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

A Guide for Patients

Leukaemia Care
YOUR Blood Cancer Charity

Introduction

Being diagnosed with B-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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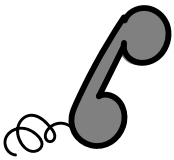
In this booklet

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

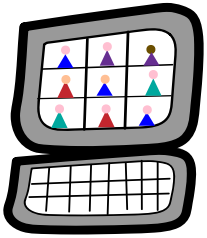


Helpline

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.

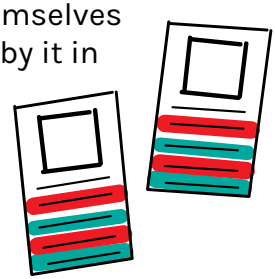
Support groups



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

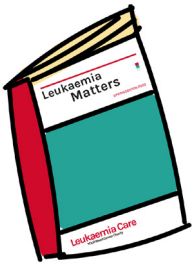
This fund provides grants to patients and families affected by ALL, to help with essential living costs. All applications must be made via the form which can be found by scanning the QR code:

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: Tracy Copping

Tracy shares her experience of B-cell acute lymphoblastic leukaemia after being diagnosed during the height of COVID-19.

It all began on 4th December 2020 when I felt a slight ache in my back. It was followed by a gripey ache in my left side. I felt unwell so I went to bed at 5.30pm and ended up sleeping right through. Thinking back, I also had an irregular cough, and the sleeping makes me realise that I was lethargic. It stayed this way until I was diagnosed. I contacted the GP after five days.

It was at the height of COVID-19 restrictions so getting to see a GP was almost impossible. The GP called me back and prescribed medication for gastritis, but also, thankfully, ordered a blood test, which I had that evening.

It was just 10am the following morning when my GP called me and asked me to come in. My heart literally sank; my stomach tumbled. Somehow, I knew it was serious. Once in with the GP I answered no to most of the questions she asked about any symptoms I was experiencing. However, that very same evening the horrid night sweats started. It was as if someone had thrown a bucket of water over me. Worse than any menopause sweats. It really upset me. I also noticed lesions on my tongue.

I was told I needed an urgent referral. A telephone appointment was made for me for 16th December – one week after my GP appointment.

Following further blood tests, I was given a bone marrow biopsy. I cried throughout the whole thing. It was at this appointment that I knew this was very serious.

It was less than three weeks from my initial back pain that the consultant called me, on 23rd December, and said, 'You have acute lymphoblastic leukaemia (ALL). Pack a bag, you need to come in for platelets and I'm transferring you to UCLH today.'

It was awful. I was alone. I arrived at midnight – scared, shocked, and terrified. As the COVID-19 restrictions had been tightened up, I wasn't allowed to have anyone with me. My husband and two daughters were distressed too.

The next morning, I was started on dexamethasone (steroids). I spent Christmas alone, in isolation – and with COVID-19 rampant at that time, I found it very tough. I was allowed one visitor per week. All the medical team at UCLH were outstanding.

The next stage was for me to start induction treatment (the UKALL14 protocol), but I didn't want to know how long my treatment would take, nor my prognosis, at that time.

I suffered with many infections, allergies and terrible fatigue. Yet every time the medical staff reassured me. They got me through. Every hurdle was overcome. At one point all treatment was withdrawn as my liver reacted badly to a chemo drug, but they got me better and found an alternative.

I had to add osteomyelitis (inflammation of the bone/bone marrow due to infection) into the mix, as well as a spell in ICU, a long-infected blister, and the removal of a uterine polyp. It was a lot to deal with as well as the leukaemia. The lasting side effects include bone necrosis, but I'll take that over the alternative.

I owe getting through that stage of my life to my friends, family, co-workers, doctors, nurses, healthcare assistant staff, and having my faith. They all supported me and that meant I came through this. There were dark times but also good times too. I cannot express how much the support has meant to me from everyone.

