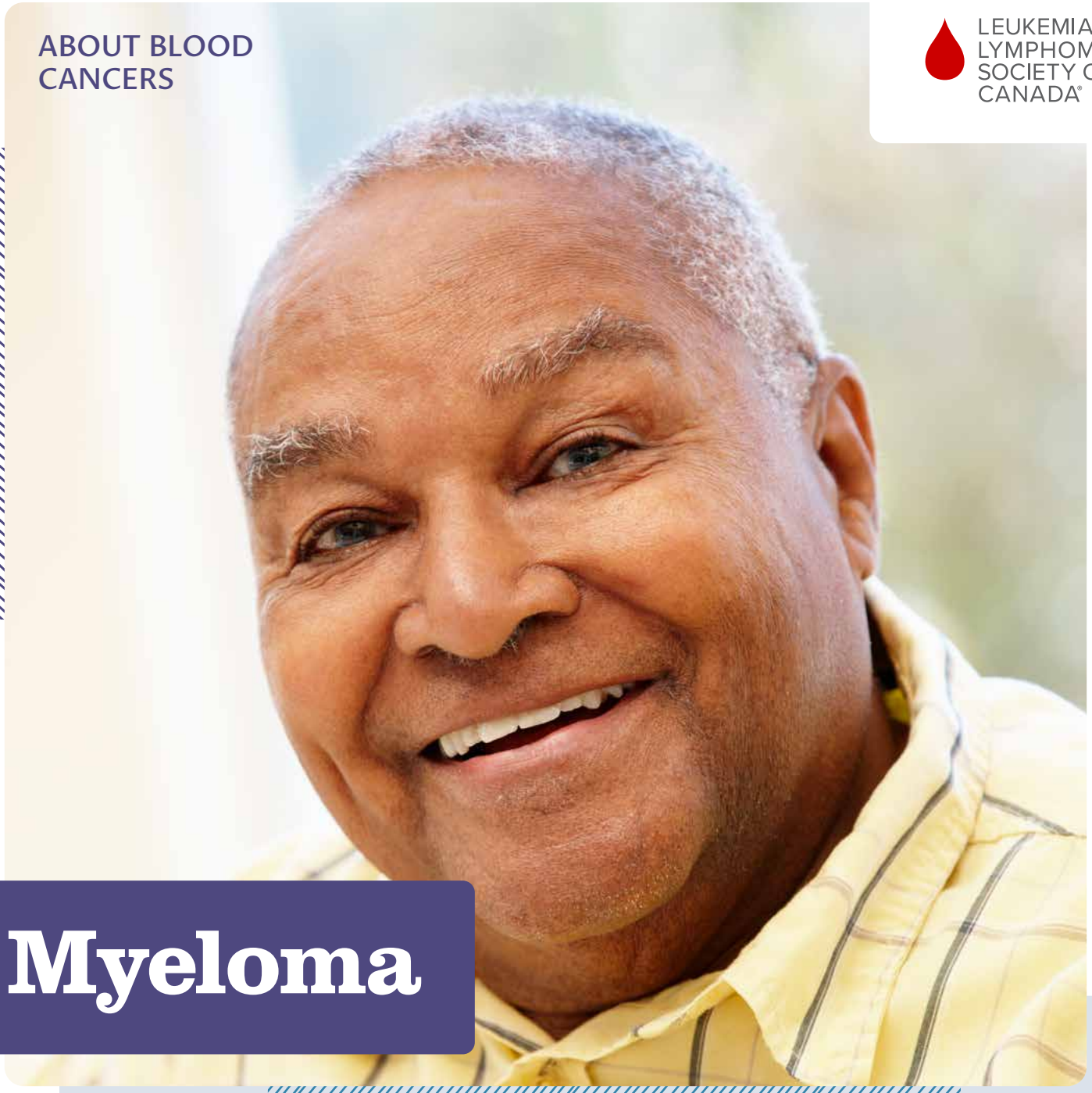
LEUKEMIA & LYMPHOMA SOCIETY OF CANADA®



Myeloma

WHAT YOU NEED TO KNOW

You or your loved one has been diagnosed with myeloma. What does it mean and how will it affect you?

