Newly diagnosed with T-cell Acute Lymphoblastic Leukaemia (ALL)

A Guide for Patients

Leukaemia Care
YOUR Blood Cancer Charity

Introduction

Being diagnosed with T-cell Acute Lymphoblastic Leukaemia (ALL) can be a shock, particularly when you have never heard of it. If you have any questions about ALL, including what causes it, who it affects, how it affects your body, what symptoms to expect and likely treatments - this booklet covers the basics for you.

The booklet was written and updated by our Patient Information Writer, Isabelle Leach, and peer reviewed by consultant haematologists.

We are also grateful to our patient reviewers, Ross Happell, Meryl Simons and Karen Collier for their contribution.

Throughout this booklet, you will see QR codes that will take you to the relevant webpage for further support. Open the camera app on your phone and hover it over the QR code to open the link (suitable for Android, iPhone 7 and above).

Alternatively, if you are not able to use QR codes and would like to be sent the relevant webpages as URLs, or you would like the list of references used for this booklet, please email **communications@leukaemiacare.org.uk.**

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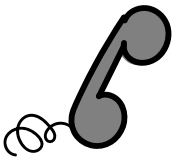
In this booklet

About Leukaemia Care

Leukaemia Care is the UK's leading leukaemia charity. For over 50 years, we have been dedicated to ensuring that everyone affected receives the best possible diagnosis, information, advice, treatment and support.

Our services

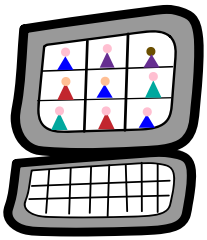


Helpline

Our helpline is available 9am to 5pm Monday to Friday. If you need someone to talk to, call **08088 010 444**.

Alternatively, you can send a message via WhatsApp on **07500 068065** on weekdays 9am to 5pm.

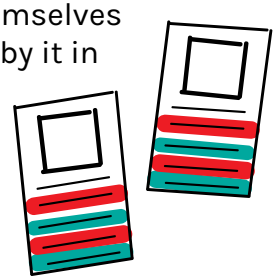
Support groups



Our nationwide support groups are a chance to meet and talk to other people who have been affected by a ALL diagnosis. For more information, scan this QR code:

Buddy support

We offer one-to-one phone support with volunteers who have had ALL themselves or been affected by it in some way. You can speak to someone who knows what you are going through. For more information on how to get a buddy call **08088 010 444** or email **support@leukaemiacare.org.uk**



Counselling service

Our counselling service helps ALL patients and their loved ones access up to six sessions of counselling. To apply, scan this QR code:

Advocacy and welfare

Our advocacy and welfare officers are here to help you find the support you need for many issues surrounding a ALL diagnosis. These include insurance, benefits and clinical trials. If you would like support from our advocacy or welfare officer, email **advocacy@leukaemiacare.org.uk** or call **08088 010 444**.

Cost of living fund

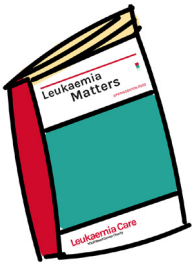
This fund provides grants to patients and families affected by ALL, to help with essential living costs. All applications must be made via the form which can be found by scanning the QR code:

Write a free will

Using our complimentary service, you can write a simple will so you know what happens to your estate when you die. To start writing your free will today, scan this QR code:

Patient magazine

Our magazine includes inspirational patient and carer stories as well as informative articles by medical professionals. To subscribe to our magazine, scan this QR code:



Patient story: Sophie Sutton

Sophie was pregnant in 2017 when she began to feel unwell, but she put her symptoms down to morning sickness. However, halfway through her pregnancy, Sophie was diagnosed with T-cell acute lymphoblastic leukaemia. Here, she tell us her story.

I was pregnant with my first child in 2017 and thought I had morning sickness. I was a fairly fit, healthy, slim woman and my bump wasn't that big. But in June 2017 when I was just about halfway through my pregnancy, the symptoms just wouldn't go away.

I had shortness of breath where I'd wake up first thing in the morning gasping for breath. I thought this might have been due to the hot weather. The midwife also told me that I had a long baby pushing on my diaphragm which could be causing this. In hindsight, I had awful bruising that I just chalked up to me knocking myself. I'd really struggle to walk into work in the morning and I remember thinking, "Why is this happening? I'm fit and healthy." Having never been pregnant before I was assuming that what I was experiencing was just regular pregnancy. However, I had a few friends who were also pregnant at the time and they weren't struggling, and I was left thinking, "Am I being over the top here?" I would get in from work and just collapse on the sofa and go straight to sleep. My husband noticed and thought that it wasn't great.

So, I decided to go see my midwife who thought I just had really bad morning sickness which was eventually going to ease. But by this point this had been going on for a while now and my mum

felt like something wasn't right, so my midwife forwarded me onto my GP. He was amazing, felt my pulse and thought my heart rate was ridiculously fast and was worried I had a blood clot on my chest, so booked me in for a scan at the hospital. He wouldn't let me drive home so my husband had to come pick me up and take me to the hospital. At this point, I did not think for one minute that it was blood cancer, thinking it was probably a blood clot or pneumonia.

After the scan they could see something on my chest but weren't sure what it was, so I was on the respiratory ward and they decided they were going to give me a biopsy on my chest. At this point I was still pretty relaxed; my husband had popped home to get me an overnight bag but a respiratory doctor came round to my bed, looking like he was about to cry and delivered the news that: "Unfortunately we think you've got leukaemia."

Obviously I was pregnant, so they were unsure how they were going to treat me, but they put me in an ambulance and sent me to the oncology centre in Bristol. That's where things went a bit crazy really. They had lots of meetings with the neonatal doctors and the haematologists and it was decided that I would start chemotherapy and a course of steroids immediately with a specific set of drugs that they were confident (using previous patients as evidence) that the chemotherapy molecules would be too big to pass through the placenta. They were confident that it wouldn't harm the baby but my haematologist stressed to me that they had to do this, so I agreed.

I responded to it surprisingly well, but the more they investigated, they realised I had T-cell acute lymphoblastic leukaemia (T-ALL), a more complex variety of ALL, so it was decided that a bone marrow transplant would be needed. I had to have my son, Freddie, two months early via a C-section (after the first two rounds of chemo) and he stayed in NICU for the next two months while I was down in the haematology ward being prepared for the transplant. Every day after chemo I would drag myself up to be at his bedside and do what I could for him, feeling absolutely horrendous but I had to do it. Knowing that my baby

needed me kept me strong through the whole process, but it was an incredibly tough time. He definitely pulled me through. I was diagnosed in June 2017 and had my transplant on the 3rd November 2017.

