
Common Side Effects of Treatment

A Guide for
Patients

Leukaemia Care
YOUR Blood Cancer Charity

Introduction

Your cancer treatment can cause various side effects and sometimes the side effects of treatment can be more difficult to manage than the illness itself. Some of these are very common and experienced by many. Some are much rarer and occur in very few patients. Sometimes the effects can be unexpected or more severe than you anticipated, and the experiences of these side effects differ from person-to-person.

This booklet is designed to provide you with information about the common side effects you may experience, what to expect and how they may be managed.

If you need specific advice or are concerned about a particular side effect, please contact your medical team or Clinical Nurse Specialist.

Booklet originally written by clinical nurse specialists, consultant haematologists and cancer counsellors. Subsequently reviewed by Manos Nikolousis, and Paul Hickey, Haematology Clinical Nurse Specialist. The rewrite was put together by Lisa Lovelidge and peer reviewed by Robert Marcus, Nicole Shepherd and Manos Nikolousis. We are also grateful to Thea Wilson, Gary Hunter and Adrian Thomas for their contributions as patient reviewers.

If you would like any information on the sources used for this booklet, please email communications@leukaemiacare.org.uk for a list of references.

In this booklet

Introduction	2
In this booklet	3
About Leukaemia Care	4
Increased chance of infection	6
Fatigue	8
Hair loss	12
Anaemia	16
Gastrointestinal side effects	18
Mouth changes	21
Cognitive effects	24
Pain and tingling	26
Fertility	29
Cardiac and lung toxicity	34
Secondary cancer risk	40
Glossary	41
Useful contacts and further support	43

About Leukaemia Care

Leukaemia Care is a national charity dedicated to ensuring that people affected by blood cancer have access to the right information, advice and support.

Our services

Helpline

Our helpline is available 9.00am - 10.00pm on weekdays and 9.30am - 12.30pm on Saturdays. If you need someone to talk to, call **08088 010 444**

Nurse service

We have two trained nurses on hand to answer your questions and offer advice and support, whether it be through emailing **nurse@leukaemicare.org.uk**, over the phone on **08088 010 444** or via LiveChat.

Patient Information Booklets

We have a number of patient information booklets like this available to anyone who has been affected by a blood cancer. A full list of titles – both disease specific and general information titles – can be

found on our website at **www.leukaemicare.org.uk/support-and-information/help-and-resources/information-booklets/**

Support Groups

Our nationwide support groups are a chance to meet and talk to other people who are going through a similar experience. For more information about a support group local to your area, go to **www.leukaemicare.org.uk/support-and-information/support-for-you/find-a-support-group/**

Buddy Support

We offer one-to-one phone support with volunteers who have had blood cancer 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

Online Forum

Our online forum,
www.healthunlocked.com/leukaemia-care, is a place for people to ask questions anonymously or to join in the discussion with other people in a similar situation.

Patient and carer conferences

Our nationwide conferences provide an opportunity to ask questions and listen to patient speakers and medical professionals who can provide valuable information and support.

Website

You can access up-to-date information on our website, **www.leukaemicare.org.uk**, as well as speak to one of our care advisers on our online support

service, LiveChat (9am-5pm weekdays).

Campaigning and Advocacy

Leukaemia Care is involved in campaigning for patient well-being, NHS funding and drug and treatment availability. If you would like an update on any of the work we are currently doing or want to know how to get involved, email **advocacy@leukaemicare.org.uk**

Patient magazine

Our quarterly magazine includes inspirational patient and carer stories as well as informative articles by medical professionals. To subscribe go to **www.leukaemicare.org.uk/communication-preferences/**

Increased chance of infection

White blood cells help us to fight infections, so anything that lowers the count can make it easier for infections to be picked up.

Blood cancers and their treatment can affect the immune system in a number of ways. Some cancers, particularly leukaemias and lymphomas, may reduce the effectiveness of the body's natural immune defenses. They do this by preventing the bone marrow from producing enough healthy white blood cells.

Several factors can affect the white blood count, including chemotherapy and radiotherapy, so patients who are undergoing these types of treatment are often prone to picking up infections such as chest infections, coughs and colds.

Chemotherapy

Chemotherapy can often have a major effect on the immune system and may reduce the body's defenses against infection for quite some months, both during and after treatment.

This is because chemotherapy reduces the number of white blood cells produced by the bone marrow. Patients undergoing chemotherapy are at risk of picking up infections 7-14 days after the chemotherapy, when the level of white blood cells are at their lowest. However, this is dependent on the person and treatment and can often happen before the seven days or after the 14 days.

Radiotherapy

Radiotherapy often has a temporary effect on the immune system and may increase the risk of infection if large areas of the body are irradiated.

Avoiding infection

You are the only person who understands what your body is telling you, so if you're feeling under the weather, avoid going out and about. You're more likely to pick up an infection or virus if you're feeling unwell. If you're feeling well, don't be afraid to go out. You just need to use your common sense and be a bit

more cautious about who you are coming into contact with.

Try to avoid people with coughs and colds and busy places such as shopping centres and supermarkets, especially just after your treatment.

This is called the nadir period – the period when your blood count is at its lowest.

Avoid having a takeaway and eating raw or uncooked foods, unpasteurised cheeses or certain pates that may contain germs that can cause infections in patients whose immunity is reduced. Try to also avoid ‘help yourself’ deli counters that tend to include these sorts of foods. When eating fruit, only eat those which can be peeled, such as bananas.

Treatment of infections

Infections are treated with antibiotics, and fever or other symptoms of infection must be regarded as an emergency since the white cells may be reduced after chemotherapy, increasing the risks of sepsis.

Contact your treating hospital straight away if:

- Your temperature goes above 37.5°C
- You suddenly feel unwell, even with a normal temperature

These are signs of infection and you may need to have antibiotic treatment, either as tablets or by drip (intravenous injection), especially if your white blood cells are low.

The sooner you let your specialist team know, the better.

Fatigue

Fatigue is one of the most common symptoms reported by patients diagnosed with a blood or lymphatic cancer. Many patients may have already found that experiencing and managing fatigue is a large part of everyday life, and, unlike 'normal' tiredness, it is not relieved by rest, so even the simplest of daily tasks can become challenging.

