

# Neutropenia (low neutrophils)

Neutropenia is a lower number of neutrophils (a type of white blood cell) than is usual for you. It can develop as an effect of lymphoma, or as a side effect of treatment. Neutropenia can increase your chance of getting infections.

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We have separate information about the topics in **bold font**. Please get in touch if you'd like to request copies or if you would like further information about any aspect of lymphoma. Phone 0808 808 5555 or email [information@lymphoma-action.org.uk](mailto:information@lymphoma-action.org.uk).

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## **What is neutropenia?**

Neutropenia is a low number of white blood cells called neutrophils in your blood. If you have neutropenia, your medical team might say that you are neutropenic, or describe you as having a low neutrophil count, or a low white cell count.

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## **What causes neutropenia in people with lymphoma?**

Neutropenia can be caused by lymphoma itself or it can be a **side effect of treatments for lymphoma**.

If your lymphoma is in your **bone marrow** it can cause neutropenia. Lymphoma in the bone marrow affects the production of neutrophils because the lymphoma cells take up space that's usually used to make healthy blood cells.

Treatments such as **chemotherapy** and **radiotherapy** affect your healthy cells (including blood cells) as well as lymphoma cells. This can lower the number of white blood cells in your blood. Throughout your **treatment**, your medical team will check your neutrophil count. For example, it can take a couple of weeks or more for your neutrophil count to return to a safe level after a cycle of chemotherapy. Your medical team only give you more treatment when your neutrophil levels have returned to a level that mean it is safe to do so.

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## **What are the symptoms and effects of neutropenia?**

When you have a low level of neutrophils in your blood, your immune system is weakened, making it harder for your body to fight infection. You are likely to get more infections, and they can be more severe or take longer to get rid of.

The risk of you developing an infection depends on how low your neutrophil count is. If it's only a little below your normal level, the risk isn't much higher than usual. Your chances of getting an infection go up as your neutrophil level goes down.

It is important to know the **signs and symptoms of infection**. **If you develop any signs of infection, seek medical attention immediately – you might need treatment, even if you are already taking antibiotics.**

Whilst you cannot prevent all infections, you can take some simple steps to **reduce your risk of infection**. This includes keeping good personal hygiene, reducing your contact with germs, protecting your skin and following food safety guidance.

### **Neutropenic sepsis**

Neutropenic sepsis is a whole-body reaction to an infection. Neutropenic sepsis is a potentially life-threatening complication of being neutropenic. Not everyone with neutropenia develops neutropenic sepsis but it is important to know the signs and symptoms.

**If you notice any signs or symptoms of neutropenic sepsis, seek medical attention straight away.**

A common symptom of neutropenic sepsis is fever (a body temperature higher than 38°C or 100.4°F). This is known as 'febrile neutropenia'.

It is possible to have neutropenic sepsis without a fever. This is sometimes called 'cold sepsis'. Treatment with **steroids** can make this more likely because they can mask a fever. For this reason, doctors sometimes use other ways of checking for sepsis, including measuring your heart rate, blood pressure, breathing rate, kidney and liver function.

Other signs of sepsis include:

- chills and shivering
- fast heartbeat or breathing
- cold, pale, clammy or blotchy skin
- dizziness, confusion, disorientation
- slurred speech
- diarrhoea
- sickness (nausea or vomiting)
- weeing less than is usual for you
- loss of consciousness.

Your medical team can give you information relevant to your situation and take any necessary precautions.

If you develop neutropenic sepsis, you are likely to need to be admitted to hospital for treatment with IV (intravenous) antibiotics.

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I developed a high temperature. My mum noticed I was looking red, and I had no energy. Just having a shower was taking all my strength. We realised that this was a red flag moment and that I needed to get straight to hospital. I had developed neutropenic sepsis and needed to be treated with antibiotics and G-CSF injections (growth factors) to help my neutrophil count recover faster. I was in hospital for a week and my next chemotherapy was delayed.

*Adam, diagnosed with nodular lymphocyte-predominant  
Hodgkin lymphoma*

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## How is neutropenia diagnosed?

Neutropenia is diagnosed using the [blood tests](#) you have during your lymphoma treatment. The number of neutrophils in your blood is measured by a blood test called a [full blood count](#) (FBC).

Neutropenia means having a lower number of neutrophils than is usual for you. There is no set number of neutrophils an individual should have. Instead, hospitals compare your count against a 'reference (or normal) range'. The reference range is a range of values typically found in healthy people.

As well as varying between individuals, ranges can differ between ethnic groups. For example, people of African, Caribbean, Middle Eastern and West Indian descent often have naturally lower numbers of neutrophils in their blood than white people. Having a naturally lower number of neutrophils due to ethnicity does not increase the risk of developing infections.

The normal range for neutrophils is usually between 2 billion (written as  $2 \times 10^9/L$ ) and 7.5 billion (written as  $7.5 \times 10^9/L$ ) neutrophils per litre of blood. Doctors usually refer to neutrophil counts just by a number, such as a neutrophil count of 0.7 (which means 0.7 billion neutrophils per litre of blood) or 4.2 (which means 4.2 billion neutrophils per litre of blood).

In general, a neutrophil count of below  $1 \times 10^9/L$  is classified as neutropenia. This means that there are fewer than 1 billion neutrophils per litre of blood.

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## How is neutropenia treated?

If your neutropenia has been caused by treatment of lymphoma, you might not need any treatment for it as your neutrophil levels often return to a safe level within a few days.

Sometimes doctors offer preventative (prophylactic) treatment, to lower your risk of infection whilst your neutrophil count is expected to be at its lowest. Preventative treatment can be:

- antibiotic medicines, which fight infections caused by bacteria (such as skin infections, tonsillitis or chest infections)
- anti-viral medicines, which fight infections caused by viruses (such as flu, chicken pox and shingles)
- anti-fungal medicines, which fight infections caused by fungi (such as thrush and some eye infections).

You might have heard of a 'neutropenic diet' (sometimes called a 'clean', 'low-bacterial' or 'low microbial' diet). The aim is to avoid foods that are more likely to contain bacteria and fungi that cause infection. However, there is limited scientific research supporting neutropenic diets, and advice varies between hospitals. Your medical team are best placed to advise you on any foods or drinks that you should avoid. We have additional information on [diet and nutrition](#) and the NHS provides guidance on [eating well with cancer](#).

Treatment with [growth factors](#) can trigger your bone marrow to make new white blood cells. This helps your neutrophil levels return to normal more quickly, lowering your risk of infection. Growth factors are hormones made naturally by your body but can also be made in a laboratory. The growth factor most commonly used is called granulocyte-colony stimulating factor (G-CSF). You have G-CSF by subcutaneous injections, given with a very small needle just underneath the skin. You might have treatment with G-CSF for one of the following reasons:

- your neutrophil count is very low and your doctor thinks you have a high risk of developing an [infection](#)
- your neutrophil count is too low for you to have the chemotherapy dose you need
- you are over 60 years old and receiving certain types of chemotherapy.

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## References

The full list of references for this page is available on our website. Alternatively, email [publications@lymphoma-action.org.uk](mailto:publications@lymphoma-action.org.uk) or call 01296 619409 if you would like a copy.

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