Now I am five years post-transplant and I have to say that I am feeling pretty good—I am back to work and doing regular exercise. I still suffer with side effects such as fatigue and have been forced into early menopause as a result of the chemotherapy and TBI, but overall I am in a good place and feel extremely grateful for that. Although I'm currently free of cancer I do think about it most days and the changes I have had to make as a result of it, I am hoping things will get easier as the years go by.

As Sophie mentioned, receiving a diagnosis of something as rare as T-cell ALL can be difficult. Our buddy scheme offers one-to-one support and the opportunity to speak to someone in a similar situation to you. Email **support@leukaemiacare.org.uk** or call **08088 010 444** to find out more.

Glossary of medical terms

Acute leukaemia

Leukaemia which progresses rapidly and is generally aggressive. There are two types: acute lymphoblastic leukaemia and acute myeloid leukaemia.

Acute lymphoblastic leukaemia (ALL)

Leukaemia in which lymphocytes start multiplying uncontrollably in the bone marrow, resulting in high numbers of abnormal, immature lymphocytes. Lymphocytes are a type of white blood cell involved in the immune response.

Allogeneic stem cell transplant

A procedure where bone marrow stem cells are taken from a genetically matched donor and given to the patient through an intravenous line. The donor may be related or unrelated.

Autologous stem cell transplant (ASCT)

Transplant of stem cells derived from part of the same individual.

Blast cell

An abnormal (dysplastic), immature blood cell found in the bone marrow or peripheral blood. As they are not mature, these cells are unable to fulfil their intended function. AML develops from these blast cells.

Blood transfusion

A procedure in which whole blood or one of its components is given to a person through an intravenous line into the bloodstream. A red blood cell transfusion or a platelet transfusion can help some patients with low blood counts.

Bone marrow

The soft blood-forming tissue that fills the cavities of bones and contains fat, immature and mature blood cells, including white blood cells, red blood cells, and platelets.

Chemotherapy

Therapy for cancer using chemicals that stop the growth of cells.

Clinical trial

A medical research study involving patients with the aim of improving treatments and their side effects. You will always be informed if your treatment is part of a trial.

Consolidation (phase)

Treatment following remission intended to kill any cancer cells that may be left in the body (also called intensification phase).

Fatigue

Extreme tiredness, which is not alleviated by sleep or rest. Fatigue can be acute and come on suddenly or it can be chronic and persistent.

Fluorescence in situ hybridisation (FISH)

Process using fluorescent dyes to attach to certain parts of chromosomes for their identification.

Full blood count or FBC

A blood test that counts the number of different blood cells.

Graft-versus-host disease

Serious complication that occurs with allogenic stem cell transplants. It happens when the graft (donated marrow or stem cells) reacts against the host (patient receiving the stem cells).

Immunophenotyping

Process that uses antibodies to identify cells based on the types of antigens or markers on the surface of the cells. This process is used to diagnose specific types of leukaemia and lymphoma by comparing the cancer cells to normal cells of the immune system.

Induction (phase)

First treatment after diagnosis intended to kill the majority of the leukaemia cells and stimulate remission.

Intrathecal therapy

Injection of chemotherapy into the cerebrospinal fluid that surrounds and protects the brain and spinal cord.

Maintenance

Treatment given to prevent cancer from coming back after it has disappeared following the first-line treatment.

Monoclonal antibody

Man-made antibodies created from identical cloned immune cells so that they all bind to the same protein commonly found on the leukaemia cells such as CD20.

Neutropenia

A condition in which the number of neutrophils (a type of white blood cell) in the bloodstream is decreased.

Neutrophil

A type of white blood cell that helps fight infection.

Palliative care

Also known as supportive care, this is a type of care that focusses on improving the quality of life for a patient with a life threatening illness and their loved ones.

Platelet

A disc-shaped element in the blood that assists in blood clotting. During normal blood clotting, the platelets clump together (aggregate). Although platelets are often classed as blood cells, they are actually fragments of large bone marrow cells (megakaryocytes).

Platelet count

A normal platelet count in a healthy individual is between 150,000 and 450,000 per microlitre of blood. In general, low platelet counts increase bleeding risks. Normal platelet count 150-450 $x10^9$/L.

Red blood cells

Small blood cells that contain haemoglobin and carry oxygen and other substances to all tissues of the body.

Stem cells

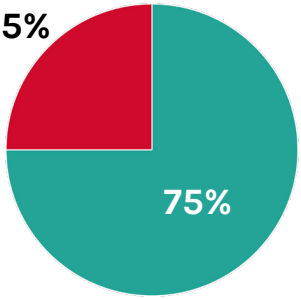
Cells that have the potential to develop into many different or specialised cell types.

White blood cell

One of the cells the body makes to help fight infections. There are several types of white blood cells. The two most common types are the lymphocytes and neutrophils. Normal white cell count is 4-11$x10^9$/L.

Summary: What is T-cell ALL?

- ALL is an **acute leukaemia**. It is caused by **lymphocytes** multiplying in an uncontrollable manner in the bone marrow. Lymphocytes are **white blood cells** that help the body **fight infections** as part of the immune system.
- **T-cell ALL** is an **uncommon**, aggressive sub-type of ALL.
- In adults with ALL, **75%** of cases have **B-cell ALL** and **25%** have **T-cell ALL**.



- In the United Kingdom (UK), 791 patients have a diagnosis of ALL (both B-cell and T-cell) per year.
- The exact cause of ALL is **unknown**. However the factors that put people at higher risk of leukaemia are thought to be changes in their chromosomes and genes.
- The increase in lymphocytes in ALL results in its **symptoms**. You may have experienced one, several or all of these symptoms before you were diagnosed. The most common symptoms and signs of ALL are:

Infections | **Fever** | **Fatigue** | **Easy bruising** | **Weight loss** | **Enlarged lymph nodes, spleen or liver** | **Joint/bone pain**

In this booklet, we will be concentrating on adult T-cell ALL. A separate booklet on B-cell acute lymphoblastic leukaemia (ALL) is available on our website. Scan the QR code to order our booklets:

What is T-cell ALL?

ALL is an acute leukaemia caused by lymphocytes multiplying in an uncontrollable manner in the bone marrow. Acute means that it often develops very quickly.

Lymphocytes are one of the types of white blood cell that help the body fight infections as part of the immune system. In ALL, the lymphocytes are immature and abnormally shaped. They are known as 'leukaemia cells' or 'blasts'. Because the cells are immature, this means they do not fight infection normally. ALL causes too many immature lymphocytes. This stops you making the other blood cells you need.

In adults with ALL, 75% of cases have early immature B-cells and 25% have early immature T-cells.

Leukaemia cells are present in the bone marrow and blood at first, but spread to the other organs over time.

