LEUKEMIA & LYMPHOMA SOCIETY OF CANADA®

B-cell Acute Lymphoblastic Leukemia

B-cell ALL

WHAT YOU NEED TO KNOW

You or your loved one has been diagnosed with B-cell acute lymphoblastic leukemia (B-cell ALL). What does it mean and how will it affect you?

This fact sheet will help you:

- Learn about B-cell ALL and how it is diagnosed
- Get an overview of treatment options
- Understand what happens next

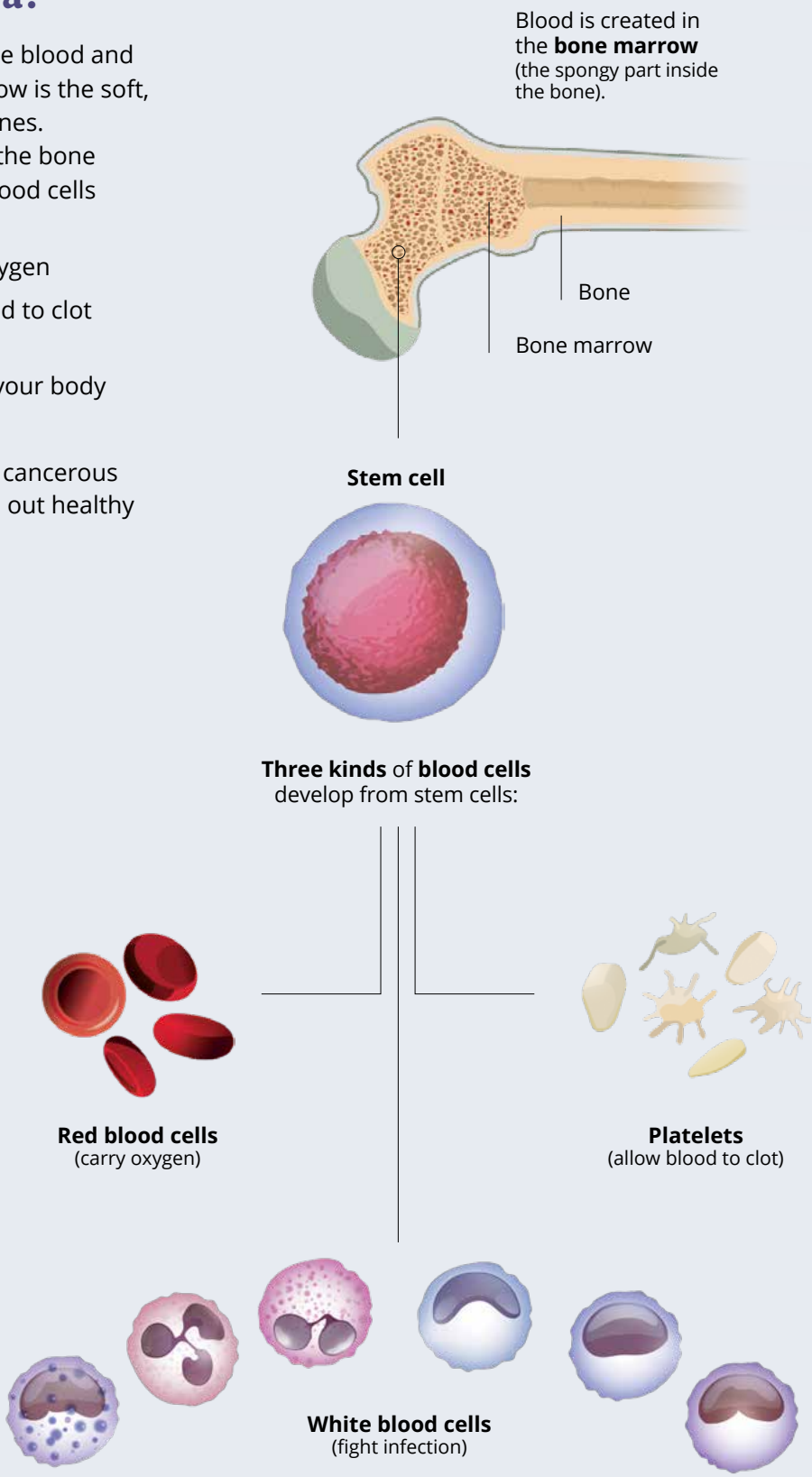
What is leukemia?

Leukemia is a cancer of the blood and bone marrow. Bone marrow is the soft, spongy material inside bones. Blood cells are formed in the bone marrow. Three kinds of blood cells develop from stem cells:

- **Red blood** cells carry oxygen
- **Platelets** help your blood to clot (stop bleeding)
- **White blood cells** help your body fight infection

When you have leukemia, cancerous blood cells form and push out healthy blood cells.

Leukemia is a cancer of the blood and bone marrow.



About B-cell ALL

- B-cell ALL is a sub-type of acute lymphoblastic leukemia (ALL)
- About 88% of children with ALL, and 75% of adults with ALL, have B-cell ALL
- It means too many B-cell lymphoblasts (immature white blood cells) are in your bloodstream and bone marrow instead of mature ones to fight infections
- It is a fast-growing (aggressive) type of blood cancer
- It affects children and adults of any age
- There is no known cause

New treatments for cancers are helping more people achieve remission.