Research has shown that as many as three quarters of people with cancer feel fatigued at some time along their cancer journey. However, many people do not report any changes in their tiredness levels as it's assumed that it is a natural consequence of living with a blood cancer.

Fatigue is a very common condition for many people with a blood cancer and it is important that fatigue is addressed in the same way that other symptoms of your cancer and treatment are managed.

Remember, you can talk to your medical team about how you are feeling as there are many ways of

managing your energy levels.

What is fatigue?

Fatigue is often referred to as exhaustion, tiredness or lethargy. You may experience fatigue either physically or psychologically, so it can affect your ability to do everyday tasks, as well as your mental ability.

When experiencing fatigue, you may find that you experience other problems such as a lack of concentration, difficulty remembering things and even a loss in sex drive. These are all recognised as effects of fatigue.

What causes fatigue?

There are a variety of reasons as to why you may be feeling fatigued:

- **Anaemia** - Red blood cells that contain haemoglobin, which carries oxygen around your body, are often reduced by leukaemia cells and chemotherapy. If you are anaemic, or have low levels of haemoglobin in your blood,

this can affect your energy levels. Blood tests will be able to establish whether you have anaemia and inform your medical team on the appropriate action to take.

- **Chemotherapy and radiotherapy** - If you have been through or are having chemotherapy treatment, fatigue may be a side effect of this process. Some of the medication you may have been prescribed can sometimes cause drowsiness, which may increase feelings of fatigue.
- **Depression and anxiety** - Anxiety and depression can contribute to fatigue. It is common for you to suffer with anxiety and depression after you've been diagnosed. These feelings do generally get better and easier to deal with. If you feel that your mood has been low for some time, you should speak to your medical team who will advise you on how to cope and manage your depression.
- **Diet** - A poor diet or loss of

appetite can lead to spells of fatigue. It is important that your body obtains the nutrients it needs in order to be able to maintain healthy energy levels.

- **Other medication** - Some medication you may be given as part of your treatment such as painkillers and anti-sickness medicines can cause drowsiness.

Managing your fatigue

There are a number of things that you can do to adapt to the changes in energy levels your body may go through. It's important that you speak to your doctor and nurses about your fatigue as they will be able to help work out a management plan for you.

Fatigue Diary

Some people find it useful to use a fatigue diary where they record their daily energy levels. This is a simple way to identify changes and any particular triggers as you can note the days and times when the fatigue is better or

Fatigue (cont.)

worse. Your physiotherapist, occupational therapist or Clinical Nurse Specialist (CNS) will be able to help you understand about conserving your energy levels to manage your fatigue.

Diet and Nutrition

Diet and nutrition are important to all people but are even more important when you are experiencing fatigue. A well-balanced diet, high in protein with carbohydrates and lots of fresh fruit and vegetables, can help sustain your body's energy. You should try and aim to drink between six to eight glasses of water a day, to make sure you are well hydrated and keep any toxins flushed through your kidneys. A reduction in alcohol consumption may also help.

Exercise

Research has shown that exercise is one of the best interventions for improving fatigue during and after treatment. It may even be useful to help build up your strength before you start treatment. Exercise helps to build your stamina and increase your strength, which in turn increases

your overall energy levels and sense of well-being. If you find yourself in and out of hospital, you can contact one of the physiotherapy team or ask your medical team about a structured exercise programme and advice about gentle, regular exercise.

Complementary therapies

Some people find that complementary therapies such as yoga, meditation and aromatherapy can help with fatigue. These kinds of therapies can help reduce your anxiety levels which in turn will reduce your fatigue. Other ways of energising yourself are through arts workshops and joining a choir, for example.

Sleep

Getting the right amount of sleep is very important, although it is possible to sleep too much. If you need to rest or sleep during the day, make sure that you take yourself off to bed rather than dozing on the sofa, and try not to sleep for any longer than two hours at the very most. Relaxation techniques such as listening to a relaxation CD or

breathing exercises have been found to promote a better night's sleep. You could also try to avoid drinking caffeine or alcohol before bed and opt for malted drinks or warm milk instead.

Managing fatigue is all about pacing yourself. Many patients find that close family and friends could help in doing everyday chores and tasks, such as ironing or cleaning. Accepting help in this way and understanding that you may not be able to do as much as you once could, can help you feel less pressured and help reduce tiredness.

Most importantly, you should listen to your body, and appreciate that your lifestyle may have to change to accommodate fatigue. However, there are ways of managing it, and it should not debilitate you.

All of the tips described are ideas for you to try. Everybody will be different, and it is important for you to find what works best for you.

To help you record your activity, rest and sleep, you can request one of our logs by emailing support@leukaemiacare.org.uk or calling **08088 010 444**.

Hair loss

Hair loss is one of the most common side effects that patients encounter following cancer treatment, but that doesn't mean it affects everybody.

Losing your hair can cause distress for both men and women, but there are many ways to cope with it.

What is hair loss?

Hair loss is when you lose the hair on your body. You may lose all your hair, some of your hair, or maybe none at all. It is most commonly thought of as loss of hair on your head, but it can also affect your eyebrows, eyelashes and body hair. It can occur gradually, or fairly quickly in just a couple of days after treatment.

What causes hair loss?

Hair loss can be caused by chemotherapy and radiotherapy. The anti-cancer drugs used work to destroy cancer cells by disrupting their growth. This can also include the hair follicles because these cells are also always growing and dividing. However, normal cells do recover,

so your hair will almost always grow back when your treatment is finished. Your medical team will discuss this with you before you start your chemotherapy.

It can take about two to three weeks for your hair to start falling out from when you start treatment, but this can vary from person-to-person and depending on the treatment you have had. You may notice that when you touch your hair, brush it or wash it, it starts to fall out.

Coping with hair loss

Losing your hair can have profound effects on your emotions. Regardless of whether you are male or female, young or old, it can affect the way you feel about yourself and others.

Hair loss can make you feel less self-confident, sad or even depressed. The value of hair should not be underestimated by anybody and feeling like this is perfectly normal. There are ways of helping yourself cope better with the loss of hair.

When it first begins to fall out,

it can cause an uncomfortable sensation on the scalp, so some people shave it off or cut it very short rather than let it fall out on its own. This can give you a feeling of some control.

When you have lost your hair, always remember you have a variety of options available to you.

Wigs

It is common for patients to imagine wigs as looking very unnatural. However, this is no longer the case and wig-making techniques have become more developed, so they look much more natural.