There are three types of lymphocytes:

1. **B-lymphocytes (B-cells):** Made in the bone marrow
2. **T-lymphocytes (T-cells):** Made in the thymus gland behind the sternum
3. **Natural killer lymphocytes (NK-cells):** Made in the bone marrow, lymph nodes, spleen, tonsils, and thymus

In ALL, only B-cells and T-cells are relevant. Natural killer cells lead to a different type of leukaemia, not covered within this booklet.

A booklet on our website named All About Leukaemia An Easy Read Document gives you more details about the production of blood cells. Scan the QR code to order our booklets:

Who does T-cell ALL affect?

In the United Kingdom (UK), the incidence of the subtypes of ALL, particularly T-cell ALL, are rare. But the incidence of ALL (both B-cell and T-cell) is 1.1 per 100,000 people per year. This corresponds to 791 patients given a diagnosis of ALL every year.

Most forms of leukaemia are more common in older people, but ALL is the exception to this. There are two major age groups of people who get T-cell ALL:

- Around 85% of patients with ALL are children under 15 years of age.
- The remaining 15% of cases are adults aged over 50 years of age.

T-cell ALL tends to occur more often in young adults than in children (25% vs 15%). It affects slightly more males than females at all ages.

- 75% of cases involve early immature B-cells
- 25% of cases involve early immature T-cells

In this booklet, we will be focusing on adult T-cell ALL.

We have booklets on other types of ALL, including B-cell ALL and childhood ALL. Scan the QR code to order our booklets:

What causes T-cell ALL?

The exact cause of ALL is unknown. Several genetic factors in patients with T-cell ALL make them more likely to develop ALL.

Chromosome abnormalities and/or gene mutations

Around 60% of patients with T-cell ALL have been identified with

chromosome abnormalities and gene mutations. These are acquired mutations that cannot be passed on to your children.

- Up to 80% of patients with T-cell ALL have a deletion of the C*DKN2A* gene, and 60% have deletions of *TAL1 (1p32)* gene.
- The most common mutations occur in the *NOTCH1/FBXW7* pathway (60% of adult patients).
- Only two of these genes, *NOTCH1* and *CDKN2A/2B* are mutated in more than 50% of T-cell ALL cases, and a large variety of genes are mutated at lower frequency.

Inherited genetic conditions

Inherited genetic syndromes result from one or more chromosome abnormalities or gene mutations. Only chromosome abnormalities and gene mutations that affect the sperm or egg cells can be inherited.

Around 5% of ALL patients have genetic syndromes associated with ALL. These include:

- **Fanconi anaemia:** This is a blood disorder in which an abnormal gene damages blood cells and prevents the bone marrow from replacing them. People with this condition have physical problems, bone marrow failure and organ defects.
- **Klinefelter syndrome:** This is due to males being born with an extra X chromosome. It is typified by having small testicles and penis, decreased facial and body hair and reduced muscle mass.
- **Ataxia telangiectasia:** This is due to a mutation in the *ATM* gene (ataxia telangiectasia mutated). It is characterised by deterioration of the nervous system, immune system and other body systems.
- **Down's syndrome:** This is caused by a random error in cell division that results in the presence of an extra copy of chromosome 21. The majority of cases of Down's syndrome

are not inherited. The risk of developing ALL is 10 to 20 greater in people with Down's syndrome compared with the general population.

For more information on genetics in ALL we have a dedicated booklet. Scan the QR code to order or download the booklet:

What are the symptoms and signs of T-cell ALL?

At first, the symptoms of T-cell ALL are not very specific and difficult to recognise. Not specific means that the symptoms are also associated with other illnesses. Sometimes, a routine blood test will show signs of ALL such as high levels of white blood cells. However the majority of patients have symptoms at diagnosis. If not treated, ALL get worse in a short period of time. This is why it is described as 'acute'.

Patients who have T-cell ALL present with extremely high white blood cell counts. In addition involvement of the central nervous system (CNS) is seen in 10% of patients at diagnosis. These leukaemia cells overwhelm the bone marrow. This stops the bone marrow from producing adequate numbers of red blood cells, platelets and white blood cells.

Reduced levels of normal blood cells cause some of the main symptoms of ALL:

- Low levels of red cells (known as anaemia) causes less oxygen to reach the body tissues
- Low levels of white blood cells prevent patients fighting infections properly
- Low levels of platelets make patients prone to a risk of bleeding

The most common symptoms and signs of ALL are:

- Weakness or fatigue
- Pale skin
- Fever and/or night sweats
- Unexpected weight loss or anorexia
- Difficulty breathing
- Easy bruising, bleeding gums
- Purpura (purple-coloured patches) but unlike bruises they are not due to injury. They tend to occur in clusters
- Petechiae (flat, two mm, red/purple spots). Like purpura, they do not disappear when pressed beneath a glass

Central nervous system involvement in ALL

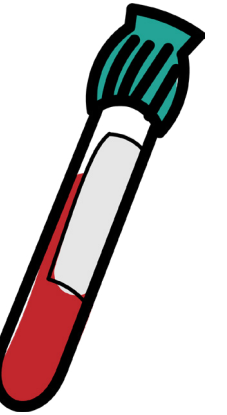
Leukaemia cells can penetrate the brain, spinal column and cerebrospinal fluid (CSF). This can result in the following symptoms:

- Headaches and dizziness
- Blurred vision
- Seizures
- Vomiting

CNS involvement of ALL is more common in:

- Younger adults
- Patients with:
  - T-cell ALL
  - Mature B-cell ALL
  - Patients with a Philadelphia chromosome
  - Swollen lymph nodes or mass in the middle of the chest

Summary: How is T-cell ALL diagnosed?



- Your haematology team will perform the following tests to diagnose your T-cell ALL:
  - Full blood count
  - Bone marrow aspiration or biopsy
  - Chromosome abnormalities or gene mutations tests
  - Immunophenotyping
- The results of these tests give your haematology team information about your ALL. For example they can find out how advanced your ALL is and what type of you have. The team should explain each test to you.

How is T-cell ALL diagnosed?

Your haematology team will conduct the following tests to diagnose your T-cell ALL:

Full blood count

A full blood count will:

- Measure the number of red cells, the different types of white cells and platelets in the blood. This tells your haematology team if you are still producing the right blood cells and how many leukaemia cells you have.
- Identify which cells are normal by placing a smear of a small sample of blood onto a glass slide to examine the blood cells under a microscope.

Leukaemia cells are different in appearance to normal lymphocytes. Abnormal lymphocytes have an unclear nucleus and little cytoplasm.

Bone marrow aspiration or biopsy

Bone marrow samples are obtained by aspiration or biopsy. The sample of bone marrow tissue can be looked at under the microscope. This will confirm the diagnosis of ALL if it is not obvious from the blood sample.

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The sample of bone marrow tissue can be looked at under the microscope. This will confirm the diagnosis of ALL if it is not obvious from the blood sample.