I've now finished the last leg of maintenance treatment. I had my final IV chemo in October 2023 and my final tablets finished at the end of 2023. I'm in remission.

I feel grateful, yet nervous, but I intend to live for today. Never give up hope. So many advances have been made over the last 10 years. Early detection is key, and so it's very important, especially to help this, to always go for a blood test when it is offered.

Patient story: Ruby Walvin

Ruby had many of the classic signs of leukaemia before diagnosis, but it was assumed she had anaemia and was sent on her way to recover. However, Ruby didn't recover. Trusting her gut, she took matters into her own hands and visited a walk-in clinic where her symptoms were recognised for what they were. Now in remission from B-cell acute lymphoblastic leukaemia, Ruby tells us her story.

My first year at university was going really well and I was having a brilliant time. I was at the Liverpool Institute for Performing Arts studying song writing and performance, both real passions of mine. I loved performing at university and at local open mic nights and I had just started a band. I had a great group of friends, loved the city and was enjoying being an independent 19-year-old.

I began to feel quite fatigued, but I initially thought I was just run down from student life. I kept thinking that a pint would make me feel better, so I just pushed through. I was that pale I was almost see-through, and I began to have pains at the bottom of my leg like shin splints.

It went on for three months until I was walking home after a friend's gig and I collapsed. By this point, other symptoms had appeared, such as weight loss, bruising and shortness of breath. I went to a walk-in clinic and they just said that I was anaemic and sent me away. But I knew something was wrong, so I went with a friend to the student health clinic the same day. Just by chance, the nurse seeing me had experience with blood cancer, and she saw how pale I was and did a blood test.

I was sent to A&E along with my bloods. My parents came down from Leicester to be with me as I was kept on a halfway ward. At the time, I didn't understand the seriousness of the situation. It wasn't until the next day when the doctors woke me up and listed off a few illnesses that it could be that I heard the word "leukaemia", and I knew then that my life was about to change.

They then moved me to a women's cancer ward where I waited over the weekend until I could have a bone marrow biopsy on the Monday. I remember waiting for the results and that night hearing the other women on my ward throwing up and suffering due to the chemo and thinking: "Is this what I have to come?" The biopsy confirmed it was B-cell acute lymphoblastic leukaemia (B-ALL) and that afternoon I was sent by ambulance to The Leicester Royal Infirmary. I knew I needed my family around me during treatment so I decided that I would go back to my hometown for treatment. It was hard saying goodbye to my close friendship group though. We spent so much time together up until that point.

I started my first round of chemo the day after I arrived at the ward. It went OK, but I don't remember a lot of it and my mum thinks that's a coping mechanism. During the second round of chemo, I had injections in my stomach which were bad. I am quite petite, but the steroids were making me very hungry. I was never satisfied, and I was eating that much that it made me very sick. My face swelled with the water retention, I lost my hair, I got pneumonia and oral thrush.

The effect on my mental health was very bad, and I got very low moods. I asked for a counsellor, but the waiting list was really long, and I was told that it would take up to seven weeks to get one. My parents decided to pay for me to go private as I couldn't wait that long.

My mum stayed at the hospital every night to support me. When I woke from morphine-induced nightmares I needed her there to calm me down. When I was really poorly, I needed her to wash me, put me to bed and get me dressed. She cooked for me and took me to hospital. It was tough being so reliant on other people after being independent, but you need your family at a time like that.

I did a year of intensive chemo and then started my maintenance period of chemo in November 2019, which lasts for two years. I

started recovering and getting some strength back and I was planning to go back to university in the February! However, I went to Liverpool for New Year's Eve to spend it with my friends, and whilst there I started getting pain in my shoulder. Just a day after I got back from Liverpool I had to go into hospital, and I was diagnosed with osteoporosis and septic arthritis in my right shoulder, which was caused by the steroids I was on and my low immunity. This required surgery and a lot of recovering in hospital as well as high doses of morphine. This set me back a lot and was quite hard for me to deal with.

