
Inotuzumab ozogamicin for Acute Lymphoblastic Leukaemia (ALL)

**A Guide for
Patients**

Introduction

Inotuzumab ozogamicin is a chemotherapy drug. 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.

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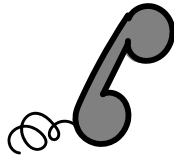
About Leukaemia Care

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

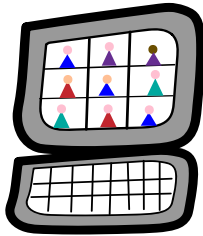
Our helpline is available 9am to 5pm Monday to Friday. If you need someone to talk to, call **08088 010 444**.



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

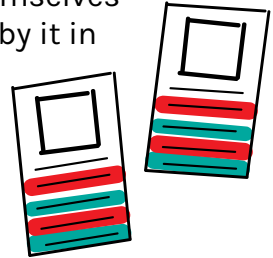
Support groups

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



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:



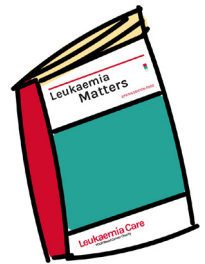
Write a free will

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:



Glossary of medical terms

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.

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).

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.

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.

Summary: Inotuzumab ozogamicin for ALL

- Inotuzumab ozogamicin is a type of **targeted cancer drug**. It is used to treat B-cell acute lymphoblastic leukaemia (ALL).
- It is approved for **relapsed ALL** (where the leukaemia has come back) or **refractory ALL** (where the ALL did not respond to treatment).
- Inotuzumab ozogamicin is a **monoclonal antibody**.
 - Inotuzumab ozogamicin sticks to CD22 proteins on the surface of leukaemia cells.
 - Once in the leukaemia cell, inotuzumab ozogamicin targets the DNA causing severe damage and leading to the death of the cell.
- Inotuzumab ozogamicin is effective in treating relapsed or refractory acute lymphoblastic leukaemia (ALL).
 - Inotuzumab ozogamicin is suitable for adults with CD22-positive ALL.
 - Adults who are positive for the Philadelphia chromosome must have received treatment with at least one tyrosine kinase inhibitor (TKI).
- You will receive inotuzumab ozogamicin as an intravenous infusion over an hour. Your haematology team will supervise your inotuzumab ozogamicin administration in hospital.
- Administration of inotuzumab ozogamicin is for three or four cycles. You can have up to six cycles if you are not having an allogeneic stem cell transplant (allo-SCT). You may stop treatment earlier if your team believe inotuzumab ozogamicin is not working for you.



- Common side effects with inotuzumab ozogamicin are:
 - Low levels of platelets
 - Low levels of neutrophil white blood cells
 - Fever
 - Abnormal liver function
 - Diarrhoea
- If you experience these side effects, you should receive help to manage them. Speak to your haematology team if you are concerned about anything

What is inotuzumab ozogamicin?

Inotuzumab ozogamicin is a treatment for adults with relapsed and refractory ALL. It is a monoclonal antibody linked to ozagamicin.

Inotuzumab ozogamicin sticks to CD22 proteins on leukaemia cells. CD22 proteins are present in 95% of immature B-ALL cells.

Once in the leukaemia cell, the ozagamicin part of inotuzumab ozogamicin causes severe damage to the DNA leading to the death of the cell.

Who receives inotuzumab ozogamicin?

Patients who receive inotuzumab ozogamicin are:

- Adults with CD22-positive relapsed or refractory ALL
- Philadelphia chromosome positive adults with relapsed or refractory ALL have had previous unsuccessful treatment with at least one TKI.

To understand more about what relapsed/refractory ALL is, please see our relapsed/refractory ALL booklet. Scan the QR code to order our booklet:



How is inotuzumab ozogamicin administered?

You receive inotuzumab ozogamicin as an intravenous infusion over an hour. Your haematology team will supervise your inotuzumab ozogamicin administration in hospital. This is so any side effects that you experience can be managed. Some of the side effects of inotuzumab ozogamicin can be life-threatening.

You will also receive paracetamol, a steroid and an antihistamine. This will happen approximately 30 minutes before your infusion. This helps to reduce the risk of an infusion-related reaction.

In general, administration of inotuzumab ozogamicin is for three or four cycles. You can have up to six cycles if you are not having an allogeneic stem cell transplant (allo-SCT). An allo-SCT is used to make sure you stay in remission if your ALL is considered high-risk.

Please see our relapsed booklet to understand more about risk levels. Scan the QR code to order our booklet:



You may stop inotuzumab ozogamicin treatment earlier if your team believe inotuzumab ozogamicin is not working for you.

Usually inotuzumab ozogamicin is effective after three cycles. If it is not reducing the number of your leukaemia cells, your treatment will be reconsidered. The overall aim of treatment with inotuzumab ozogamicin is to get you back into complete remission.

Your haematology team will also supervise you for at least one hour after the end of your infusion. This is to check for any symptoms of infusion-related reactions. These include:

- Low blood pressure

- Hot flush
- Breathing problems

Inotuzumab ozogamicin can be dangerous if your levels of immature leukaemia cells are too high. This is because it can be unsafe for you to have too many leukaemia cells dying at the same time. Dead cells release waste products that might overwhelm your kidneys and other organs if they reach high levels in your blood. This is tumour lysis syndrome. When the levels of leukaemia cells are too high, your haematology team may reduce them with other drugs first.