Your haematologist will take your bone marrow sample from the hip bone. You should have a local anaesthetic and your haematologist will use special biopsy needles. If you need any further pain relief or have any concerns, make sure to raise this during the procedure.

Procedure

The bone marrow aspiration is usually done first. After a small incision over the hip bone, the specialist inserts a hollow needle into the bone marrow. Then the specialist removes (aspirates) a sample of liquid bone marrow using a syringe attached to the needle. The aspiration takes only a few minutes.

The specialist will take a small core of bone marrow biopsy. They will use a larger surgical needle with a cylindrical blade.

The diagnosis of T-cell ALL requires the bone marrow to contain 20% or more immature lymphoblasts. A diagnosis of T-cell lymphoblastic lymphoma is when:

- The lymphoblasts are limited to a mass in a lymph node or other lymph tissue.
- Less than 20% of the bone marrow cells are lymphoblasts.

Lumbar puncture

Your haematology team perform your lumbar puncture to check if leukaemia cells have entered your CNS. Your haematologist will examine your CSF for any leukaemia cells present. You will nearly always have an injection of chemotherapy into the space around your spinal cord at the same time. This is called 'intrathecal chemotherapy'.

Procedure

Your doctor will ask you to lie on your side with your legs pulled up and tucked under the chin. This position makes it easier for inserting the lumbar puncture needle between the vertebrae in your lower back. Vertebrae are the individual bones that make up your spine.

Your doctor will clean the skin over your lumbar vertebrae and inject a local anaesthetic. Insertion of a thin aspiration needle between two vertebrae is then carried out. This allows the removal of a sample of cerebrospinal fluid. You should not be in

pain, but you might feel some pressure. If you experience pain, make sure to raise this.

If you are having intrathecal chemotherapy, this will be slowly injected at this point before the needle is removed.

At the end of the procedure, the doctor will remove the needle and apply a small plaster.

Chromosome abnormalities or gene mutations tests

Patients with T-cell ALL have chromosome abnormalities and gene mutations. Tests for these abnormalities help the haematology team understand how your ALL might develop over time. This also helps organise your treatment plan.

The following tests help to identify them:

Standard cytogenetic analysis

Cytogenetic means study of chromosomes. This involves examining the leukaemia cells in the laboratory while they are dividing. This will show any chromosome abnormalities and gene mutations.

Molecular cytogenetic analysis

This method uses a technique called fluorescence in situ hybridisation. It labels small portions of DNA with fluorescent particles. This allows your haematology team to:

- Detect sequences of DNA
- Locate a gene on a chromosome
- Determine the number of copies of a gene
- Detect any chromosomal abnormalities

Around 60% of patients with T-cell ALL have chromosome abnormalities and gene mutations. The remaining patients do not have detectable chromosomes and mutation abnormalities.

For more information on genetics in ALL we have a dedicated booklet. Scan the QR code to order or download the booklet:

Polymerase chain reaction (PCR) test

PCR tests analyse genetic information. The first step in the PCR test is to make millions of copies of the small pieces of the DNA from the sample. This is because large amounts of a DNA sample are necessary for genetic analyses. It is an inexpensive and quick process.

A PCR test can detect evidence of the Philadelphia chromosome. Between 20% and 30% of adults with ALL have the Philadelphia chromosome.

PCR tests throughout your treatment period can check your response to current treatment. This is called measurable residual disease (MRD). Your haematology team will adjust your treatment according to your results.

Immunophenotyping

Immunophenotyping is a method to detect proteins found on blood cells. Each type of blood cell has different proteins on its surface.

Immunophenotyping can tell which of your lymphocytes are affected by looking for the B-cell or T-cell proteins. These proteins are called cluster of differentiation (CD) proteins. Each unique protein has a separate CD number instead of a name. This is because there are so many proteins.

CD proteins found on T-cells include CD1a, CD2, CD4, CD5, CD7 and CD8. T-cells have different CD proteins to B-cells. This helps to distinguish between B-cell ALL and T-cell ALL.

Your haematology team will measure your MRD using either a blood or bone marrow sample.

Common tests for measuring MRD take place in a laboratory. They include:

- Flow cytometry
- Polymerase chain reaction (PCR) tests

One way of looking at the CD proteins is flow cytometry. In flow cytometry, blood cells dissolved in a fluid float past at least one laser. The flow cytometer measures the size and structures of thousands of cells in a short amount of time. It does this by looking at the pattern of how the laser light is reflected as it bounces of the proteins on the cells.

Imaging tests

The following tests can help assess the impact of the leukaemia on the organs of your body:

- X-rays
- Ultrasounds
- Computer tomography scans
- Magnetic resonance imaging

There is a lot of information about cancer on the internet and much of it will not be applicable to you. We suggest you discuss with your medical team which sources of information are relevant and reliable.

Summary: What is the treatment for T-cell ALL?

- Your haematology team will start your ALL treatment **straight after** your diagnosis. This is because ALL has a **fast progression**.
- The main treatment for T-cell ALL is **high intensity combination chemotherapy**. This results in good overall survival.
- Haematologists divide treatment of ALL into **three phases** as follows:
  - **Induction treatment:** This is the first treatment after diagnosis. Its goal is to kill as many of your leukaemia cells as possible.
  - **Consolidation treatment:** The aim of this phase is to help reinforce your remission or to stay in remission This reduces any risk of a relapse.
  - **Maintenance treatment:** After your consolidation treatment maintenance tries to prevent any relapse of your ALL. Maintenance treatment will last for two to three years.

This booklet is written to introduce you to what to expect across all steps. We have written dedicated booklets for each of the ALL treatment phases for when you reach that stage. Scan the QR code to order or download our booklets:

What is the treatment for T-cell ALL?

Your haematology team will start your ALL treatment soon after your diagnosis because ALL has a fast progression. In general, you will need to go to hospital and remain there for several weeks.

All cancer diagnoses are discussed at group meetings. These are called multidisciplinary teams (MDTs). This helps bring in the skills of lots of different types of doctors and nurses. The aim of treatment is to make sure the selected treatment is the most appropriate.

What are the phases of treatment?

Clinicians divide treatment of ALL into three separate treatment phases:

- Induction of remission and CNS prophylaxis
- Consolidation
- Maintenance (also called remission continuation or post-remission maintenance)

These are all separate individual treatment phases.

Induction treatment

Induction treatment is the first treatment given straight after diagnosis. The aim of the induction treatment is to kill as many leukaemia cells as possible.

Induction treatment should encourage complete remission. In general complete remission means the treatment has removed as many of the leukaemia cells as possible.

Induction treatment consists of a combination of chemotherapy drugs. Your haematology team will administer your treatment in hospital. You should be in hospital for up to eight weeks.

