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# **Blinatumomab for Acute Lymphoblastic Leukaemia (ALL)**

**A Guide for  
Patients**

**Leukaemia Care**  
YOUR Blood Cancer Charity

# Introduction

**Blinatumomab is a monoclonal antibody. Its monoclonal antibodies target the CD19 proteins on the surface of your leukaemia cells. This stimulates your immune system to destroy the leukaemia cells. If you have any questions about this ALL treatment - 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](mailto:communications@leukaemiacare.org.uk).

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# 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

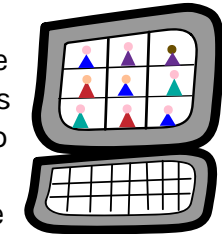
Our helpline is available 9am to 5pm Monday to Friday. If you need someone to talk to, call **08088 010 444**.



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

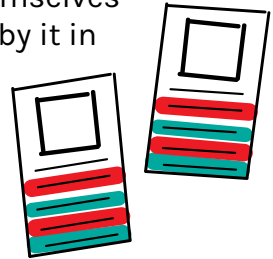
### Support groups

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@leukaemicare.org.uk](mailto:support@leukaemicare.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](mailto: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:



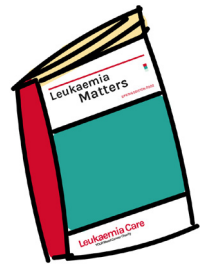
## Write a free will

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:



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# 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.

## **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.

## **Induction (phase)**

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

## **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.

## **Stem cells**

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

# Summary: Blinatumomab for ALL

- Blinatumomab is a **monoclonal antibody** target drug for the treatment of ALL. It is used when you have had a relapse of your ALL or when you are at high risk of a relapse.
  - With blinatumomab, its monoclonal antibodies stick to the CD19 protein found on B-cells. This stimulates the body's immune system to destroy the leukaemia cells.
  - Blinatumomab is suitable for both Philadelphia chromosome-positive and Philadelphia chromosome-negative patients. However, it is used at different stages if you have these chromosome changes.
- Administration of blinatumomab is via an intravenous infusion pump over a period of up to 96 hours.
- Your haematology team will recommend you stay in hospital for:
  - The first nine days of the first cycle of blinatumomab
  - The first two days of the second cycle of blinatumomab



# What is blinatumomab?

Blinatumomab is a monoclonal antibody. Its monoclonal antibodies target the CD19 proteins on the surface of your leukaemia cells. This stimulates your immune system to destroy the leukaemia cells.

Please see our booklet on B-cell ALL (newly diagnosed) for more information on CD proteins. Scan the QR code to order our booklet:



Blinatumomab is an antibody treatment that only targets the CD19 protein. It is called a monoclonal antibody because it only targets one protein.

Blinatumomab also binds to the CD3 protein on T-cells to help them recognise and attack the leukaemia cells.

## Who receives blinatumomab?

Adults with Philadelphia chromosome-negative relapsed or refractory B-precursor ALL can receive blinatumomab.

# How is blinatumomab administered?

Blinatumomab is continuously delivered via 'smart' infusion pumps over a period of four weeks. Infusion bags are changed two times per week. 'Smart' infusion pumps use computer technology and drug software libraries to reduce any dosing errors.

There is an induction phase and a consolidation phase with chemotherapy treatments.

Treatment consists of:

- Up to two cycles for induction
- Three more cycles for consolidation treatment

You will be in hospital for the first nine days of the first cycle with blinatumomab and the first two days of the second cycle. Treatment is given to you as an outpatient after that. You often can have the treatment at home.

## Benefits of treatment with blinatumomab in patients with ALL

Blinatumomab has the following benefits for patients with ALL:

- It is available as a monotherapy which avoids complicated treatment combinations
- It is suitable for adults and children, although with certain restrictions
- It can treat both Philadelphia chromosome-positive and Philadelphia chromosome-negative ALL patients

# What are the side effects with blinatumomab?

The most common side effects experienced by patients taking blinatumomab are given below. The percentages of patients affected by them are also included:

- Fever (70.8% of patients)
- Infusion-related reactions (33.4%)
- Headache (32.7%)
- Nausea (23.9%)
- Low levels of red blood cells - Anaemia (23.3%)
- Low levels of platelets - Bruising/bleeding (21.6%)
- Build-up of fluid in parts of the body causing a swelling - Oedema (21.4%)

The most serious side effects with blinatumomab are:

- Infections (26.6%)
- Neurological events (12.2%)
- Neutropenia/febrile neutropenia (9.1%)
- Cytokine release syndrome (2.7%)
- Tumour lysis syndrome (0.8%)