This fact sheet will help you:

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

What is myeloma?

Myeloma is the second most common form of blood cancer: an estimated 4,100 new cases of myeloma were diagnosed in Canada in 2023.

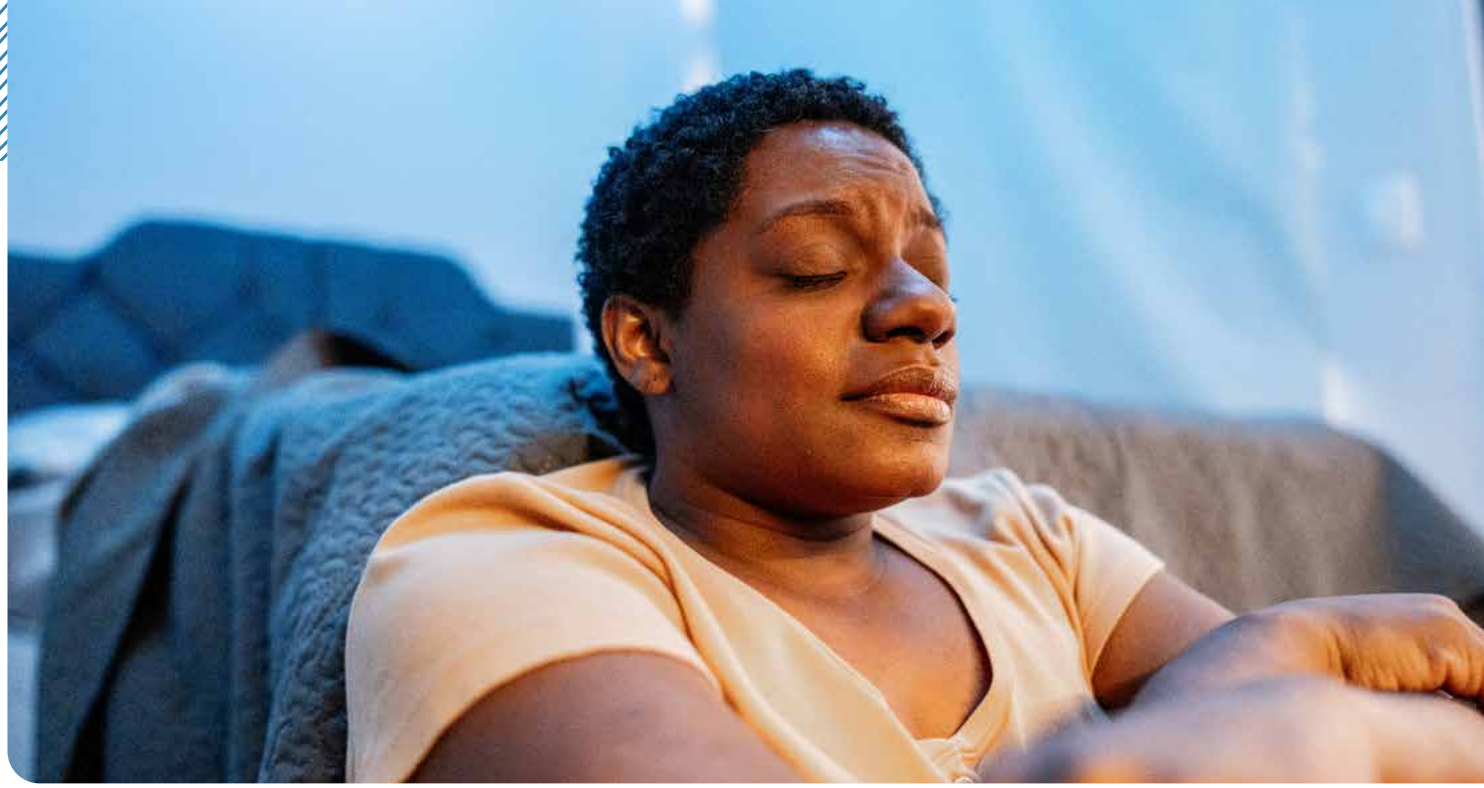
Myeloma is a cancer of the plasma cells: a type of white blood cell that makes antibodies to fight infection. Myeloma occurs when B lymphocytes (B-cells), a special type of white blood cell found in bone marrow, produce an abnormal protein (monoclonal protein, often called M protein).

