

# Navigating Immune Challenges in CLL: Infection Prevention and Management

CLL IC Task Force Advocacy Working Group



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## About the CLL Immune Challenges Task Force

Created in 2025, the CLL Immune Challenges (IC) Task Force is a global, multidisciplinary group of patients, patient advocates, doctors, researchers and pharmaceutical company partners. The Task Force aims to drive policy change and create new resources that directly address immune challenges faced by people living with CLL to improve outcomes, quality of life and autonomy. More information on the CLL IC Task Force can be found on the CLL Advocates Network (CLLAN) website:

<https://www.clladvocates.net/>

## About this document

This educational resource is the first in a series of resources for patients and their carers on navigating immune challenges in Chronic Lymphocytic Leukaemia (CLL). It focuses on infection prevention and management, offering practical information on strategies to prevent and cope with an infection as someone living with a weaker immune system, to support a full and active life with CLL. This resource is intended to complement – not replace – advice from your healthcare team. Please speak to your healthcare team to create a personal plan for preventing and managing infections.

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# Chronic Lymphocytic Leukaemia (CLL) and the immune system

## What is chronic lymphocytic leukaemia (CLL)?

CLL is a cancer affecting the blood and bone marrow.<sup>1</sup> It often develops slowly and does not always require immediate treatment though the progression of disease is highly variable.<sup>2</sup> This guide intends to give you a list of actions that you can take to prevent and manage infections helping you live a long, healthy, and free life with CLL.

## Function and core components of the immune system

The immune system is a network of tissues, organs, and cells that protect the body from microbes, known as pathogens. These pathogens include bacteria, viruses, or fungi, and they are the cause of many infections.<sup>3</sup>

When the body detects a pathogen, it triggers an immune response.<sup>4</sup>

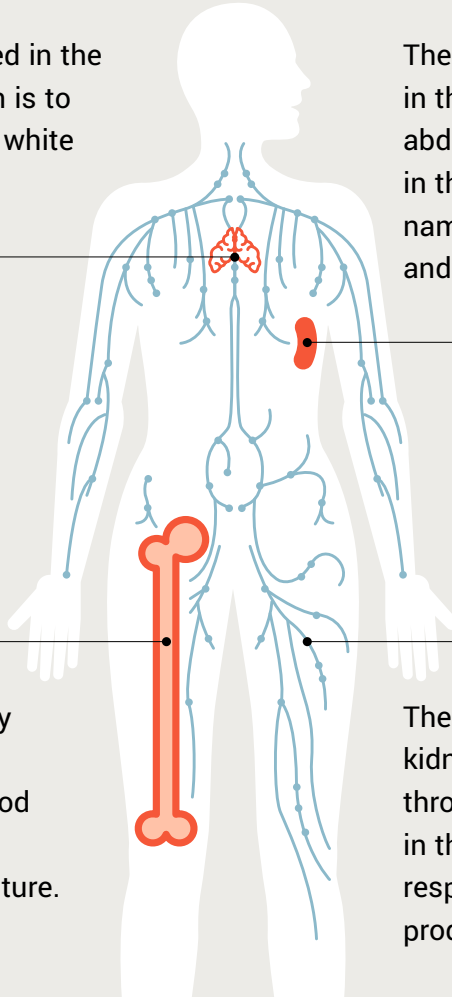
### The core organs involved in the immune system are:<sup>5</sup>

The **thymus**, a gland located in the chest whose main function is to produce and mature some white blood cells.

The **spleen**, an organ located in the left side of the upper abdomen where cells involved in the immune response, namely B-cells and monocytes and macrophages, live.