The NHS makes provision for the supply of wigs to people who need them in order to help cope with medical hair loss. Choosing a wig can be daunting, but it is good to consider whether you want to replicate the hair you already have or perhaps go with a different style or colour. Take someone along with you when choosing your wig for advice and support, and don't be afraid to ask a professional for help. Also practice wearing your wig in

your own home, so that you feel more comfortable and confident wearing it when you are out.

There are two main wig options to consider:

- 1. Synthetic fibre wigs** – These are pre-styled and available in a range of colours. When they are washed correctly they revert back to their original style, and they are less prone to colour fade. They can last from nine to 12 months, but this can depend on the length, as longer styles can be more prone to 'friction frizz' from clothing.
- 2. Human hair wigs** – These can be heat styled to exactly how you like it. This means they require more attention and the colour can fade. They do not frizz like synthetic wigs but can be more difficult to manage.

There are wig styles for men too which can be customised to suit. They are available at some wig suppliers. Please visit www.lookgoodfeelbetterformen.org for more information.

Hair loss (cont.)

Alternative head wear

Some people may decide to use a hat or headscarf instead of a wig. These can include regular hats and scarves, as well as more specialist headwear.

Not only is this option comfortable, it offers flexibility as you can change the head wear dependent on the temperature, your environment and even your clothing.

Going without a replacement

You may decide that you would like to go natural, and instead of a wig, you may decide to define yourself with make-up and jewellery. Do remember that the skin on your scalp can be very sensitive, especially in the sunlight, so take precautions to protect yourself if you choose not to opt for a wig or alternative head wear.

Moisturising your scalp frequently stops it from becoming dry and itchy.

You could also try wearing a scarf or turban at night as we lose a lot of heat from our head, so this

often stops people waking up at night feeling cold.

Tip: Some patients find that turning their head upside down and massaging three to four times a day can help promote healthy hair follicles by increasing blood circulation to the head.

Other options

If you lose your eyebrows and eyelashes, make-up can be a great way of enhancing your features. Why not visit a make-up counter at your local department store or beauty salon for advice?

Research is ongoing into the cause and treatment of hair loss and there are promising new preventative treatments being assessed.



Anaemia

Anaemia essentially means a lack of blood and, in particular, red blood cells. Haemoglobin, a protein in red blood cells, is required to help carry oxygen around the body. Anaemia is fairly common in blood cancer patients and many will develop it at some point during their illness as a result of the illness itself or treatment.

Blood tests will be able to establish whether you have anaemia and inform your medical team on the appropriate action to take.

What causes anaemia?

People can become anaemic for a number of different reasons. If you have leukaemia or a condition where the bone marrow isn't working properly, this can cause a drop in haemoglobin. Chemotherapy and other cancer drugs can affect your haemoglobin level, causing it to be low for the duration of the time you are on treatment, and often for a period of time afterwards as well. Often, the haemoglobin recovers after chemotherapy without people needing a transfusion.

Symptoms of anaemia

Anaemia can often go undetected as the symptoms can vary and can be very vague. For example, tiredness, feeling weak and pale in colour, most patients with severe anaemia become short of breath on walking upstairs, may experience dizziness on standing or a feeling your heart is beating quicker.

These symptoms occur because the red blood cells that contain haemoglobin are low, and therefore the oxygen level in the body is low. As a result, you may feel like you have no energy.

Treating anaemia

Initially, if you feel as though you have the symptoms of anaemia, you should contact your specialist nurse who may check the level of haemoglobin. Your doctors may recommend that you have a blood transfusion if your haemoglobin level is very low.

A blood transfusion will increase the number of red blood cells in your blood, which will enable more oxygen to be carried around the body, meaning you'll have more energy and you won't feel as breathless, tired or look as pale.



Gastrointestinal side effects

Cancer drugs can have various effects on your digestive system. Some can induce nausea and vomiting, others can cause constipation or diarrhoea. Different cancer drugs will affect people differently, and while not all of them will affect your digestive system, gastrointestinal side effects are common.

Nausea and vomiting

Chemotherapy induced nausea and vomiting (CINV) is a common side effect of many chemotherapeutic drugs. It is estimated that more than 70% of patients will experience some degree of CINV during their treatment.

What causes CINV?

There are treatments and external factors that contribute to the risk of developing CINV. Some types of chemotherapy may not cause nausea and vomiting, while others may.

The chemotherapeutic drugs that are known to have a high risk of nausea and vomiting are referred to as highly emetogenic

chemotherapy and the drugs that have a moderate risk are called moderately emetogenic.

External risk factors include:

- Patients under 55-years-old
- History of low or zero alcohol consumption
- Female patients
- History of morning sickness or motion sickness
- Previous experience of CINV

Types of CINV

There are several types of nausea and vomiting as a result of chemotherapy drugs.

1. **Acute** – occurs within 24-hours of receiving chemotherapy.
2. **Delayed** – occurs one to five days after chemotherapy treatment.
3. **Breakthrough** – occurs despite chemotherapy treatment.
4. **Anticipatory** – sickness triggered by taste, odour or anxiety related to chemotherapy.

5. Refractory – occurs during subsequent cycles when antiemetic drugs (drugs that are effective against vomiting and nausea) have failed in earlier chemotherapy cycles.

You may experience some, all or none of these types of CINV.

Treatment of CINV

Treatment methods are available to help prevent and manage CINV. Anti-sickness drugs, called antiemetics, are often given before the dose of chemotherapy to treat breakthrough nausea and vomiting.

5-HT3 inhibitors are very effective antiemetics. They work by blocking one or more of the nerve signals that cause nausea and vomiting. Some 5-HT3 inhibitors include ondansetron, NK1 drugs such as emend and dexamethasone.

Complementary therapies have also reportedly been effective in helping to reduce CINV. These include eating ginger, acupuncture, guided imagery therapy, music therapy and muscle relaxation.

Changes in appetite

Cancer drugs can affect your appetite and you may lose your appetite for a variety of reasons. Feeling sick, changes in taste sensations and lethargy can all affect your appetite. Chemotherapy may put you off your food and some biological therapies such as interferon can cause taste changes, loss of appetite as well, and sickness and diarrhoea.

