

Blood Cancers

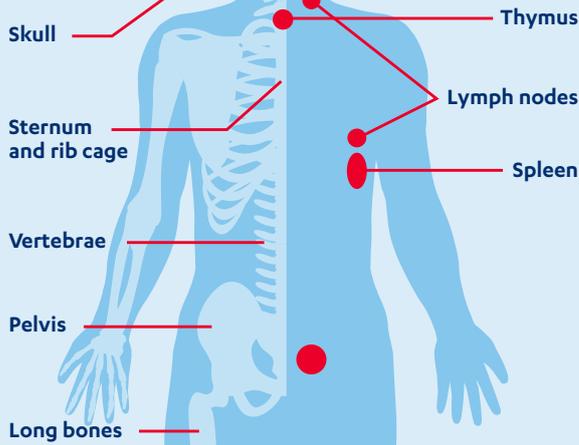
Cancers affecting the blood, bone marrow and lymphatic system¹

How are blood cells normally produced?^{2,3}

Blood cells develop through a process called **haematopoiesis**. This involves **bone marrow** and part of the **lymphatic system**.

Bone Marrow

Bone marrow is a spongy tissue that can be found in:



Lymphatic System

Lymphatic organs involved in haematopoiesis are:

Bone marrow contains unspecialised cells known as haematopoietic stem cells. As they divide and mature, they become more specialised and develop into one of the **three types of blood cell**, each with a specific function.

White blood cells

Protect against infections and foreign matter



Red blood cells

Transport oxygen around the body



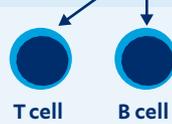
Platelets

Prevent bleeding



Lymphocytes

Lymphocytes are a type of white blood cell and include **B cells** and **T cells**, which play an important role in the immune system.



T cell

B cell

B cells & T cells

Usually produced in the bone marrow, B cells also mature in the bone marrow while T cells mature in the thymus. Plasma cells develop from B cells.

Blood cells only last for a limited period of time, and so they constantly need to be replaced in the correct numbers to meet the body's needs. One of the key functions of the spleen is to remove worn out blood cells from circulation.

An additional component of blood is plasma.

What causes blood cancer?¹

To function properly, the body needs to produce exactly the right amount of each type of blood cell. Blood cancers develop when damage occurs to vital genes, disrupting the normal lifecycle of blood cells, and upsetting this balance.

Risk factors include:



Infection



Low immunity



Radiation



Chemotherapy



Genetic disorders



Chemical exposure



Environmental factors



Autoimmune disorders

What are the symptoms of blood cancer?⁴

Many symptoms of blood cancer are a result of fewer healthy, functioning blood cells, or overproduction of abnormal cells, causing a lack of space where blood cells are produced, i.e. bone marrow and the lymphatic system.

Symptoms of blood cancer can vary, but commonly include:



× **Tiredness**
× **Breathlessness**
Caused by a decrease in red blood cells



× **Swollen/painful glands**
× **Bone pain**
Caused by a build-up of abnormal blood cells in bone marrow and lymphatic system



× **Bruising**
× **Bleeding**
Caused by a decrease in platelets



× **Infections**
× **Fever**
Caused by a decrease in white blood cells



× **Unexplained or unexpected weight loss**

MAKE BLOOD CANCER VISIBLE

People impacted by blood cancer need more than treatment and care. To improve awareness and further support patients and their families, Janssen has launched 'Make Blood Cancer Visible' - a campaign to get people talking about blood cancers and bring forward patient perspectives.

#LETSTALKABOUTBLOODCANCER

visit www.facebook.com/letstalkaboutbloodcancer

Blood Cancers

Cancers affecting the blood, bone marrow and lymphatic system¹

How are blood cancers classified?^{1, 5-12}

There are 140 different types of blood cancer, which can be classified in three main groups

Leukaemia

A cancer of white blood cells

Classified by:

- Type of white blood cell affected
- Whether the disease is acute (progressing quickly) or chronic (progressing slowly)

≈1 in 3

cancers in children in industrialised countries is a **leukaemia**

≈40%

of leukaemias are classified as **chronic lymphocytic leukaemia**

Lymphoma

A cancer that starts in the lymphatic system

Two main types:

- Hodgkin lymphoma (HL)
- Non-Hodgkin lymphoma (NHL)

Lymphoma is the most common blood cancer

Myeloma

A cancer of plasma cells in the bone marrow

The cancerous plasma cells also produce large amounts of an abnormal antibody (also known as an immunoglobulin), causing impairment of organs or tissue

≈40,000

people develop **myeloma** in Europe each year

For more information on disease burden and prevalence please visit www.diseasealens.com

Other blood disorders closely related to blood cancers and that may develop into leukaemia, include:

Myelodysplastic syndrome

Some blood cells made in the bone marrow are damaged resulting in a lack of healthy blood cells being released into the bloodstream

Myeloproliferative neoplasm

Too many of one or more types of blood cell are made in the bone marrow

References

- 1 Rodriguez-Abreu D, Bordoni A, Zucca E. Epidemiology of hematological malignancies. *Ann Oncol.* 2007;18(Suppl 1):i3-i8.
- 2 Munker R. Basic biology of hemopoiesis. In: Munker R, Hiller E, Glass J, Paquette R, eds. *Modern hematology: biology and clinical management*. 2nd edition. Totowa, NJ: Humana Press, 2007; 1-18.
- 3 Knight R, ed. *Transfusion and transplantation science*. Oxford: OUP, 2013; 12.
- 4 Patient.co.uk. Leukaemia: a general overview. Available at: <http://www.patient.co.uk/pdf/4876.pdf> Last accessed February 2016.
- 5 Smith D, Yong K. Multiple myeloma. *BMJ.* 2013;346:f3863.
- 6 LeukaemiaCARE. About blood cancer. Available at: <http://www.leukaemiacare.org.uk/about-blood-cancer> Last accessed February 2016.
- 7 World Health Organization Europe, European Environment and Health Information System. Incidence of childhood leukaemia: fact sheet 4.1, December 2009. Available at: http://www.euro.who.int/__data/assets/pdf_file/0005/97016/4.1.-Incidence-of-childhood-leukaemia-EDITED_layouted.pdf?ua=1 Last accessed February 2016.
- 8 Cancer Research UK. Chronic lymphocytic leukaemia (CLL) incidence statistics. Available at: <http://www.cancerresearchuk.org/cancer-info/cancerstats/types/leukaemia-ctl/incidence> Last accessed February 2016.
- 9 Lymphoma Research Foundation. Non-Hodgkin lymphoma (NHL). Available at: <http://www.lymphoma.org/site/pp.asp?c=bkLTkaOQLmK8E&b=6300139> Last accessed February 2016.
- 10 EUCAN. Multiple myeloma and immunoproliferative diseases: estimated incidence, mortality & prevalence for both sexes, 2012. Available at: <http://eco.iarc.fr/eucan/Cancer.aspx?Cancer=39> Last accessed February 2016.
- 11 Albitar M, Manshouri T, Shen Y, et al. Myelodysplastic syndrome is not merely "preleukemia". *Blood.* 2002;100:791-8.
- 12 Arranz L, Sánchez-Aguilera A, Martín-Pérez D, et al. Neuropathy of haematopoietic stem cell niche is essential for myeloproliferative neoplasms. *Nature.* 2014;512:78-81.



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