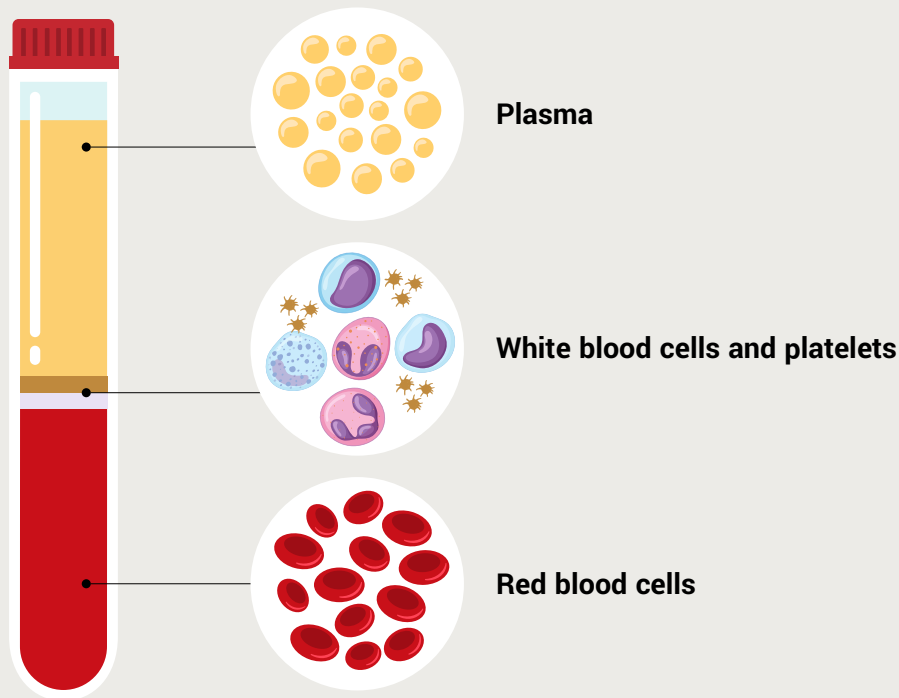
The **bone marrow**, a spongy material found inside our bones which makes all blood cells and is the site where some white blood cells mature.

The **lymph nodes**, which are kidney shaped organs located throughout the body involved in the adaptive immune response mediated by antibody producing B-cells and T-cells.



The bloodstream carries mature immune cells and antibodies throughout the body to detect, respond to, and remove pathogens.

A key part of the immune system are white blood cells. There are five different types of white blood cells each with a specific function:<sup>5</sup>



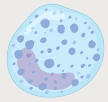
### White blood cells and platelets



**Lymphocyte** – recognise specific pathogens and can be divided into B-cells, T-cells and natural killer cells.<sup>5</sup> When mature B-cells are alerted of the presence of pathogens they release specific proteins known as antibodies which help remove pathogens.



**Eosinophil** – activated during allergic reaction, inflammation, and help fight against parasitic infections.



**Basophil** – activated during allergic reactions and inflammation.



**Neutrophil** – the most common white blood cells that are the body's first responders to bacterial and fungal pathogens.



**Monocyte** – activated to “clean up” dead cells and pathogens and working with other immune cells to develop targeted immune responses.



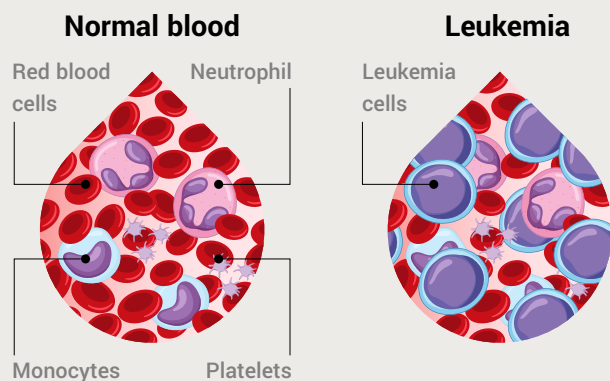
**Platelets** – helps clot blood to prevent excessive bleeding.

Together, these cells and organs allow the body to recognise, attack, and remember harmful pathogens, keeping us healthy.