Some doctors and nurses advise you to avoid your favourite foods whilst undergoing cancer treatment as you may learn to associate the treatment with the food and go off it permanently. If you're worried about losing weight due to a loss of appetite, your medical team will be able to recommend some high calorie drinks that you can sip.

Diarrhoea

Diarrhoea is a common side effect of some chemotherapy drugs. It will usually occur in the first few days after treatment and can sometimes be quite severe.

Gastrointestinal side effects (cont.)

If you do experience severe diarrhoea, you will become dehydrated quite quickly so it's important that you drink plenty of fluids. Make sure you tell your medical team if you are experiencing bad diarrhoea as there are treatments available that will be able to help you control it.

Constipation

Some chemotherapy drugs and biological therapies, as well as some anti-sickness drugs given with chemotherapy, can result in constipation. This can be because the drugs affect the nerve supply to the bowel for a while.

Constipation is usually treated with laxatives and you should let your medical team know if you are experiencing constipation as they will be able to help you to relieve it. Try to eat plenty of fresh fruit, vegetables and fibrous foods which will help to encourage bowel movements. However, if your constipation doesn't ease, go back to your doctor or nurse.

Mouth changes

Sore mouth or oral mucositis is the painful inflammation of the mucosal lining of the mouth. It is a common side effect of chemotherapy and usually begins four to ten days after chemotherapy and can last up to seven to ten days (or longer depending on treatment).

Not all patients receiving chemotherapy experience a sore mouth, although patients who receive high doses of chemotherapy or who undergo radiation to the head and neck have a higher risk of developing mucositis.

Symptoms of sore mouth

Symptoms of sore mouth (oral mucositis) include:

- Mild to severe mouth pain
- Erythema (redness)
- Swelling
- Difficulty in swallowing
- A noticeable increase or decrease in saliva

If you experience any of these symptoms after your

chemotherapy, consult your doctor who will be able to advise you on how to manage sore mouth.

Managing sore mouth

Good oral hygiene is the key to preventing or minimising oral mucositis. Good hygiene protects the mouth from infection, reduces irritation and the formation of plaque.

You can keep your mouth clean by:

- Brushing teeth with a soft tooth brush regularly, especially after meals
- Rinsing your mouth with a non-alcoholic mouth wash
- Keeping your lips moist to avoid dryness

Before you begin any course of chemotherapy, it is advisable to get a dental examination as this will help to correct any pre-existing dental problems. During treatment, it might also be useful to let your dentist know which drugs you are receiving/have received so that they can help with the relevant oral monitoring.

Mouth changes (cont.)

You can also help to prevent mouth pain by:

- Avoiding hot or spicy foods – keep them bland
- Avoiding foods that are hard and could scrape the mouth lining
- Drinking plenty of fluids to prevent dehydration which can occur due to difficulty in swallowing
- Eating soft fruits
- Avoiding chewing gum – there's a risk you might bite your tongue
- Avoiding biting your lips
- Avoiding or reducing alcohol and smoking
- You can also buy artificial saliva and oral solutions that can help with pain and discomfort. Ask your specialist for advice on what's available

Treating sore mouth

There are few preventative treatments for a sore mouth that have been shown to be beneficial. For mild to moderate

pain, your doctor may prescribe over the counter painkillers such as paracetamol. For more severe pain, it may be necessary to prescribe stronger painkillers such as morphine.

Other medications such as sedatives may also be prescribed to aid rest when the mouth pain interferes with sleep.

Alternative therapies that have helped other patients include relaxation, massage therapy and counselling.

Research has shown that cytokines and growth factors can stimulate the growth of cells lining the mouth, which may help prevent or reduce oral mucositis. However, more research is needed.



Cognitive effects

Many people who have received treatment for blood cancers report an invisible side effect which affects their cognitive – or thinking – processes. It is sometimes called chemo brain or chemo fog and refers to a range of thought processes.

Causes of chemo brain

More research is needed about the causes of chemo brain and the symptoms are not yet completely understood. Studies of brain scans of patients treated with chemotherapy suggest that there may be changes to the structure of the brain and how it functions. This depends on the types of drugs given, the dose and the duration of the course.

There are a number of other possible causes for these cognitive effects including hormonal changes such as early menopause, low estrogen, anaemia and when radiotherapy is given in addition to chemotherapy. Other contributing factors include age, genetic factors and cancer itself.

Decreased concentration can also be caused by fatigue, depression,

anxiety and stress. These are all common after treatment and so it is important to know that there are other factors involved.

Most people find that the effects only last for a short period of time. For others it takes a longer time for the brain to recover and the effects may last for some months or longer. Not everyone will be affected, and the impact will vary from person-to-person.

Symptoms

When suffering from chemo brain you may notice that you experience some or all of the following:

- Memory difficulties
- Struggling to find your words
- Finding it hard to concentrate on a task
- Planning, starting or completing tasks and multi-tasking are difficult
- Taking longer to finish a task
- Difficulty in making decisions and solving problems

These symptoms may be very

subtle and difficult to describe. They can affect how you function in your daily life, particularly when you are trying to resume life again after treatment. Please do seek help and support from your medical team if you are distressed.

Coping with and managing chemo brain

When trying to cope with chemo brain, it is important not to put too much pressure on yourself. Keep your life as simple as possible and make sure you allow extra time to complete more complex activities. It may take some time for you to return back to your normal functioning.

The following five tips may be useful to help you manage your symptoms and promote your recovery:

1. Understand what influences your memory or cognitive problems by keeping a diary.
2. Schedule activities and plan your day based on when your brain works its best.
3. Relieve stress through

relaxation and meditation.

4. Learn coping strategies to reduce your chances of forgetting things.
5. Perform brain training exercises to improve memory and cognition.

Treatment for chemo brain

Treatment for the cognitive effects of chemotherapy usually begins with strategies that do not involve drugs.

Acupuncture has been shown to help with cognition, although more research is needed into the suitability of this as a treatment. For example, it is not recommended for those being treated with chemotherapy as it can increase the chances of infection and bleeding. For people with more severe cognitive problems, drugs that stimulate the brain may be useful.

Pain and tingling

Peripheral neuropathy is a term used to describe damage to nerves that are outside the brain and spinal cord (peripheral nerves).

It is not caused by one specific disease and there are many different conditions and medications that can damage the peripheral nerves. The symptoms vary depending on which nerves are affected but peripheral neuropathy often affects the hands, feet and lower legs.