Then the COVID-19 pandemic hit and the whole world went into lockdown. Yet in this time I recovered – I got back into exercise and started singing and playing guitar again. I moved back to Liverpool in the July in a flat with my friend and started uni again. I spent a lot of the time going back and forth from Liverpool to Leicester for treatment, and then I had to shield in Leicester for the second lockdown and finish my first year of degree online, but my mental health and physical health were a lot better. I still dealt with hospital admissions and infections, but I recovered a lot quicker.

I am in remission and have been since the first round of chemo, which I am very happy about. My treatment finished on 17th July, which means I can really start recovering and go into the second year of my degree chemo-free! I am trying to build up my fitness, I do suffer from survivors guilt and PTSD and see a counsellor for this but medically I am back to normal, just every two months I go for a check up.

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

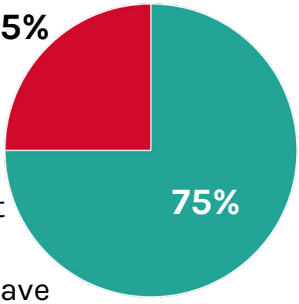
Cells that have the potential to develop into many different or specialised cell types.

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 B-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.
- In adults with ALL, most cases (**75%**) are **B-cell ALL**. This means that it is the B type of lymphocytes that are involved. The other **25%** of cases ALL in adults affect the T lymphocytes (**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 factors that put people at higher risk of leukaemia are thought to be changes in their chromosomes and genes. Chromosome abnormalities and gene mutations are seen in 60-80% of patients with B-cell ALL. These changes are not hereditary but are acquired after birth.
- 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 B-cell ALL. A separate booklet on T-cell acute lymphoblastic leukaemia (ALL) is available on our website. Scan the QR code to order our booklets:

What is B-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 helps 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, they do not fight infection normally. ALL causes too many immature lymphocytes in the bone marrow. This stops you making the other blood cells you need.

Leukaemia cells are present in the bone marrow and blood at first, but then 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 involved. 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 B-cell ALL affect?

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

The majority of patients with ALL are children:

- 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.

In adults with ALL:

- 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 B-cell ALL.

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

What causes B-cell ALL?

The exact cause of ALL is unknown. However factors that put people at higher risk of leukaemia are thought to be changes in their chromosomes and genes.

Patients who develop B-cell ALL show changes in their chromosomes and genes. Chromosomes abnormalities and gene mutations are seen in 60-80% of patients with B-cell ALL. The remaining patients do not have any detectable chromosomes or mutation abnormalities.

Chromosome abnormalities and/or gene mutations

The changes in the chromosomes and genes in patients who develop B-cell ALL are not hereditary. They are acquired during your lifetime and cannot be passed onto your children.

The chromosome abnormalities and gene mutations seen in

patients with B-cell ALL include:

- Philadelphia chromosome: t(9;22) BCR-ABL1
- Chromosome translocations
  - t(4;11) (q21;q23)
  - t(1;19) (q23;p13)
- Philadelphia-like or BCR-ABL1-like chromosome
- Gene mutations *CRLF2*, *NOTCH1* or *FBW7*

Inherited genetic conditions

Inherited genetic syndromes result from one or more chromosome abnormalities or gene mutations.

Patients with the following inherited genetic syndromes have an increased risk of developing ALL:

- **Fanconi anaemia:** In this is blood disorder, an abnormal gene damages blood cells and prevents the bone marrow from replacing them. People with this condition have:
  - Physical problems
  - Bone marrow failure
  - Organ defects
- **Klinefelter syndrome:** This is due to males being born with an extra X chromosome. These patients have:
  - Small testicles and penis
  - Decreased facial and body hair
  - 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 B-cell ALL?

At first, the symptoms of B-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 gets worse in a short period of time. This is why it is described as 'acute'.