Myeloma cells are usually found in your bone marrow, but they may also build up in any part of your body, including your skin, muscles, blood, or lungs. These accumulations are called plasmacytomas (malignant plasma cells).

The most common form of myeloma is **multiple myeloma**, which involves multiple tumours. In most people, the disease is already in multiple sites when diagnosed.

Asymptomatic myeloma is a form of myeloma that has no symptoms or organ damage. It is known as smoldering myeloma. Older adults often have a variant of myeloma called monoclonal gammopathy of undetermined significance (MGUS). This occurs when there is an isolated monoclonal protein in their blood, but few (or no) malignant plasma cells in the bone marrow.

About myeloma	• It can grow slowly with no symptoms, or may include symptoms • Around 11 people are diagnosed with myeloma in Canada each day • It usually has no obvious cause • Advances in treatment are extending survival and improving quality of life and life expectancy
Risk factors	Certain factors can increase your risk of getting myeloma: • Older age (60+) • Gender (male) • Race: People of African descent are more than twice as likely to get myeloma than white people • Medical history of MGUS • Environment: possible link with exposure to radiation, pesticides, fertilizer, and some metals • Obesity • Chronic conditions that affect the immune system (chronic immunodeficiency) • Inflammatory conditions like cardiovascular disease or type 2 diabetes • Occupations such as firefighters and other jobs with exposure to certain chemicals



Symptoms of myeloma

The most common symptoms of myeloma are bone pain and fatigue.

You may experience:

- Abnormalities, fractures, or other damage to your bones
  - Caused by osteoporosis or thinner, weaker bones from the myeloma
- Fatigue, shortness of breath during normal physical activities, dizziness, and pale complexion
  - Caused by a low red blood cell count (anemia)
- Kidney problems, including kidney failure
  - Caused by monoclonal protein deposits in your kidneys
- Recurrent infections, and easy bruising and bleeding
  - Caused by low blood cell counts (red blood cells, white blood cells, or platelets)
- Thirst, frequent urination, upset stomach, bone pain, confusion, and muscle weakness
  - Caused by high calcium levels in your blood
- Numbness, tingling, burning, or pain in the hands or feet
  - Caused by nerve damage to the hands and feet (peripheral neuropathy)
- Abnormal protein build-up in the heart and kidneys
  - Caused by monoclonal protein deposits in these organs
- Hyperviscosity syndrome (in rare cases) with abnormal bleeding, headaches, chest pain, decreased alertness, and shortness of breath
  - Caused by a build-up of monoclonal protein and thickening of the blood

Your diagnosis

With a diagnosis, your doctor can determine the right treatment for you. Your test results help your doctor predict how myeloma will likely progress and how you may respond to treatment.

Here are some possible tests you may undergo:

Name of test	Description
Medical history and physical exam	The doctor reviews past illnesses, injuries, and symptoms. They examine your lungs, heart, and other organs. They check for infection and discuss bone pain or fractures (breaks) with no known cause.
Bone marrow aspiration and biopsy	These two procedures, usually done at the same time, draw bone marrow cells for comprehensive testing.
Imaging tests	**Computed tomography (CT) scan** uses a computer linked to an X-ray machine to make a series of detailed pictures of areas inside the body. **Magnetic resonance imaging (MRI)** uses magnetic fields and radio waves to create images of the body's organs, including the brain and tissues. Doctors may request a scan of the head and/or spinal cord to look for changes in the bone marrow and pockets of myeloma cells. **Positron emission tomography (PET)** uses mildly radioactive material to create a 3D image of the body. It can identify changes in the bone marrow and pockets of myeloma cells.
Lab tests	These tests look for monoclonal protein. Myeloma often causes you to have large amounts of this protein in your blood or urine.
Protein electrophoresis tests	Proteins in blood and urine samples are separated to identify and quantify individual antibodies.
Serum free light chain assay	This test provides information on a particular part of monoclonal proteins, the free light chains, which may be a sign of a plasma cell disorder.
Flow cytometry	This test determines whether abnormal plasma cells are present in a liquid sample of bone marrow or blood.
Cytogenetic analysis	This test looks for changes in plasma cell chromosomes.
Next generation sequencing	This technology increases the speed and reduces the cost of DNA sequencing to look for plasma cell gene mutations.