If you have any further questions, please speak to your doctor or nurse who will be able to advise you on managing and coping with peripheral neuropathy.

Causes of peripheral neuropathy

One of the main causes of peripheral neuropathy is cancer and its treatment. There are several ways that the disease and anti-cancer drugs can cause peripheral neuropathy:

- **Nerve damage** - this is the most common cause of peripheral neuropathy in cancer patients.
- **Radiotherapy** - although rare, radiotherapy may damage

nerves within the treated area. This may develop months or years after treatment.

- **Paraneoplastic peripheral neuropathy** - occasionally in some types of cancer, the body produces substances that damage peripheral nerves. This can occur in patients with myeloma and lymphoma.

You may be at higher risk of being affected by peripheral neuropathy if:

- You are receiving more than one drug that can cause nerve damage.
- You have received previous anti-cancer drugs that can cause peripheral neuropathy.
- You have diabetes.
- You have low levels of vitamins and minerals in your body.

There are a large number of anti-cancer drugs that don't cause peripheral neuropathy. Your doctor will be able to discuss these with you and help you to consider your options.

Symptoms of peripheral neuropathy

The symptoms of peripheral

neuropathy vary depending on which peripheral nerves are damaged. Damaged nerves as a result of anti-cancer drugs usually affect the sensory nerves but can also affect the motor and autonomic nerves.

Peripheral neuropathy usually affects the hands, feet and lower legs. The reason for this is because the nerves in these parts of the body are longer and the longer a nerve is, the more susceptible it is to damage.

Symptoms gradually improve once the drug is stopped but can sometimes get worse for a few weeks after this, before they get better. This is known as coasting.

Symptoms include:

- **Sensation changes** - You may have a feeling of heaviness or a 'pins and needles' sensation in the affected area. You may also notice unusual sensations such as warmth or burning. You may also find that even the slightest touch in the affected area feels painful.
- **Pain** - The pain can vary from person-to-person and can be mild or severe. The pain is often a sharp or stabbing feeling or a burning sensation. It can even

feel like minor electric shocks. The good news is, there are treatments to relieve pain.

- **Numbness** - You may lose feeling in the affected area. Often the feet and finger tips are the first areas of the body to be affected.
- **Muscle weakness** - If a muscle isn't being stimulated by a nerve, it may lose strength. Depending on which muscles are affected, it may be difficult to walk or carry out tasks such as climbing the stairs.
- **Dexterity** - If the finger tips are affected, you might find it difficult to do fiddly tasks such as doing up buttons or tying your shoelaces.

Coping and managing with peripheral neuropathy

If you're being given a drug that can cause peripheral neuropathy, your doctor will monitor you for signs of nerve damage before each treatment. The earlier damage is detected, the better, so it's important to tell your doctor if you notice any of the symptoms listed in this chapter, or they will get worse.

Pain and tingling (cont.)

There isn't a treatment to prevent or reverse nerve damage caused by anti-cancer drugs. The most effective treatment is prevention of further nerve damage by either lowering the dose or stopping treatment altogether.

Most people find that their symptoms gradually improve as their nerves recover. For others, the damage will be permanent. People usually find ways to cope with this situation and find their symptoms become less troublesome over time.

Nerve pain can be managed in a number of ways:

- 1. Drugs** - Drugs can alter nerve impulses and relieve pain. Anticonvulsants, antidepressants and morphine can all be used to treat nerve pain.
- 2. Acupuncture** - It's not clear how this type of complementary therapy works but it's suggested that it may block pain messages from being sent to the brain.
- 3. Psychological support** - This may reduce anxiety and tension caused by the pain.

4. Pain teams - Many hospitals have pain teams which are made up of specialist nurses and doctors who can advise on dealing with pain. Your GP or medical team can refer you if your pain is getting you down.

5. Muscle strength exercises
- Although it is important to not overwork yourself, certain exercise classes may be useful. For example, Tai Chi can help to improve balance and increase muscle tone.

Peripheral neuropathy can affect different people in different ways. The level of support each person needs can vary from person-to-person. It's natural to feel isolated, lonely and frustrated if your symptoms start to affect your daily life. You may also feel anger, resentment and anxiety. It's important to remember that these feelings are all normal and are your way of coping with the symptoms and side effects of your treatment.

Fertility

When facing a diagnosis of leukaemia the priority is survivorship.

As a part of treatment, patients will be exposed to a number of treatments that may put them at risk of infertility.

Chemotherapy is designed to kill cells in our body that divide rapidly and, unfortunately, this is the case of testicular cells (responsible for producing sperm) and ovarian cells (that produce eggs). As a result, both men and women are at risk of permanent or temporary infertility when they undergo this type of treatment. Other types of treatment, like pelvic radiotherapy and pelvic surgery, may affect fertility directly.

In the UK, there are some restrictions to all types of fertility treatments. Funding for fertility treatments, under the NHS, has several rules, so it is important to seek guidance. As soon as possible, you should seek information from both your oncologist and fertility specialists in order to make informed decisions about fertility and the

next steps you should take.

One of the options is to cryopreserve (freeze) your gametes (eggs and sperm) before you undergo cancer treatment. This will put your mind at ease, and give you an opportunity to have biological children, in case your fertility hasn't recovered after treatment. However, sometimes you need to speed up your cancer treatment, meaning that it may not be possible to get fertility preservation beforehand.

You should take all opportunities to discuss treatment and make a shared decision with your doctor and your partner about cancer treatment, chances of maintaining or recovering fertility in the future and fertility preservation.

Women and infertility

Women are born with all the eggs they will ever have. After puberty, one egg is released which then travels from the ovary through fallopian tubes until it reaches the uterus. If this egg is not fertilised by a sperm, the pregnancy will not occur. Ovarian reserve is the term

Fertility (cont.)

used to describe the remaining egg supply of the ovaries.

When you are diagnosed with leukaemia, your fertility may be at risk, due to cancer treatments, but there are options available that can still allow you to have children.

Egg freezing

Due to a technique called vitrification, eggs can now be frozen in liquid nitrogen in order to be used later. It is important to note that there is a reduction in the success of egg freezing in women above the age of 35. For any questions about this procedure, you should seek advice from your doctor.