Patients who have ALL produce large amounts of leukaemia cells. 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 that you need.

These reduced levels of normal blood cells lead to 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 or petechiae
- Purpura (purple-coloured patches) but unlike bruises they are not due to injury. They tend to occur in clusters over a single area of the body
- Petechiae (flat, two mm, red/purple spots). Like purpura, they do not disappear when pressed beneath a glass
- Frequent chest or urinary tract infections
- Unexplained painless swollen lymph nodes in the neck, armpit, or groin
- Swelling or discomfort in the abdomen due to enlarged spleen or liver
- Pain in the bones or joints

Central nervous system involvement in ALL

Your central nervous system (CNS) involvement is made up of the brain and spinal cord. A fluid surrounds these organs to protect them. This is the cerebrospinal fluid (CSF).

Leukaemia cells can enter the brain, spinal column and cerebrospinal fluid. This may result in the following symptoms:

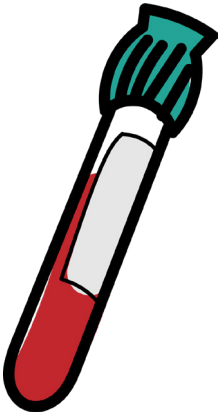
- Headaches and dizziness
- Blurred vision
- Seizures

- Vomiting

CNS involvement of ALL is more common in:

- Younger adults
- Patients with:
  - T-cell ALL
  - Patients with a Philadelphia chromosome

Summary: How is B-cell ALL diagnosed?



- Your haematology team will perform the following tests to diagnose your B-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
  - What type of ALL you have
- Your haematology team should explain each test to you.

How is B-cell ALL diagnosed?

Your haematology team will conduct the following tests to diagnose your B-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. A piece of bone marrow tissue from the sample 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 a special biopsy needle. If you need more 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 B-cell ALL can be made if the bone marrow contains 20% or more immature lymphoblasts. If the lymphoblasts are limited to a mass in a lymph node or other lymph tissue and less than 20% of the bone marrow cells are lymphoblasts, a diagnosis of B-cell lymphoblastic lymphoma is made.

Lumbar puncture

Your haematology team do a lumbar puncture to check if your leukaemia cells have entered your CNS. After the lumbar puncture, your haematologist will examine your CSF for any leukaemia cells present. You will need further treatment straight after diagnosis if this is the case.

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 the 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 do 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 B-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

Between 60% to 80% of patients have chromosome abnormalities and gene mutations. The remaining patients do not have detectable chromosomes and mutations 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 using your ALL cells. 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 in particular. 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 the proteins found on blood cells. Each type of blood cell has different proteins on its surface. Your haematology team can use immunophenotyping to 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 the B-cells include CD19, CD20, CD22 and CD24.

B-cells have different CD proteins to T-cells. This helps to distinguish between B-cell ALL and T-cell ALL.

Flow cytometry

In flow cytometry, particles 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.

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

It is preferable not look on the internet for information about your diagnosis and treatment. It is difficult to pick out the information that is relevant to you. Your haematology team or our ALL booklets will be able to provide you with the information you are looking for.

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

- Your haematology team will start your ALL treatment **straight after** your diagnosis. This is because ALL has a **fast progression**.
- 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 with the intention of introducing 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 B-cell ALL?

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

Discussions about treatment takes place in group meetings. These are multidisciplinary teams (MDTs). They bring the skills of lots of different types of doctors and nurses together. 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. Complete remission means the treatment has removed the majority of all the leukaemia cells.

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

5% of ALL patients. The percentage of leukaemia cells in the CNS of these patients at diagnosis is variable. These cells can cause relapse of the ALL in up to 30% of cases.

Your lumbar puncture may show you have leukaemia cells in your CNS. In this case, your haematologist will inject strong chemotherapy (methotrexate) into your CSF. Oral or intravenous chemotherapies are not used to treat the CNS. They cannot penetrate the CNS through these routes.