Central nervous system prophylaxis and treatment

At diagnosis, leukaemia cells are present in the CSF of around

10% of ALL patients. The percentage of leukaemia cells in the CNS of these patients at diagnosis is variable. These cells can cause relapse of ALL in up to 30% of cases.

The majority of patients will need treatment with intrathecal chemotherapy. This is where chemotherapy is injected into the fluid around your spinal cord after a lumbar puncture. It is important to treat CNS disease, or prevent it from occurring. Oral or intravenous chemotherapy cannot be used instead as they do not penetrate into the CSF at high enough levels.

Consolidation treatment

Patients receive consolidation treatment to help them reinforce their remission.

Maintenance treatment

You will receive maintenance treatment after your consolidation treatment. This is to prevent any relapse of your ALL. Without maintenance therapy, there is a significant risk that the ALL will return.

Maintenance treatment usually consists of low-dose combination chemotherapy delivered as an outpatient. You will need to come to hospital for intravenous and intrathecal chemotherapy but these are usually given as a day case.

Maintenance treatment will last for two to three years.

What are the different kind of drugs I can get?

Chemotherapy

A chemotherapy drug is a type of cancer treatment that kills cells within the body. It is a broad term for drugs that can work in lots of different ways.

A common combination of chemotherapies used for ALL is:

- Vincristine

- An anthracycline drug such as daunorubicin, doxorubicin or idarubicin
- Cyclophosphamide or cytarabine
- Asparaginase or pegaspargase (a derived version of asparaginase)

Chemotherapy is often combined with a steroid such as dexamethasone or prednisolone.

Which chemotherapy you will get varies depending on the stage of your treatment (induction, consolidation or maintenance). Please see our booklets on each stage to understand the process as you go. Scan the QR code to order or download our booklets:

Targeted treatment

Targeted treatments are drugs that target specific proteins on the surface of the leukaemia cells. Targeted treatments do less damage to normal cells compared with chemotherapy. Examples of targeted treatments you might receive are tyrosine kinase inhibitors (TKIs).

Tyrosine kinase inhibitor

This is usually used if you have the Philadelphia chromosome. TKIs are drugs that inhibit the tyrosine kinase enzyme. This is a protein which controls the function of a cell. The TKIs stop the leukaemia cells growing and dividing.

Imatinib is an example of an effective TKI, although there are newer ones.

Immunotherapy

Immunotherapy is a treatment that helps your immune system to fight the cancer. In general, your immune system ignores your own cells. Its role is to fight off foreign substances that are not part of your body. Although the ALL cells comes from you, they are also abnormal. Therefore, we can encourage the immune system to attack them.

Monoclonal antibodies

Monoclonal antibody drugs attach themselves to particular surface proteins on the leukaemia cells. Your immune system can detect these antibodies. They encourage your body's immune system to kill the leukaemia cells.

Blinatumomab is an example of a monoclonal antibody designed to attach itself to the CD19 protein on B-cells.

You might receive blinatumomab if you have not responded to previous treatment.

For more information, we have a dedicated booklet on blinatumomab as a treatment for ALL. Scan the QR code to order or download the booklet:

Antibody-drug conjugates

Antibody-drug conjugates are made of a monoclonal antibody linked to a powerful anticancer drug.

The monoclonal antibody part of the drug targets specific proteins on the leukaemia cell as described in the last section. The linked anticancer drug part then destroys the leukaemia cell directly.

Inotuzumab ozogamicin is an example of antibody-drug

conjugate. The monoclonal antibody inotuzumab is linked to the anticancer drug ozogamicin. Inotuzumab attaches to the CD22 proteins on the leukaemia cell. Ozogamicin then destroys it.

Inotuzumab ozogamicin has been effective for patients with relapsed ALL.

For more information, we have a dedicated booklet on inotuzumab ozogamicin as a treatment for ALL. Scan the QR code to order or download the booklet:

Other antibody-drug conjugates are being studied as frontline treatment for newly diagnosed ALL patients. Results are encouraging. They will be added to this booklet if they become approved. For more information about trials, contact our Advocacy Team by emailing advocacy@leukaemiacare.org.uk or calling 08088 010 444.

Chimeric antigen receptor (CAR) T-cell therapies

CAR T-cell therapies are new ALL treatments. They have shown very positive results where they have been used so far. The process of creating CAR-T therapy is complex.

A haematology specialist will filter out the T-cells from your blood and alter them in a laboratory. Your modified T-cells are able to destroy the leukaemia cells when they are put back into your body. They do this by looking for specific proteins on leukaemia cells.

Tisagenlecleucel is the first approved CAR T-cell therapy for the treatment of ALL in the UK. Tisagenlecleucel kills leukaemia cells carrying the CD19 protein. It is only available to some patients.

Treatments for T-cell ALL have been more challenging than for B-cell ALL. In T-cell ALL, only CD5 is a possible protein target. It is

one of the most common surface markers of T-cells present in 80% of patients. Negative interactions have occurred between CAR T-cell therapy and the patient's own T-cells.

Trials of CAR T-cell therapy for patients with a new diagnosis of ALL are ongoing. You can find out more details by speaking to our Advocacy Team. You can email them on advocacy@leukaemiacare.org.uk, or call **08088 010 444**.

For more information, we have a dedicated booklet on CAR T-cell therapy as a treatment for ALL. Scan the QR code to order or download the booklet:

Nelarabine

Nelarabine is a water-soluble, anticancer drug, toxic to T-cell leukaemia cells. Nelarabine is effective for the treatment of adults with refracted or relapsed ALL.

Stem cell transplant

A stem cell transplant works by replacing your stem cells in your bone marrow. This is where blood cells are made including your leukaemia cells. The aim of replacing your stem cells is to help you only make normal blood cells again.

Patients can receive a stem cell transplant to reduce the risk of replace. There are two types of stem cell transplant:

- **Allogeneic stem cell transplants (allo-SCT)** are a stem cell transplant that uses stem cells from a matching sibling or matching donor.
- **Autologous stem cell transplants** use stem cells from the patients themselves. They are rarely performed for ALL patients.

Some patients who have relapsed may also have an allo-SCT.

Procedure

Before your allo-SCT, you will receive high-dose chemotherapy. This is to kill the leukaemia cells in the bone marrow.

You then receive the healthy donor stem cells into your vein. These cells migrate to your bone marrow where they form new blood cells. After the allo-SCT, you will receive drugs to prevent rejection of the donated stem cells. You will have to stay in hospital for four to six weeks.

For more information, we have a dedicated booklet on stem cell transplants as a treatment for ALL. Scan the QR code to order or download the booklet:

Treatment for patients who cannot tolerate intensive treatment

The treatments we have described so far in this booklet are very intensive. They can cause damage to the body. Intensive chemotherapy may not be safe for you if:

- You are unwell
- You have other health conditions

Your age also plays a role. This is because you are more likely to have other health conditions or be unwell with increasing age. Age alone should not be a factor in decision making about treatment options.