If you are able to freeze your eggs before starting treatment, you will follow the standard form of fertility preservation for women. It must be noted that depending on how aggressive the leukaemia is – particularly if it is an acute leukaemia – this may not be possible as treatment often needs to be started immediately. For more information about whether you will be able to do this, speak to your doctor.

On the day of the procedure, you

will go to theatre and be put under light sedation and, with the help of a scanner and a fine needle, your eggs will be extracted from the ovary, treated in the laboratory and then will be frozen. Before egg collection, some injections of hormones may be given (to stimulate your ovary to mature more eggs than usual) as well as blood tests and ovary scans.

There are alternatives, but some are still in early stages, so seek information from your doctor about what your other options might be.

Men and infertility

Chemotherapy directly affects the cells responsible for producing sperm. Therefore, before undergoing cancer treatment, you should freeze your sperm as this gives you the option of fathering a biological child in the future. Depending on age, strengths of chemotherapy and other factors, you may, or may not recover your fertility after treatment.

You should seek referral to an Andrology Department in order to freeze your sperm. Depending on how aggressive your disease type is, there might not be time

to freeze your sperm, but your doctor will let you know if this is possible.

On your arrival, you will need some blood count results and a referral from your oncologist. You will be asked to produce a fresh sample that will then be analysed and frozen (cryopreserved) in liquid nitrogen. You will also be asked to fill in some consent forms that are a legal requirement. You can store your samples up to a maximum of 55 years.

In the event that you haven't recovered your fertility, but you are planning to start your family, you can then transfer your frozen sperm to an IVF clinic for your partner.

For more information about sperm storage go to the HFEA (Human Fertilisation and Embryology Act) website at: www.hfea.gov.uk

How to cope with infertility post treatment

The uncertainty about your fertility status may be daunting and concern you. Different people will react in different ways and

cope differently to infertility.

You should check your fertility status as soon as possible. This will empower you to make decisions in the future regarding starting a family, and to make the necessary arrangements.

Before you think of which options to take into consideration, you can seek advice from your doctor, or ask to be referred to a fertility counsellor. Talking through your fears and doubts will ease the pressure and help you to cope with the uncertainty and help you to make informed decisions about the future. If you are in a relationship, involve your partner as soon as possible. Be open, transparent and upfront. If your partner asks questions that you struggle to answer, or if they have their own questions and want to expose their concerns, bring them to your consultations. This way you and your partner can go through the difficulties together with the support of a medical professional.

If you are infertile and you have frozen eggs or sperm before chemotherapy treatment, you may seek referral to an IVF clinic. Some fertility clinics offer couples

Fertility (cont.)

dealing with fertility issues to have a baby through different means. The techniques are:

- 1. IVF (In-vitro fertilization)**
- when sperm and eggs are placed close to one another, allowing the sperm to swim and fertilise the egg.
- 2. ICSI (Intra cytoplasmic injection)** - where under the microscope, the embryologist manually inserts the sperm into the egg, fertilising it.

The techniques are done in a laboratory environment and they aim to create embryos outside of the human body. The embryo now created can be implanted into the woman's womb in order to start a pregnancy.

If you were looking to try and obtain some NHS funding for the procedure, the first step is to find out what your Clinical Commission Group's (CCG) fertility policy is before getting a referral from your GP to a fertility clinic. The policies for each CCG can be found on the Fertility Fairness website at: www.fertilityfairness.co.uk. Once you are on the website, click on 'compare your area' and you will

find the policy for each CCG.

Some areas of England do not fund any fertility treatment and, generally speaking, egg and sperm donation is not available on the NHS.

If you haven't frozen your gametes (sperm or eggs), you could be refused treatment, or you may be told that you have to cover the costs of the gamete donation part, but hopefully secure funding for the procedure.

For leukaemia patients, they would need to appeal or submit an Individual Funding Request supported by their GP and any oncology specialists. Sometimes, if there is no funding for fertility treatment in the area, cancer patients can secure money from Oncology Commissioning for fertility treatment.

If you have any questions about NHS funding for fertility treatment or would like some advice or emotional support, information can be found at fertilitynetworkuk.org

Adoption is an alternative when all the above options are not possible.



Cardiac and lung toxicity

Cardiotoxicity

Anthracyclines, such as doxorubicin and idarubicin, remain an important class of chemotherapy drug. Unfortunately, how effective they are in treating cancer is limited by a cumulative dose-dependent cardiotoxicity, which can cause irreversible heart failure.

Progressive cardiotoxicity usually occurs after the completion of treatment with anthracyclines and may become apparent within one year of the completion of treatment (early onset chronic cardiotoxicity) or many years after chemotherapy has been completed (late onset chronic cardiotoxicity). This particular aspect of anthracycline-induced cardiotoxicity is particularly relevant in adult survivors of pediatric malignancies. Up to 65% of patients with a history of a childhood malignancy treated with doxorubicin can have echocardiographic evidence of abnormalities in the way the left ventricle of the heart contracts.

The greatest risk factor for anthracycline-induced cardiotoxicity is the cumulative dose. To prevent the occurrence

of cardiomyopathy, it is recommended that total cumulative dosage should not exceed the following limits:

- 550-600mg/m² of daunorubicin for adults
- 450-550mg/m² of doxorubicin for adults
- 300mg/m² for children over two years of age
- 10mg/kg body weight for children under two years of age

In addition to the cumulative dose, other risk factors have been identified that increase the risk of anthracycline-induced cardiotoxicity, including extremes of age, female gender, prior radiation therapy of the thoracic cavity in the chest, hypertension, concomitant treatment with cyclophosphamide, trastuzumab or paclitaxel, and the presence of cardiac disease or high blood pressure.

Patients who are given anthracyclines after they have stopped treatment with other cardiotoxic agents can also be at an increased risk of cardiotoxicity. In all these patients, a total cumulative dose of 400mg/m² in

adults should only be exceeded with great caution.

Treatment and monitoring

Anthracyclines should not be administered with other cardiotoxic treatments unless the patient's cardiac function is closely monitored.

If you have, or have previously had, heart disease, you are more likely to experience cardiac toxic effects. Therefore, it is important that you are assessed before receiving treatment, and carefully monitored during your whole treatment.