## The immune system and chronic lymphocytic leukaemia

In CLL, the B-cells (a specific type of lymphocyte) develop abnormally and slowly build up in the body due to an extension of their normal life span, and in some cases, a faster growth rate. The consequences of these abnormal cells include:<sup>6</sup>

- They may not make enough antibodies (known as hypogammaglobulinemia\*) and cannot fight infections effectively.
- The abnormal B-cells can build up in the bloodstream and “crowd out” healthy blood cells, which means the immune system is weaker overall.
- They stop other immune cells, namely T-cells, from responding normally.



## Immunocompromise

Having both a weakened immune system and a lack of available antibodies due to CLL means when you develop infections, you will have more trouble getting rid of the infection.<sup>7</sup> This is known as “**immune suppression**”.<sup>4</sup> You may also hear your doctor use the term “**immunocompromised**”.

People with CLL are immunocompromised but can also experience “immune challenges”. This is a broader term that refers to having an increased risk of:

- **Opportunistic infections** – infections caused by pathogens that often cause no or mild illness in people with a typically functioning immune system. These include infections by pathogens most people already carry but are kept in check by healthy immune systems. People with a weakened immune system are also more likely to develop a more severe form, and recovery may take longer and be more difficult.<sup>8,9</sup>
- **Developing other cancers (also known as secondary cancers)** – a new, separate cancer developing as a consequence of immune deficiency.<sup>2</sup> The most common cancer you are at risk of developing are skin cancers such as melanomas. However, you may also be at higher risk of developing other cancers like sarcomas, lung, renal, and prostate cancers.<sup>2</sup>

You may also hear your doctor use the term “**secondary immunodeficiency**”. This means that your immune system has become weaker because of another illness or treatment, making you more likely to get infections or causing infections to last longer or be more serious.<sup>10</sup> Your treatment team can check for this, explain what it means for you, and advise on the next steps if treatment is needed.

**This resource provides information on infection prevention and management.**

**Taking care of your immune challenges is a core part of living with CLL, regardless of whether you are on treatment or in active monitoring.**

\* hy-poe-gam-uh-glob-yuh-luh-nee-mee-uh

## Common infections

The majority of infections in people with CLL are caused by bacteria. The common sites for bacterial infection include:<sup>11</sup>

- Lungs
- Sinuses
- Skin
- Urinary tract
- Gastrointestinal tract

Common examples of bacterial infections include pneumonia and *E. coli*.

People living with CLL are at an increased risk to developing viral infections. These include:<sup>12</sup>

- Seasonal viruses like influenza (“flu”) and coronavirus
- Shingles (also known as herpes zoster)

Though fungal infections are less common than bacterial or viral infections in people living with CLL, they are a particular challenge, increasing risks with certain treatments.<sup>11</sup> These infections include:<sup>13</sup>

- Aspergillosis – caused by inhaling mold spores in the environment and affects the lungs, causing breathing difficulties.
- Cryptococcosis – caused by a fungus found in the environment e.g. in soil or bird droppings and affects the lungs or brain.
- Yeast infections (candidiasis) – caused by *Candida*, a common fungus that normally lives in the mouth, gut, skin or vagina.

The risk of opportunistic infections means you must constantly observe yourself for any changes to your health and contact your healthcare team at the earliest opportunity once you identify a change or symptom. This is because infections need to be controlled before you can start some CLL treatments.<sup>14</sup>



**Symptoms of infection that could be a reason to contact your healthcare team:<sup>15</sup>**



Sore throat



Productive coughs (green mucus)



Diarrhoea



Vomiting



Feeling faint or dizzy



New pain anywhere in your body



Red, hot, or swollen skin



General malaise



Headaches/ stiff neck



Burning sensation when passing urine or passing small amounts of urine



Pain, unusual discharge, or itching from your genitals



Pain, redness, or discharge around the site of a central line



Temperature that's lower or higher than your normal range



Speaking to your healthcare team can sometimes feel overwhelming and you may not want to reach out to them, but having open communication with your team plays an important role in protecting your physical, mental, and emotional wellbeing.