In all our later treatment booklets, we highlight how treatment is different if you cannot have intensive treatment.

New treatments

Researchers are always developing and testing new drugs for ALL. They are often looking for drugs more specific than standard chemotherapy. These drugs should work better and have fewer side effects.

A particularly busy area of research is clinical trials of other CAR T-cell therapies. This is because of the positive results achieved with tisagenlecleucel.

Combinations of chemotherapies and monoclonal antibodies are also being trialled.

Clinical trials

Clinical trials comparing new treatments with existing treatment are always in progress. These clinical trials are often available online at **https://clinicaltrials.gov/**. Clinical trials can offer you a chance to access new treatments, but the entry criteria for a trial can be very strict.

The treatment being tested is not guaranteed to be better than existing options. Speak to your healthcare team to decide if a trial is right for you. Your haematology team may know of a clinical trial featuring a treatment that may benefit you. They may ask you to take part in the trial, but the choice is yours.

You can also speak to our Advocacy Team by emailing **advocacy@leukaemiacare.org.uk** or calling **08088 010 444**.

This booklet is only a guide of what you might experience. Your haematology team will give you a copy of your specific treatment plan.

What are the side effects of treatments used in ALL?

Chemotherapy treats the leukaemia cells and normal cells in the same manner. The effect of the chemotherapy on the normal cells is the cause of side effects.

Side effects of the chemotherapy include:

- Fatigue
- Nausea
- Vomiting
- Diarrhoea
- Hair loss
- Infections
- Bleeding
- Constipation, particularly if treatment includes vincristine

Side effects often vary between drugs. For example, anthracyclines are known to cause muscle damage. You should receive information that is specific to the drug you are taking.

Targeted therapy drugs target specific parts of the leukaemia cells. Targeted therapy often causes less side effects than chemotherapy for this reason. Targeted therapy still has side effects which tend to be specific to each drug. It is important to report any new side effects at each of your follow-up appointments. Nursing staff are often the best people to ask about any new side effects.

Treatment outcomes

The aim of treatment is to balance the desired outcome with damage to your body. Treatments are intensive because ALL is fast growing.

How well you respond to treatment will be measured from time to time. The haematology team will be looking for:

- Number of cells that can be detected in the blood
- Number of cells that can be detected in the bone marrow
- Remission i.e. where the number of cells in your blood stream is very low or undetectable

How low it goes depends on your stage of treatment (induction, consolidation or maintenance). Please see our booklets on each stage to understand the process as you go. Scan the QR code to order or download our booklets:

It is a positive sign if you have no detectable disease after consolidation. This means your risk of relapse is low. This should remain the case throughout maintenance treatment.

Do not panic if this doesn't happen for you. You may be offered other treatment to help boost your response at this stage.

Measurable residual disease

Measurable residual disease (MRD) measures leukaemia in the body at a molecular level rather than at cellular level. It counts the very small amount of leukaemia present in your body that might be missed when your blood is viewed under a microscope.

- If leukaemia cells are still present in your body, you are said to be MRD positive
- If you have no disease detectable in your body, you are said to be MRD negative

MRD gives a very accurate assessment of remission and an early detection of relapse. It might be measured during or after treatment. Measurement of MRD after treatment will let your haematology team about your risk of relapse.

Your haematology team will measure your MRD using either a blood or bone marrow sample.

Common tests for measuring MRD take place in a laboratory. They include:

- Flow cytometry
- Polymerase chain reaction (PCR) tests

We explain how these tests work in the diagnosis section for your information.

Any tests and their results should be properly explained to you.

Follow-up care

Once you are in long-term remission, your haematology team will discuss your follow-up care.

ALL patients need regular appointments to detect signs of relapse or complications. Experts recommend checks of your MRD every three months.

Your follow-up appointments will continue for several years. The frequency of appointments will depend on:

- Your type of treatment
- Your supportive care needs. For example, any support you need to manage ongoing side effects

You should report any new or worrying side effects to your medical team straight away at your follow-up appointments. You should also discuss any emotional or mental health concerns you have. It is common for the end of treatment to trigger some emotions that you may need support with.

While you are in this follow-up phase, it can be helpful to keep in touch with other patients in your position. Our buddy scheme offers one-to-one support and the opportunity to speak to someone in a similar situation to you. Email **support@leukaemiacare.org.uk** or call **08088 010 444** to find out more.

What is the prognosis for T-cell ALL?

Prognosis is the forecast of the course of your leukaemia based on medical experience.

Prognosis for ALL patients depends on factors such as:

- Overall fitness
- Risk factors e.g. certain genetic mutations
- Response to treatment

Haematology teams can give you a figure of how many people live to five years after diagnosis. This is a statistic called **overall survival**.

The overall survival estimate for patients with T-cell ALL at five years is 50%.

This is an average of all patients. It is not possible to predict what will happen for you for certain. Your team will only be able to give you an idea whether they expect you to be like an average person or why you might be different.

In this section, we explain some factors that doctors might use to tell you where you might sit in relation to the average person with ALL.

Overall fitness

Fit patients have the ability to withstand intensive chemotherapy and an allo-SCT.

In general, people become frailer as they get older, but your age alone should not be the only decision making factor.

Adjusting the dose of chemotherapy can help achieve complete remission in unfit patients.

Risk factors for ALL

Haematologists classify patients with ALL into risk groups according to:

- Their age (linked to fitness)
- White blood cell count at diagnosis
- Leukaemia cell type
- Chromosome changes
- Their response to treatment

There are two risk groups of patients with ALL:

- **Standard-risk (low-risk):** Patients who do not have any of the risk factors below.
- **High-risk:** Patients with the following risk factors:
  - Aged 50 or older at diagnosis
  - High white blood cell count at diagnosis
  - Having certain genetic abnormalities
  - A poor response to initial treatment such as a lower than expected remission

Response to treatment

It is a positive sign if you have no detectable disease after consolidation. This means your risk of relapse is low. This should remain the case throughout your maintenance treatment.

Do not panic if this doesn't happen for you. You may be offered other treatment to help boost your response at this stage.

Summary: Supportive care

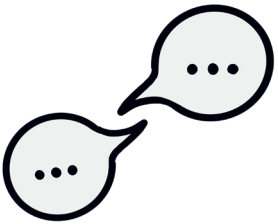
Supportive care is available at any time. It is a term that means any medication or medical care that is not given to treat your leukaemia. The aim is to **improve your quality of life**.

As well as your ALL treatment you are likely to need treatment for side effects (e.g. to treat nausea). You might be offered medication or different treatment strategies like counselling or physiotherapy. It depends on your situation.