More information about infections can be found in our booklets on B-cell ALL and T-cell ALL (newly diagnosed). Scan the QR code to order our booklets:



## Cytokine release syndrome

Cytokine release syndrome is a full-blown inflammatory response to a variety of factors. These include infections and certain drugs. Cytokine release syndrome shows a variety of symptoms. These can range from mild, flu-like symptoms to severe and life-threatening. They include:

- Mild symptoms include fever, fatigue, headache, rash, joint and muscle pain
- More severe cases experience:
  - Low blood pressure
  - High fever
  - Circulatory shock
  - Blood vessel leakage
  - Disseminated intravascular coagulation
  - Multi-organ system failure

## Tumour lysis syndrome

Tumour lysis syndrome occurs when large numbers of leukaemia cells die at the same time. When dying, leukaemia cells release uric acid, potassium and phosphorus into the blood. The levels of these waste products can get higher than the kidney can cope with. This may result in damage to the kidney, but also the heart and liver.

The risk of tumour lysis syndrome and cytokine release syndrome is why the first cycles of blinatumomab are given in hospital. After that, the risks are lower so you can be treated at home.

## Fertility, pregnancy and breast-feeding

### Fertility and contraception

No human studies have assessed the effects of blinatumomab on fertility. Blinatumomab is a fairly new treatment but its

effects may be seen over time as it is used more. It may be hard to say what the effect is as chemotherapy also damages fertility. Blinatumomab is also only used after these treatments. Discuss this with your doctor if you are concerned.

If there is a possibility of pregnancy, you should use effective contraception:

- During treatment with blinatumomab
- For at least 48 hours after treatment with blinatumomab

### **Pregnancy**

Human reproductive studies with blinatumomab are not available. There is no data on the use of blinatumomab in pregnant women.

It is not recommended to take blinatumomab during pregnancy.

### **Breastfeeding**

There is no evidence that blinatumomab or its metabolites can get into human milk. But, given its pharmacological properties, breastfeeding still presents a possible risk to the newborn. Breastfeeding is not recommended:

- During treatment with blinatumomab
- At least 48 hours after treatment with blinatumomab

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# Which drugs may interact with blinatumomab?

No drug interaction studies of blinatumomab are available to date.

Your haematology team will ask you about other medications you are taking before you start. They will also inform you of things to avoid. It is prudent to tell your doctor or nurse that you are having blinatumomab if you need to start any other medications.

If you would like support and advice regarding your treatment, you can speak to someone on our helpline by calling **08088 010 444**. We're available from 9:00am – 5:00pm Monday to Friday.

# What happens if blinatumomab doesn't work for me?

If blinatumomab has not worked for you, other treatments are available. They include inotuzumab ozogamicin and chimeric antigen receptor (CAR) T-cell therapy.

Your haematology team may offer you combinations of chemotherapy. If you did not start your ALL treatment with chemotherapy you may receive a combination of:

- Vincristine
- Daunorubicin or doxorubicin
- Cytarabine
- Asparaginase
- Etoposide
- Mercaptopurine
- Methotrexate
- Cyclophosphamide
- Steroids such as prednisone or dexamethasone

Other options include radiation therapy or stem cell transplant. Your consultant will be able to tell you about the best treatment for you going forward.

Booklets on other treatments for relapsed or refractory ALL are on the Leukaemia Care website. Scan the QR code to order our booklets:





**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](http://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](http://www.leukaemiacare.org.uk)**  
**[support@leukaemiacare.org.uk](mailto:support@leukaemiacare.org.uk)**

## Blood Cancer UK

Leading charity into the research of blood cancers.

**0808 2080 888**  
**[www.bloodcancer.org.uk](http://www.bloodcancer.org.uk)**

## Cancer Research UK

Leading charity dedicated to cancer research.

**0808 800 4040**  
**[www.cancerresearchuk.org](http://www.cancerresearchuk.org)**

## **Macmillan**

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

**0808 808 0000**

**[www.macmillan.org.uk](http://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](http://www.maggiescentres.org)**

## **Citizens Advice Bureau (CAB)**

Offers advice on benefits and financial assistance.

**08444 111 444**

**[www.adviceguide.org.uk](http://www.adviceguide.org.uk)**

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# 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](mailto:communications@leukaemiacare.org.uk).

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**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 blinatumomab for 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](mailto: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@leukaemicare.org.uk](mailto:fundraising@leukaemicare.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



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](http://www.leukaemiacare.org.uk)

[support@leukaemiacare.org.uk](mailto: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