When speaking to your healthcare team, you may want to have a:

- 1. List of questions ready ahead of your appointment
- 2. Way to record their answers to ensure you take away accurate information
- 3. Member of your family or a friend accompany you



# What you can do

There are many things you and your carers or family members can do in your daily life as best practice to prevent infections. There may be other things that you find work for you in preventing infections, and the below is a guide of the most common ways to protect yourself.

## Vaccinations

Vaccines are a safe and effective way to boost immunity and protect you against certain infections.<sup>9</sup>

There are two types of vaccines: live and non-live or inactivated vaccines.<sup>16</sup> As someone living with CLL, **non-live or inactivated vaccines** are safe for you to get.<sup>16</sup> Vaccines for the following infections are commonly recommended for people with CLL:<sup>16,18</sup>

| Non-live or inactivated vaccines    | Live vaccines  |
|-------------------------------------|----------------|
| ✓ Influenza ("flu")                 | ✗ Measles      |
| ✓ Pneumonia                         | ✗ Mumps        |
| ✓ Coronavirus                       | ✗ Rubella      |
| ✓ Respiratory Syncytial Virus (RSV) | ✗ Live polio   |
| ✓ Shingles (Shingrix)               | ✗ Yellow fever |
| ✓ Tetanus                           | ✗ Varicella**  |

Other additional non-live vaccines may be recommended according to specific local infection risk and lifestyle factors e.g. monkeypox vaccine and inactivated Japanese B encephalitis.

**If you are going on holiday, you may need other travel vaccines. To understand what vaccines you may need and which are safe for you to receive, please speak to your healthcare team.**

The best time to get vaccines is early in the illness, before starting a new treatment or when the disease is stable. Your healthcare team can guide you about the timing that is right for you.

### What you need to know

As you have a weakened immune system, you may not respond in the same way to vaccines as people with healthy immune systems. You may be given additional booster doses of certain vaccines to provide you with the necessary protection.<sup>9</sup>

It is important that you receive all the recommended vaccines and keep up to date with additional doses or boosters based on your country's national guidance on CLL and/or your healthcare team's vaccine guidance.<sup>9</sup>

\*\*Varicella is used to prevent chickenpox and shingles.<sup>17</sup>

## What to avoid

You should not receive live vaccines.<sup>9,16</sup> You should also avoid contact with children who have received the live nasal flu and/or nasal polio vaccine for at least seven days as they can pass on the live virus during this time.<sup>18</sup>

## Protective measures

There are many things you can do to protect yourself from infections, including physical distancing (6 feet or 2 metres) from people that are ill and working from home or meeting online. Wearing a protective face mask can help to prevent respiratory infections,<sup>19,20</sup> especially if you are:

- Going to be in public spaces where there are crowds or air cannot flow.
- Going into medical facilities like hospitals and clinics.
- Working in the garden, for example, handling garden waste, natural fertilizers, turning compost, hedge pruning and other gardening activities.

For the best protection, your mask should be high-quality and fit you well.<sup>9,20</sup> Good options include FFP2, FFP3, KN95, or N95 masks. Even at times when you do not feel like you need a mask, it is helpful to always carry one with you.<sup>20</sup> We understand that wearing a mask can feel challenging when others around you are not doing the same. However, wearing a well-fitted mask provides an extra layer of protection against respiratory infections.<sup>20</sup>

**Tip: When in public, you can explain to other people that you have a health condition that makes you more vulnerable to infections, so you are being extra careful.**

If you feel like your psychological well-being is being impacted due to feeling socially excluded for wearing a mask, you may want to ask for help and advice from a medical professional.<sup>20</sup>

## Practicing good general hygiene

### Hand hygiene

Washing your hands properly and frequently is one of the most effective ways to prevent infections.<sup>19</sup> If you are unable to wash your hands, you can use hand sanitizer that contains at least 60% alcohol.<sup>19</sup> You should always carry hand sanitizer with you in case it is not available in public areas,<sup>19</sup> but you should try to wash your hands with soap and water where possible.