Most people with B-cell ALL will go into remission. But many people may relapse (cancer returns) and need further treatment.

Signs and symptoms

If you have B-cell ALL, you will likely feel ill because your body is not making enough mature blood cells.

You may experience:

- Ongoing infections and fever
  - When your white blood cell count is low (neutropenia)
- Fatigue, shortness of breath during normal physical activities, dizziness, and pale complexion
  - When your red blood cell count is low (anemia)
- Bruising easily, ongoing bleeding from minor cuts, pinhead-sized red spots on your skin, frequent or severe nose bleeds, bleeding gums, and blood in your urine
  - When your platelet count is low (thrombocytopenia)
- Night sweats
  - Possibly a response from your immune system
- Bone or joint discomfort
  - When your white blood cells accumulate and cause your bone marrow to expand
- Pain or fullness below the ribs
  - When leukemia cells build up in your liver or spleen, causing your abdomen to swell
- Weight loss
  - When you lose your appetite or have a hard time keeping food down
- Lumps under your skin around your neck, stomach, pelvis, and armpits
  - When your lymph nodes are swollen

Your diagnosis

With a diagnosis, your doctor can determine the right treatment for you. Your test results help your doctor predict how B-cell ALL will likely progress and how you may respond to treatment. Here are some possible tests you may do:

Name of test	Description
Medical history and physical exam	The doctor will review past illnesses, injuries, and symptoms, examining your lungs, heart, and other organs.
Complete blood count	This test measures the number of red blood cells, white blood cells, and platelets in a sample of your blood to find out if the counts are high or low.
Blood cell examination	This test looks at blood cells under a microscope to see if they appear normal. With B-cell ALL, you may have many abnormal cells.
Bone marrow aspiration and biopsy	These two tests look at bone marrow cells for anything unusual in your chromosomes (for example, the presence of cancer cells). They are usually done at the same time.
Flow cytometry	During this test, cells are taken from your blood or tissue biopsy to detect proteins or markers (antigens).
Genetic testing	These tests may include cytogenetics, polymerase chain reaction (PCR), and fluorescence in situ hybridization (FISH). They look for specific genetic mutations associated with B-cell ALL.

B-cell ALL treatment

Your treatment is focused on destroying as many leukemia cells as possible and stabilizing your blood cell production. When you no longer have evidence of leukemia cells in your body, you are said to be in remission.

Planning your treatment

Identifying your disease subtype is an important step in planning your treatment. Your doctor will also assess changes to your chromosomes and genes to determine your treatment plan.

Types of treatment

- **Chemotherapy** uses medicine (chemicals) to kill cancer cells
- **Radiation** uses X-rays or other high-energy rays that can kill cancer cells
- **Stem cell transplantation** transfers a healthy person's (donor) stem cells to your body to help get rid of the leukemia
- **Targeted therapy** uses drugs or other substances to target and attack specific cancer cells. These treatments are usually less likely to harm normal cells.

Factors that affect treatment

Discuss your treatment options with your doctor to make sure you understand the benefits and risks of each approach. Your treatment plan is based on:

- Your age and overall health
- Your medical history
- Your lab test results
- Whether you have a chronic or aggressive form of B-cell ALL
- Your preference

Clinical trials are research studies that aim to improve the care and treatment of people living with cancer.

For some people with a blood cancer, a clinical trial may be the best treatment choice. Talk to your healthcare team for more information.

Treatment side effects

When you begin your treatment for B-cell ALL, you may experience mild to severe side effects, depending on your age, your overall health, and your treatment plan. Most side effects disappear once your treatment ends. New drugs and therapies can help control most side effects. Speak to your doctor if you are having side effects.

Common side effects

You may experience side effects from your treatment, such as:

- Infections
- Fatigue
- Diarrhea and constipation
- Nerve pain
- Blood clots
- Bleeding
- Foggy brain

Long-term or late effects of treatment

Medical follow-up is important after treatment for B-cell ALL. You may need blood tests, bone marrow tests, or molecular tests to find out whether your disease is in remission or whether you need further treatment. Your healthcare team should provide you with a care plan listing how often you will need follow-up visits, and which tests you will have at those visits.

- **Long-term side effects** are common and can last for months or years after treatment ends. Examples include fatigue, nerve pain, other cancers, and heart disease.
- **Late effects** are medical problems that do not show up until years after treatment ends. See your doctor to get follow-up care for possible early detection of heart disease, secondary cancers, fertility problems, thyroid problems, trouble concentrating, and chronic fatigue.
- **Children can experience side effects** that affect learning, growth, cognitive (brain) development, and social and psychological development.

Living with B-cell ALL can be overwhelming. Seek medical help if you feel "down" or "blue" or don't want to do anything and your mood does not improve over time. These could be signs of depression, an illness that should be treated even when you're undergoing treatment for B-cell ALL. Treatment for depression has important benefits for people living with cancer. Remember, you are not alone.

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