For routine monitoring, the most suitable investigations are:

- **Echocardiograms (ECGs):**
Before and after each treatment cycle.
- **Left ventricular ejection fraction (LVEF), which measures the amount of blood being pumped around the body by the left ventricle and is a good indication of heart function:** Before treatment, after each accumulated dose of about 100 mg/m², and if symptoms of heart failure occur.

In children and adolescents who will have a prolonged risk of cardiomyopathy, long term cardiological monitoring is recommended over several years.

There are no treatments that are specific to anthracycline-induced congestive heart failure. Rather, treatment should utilise standard therapies for congestive heart failure, including ACE inhibitors, beta-blockers and loop diuretics for volume management. In a recent study of patients with an anthracycline-induced decrease in left ventricular ejection fraction (LVEF) to 45% or less, treatment with enalapril and carvedilol resulted in normalisation of LVEF in 42% of patients.

Risk assessment: diabetes, blood pressure, smoking

Cardiotoxicity is related to treatment with anthracyclines or other cardiotoxic chemotherapies. In addition, radiotherapy prior to, or during treatment, with these drugs is known to increase the cardiotoxic effects.

Toxic side effects on the heart are more likely in children, the elderly and patients with

Cardiac and lung toxicity (cont.)

a history of cardiac disease or high blood pressure. In addition, the extent of the cardiotoxic side effects is dependent on the cumulative total lifetime dose of the anthracyclines received by the patient.

Previous or current cardiovascular disease, particularly heart failure and the effect of diabetes on your arteries and your heart (high blood pressure, heart attack or stroke), can decrease the ability of your blood to circulate around your body and reduce the amount of oxygen getting to your organs. This predisposes you to cardiotoxicity, as does a lack of oxygen from other causes. A lack of oxygen can be caused by radiotherapy (to the areas treated) or by smoking.

Stopping smoking is the best way for you to increase the oxygen getting to your organs. This may help to lessen side effects. A lot of support is available for you as people who smoke are much more likely to stop with encouragement and support.

Your doctor will weigh up the benefits and risks of the treatments and decide the best treatment for you.

Cardiotoxicity and radiation

While the use of radiation therapy has generally been in decline, it remains an effective addition to chemotherapy in a number of cancers such as leukaemia, lymphoma and breast cancer. Radiation therapy is still used for the treatment of over 50% of cancer patients. As a result, cardiotoxicity after radiation therapy is not a newly discussed side effect.

This treatment technique delivers high radiation doses to large proportions of the heart. Generally, pericarditis (inflammation of the tissue that holds the heart in place) was observed as acute and late toxicity at that time, as well as congestive heart failure, ischemic coronary artery disease (restriction in blood supply to tissue), arrhythmia, or a heart attack. The leading cause of non-cancer mortality among long-term survivors after radiotherapy for Hodgkin's Lymphoma was cardiovascular death. It should be noted that radiation doses applied to the whole heart have been much higher than in the treatment of breast cancer and,

in Scandinavian breast cancer studies, mainly an increased incidence of ischemic events and unclear cardiac deaths was observed.

Cardiotoxicity related to previous radiation therapy can have significant consequences years after treatment, but the exact cause of it is not clear. It has been suggested that radiotherapy leads to an acute inflammation within the heart blood vessels and to continuous inflammatory processes. It can cause cardiomyopathy, coronary artery disease, valvular disease (damage to one of the four heart valves), and disease of the heart conduction system and pericardium (membrane enclosing the heart).

Cardiotoxicity after radiation therapy is more likely to occur with the following:

- Higher radiation doses
- Younger age at the time of radiation therapy
- Existing cardiovascular risk factors such as hypertension or coronary artery disease
- Subsequent treatment with

cardiotoxic drugs such as anthracyclines

Lung toxicity

Bleomycin

The major limitation of bleomycin therapy is usually pulmonary toxicity, which can be life threatening and has been described in up to 10% of patients receiving the drug. One of the potential determinants of bleomycin toxicity is bleomycin hydrolase, the enzyme that is primarily responsible for metabolising bleomycin into nontoxic molecules.

The risk of bleomycin-induced lung toxicity is higher in older patients. Cumulative doses of more than 400U are also associated with higher rates of pulmonary toxicity. Although high-grade lung injury is very rare with cumulative doses less than 400U, injury can occur at doses less than 50U. Rapid intravenous infusion may also increase the risk of pulmonary toxicity.

Concomitant use of other chemotherapeutic agents, working alongside another drug, is associated with an

Cardiac and lung toxicity (cont.)

increased risk of pulmonary toxicity. This association is classically demonstrated with cisplatin, but there are reports of an increase in the risk of lung toxicity with regimens containing cyclophosphamide and gemcitabine. Some data suggests that high cumulative doses of cisplatin also contribute to late impairment of pulmonary function and restrictive lung disease in long-term testicular cancer survivors. Since more than 80% of bleomycin is eliminated by the kidneys in normal individuals, renal insufficiency is an established risk factor for bleomycin toxicity.

Carmustine (BCNU)

BCNU is a nitrosourea-based agent used for the treatment of brain cancers, multiple myeloma, Hodgkin's and non-Hodgkin lymphoma. Pulmonary fibrosis is BCNU's most serious complication and it has been reported in up to 10% of patients.

Effects of radiotherapy

Side effects of radiotherapy can include:

- Oedema – a build-up of fluid in the body

- Deterioration and sloughing of the skin lining the lungs
- Disruption of the small blood vessels in the lungs
- Partial collapse of the lung

More serious side effects of radiation therapy, which can develop months to years after radiotherapy, include:

- **Pneumonitis** – inflammation of the walls of the alveoli (air sacs) in the lungs
- **Pulmonary fibrosis** – build-up of scar tissue in the lungs

They affect patients' quality-of-life and may even lead to death.

Short term effects

Radiation pneumonitis is an inflammation of the lungs specifically following radiation therapy, affecting 25% of patients who have radiation for lung cancer, but may also be caused by radiation therapy to the chest for other cancers such as breast cancer and lymphomas.

Shortness of breath, chest pain, a cough and fever commonly occur two to three months after radiation therapy is finished.

Diagnosis can be made by a chest X-ray. Treatment includes steroids to help the patient recover, and, without this treatment, pulmonary fibrosis of the lungs may result.

Pneumocystis pneumonia (PCP) is a disease caused by the fungus *pneumocystis jirovecii* which is present in more than 50% of the general population without causing any symptoms.