Wet hands

Apply soap

20 seconds

Wash front and back



Between fingers

Under fingernails

Rinse

Dry with clean cloth



## General hygiene

You should also make sure you:<sup>21</sup>

- Brush your teeth regularly with a soft bristle toothbrush and use dental floss and mouthwash as the mouth and teeth can be a source of opportunistic infections.
- Make sure to store your toothbrush away from other people's toothbrushes.
- Use moisturising lotion after a shower or bath to stop your skin from becoming dry and cracked.
- Avoid sharing food, cups, cutlery, or personal items.
- Wear sun protection when you are outside to protect you from UV rays. This includes wearing sunscreen and protective clothing, such as hats.
- Wear protective gloves when gardening and doing housework.
- Avoid changing the water in flower vases because it is a source of bacteria.
- Wash your hands thoroughly after petting or stroking animals.
- If you can, avoid handling animal waste, such as litter trays or manure.
- Clean cuts, scrapes, and grazes immediately with warm water, soap, and an antiseptic.

There may be more ways you can protect yourself from infections that fit your daily life. You should speak to your healthcare team to understand what preventative steps you can take based on your routine and daily activities.

## Handling food safely

Everyone should practice safe food handling practices. As your immune system is weaker, it is even more important for you to take care over food hygiene to avoid getting food poisoning.<sup>22</sup> This includes washing your hands thoroughly while preparing food and only eating:<sup>23</sup>

- Fully cooked food
- Pasteurised dairy, fruit juices and honey
- Heat treated nuts and dried fruit
- Clean or bottled water



If you have a low neutrophil count, you should take extra care and your healthcare team may tell you to avoid certain foods that have a higher risk of causing infection, such as:<sup>21</sup>

- Raw or undercooked meat and seafood (e.g. sushi, rare steak)
- Unpasteurized cheeses and milk
- Raw sprouts
- Pre-cut fruits and vegetables from salad bars

## Staying smoke-free

If you are living with CLL, you should avoid tobacco smoke. Smoking and vaping increases the risk of lung infections and the development of second cancers.<sup>24</sup>



# What medicine can do for you

There are some medicines that can work alongside your everyday routine that can keep you healthy and reduce the chance of developing serious infections. Your healthcare team can talk to you about the options that are best for you.

## Antimicrobial and antiviral medication

Antimicrobial and antiviral medicines are recommended for people living with CLL that have severe immunosuppression in some parts of the world to prevent serious infections such as Varicella zoster virus infections or bacterial or fungal pneumonia.<sup>25</sup> These medicines are used as preventative treatments, known as prophylaxis or prophylactic medicine.<sup>†16</sup> You may also be given antibiotics and antiviral medicines during or after treatment to reduce the risk of infections.

Prophylaxis can be used when patients live in regions where infections with no currently available vaccines are common, such as malaria.

### Remember:

- ✓ Infections can be treated, and with the right support, you can recover well when you act quickly.
- ✓ Take your medication as prescribed.

For any questions on preventing infections or managing immune challenges, please reach out to your healthcare team.

## Immunoglobulin G (IgG) Therapy

Immunoglobulin G (IgG) therapy is a treatment that helps support the immune system by replacing antibodies that are low or missing. IgG therapy has been used safely for many years and can reduce how often you get infections, how severe they are and the need for hospital stays or antibiotics.<sup>26</sup>

For people with secondary immunodeficiency, IgG therapy may help prevent infections rather than treating them. Your healthcare team can talk to you about if this treatment could be right for you.

### What you need to know

IgG therapy collects antibodies from healthy blood donors.<sup>9</sup> It is given in two ways: as a drip through a vein in the arm (intravenously), once a month, though frequency can vary,<sup>9</sup> or as an injection under the skin (subcutaneously), usually weekly.<sup>9,16</sup>

Not everybody living with CLL may require or can get this treatment, as it is depends on local regulations and guidelines.<sup>27</sup> If you can get the treatment, you should think about and discuss it with your healthcare team to understand the benefits, risks, and possible side effects, such as headaches, chills, or back pain.<sup>9</sup>

## Growth factors to increase white blood cells

Some treatments can lead to your white blood cell count being low. Your healthcare team may recommend that you receive growth factors called G-CSF (granulocyte-colony stimulating factor) to increase the number of white blood cells, especially neutrophils, the body's first responders to bacterial infections, and stem cells in your blood, which could lower your risk of infection.<sup>16</sup>

If your doctor recommends you have a growth factor, you will usually receive this as an injection under the skin, in the tummy or into an arm or leg.<sup>16</sup> After receiving G-CSF, you may feel pain in your bones as a side effect.

