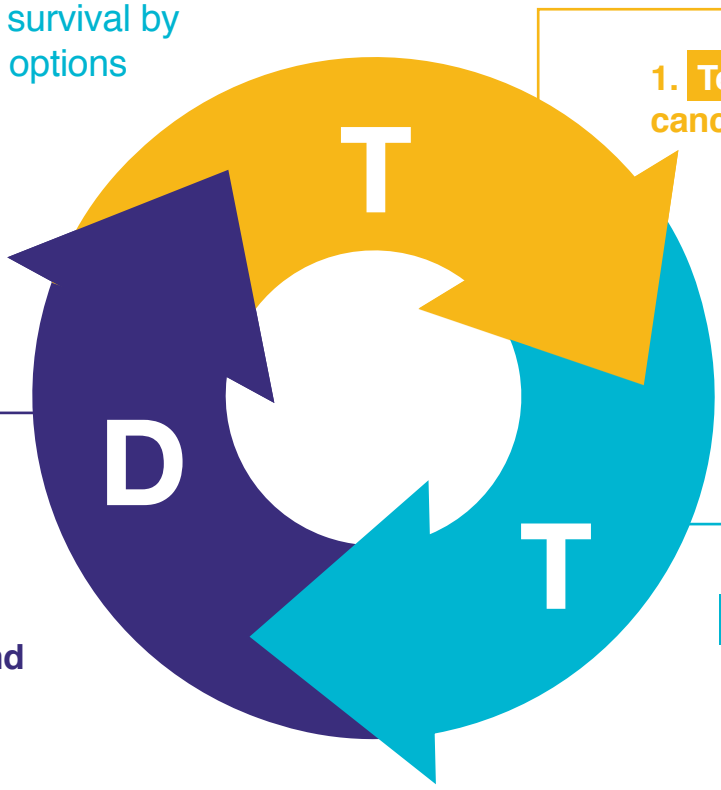
The Glasgow Cancer Test

Some 35,000 people are living with **advanced breast cancer** in the UK. **The Glasgow Cancer Test** was developed by scientists at the University of Glasgow to capture all the important information found in a cancer's DNA to guide a patient's treatment plan.

The detailed information from this kind of cancer DNA testing can expand the treatment and trial options available to patients – and save them from treatments that are unlikely to work.

We are working with the NHS to make this kind of test part of routine cancer treatment.

Cancer DNA testing is the first step in improving cancer survival by unlocking treatment options



1. Test the cancer's DNA

2. Find the Treatments/Trials that match the cancer's DNA

3.Use the Data (information from the tests and patients) **to help researchers find new treatments**

What does DNA have to do with cancer?

DNA is the recipe of life. A copy of this recipe can be found in each and every cell, containing instructions for all the different cells and organs in our bodies. Cancers occur when the DNA within a cell is altered and the instructions begin to contain errors, making cells grow out of control.

A breast cancer occurs as a result of an abnormal growth of cells within the breast. There are different types of breast cancer depending on what kind of hormones are making it grow and the DNA alterations in the cancer. **Advanced breast cancer (or metastatic or secondary breast cancer)** is where the cancer has spread beyond the breast area to the liver, lung, bones or brain.

Matching the right medicine to the right patient at the right time depends on testing for these DNA alterations in routine cancer care.

Hard facts

In the UK, more than 11,500 people die from advanced breast cancer every year because they have run out of treatment options.

While all cancer patients will learn more about their cancers from cancer DNA testing, people with advanced cancers will especially benefit from having information about more treatment options.

Cancer DNA Testing

To better match patients to the best treatments for them and for trials for new drugs, it is important to test for DNA alterations **at the time of a person finds out they have a cancer.**

Scientists at the University of Glasgow have developed the **Glasgow Cancer Test (GCT)** to look at **changes to more than 170 genes** that are important for finding out exactly what kind of cancer it is, deciding current treatments and for being matched to drug trials if the cancer continues to grow. The GCT will pick up both inherited DNA alterations and ones that have occurred over time.

While the GCT has been used in trials for different types of cancer throughout the UK, from the outset the scientists at the Glasgow Precision Oncology Laboratory have been working with the NHS on how they can use the GCT in day-to-day healthcare.

Over the next 12-18 months, **new targeted medicines are expected to be approved for advanced breast cancer** based on cancer DNA alterations. **GCT is designed to detect the all DNA alterations that will be a match with these new drugs.** But it's important to understand that these new drugs based on cancer DNA alterations are just the beginning.

Many new treatments are being designed based on cancer DNA alterations. There were more than 700 cancer drugs in trials in 2017 and over a third of those were based on cancer DNA alterations and this will only continue to increase. In order to make sure that **advanced breast cancer** patients aren't missing out on new approved drugs or drug trials, they **all need cancer DNA testing.**

How does it work?

When a doctor thinks a patient's cancer has spread, a small sample of the cancer will be tested to find out more about it. That same sample can be tested at the same time using the GCT. A report is delivered to the doctor with information about the cancer's DNA and which also gives them with all the information they would need for their discussions with the patient about what treatments they might have, **what trials are available – and what treatments won't work for them.**

The whole picture – from the outset

The GCT is designed to be a single, simple, affordable test that **checks everyone for everything at the same time** to give doctors and patients the whole picture.

Without this new kind of testing, it is hard to match the right treatments or drug trials to the right patients and many trials can't be completed. When trials aren't completed, new drugs can't be approved.

Lesley Stephen, Edinburgh 2020

"In 2014 I was diagnosed with advanced breast cancer, which spread to my lungs, liver, bones and brain. I was lucky to get onto a trial that has given me an extra five years, but now my cancer is growing again. This time I want cancer DNA testing to help me access new treatments or trials targeted to my cancer. It really doesn't have to be guesswork anymore."

What are drug trials?

Drug trials offer access to new treatments. In most cancer drug trials, some patients will receive a new drug, while others will have a standard treatment, so the drugs can be compared. In other types of trials, only the experimental drug is given. While the trial might not give any special benefit to the person taking part in it, patients on trials are closely checked, meaning that any side effects are noticed and dealt with quickly.

When cancer DNA testing is used to match patients to trials, we know there is a good possibility the trial will work for the patients and the trials themselves are usually more successful. Cancer DNA testing is increasingly important to **allow patients to be matched to the right targeted drugs** in new trials.

The more trials that can recruit patients quickly and be completed, the more new drugs will become available faster and at lower costs, and this can result in more treatment choices for patients and cheaper medicines to the healthcare system.

Other benefits

- **The GCT can also allow patients to potentially access treatment through an expanded access programme.** Expanded access programmes link patients and their doctors to pharmaceutical industry programmes. In these programmes, it is possible to access drugs that are currently **not licensed for that cancer, but which the DNA testing shows could be a good match for their cancer.**
- The data or information from routine cancer DNA testing supports further research and can help doctors to be confident about suggesting alternative treatments. It also allows the healthcare system to 'learn' from every patient, to become what is called a 'learning healthcare system' **The more information, the faster we learn, and the faster treatments can be tailored for the individual patient.**

University of Glasgow

GPOL
GLASGOW PRECISION ONCOLOGY LABORATORY

For further information, please contact xxxxxxx

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