PCP does cause symptoms of pneumonia (progressive shortness of breath, non-productive cough and low-grade fever) in immunocompromised patients and represents a major cause of illness and death.

A recent Cochrane systematic review of 13 trials in non-HIV patients with leukaemia found that prophylaxis with trimethoprim/sulfamethoxazole reduced the occurrence of PCP by 85%. The review concluded that prophylaxis should be considered for all non-HIV immunocompromised patients at risk of PCP.

Medium to long-term effects

Pulmonary fibrosis generally occurs following pneumonitis due to radiation therapy. It commonly occurs six to 24 months after the pneumonitis, especially if this has not been diagnosed or treated adequately. However, pulmonary fibrosis may develop several years after radiation therapy is completed.

Pulmonary fibrosis can lead to chronic pulmonary insufficiency, when the lungs cannot take in enough oxygen or expel enough carbon dioxide to keep the body healthy. This condition depends on the proportion of the lung treated with radiation, because fibrosis is limited to the area of the lung that has been irradiated.

When a large area of the lung has been irradiated, the extensive pulmonary fibrosis leads to pulmonary hypertension and cor pulmonale can develop. Cor pulmonale is an abnormal enlargement of the right side of the heart due to the pulmonary hypertension. Symptoms of cor pulmonale include shortness of breath and fainting on exertion, fatigue, lethargy and chest pain.

Secondary cancer risk

Secondary cancer is a cancer that has developed after your treatment for another cancer has finished. The cumulative incidence of secondary cancers after 15 years varies between 1.0 to 4.5%. Radiation therapy has been linked to occurrences of secondary cancers including leukaemia and cancers of the thyroid, lung and bladder carcinoma.

Chemotherapies are known to cause secondary cancers, the most common of which are myelodysplastic syndromes (conditions that can occur when the blood-forming cells in the bone marrow become abnormal) and leukaemia, mainly acute myeloid leukaemia (AML).

Types of chemotherapy whose anti-cancer action is to damage DNA in normal cells may result in secondary cancers in the future.

Chemotherapies that are most likely to cause this damage are alkylating agents, such as cyclophosphamide, platinum drugs such as cisplatin, and anthracyclines such as

daunorubicin and doxorubicin.

Secondary leukaemia has been reported in patients treated with anthracyclines, including daunorubicin and doxorubicin. Secondary leukaemia is more common if:

- The anthracyclines are given in combination with DNA-damaging anti-cancer drugs or with radiotherapy
- Patients have been heavily pre-treated with cytotoxic drugs
- The dose of the anthracyclines has been escalated

Despite the incidence of secondary cancers mentioned, chemotherapies and radiation therapy have crucial role in the curative treatment of primary cancers. Possible risks of second cancers should not influence the use of effective treatments. Your doctor will advise you on how to consider the relatively low risks involved.

Glossary

Acute Myeloid Leukaemia (AML)

Acute myeloid leukaemia (AML) is a type of blood cancer that starts from young white blood cells called granulocytes or monocytes in the bone marrow.

Anaemia

A medical condition in which the red blood cell count or haemoglobin is less than normal.

Antibiotics

These are used to treat or prevent bacterial infections. They work by killing bacteria or preventing them from reproducing and spreading.

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.

Cancer

A group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body.

Chemotherapy

A form of cancer treatment that uses one or more anticancer drugs as part of a standardised chemotherapy regime.

Chronic

A human health condition or disease that is persistent or otherwise long-lasting in its effects. The term chronic is usually applied when the course of the disease lasts for more than three months.

Complementary therapies

These are treatments used alongside conventional western medicine.

Fatigue

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

Mucositis

Oral mucositis is a common complication of chemotherapy. It begins five to ten days after the start of chemotherapy and lasts seven to 14 days. Chemotherapy-

Glossary (cont.)

induced mucositis causes the mucosal lining of the mouth and gut to atrophy (waste away) and break down forming ulcers, leading to a sore mouth and diarrhoea.

Myelodysplastic Syndrome (MDS)

A disorder in which the bone marrow does not make enough healthy blood cells, the maturation of the cells is abnormal and there may be blasts visible in the marrow. It may be a precursor to the development of acute leukaemia.

Radiotherapy

The use of high-energy X-rays to treat cancer. The radiotherapy

field is the area of the body being treated. Cancer cells are killed within the radiotherapy field.

Red blood cell

The blood cell that carries oxygen. Red cells contain haemoglobin, which permits them to transport oxygen (and carbon dioxide).

Secondary leukaemia

A collective term used to describe a group of patients with acute myeloid leukaemia (AML) or myelodysplastic syndrome (MDS) who have a history of environmental, occupational or therapeutic exposure to hematotoxins or radiation.

Tell us what you think!

If you would like to give us some feedback about this patient information booklet, please hover over the code to the right using your phone or tablet's camera. Click the link as it appears and this will take you to a short web form to fill in.

Suitable for Android, iPhone 7 and above.



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

There are a number of organisations, including ourselves, who provide expert advice and information.

Leukaemia Care

We are a charity dedicated to supporting anyone affected by the diagnosis of any blood cancer.

We provide emotional support through a range of support services including a helpline, patient and carer conferences, support group, informative website, one-to-one buddy service and high-quality patient information. We also have a nurse on our help line for any medical queries relating to your diagnosis.

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

Bloodwise

Bloodwise is the leading charity into the research of blood cancers. They offer support to patients, their family and friends through patient services.

020 7504 2200
www.bloodwise.org.uk

Cancer Research UK

Cancer Research UK is a leading charity dedicated to cancer research.

0808 800 4040
www.cancerresearchuk.org

Macmillan

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

0808 808 0000
www.macmillan.org.uk

Maggie's Centres

Maggie's offers free practical, emotional and social support to people with cancer and their families and friends.

0300 123 1801
www.maggiescentres.org

Citizens Advice Bureau (CAB)

Offers advice on benefits and financial assistance.

08444 111 444
www.adviceguide.org.uk

Leukaemia Care is a national charity dedicated to providing information, advice and support to anyone affected by a blood cancer.

Around 34,000 new cases of blood cancer are diagnosed in the UK each year. 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.leukaemicare.org.uk

support@leukaemicare.org.uk

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

Registered charity
259483 and SC039207

Leukaemia Care
YOUR Blood Cancer Charity