**Choosing to start preventative medicines is a personal choice. Your healthcare team can help you understand if they are right for you, what they do, their effectiveness and any potential side effects.**



# Recovering from an infection

If you get an infection, take time to recover and accept help from family and friends. To recover well:

- Closely follow the advice your healthcare team give you. This includes taking the full course of any medicines prescribed by your healthcare team.
- Monitor your symptoms closely when you have the infection, contacting your healthcare team if symptoms change or get worse.
- Eat a healthy, balanced diet and drink plenty of water to stay hydrated. This includes a range of colourful fruits and vegetables, lean proteins, low-fat dairy products and alternatives, and whole grain carbohydrates.
- Prioritise rest and sleep to support your immune system's recovery.
- Practice good hygiene, including washing your hands often and thoroughly to prevent reinfection or spreading the infection.
- Attend all follow-up appointments, wearing a mask in healthcare settings.
- Support your mental wellbeing by speaking to family, friends, or support services, and by doing activities that help you relax.



# Coping with CLL and immune challenges

There are many things you can do to feel more like yourself and adjust to “your new normal”. This includes:<sup>28</sup>



- **Being physically active, maintaining a balanced diet, and keeping to a sleep schedule.** This can help your body and immune system to stay as strong as possible and reduce the risk of infections. Your healthcare team can help find a routine that works well for you and your energy levels.
- **Keeping open communication with your support system.** This includes your healthcare team and your carers. They can help you look for and quickly manage any infections, autoimmune complications, and other complications.
- **Following your prescribed treatment plan.** This can prevent the disease from progressing and further reducing your immune system’s functions. It will also help you to catch any changes early, minimise your risk of infection, and manage the disease.
- **Asking for mental and emotional support.** Professionals can help manage feelings of stress, anxiety, or depression due to CLL or living with immune challenges.<sup>20</sup> Patient groups and charities can also offer support. Please check the CLLAN website to find your local patient group or charity.
- **Finding opportunities to connect with others living with CLL.** Talking to people who understand life with CLL and immune challenges can help by sharing experiences and ways to cope with CLL, treatments, and immune challenges. Patient groups and charities can help connect you with other people living with CLL.
- **Recording data.** While in active monitoring, it may be useful to document your infections so that you have data to give your healthcare team. This includes start date, daily symptoms, and end date.

If you are caring for or live with someone living with CLL, you can:

- **Monitor health:** CLL can impact the way families and friends of the person living with CLL live. Getting information online from educational resources or from a healthcare provider can help you understand the condition, expectations, and best ways to advocate and promote healthy living for your loved one.
- **Offer emotional support:** Outside of medical support, your loved one is likely to need social support. It is important to create a space where they can talk to you openly about their feelings or worries.
- **Family protection measures:** You are encouraged to maintain personal protection and get vaccinated to create a protective barrier for your loved one.
- **Get mental, emotional and social support:** Finding a place to share your concerns with other carers can be helpful. Patient groups and charities can offer support and connect you with other carers. Please check the CLLAN website to find your local patient group or charity.
- **Support healthy habits:** Focus on promoting a balanced diet, being physically active, and getting good sleep. Sticking to a routine can make your loved one feel less alone and help them cope with CLL. Keeping a positive outlook and knowing when to ask for help is important to have a good quality of life for both you and your loved one.



Living with and caring for someone living with CLL can be challenging. Your healthcare team, patient advocate groups and associations can give you resources that will support you on this journey.

For more support, reach out to the patient group in your country. A list of patients groups can be found on the CLLAN website: <https://www.clladvocates.net/membership/members/>

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