Concerns you might experience include:

- Infection risk
- Fatigue
- Symptoms coming from not making other blood cells
- Mental health issues
- Challenges with work, money or dealing with issues at home

This section focuses on things that happen during treatment. You can also get supportive care for symptoms when you are not actively receiving treatment. This applies even if you have not been treated for months or years. Your haematology team will work out if it is related to your ALL.



Make sure you talk to your healthcare professionals regularly. They will be able to help you if you need any treatment for physical symptoms or side effects.

Supportive care

ALL is an aggressive illness. Therefore treatment to deal with it has to be fairly intensive. During your treatment and afterwards, supportive care can improve your quality of life. It will help prevent, or treat, the symptoms of ALL as soon as possible.

Supportive care can also reduce the side effects caused by treatment. In this booklet, we focus on the immediate effects of diagnosis and treatment.

Supportive care is not only limited to the physical impact of your ALL. It will provide support for matters that are:

- Psychological
- Social
- Spiritual

In this section, we list some examples of supportive care. We also give you tips to help yourself.

Fatigue

A very common side effect of ALL treatment is fatigue. It can be caused directly by the drugs. It can also have other causes. One example is the psychological and emotional stress of diagnosis. Fatigue is often frustrating as it cannot be treated with medicines.

Solutions to decrease your level of fatigue are available. This includes pacing yourself or improving the quality of your sleep.

Make sure you discuss your fatigue throughout your treatment with your healthcare team. You also raise it after treatment. It is very common for it to continue after treatment. There are fatigue services to help if it affects you long term or particularly severely. But waiting lists can be long.

Infection

You should be aware that you are vulnerable to infections whilst on treatment. This is because most treatments have an effect on other aspects of your immune system. You should be able to recognise symptoms of infections. Common symptoms of infection include:

- Fever – a raised temperature (38°C or higher)
- Aching muscles
- Diarrhoea
- Headaches
- Excessive tiredness

You should seek help as soon as possible if you experience any of these symptoms. Infections can progress more quickly if you are receiving active cancer treatment. Your haematology team should give you a specific phone number and instructions on what to do if you are aware of symptoms of infection.

Prevention of infections

Simple precautions can help you reduce your risk of infection. These are:

- Washing your hands after using the toilet and touching doorknobs and banisters.
- Limiting your time in crowds, especially if there is an epidemic of flu or other illness.
- Following food safety advice and not keeping food after use-by dates. Cleanliness in the kitchen is important.
- Neutropenic diets to protect you from infection are now no longer advocated nowadays. There is limited evidence as to whether they help to reduce your risk of infection. Neutropenic diets recommended avoiding the following foods to reduce the risk of getting an infection from foodborne bacteria:

- Raw vegetables
- Fruit
- Meat or unpasteurised dairy products

Specific advice on how to protect yourself from COVID-19 infection is available on our website. It is constantly updated. Scan the QR code to take you there:

Antibiotics normally used to treat infections can also be used to prevent them where applicable. Most common antibiotics and antifungals used are:

- Trimethoprim/sulfamethoxazole (cotrimoxazole) for pneumocystis pneumonia prophylaxis
- Aciclovir to prevent viral infections

General wellbeing

Where possible you should eat a well-balanced diet. This will help you:

- Feel stronger
- Have more energy
- Recover without delays

You may lose weight on treatment due to changes in taste or appetite. This may also be due to the side effects of treatment, which includes sore mouth, or nausea and sickness.

Other digestive issues can also occur, such as constipation. These will be related to the treatments you are receiving.

Support with transfusions

Supportive care also includes:

- Blood transfusions (red cells or platelets). This is needed if your bone marrow is unable to make normal blood cells during your treatment. This might involve a different appointment.
- Treatment with antibiotics, antifungals or antivirals.
- Injections of growth factors will help you produce more white cells if you need that. Transfusion of white blood cells carries a high risk of side effects and will not performed.

Mental health, emotional health, mood and behaviour changes

Starting treatment for a serious illness can be overwhelming emotionally as well as physically. It's normal to feel emotions such as:

- Anger – Why has this happened to you
- Guilt – For being away from home for a long time
- Fear – Worrying about the future
- Confusion – Not understanding the new terminology

Talking to others can help. It can be difficult to talk to loved ones so you might need someone independent. This is where Leukaemia Care can help.

A diagnosis of ALL can be a lot to take in, especially when it comes to treatment options and prognosis. If you think you may benefit from counselling, we can offer funding for up to six sessions. Scan the QR code to fill in a form:

Work and money

Being in hospital for a long period is challenging for anyone. However, it may add additional stress for those patients who would otherwise be working. If you are diagnosed while you are at school or university, you might have to contact your place of education to defer your attendance.

You will need to keep your employers informed. They are likely to be supportive. However, Leukaemia Care and other organisations can help you if they are not.

Your ALL may also affect your finances even if you are not working. Leukaemia Care are aware that being diagnosed with leukaemia comes with extra spending costs. We can offer financial support, including direct grants.

For more information about the financial help that we can provide, scan the QR code to take you there:

Home life

A diagnosis of leukaemia is likely to impact your home life. This stems from a long period of time you may need to spend in hospital which is very common for ALL patients.

Our newly diagnosed checklist can be useful in seeking help. Scan the QR code to take you there:

This should make you feel less stressed if you seek help early. Then you are able to focus more on your physical treatment.

Summary: End of life care

Unfortunately, treatment for ALL is not certain to work. This includes intensive treatments.

This should be explained clearly and sensitively if this happens for you. You should still be offered treatments to manage your symptoms.

You should be given an idea of how long you are expected to live. However, your haematology team might not be able to give you an accurate prognosis.

It is helpful to have planned ahead for this situation. This includes:

- Thinking about how you wished to be cared for if you can no longer express yourself
- Making a will
- Considering how you might wish to be cared
- Planning in advance who can make decisions easier for you, your family and your medical team

If you would like support and advice about your ALL diagnosis, including end of life care, you can speak to someone on our helpline by calling **08088 010 444**. We're available from 9:00am – 5:00pm Monday to Friday.

End of life care

What happens if treatment stops working?

Your haematology team might explore other treatment options if treatments for your T-cell ALL are no longer working. However, they may give you a terminal diagnosis if there are no options left. They will discuss this with you first.

What happens next?

A terminal diagnosis means your team feel there are no more treatment options left that can cure or control your ALL. Other care to improve quality of life should continue. They will let you know when you need end of life care. End of life care may last days, months or years.

Your healthcare team should ask you about your individual wishes and how you feel over time. They will treat with this in mind. End of life care should help you live as well as possible until you die. The aim is to help you enjoy a good quality of life, and die with dignity.

Most hospitals have palliative care teams. They have experience in dealing with end of life and its related symptoms. You should have access to a community palliative care team if your local hospital does not have one.