Recommended pre-medications before dosing with inotuzumab ozogamicin include:

- A corticosteroid, an antihistamine and a drug to prevent fever (e.g. paracetamol)
- Hydration and treatment to reduce uric acid levels, one of the waste products that leukaemia cells will create

Infusion-related reaction

An infusion-related reaction is defined as a disorder due to an adverse reaction to the infusion of a drug. Infusion-related reactions occur in 10% of patients receiving inotuzumab ozogamicin.

When an infusion-related reaction occurs, your haematology team will start the following steps:

- Immediate interruption of the infusion
- Appropriate medical treatment
- Discontinuation of the infusion for the rest of the cycle if needed
- Administration of steroids and antihistamines for severe infusion-related reaction

What are the side effects of inotuzumab ozogamicin in ALL patients?

Below are the most common side effects experienced by patients receiving inotuzumab ozogamicin. The percentages of patients affected by them are also included:

- Low levels of platelets (51% of patients)
- Low levels of neutrophils (49%)
- Infection (48%)
- Low levels of red blood cells (anaemia - 36%)
- Low levels of white blood cells (35%)
- Fatigue (35%)
- Haemorrhage (33%)
- Fever (32%)
- Nausea (31%)

The most serious side effects with inotuzumab ozogamicin are:

- Infection (23% of patients)
- Febrile neutropenia (11%)
- Haemorrhage (5%)
- Fever (3%)
- Stomach pain (3%)
- Veno-occlusive disease (VOD - 2%)
- Tumour lysis syndrome (2%)

Veno-occlusive disease

Veno-occlusive disease (VOD) occurs in 2% of patients with B-cell relapsed or refractory ALL who are receiving inotuzumab ozogamicin. VOD is also called sinusoidal obstruction syndrome. It occurs when the small blood vessels in and around the liver become blocked.

VOD is more common in patients who undergo a SCT after achieving remission with inotuzumab ozogamicin treatment. VOD develops in the first few weeks after a SCT and can be mild or severe.

Symptoms of VOD include:

- Jaundice (your skin and whites of the eyes become yellow and your urine is dark yellow)
- Liver tenderness (under the ribs on the right side of the body)
- Liver enlargement
- Ascites (abnormal build-up of fluid in the abdomen)
- Sudden weight gain

VOD damages cells in the liver resulting in an obstruction that reduces blood flow in the liver. This can cause changes throughout the body that can lead to organ failure. Organs affected are the lungs, kidneys and brain.

It is important to recognise the symptoms of VOD early on because the condition can worsen quickly. Treatment of VOD includes supportive care, intensive care and specific treatment with defibrotide. The mechanism of defibrotide is not yet fully understood.

Tumour lysis syndrome

Tumour lysis syndrome occurs in 2% of patients with B-cell relapsed or refractory ALL taking inotuzumab ozogamicin. It may be life-threatening.

Tumour lysis syndrome occurs when large numbers of leukaemia

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

Symptoms of tumour lysis syndrome include:

- Nausea and lack of appetite
- Vomiting
- Fatigue
- Low output of dark urine
- Pain in the side
- Numbness, seizures, or hallucinations
- Muscle cramps and spasms
- Heart palpitations

You will be monitored closely for tumour lysis syndrome and may be given drugs such as allopurinol or rasburicase to prevent it.

Fertility, pregnancy and breast-feeding

Fertility and contraception

Inotuzumab ozogamicin may affect both male and female fertility. There have not been any studies so far as inotuzumab ozogamicin is still a relatively new treatment. It is also hard to separate the effects of inotuzumab ozogamicin from other treatments known to affect fertility. For example, you are likely to have already had chemotherapy.

You can seek advice for fertility preservation before treatment. Sometimes your treatment is too urgent to do this.

Pregnancy

Inotuzumab ozogamicin has not been studied in pregnant women. It is not recommended to take inotuzumab ozogamicin during pregnancy.

Breastfeeding

Inotuzumab ozogamicin has not been studied in women who are breastfeeding. But, given its mechanism of action, women should not breastfeed at the following times:

- During treatment with inotuzumab ozogamicin
- For at least two months after the final dose of inotuzumab ozogamicin

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

Interaction of inotuzumab ozogamicin with other drugs

There are no formal clinical drug interaction studies with inotuzumab ozogamicin.

Patients receiving inotuzumab ozogamicin show a lengthening of the QT interval. This can be seen on their electrocardiogram (ECG) tracing. A lengthening of the QT interval is a sign that the heart's electrical system is taking longer to recharge between heart beats. Your administration of inotuzumab ozogamicin will be monitored if you are taking drugs that are known to prolong the QT interval as well. These include the antidepressant citalopram and some antibiotics and antifungals.

Your haematology team will perform an ECG on you before starting you on inotuzumab ozogamicin. This is important if you are also taking drugs known to prolong QT interval. Your haematology team will check your QT interval on a regular basis.

What happens after treatment with inotuzumab ozogamicin?

The aim of inotuzumab ozogamicin is to help you return to remission. If your treatment is successful, your leukaemia blood cell counts will eventually return to within normal ranges.

You might go straight into another treatment even if inotuzumab ozogamicin has worked for you. Your haematology team may use an allogeneic stem cell transplant if you are at high risk of relapse to make sure you stay in remission.

Adding a TKI may improve your complete remission if you are positive for the Philadelphia chromosome. This may improve the chances of remission compared to inotuzumab ozogamicin alone.

If inotuzumab ozogamicin has not worked for you, other new drugs may be available. They include:

- Blinatumomab
- CAR T-cell therapy

If you did not start your ALL treatment with chemotherapy you may receive a combination of the following:

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

Other options include radiation therapy or an allogeneic stem cell transplant. Your consultant will be able to let you know of 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:



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



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 inotuzumab ozogamicin 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, 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



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