Consolidation treatment

Patients receive consolidation treatment to help them reinforce their remission. This reduces the risk of a relapse.

Relapse is the recurrence of ALL when response to frontline treatment stops in patients who had a remission before.

Consolidation therapy consists of lower doses of the drug combinations used for induction.

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 distinct chance that the ALL will return.

Maintenance treatment usually consists of low dose chemotherapy with a steroid drug. You can receive maintenance treatment as an outpatient. This prevents you having to stay in hospital. This might still mean going to the hospital for treatment on occasion. Sometimes you can have the treatment at home.

Maintenance treatment will last for two to three years. The time you will receive your maintenance treatment depends on many factors.

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 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

In general, you receive a TKI when you have the Philadelphia chromosome. TKIs are drugs that inhibit the tyrosine kinase enzyme which controls the function of a cell. They stop the cell 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 leukaemia cells come from you, they are abnormal. Thus, 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 a monoclonal antibody designed to attach itself to the CD19 protein on B-cells.

You might receive blinatumomab if you:

- Are Philadelphia chromosome-negative
- 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 consist of a monoclonal antibody linked to a powerful anticancer drug.

The monoclonal antibody part of the drug targets specific proteins on the leukaemia cell. The linked anticancer drug part then destroys the leukaemia cell.

Inotuzumab ozogamicin is an example of antibody-drug conjugate. The monoclonal antibody is inotuzumab. The anticancer drug is 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 treatments 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 relatively new to ALL treatment. 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.

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 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:

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 relapse. 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 ASCT, you will receive high-dose chemotherapy. This will kill the leukaemia cells in the bone marrow. This is called myeloablative conditioning.

You then receive the healthy donor stem cells into your vein. These cells in your blood migrate to your bone marrow where they form new blood cells. After the 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. This means they can cause damage to your body. These include standard high-dose chemotherapy treatment used for induction treatment. Standard high-dose chemotherapy is also used to prepare the bone marrow for a stem cell transplant. This means there can be a lot of side effects. The high-dose 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.

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 in trials.

Clinical trials

Clinical trials comparing new treatments with existing treatments 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 your treatment 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

Your haematology team should also explain your tests and results to you.

Follow-up care

Your haematology team will discuss your follow-up care as soon as you are in long-term remission.

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 B-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**. This number of people who survive decreases if you look at older groups of people.

Overall survival estimates for ALL are:

- 65% alive at five years after diagnosis for those aged 18 to 45
- 46% alive at five years after diagnosis for those aged 46 to 65
- 11% alive at five years after diagnosis for those aged over 65

These overall survival estimate figures are just averages of all patients with ALL within defined age groups. It is not possible to predict for certain 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 look at the factors that doctors might use to tell you where you might fit in relation to the average person with ALL.

Overall fitness

- Medically fit patients can withstand intensive chemotherapy and an allogeneic stem cell transplants. In general, people become frailer as they get older.
- Patients who cannot tolerate intensive chemotherapy can still achieve complete remission if their haematology team adjust the doses of their treatment. Treating leukaemia requires balancing drug doses.

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
  - Having a poor response to initial treatment such as a lower than expected remission rate

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

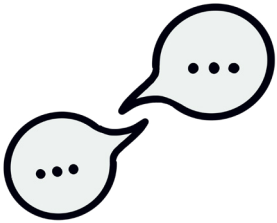
Supportive care is available at any time. It is a term that means any medication or medical care that is not given to treat your leukaemia. The aim is to **improve your quality of life**.

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 while 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 is 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 will have to contact your place of education to defer your attendance while you are on treatment.

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 the 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 and any stage of treatment too.

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 B-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?