Going through this process is often easier if you have made plans in advance. We recommend that you set up a will. This is a 'living will' in which you can express your wishes for care. You can also consider including a 'Do Not Resuscitate' (DNR) order. Creating a living will reduces stress for others if it is in writing and your family is aware.

Your haematology team should talk over with you your wishes for your future care. Sometimes your choices can be limited by the nature of your ALL. For example, blood transfusions and various supportive drugs can only be delivered in hospital. Options should be discussed with you regardless. Your haematology team will also provide support to your family, carers and loved ones.

Leukaemia Care is a national blood cancer charity supporting anybody affected by a blood cancer. This includes patients, family, friends and the healthcare professionals that support them.

To make a donation or become a regular giver, please visit **www.leukaemiacare.org.uk/donate**

Thank you!

Useful contacts and further support

There are a number of helpful sources to support you during your diagnosis, treatment and beyond, including:

- Your haematologist and healthcare team
- Your family and friends
- Your psychologist (ask your haematologist or CNS for a referral)
- Reliable online sources, such as Leukaemia Care
- Charitable organisations

Leukaemia Care

Leukaemia Care is the UK's leading leukaemia charity. For over 50 years, we have been dedicated to ensuring that everyone affected receives the best possible diagnosis, information, advice, treatment and support. We are here for everyone affected by leukaemia and related blood cancer types – such as myelodysplastic syndromes (MDS) and myeloproliferative neoplasms (MPN). We believe in improving lives and being a force for change. To do this, we have to challenge the status quo and do things differently.

Helpline: **08088 010 444**
www.leukaemiacare.org.uk
support@leukaemiacare.org.uk

Blood Cancer UK

Leading charity into the research of blood cancers.

0808 2080 888
www.bloodcancer.org.uk

Cancer Research UK

Leading charity dedicated to cancer research.

0808 800 4040
www.cancerresearchuk.org

Macmillan

Provides free practical, medical and financial support for people facing cancer.

0808 808 0000
www.macmillan.org.uk

Maggie's Centres

Offers free practical, emotional and social support to people with cancer and their loved ones.

0300 123 1801
www.maggiescentres.org

Citizens Advice Bureau (CAB)

Offers advice on benefits and financial assistance.

08444 111 444
www.adviceguide.org.uk

How you can help us

If you've been affected by ALL, sharing your story can help others going through a similar situation and help the public to better understand.

Scan the QR to share your story:

Alternatively, you can email our Communications Team at communications@leukaemiacare.org.uk.

We are continually working to make sure our information is up to date and includes everything you need to help feel supported and empowered to advocate for yourself. With this, it is important for us to listen to any feedback you might have about our newly diagnosed with T-cell ALL booklet.

Scan the QR to take you to our shop to leave a review of our booklet:

Alternatively, you can email our Information Team at information@leukaemiacare.org.uk, call our office line on **01905 755 977** or write a letter to our Head Office at **Leukaemia Care, One Birch Court, Blackpole East, Worcester, WR3 8SG**.

Take on a challenge for Leukaemia Care

We have a range of fundraising challenges that you can get involved in to help us continue to provide care and support to those affected by a leukaemia, MDS or an MPN.

Running, swimming, cycling and adrenaline challenges are available to take part in, both in the UK and abroad. There really is something for everyone.

If you're interested in taking part in a challenge, speak to a member of our Fundraising Team by emailing fundraising@leukaemiacare.org.uk or calling **01905 755977**.

Alternatively, scan this QR code to find out all the ways you can get involved with Leukaemia Care:

"It was a pleasure to meet you and to take part in my first half marathon together with the Leukaemia Care team! I'm a scientist and work in immunology research. A dear family member passed away from leukaemia seven years ago this month, so I did this in his memory. I smashed my goal of under two hours with a final time of 1:53! I'm extremely happy, thank you so much for all your hard work and it was great to see you cheering us on along the track. I loved the look of the vests too! See you again, next year maybe!" **- Alexandru Bacita ran London Landmarks for Leukaemia Care in 2022**

Your gift today will ensure that Leukaemia Care can continue to offer support to leukaemia patients and those who love them

Yes, I want to make a regular gift to Leukaemia Care of £5 or £ ☐ a month starting on the 1st ☐ or the 15th ☐ of each month (please tick one).

Please note: the minimum for a direct debit is £2 a month.

Title: .....

First name or initial(s): ..... Surname: .....

Full home address: .....

.....

Postcode: ..... Phone: .....

Email: .....

☐ **Gift Aid Declaration: Please tick here if you want Leukaemia Care to reclaim the tax that you have paid on all your donations you make in the future or have made in the past four years.**

Instruction to your Bank or Building Society to pay by Direct Debit

Name of Account Holder(s): ..... / .....

Bank/Building Society account number: ☐

Branch sort code: ☐

Name and full postal address of you Bank or Building Society: .....

.....

Instruction to your Bank or Building Society: Please pay Leukaemia Care from the account detailed in this instruction subject to the safeguards assured by the Direct Debit Guarantee. I understand that this instruction may remain with Leukaemia Care and, if so, details will be passed electronically to my Bank/Building Society.

Signature(s): ..... / .....

Date: ☐

This guarantee should be detached and retained by the payee.

The Direct Debit Guarantee

DIRECT Debit

This Guarantee is offered by all banks and building societies that accept instructions to pay Direct Debits.

The efficiency and security of the scheme is mentioned and protected by your own Bank or Building Society.

If the amounts to be paid or the payment dates change, Leukaemia Care will notify you 10 working days in advance of your account being debited or as otherwise agreed.

If an error is made by Leukaemia Care or your Bank or Building Society, you are guaranteed a full and immediate refund from your branch of the amount paid.

You can cancel a Direct Debit at any time by writing to your Bank or Building Society. Please also send a copy of your letter to us.

Leukaemia Care is the UK's leading leukaemia charity. For over 50 years, we have been dedicated to ensuring that everyone affected receives the best possible diagnosis, information, advice, treatment and support.

Every year, 10,000 people are diagnosed with leukaemia in the UK. We are here to support you, whether you're a patient, carer or family member.

Want to talk?

Helpline: **08088 010 444**
(free from landlines and all major mobile networks)

Office Line: **01905 755977**

www.leukaemiacare.org.uk

support@leukaemiacare.org.uk

Leukaemia Care,
One Birch Court,
Blackpole East,
Worcester,
WR3 8SG

Leukaemia Care is registered as a charity in England and Wales (no. 1183890) and Scotland (no. SC049802).

Company number: 11911752 (England and Wales).

Registered office address: One Birch Court, Blackpole East, Worcester, WR3 8SG

Leukaemia Care
YOUR Blood Cancer Charity

Trusted Information Creator
Patient Information Forum