Lymphoma and the immune system

This page is about the ways in which the immune system is affected by lymphoma.

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How does lymphoma affect the immune system?

Lymphomas are due to cancerous lymphocytes (either B cells or T cells). As lymphocytes are part of the immune system, some parts of the immune system may not work as well as normal in people who have lymphoma. Even if they are not cancerous, other cells of your immune system might not work as well as usual if you have lymphoma, because the different parts of the immune system work together.

- If you have T-cell lymphoma, you might not have enough normal T cells to fight infection. A shortage of T cells increases your risk of developing viral infections (for example, shingles and viruses that cause cold sores) and tuberculosis (TB).
If you have B-cell lymphoma, you might not have enough normal B cells to fight infection. A shortage of B cells increases your risk of bacterial infections (for example, pneumonia and urinary tract infections).

Lymphoma in the bone marrow can take up the space needed for normal blood cells to develop, including other types of white blood cell that fight infection, such as neutrophils.

Cancer cells, including lymphoma cells, also use up your body's energy. This can affect your immune system's ability to work well and can result in weight loss and loss of muscle mass.

How does treatment for lymphoma affect the immune system?

Lots of cancer treatments affect the immune system. Treatments for lymphoma aim to kill the cancerous lymphocytes. However, these treatments also kill some of your body’s healthy cells, including immune cells. Different types and intensities of treatment affect your body differently.

Effects of treatment on your immune system

Chemotherapy causes damage to bone marrow, which is where your blood cells are made. Your body might not be able to make as many blood cells as usual, reducing your blood counts. Many people treated with chemotherapy develop neutropenia (a shortage of neutrophils). Neutropenia increases your risk of infection, particularly infections due to bacteria. Certain drugs, such as fludarabine, can also lower your number of lymphocytes. This can increase the risk of infection.

Steroids can increase your risk of infections, particularly those caused by viruses (such as those that cause cold sores and chickenpox) and fungi (such as thrush).
Stem cell transplants can have a greater effect on the immune system than most other treatments. This is because they involve high doses of chemotherapy (and sometimes radiotherapy too) that kill cancer cells but also kill the cells in the bone marrow that make immune cells. If you have a stem cell transplant, you also have other treatments (called anti-infection ‘prophylaxis’) to protect your body from infection until your immune system has recovered.

A splenectomy is an operation to remove the spleen. A few people with lymphoma have a splenectomy. Having no spleen can increase your risk of infection with certain bacteria. If you have a splenectomy, you usually have antibiotics and vaccinations to reduce the risk of infections.

**Other ways treatment can affect your immune system**

Anything that damages the physical barriers of your immune system can increase your risk of infection.

Needles pass through the skin barrier. They are needed to put treatments into your bloodstream and for blood to be taken for blood tests. The tiny holes the needles make in your skin can give germs a way to get into your bloodstream. Lines that stay in place for a while, such as central lines and drips, give more opportunities for infection to develop. Surgery, including biopsies (where a sample of tissue is removed) also create a break in your skin that can allow germs into your body. Your medical team take great care to avoid introducing infections when performing any procedures. They also regularly check lines and wounds and keep them clean. Tell your medical team if you notice any signs of infection, such as redness, swelling or pain at the affected area.

Some people get dry mucous membranes or a sore mouth during treatment for lymphoma. These problems are most common with radiotherapy to the head and neck and some chemotherapy, particularly at high doses. The mucous membranes work as a physical barrier to protect you from infection. If they are dry and sore, they are not working well, which gives organisms more opportunity to enter your body. If you have these problems, there are things you can do to soothe any discomfort and to help prevent infection.
Your medical team might be able to give you treatments to reduce your risk of infection.

Your skin can also be affected by the lymphoma itself or as a side effect of treatments for lymphoma. You might develop dry, sore or itchy skin. It is important that you follow any advice from your medical team to avoid introducing infections through broken skin.

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**The immune system after treatment**

Your immune system should recover over time after your treatment for lymphoma. Most people who have recovered after standard treatment for lymphoma and are in remission are not at increased risk of infection. Some treatments can have longer-term or permanent effects on the immune system, for example:

- **Splenectomy** - the increased risk of infection lowers over time but never goes away completely. Be vigilant for signs of infection and follow any advice from your medical team.

- **Stem cell transplants** – it takes many months to recover from a stem cell transplant. If you had an allogeneic stem cell transplant (where you were given donor stem cells), you will need immunosuppressive drugs (drugs that dampen your immune system) after your transplant to stop your new donor immune system from attacking your own cells. Many healthy cells, including immune cells, are also killed by the treatment. This means your immune system is very low after a transplant and it can take more than a year to recover. Most people need to have their childhood vaccinations again after having an allogeneic stem cell transplant.

- **Certain chemotherapy drugs** that affect lymphocytes, for example fludarabine (often used to treat chronic lymphocytic leukaemia) - problems with immunity can persist for a year or two after treatment. The increased risk of infection generally decreases over time.

It is only natural to feel concerned if you have symptoms of infection or swollen lymph nodes after you have been treated for lymphoma. Everybody
gets infections from time to time. If you have **neutropenia** or are having treatment for lymphoma, infections can be more serious and you should seek medical advice immediately if you suspect you have an infection. If you are in **remission** and have a normal neutrophil count, you should only worry if your lymph nodes do not shrink back down after the infection has gone. Always contact your medical team if you are worried about infection or any new or worsening symptoms.

### Using the immune system to treat lymphoma

Some lymphoma treatments use the immune system to help treat the lymphoma. These include:

- **Antibody therapy**, which uses man-made antibodies to mark out lymphoma cells and tell your immune system to kill them. For example, **rituximab** is an antibody used to treat many types of lymphoma. Antibody therapy is often used in combination with **chemotherapy**. This might be known as ‘chemoimmunotherapy’.

- **Allogeneic stem cell transplants**, which give you a new immune system from a donor. The new immune system can recognise and attack lymphoma cells. This is known as the ‘**graft-versus-lymphoma**’ effect.

- **Targeted drugs** that can change the way your immune system works or help your immune system to recognise lymphoma cells, for example, **immunomodulators** like lenalidomide and **checkpoint inhibitors** like nivolumab.

- **CAR-T cell therapy**, where your own T cells are genetically modified (changed) in a laboratory to recognise lymphoma cells before being given back to you.

If a lymphoma develops in someone who is taking immunosuppressive drugs, reducing or stopping those drugs may allow the immune system to get rid of the lymphoma.

Newer drugs and CAR-T cell therapy show promise for treating lymphoma but clinical trials continue to be done to find out more about these
treatments and how best to use them. Find out more about clinical trials and search for a trial that might be suitable for you at Lymphoma TrialsLink.

References

These are some of the sources we used to prepare this information. The full list of sources is available on request. Please contact us by email at publications@lymphoma-action.org.uk or phone on 01296 619409 if you would like a copy.


Further reading

- Antibody therapy
- Glossary
- Stem cell transplants
- Targeted drugs
- The immune system
- What is lymphoma?
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