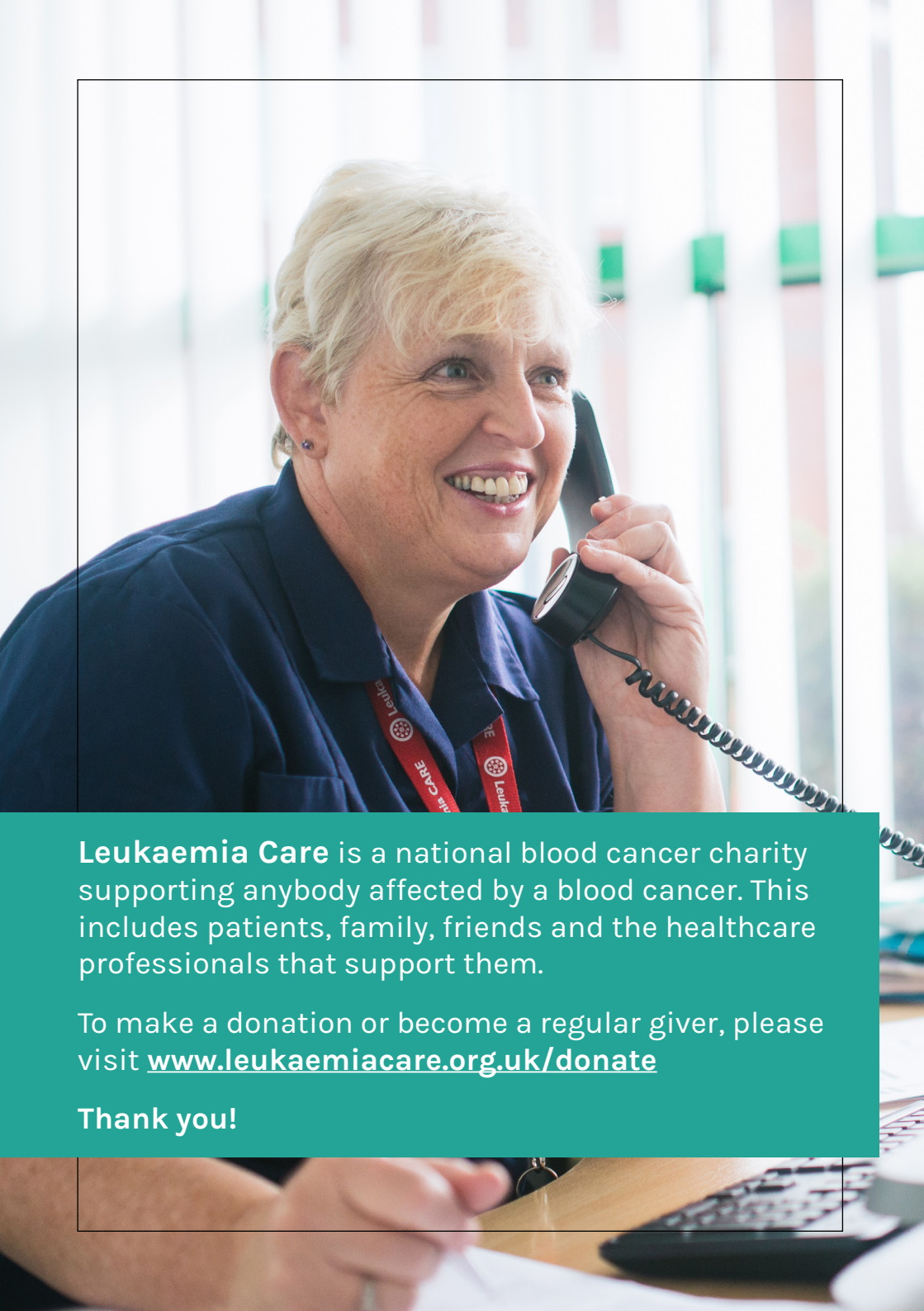
A terminal diagnosis means your team feel there are no more treatment options left that can cure or control your ALL. Other care to improve quality of life should continue. They will let you know when you need end of life care. End of life care may last days, months or years.

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 with you about 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 B-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,
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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
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