Stages of myeloma

Identifying the stage of the disease is an important step in planning your treatment. The stage of myeloma refers to how the disease has progressed. **It does not determine how well you will respond to treatment.**

Your doctor will determine the stage of the disease using the **Revised International Staging System**. That system uses blood and marrow tests (cytogenetics).

Staging depends on the levels of proteins found in the blood and bone marrow cytogenetic analysis:

- Albumin
- Beta-2 microglobulin
- LDH (lactate dehydrogenase): a blood enzyme that indicates plasma cell growth and division
- Presence or absence of plasma cell chromosome abnormalities

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.

Myeloma treatment

Treatment for myeloma aims to manage your symptoms and any complications. The treatment approach is based on the stage and whether you are eligible for a stem cell transplant.

Your treatment will focus on **remission**; this is when there is no evidence of myeloma cells in your body. New treatments for myeloma have been introduced in recent years, including clinical trials.

Plasmacytomas are malignant plasma cells that can build up in any part of the body. These can often be cured with radiation treatment. They can return or develop into multiple myeloma.

You may experience side effects from treatment. Most side effects improve or go away after treatment ends. New drugs and therapies can help control most side effects.

Types of treatment

Common myeloma treatments and potential side effects include:

- **Watch and wait** is the typical treatment for people with slow-growing myeloma (asymptomatic). You will not receive treatment until the disease progresses.
- **Radiation therapy** uses X-rays or other high-energy rays for a localized or solitary plasmacytoma.
  - **Potential side effects:** skin redness, dryness, itching, blistering, nausea, diarrhea, vomiting, loss of appetite, headaches, swelling, fatigue, shortness of breath, diseases or disorders affecting the heart (cardiopathy), temporary hair loss, and secondary cancers
- **Chemotherapy** uses medicine (chemicals) to kill cancer cells. Induction chemotherapy is often given right after diagnosis.
  - **Potential side effects:** fever or chills, fatigue, nausea, loss of appetite, mouth sores, nerve damage (peripheral neuropathy), changes in blood cell counts, infection, rash, vomiting, diarrhea, shortness of breath, swelling, and temporary hair loss
- **Immunotherapy** uses a drug or antibody that can either boost or pause your immune system to help your body fight cancer. Immunotherapy includes CAR T-cell therapy. Availability in Canada currently varies from one province to the other or through a clinical trial.
  - **Potential side effects:** rashes, fatigue, diarrhea, nausea, vomiting, infections, low blood counts and decreased thyroid hormone levels
- **Targeted therapy** is a type of drug therapy that targets specific substances on cancer cells. These drugs are often given in pill form and may be useful when the disease has relapsed after other treatments. Availability in Canada currently varies from one province to the other or through a clinical trial.
  - **Potential side effects:** low blood cell counts (white, red, and platelets), infection, bleeding, anemia, skin problems, high blood pressure, fatigue, diarrhea, neuropathy, and slower healing time for wounds
- An **autologous stem cell transplant (SCT)** may be part of your initial treatment if it suits your age and physical health. After collecting your own (autologous) stem cells, doctors put them back them in your body (like a blood transfusion) following high-dose chemotherapy. The goal is to improve the length of your remission and survival.
  - **Potential side effects:** low white blood cell count (increased risk of infection), low platelet count (increased risk of bleeding or bruising), low red blood cell count (causes fatigue, dizziness, shortness of breath, and feeling unwell), mouth sores and issues with your digestive system such as nausea, poor appetite, vomiting and diarrhea.

Types of treatment (cont'd)

- In some cases, an **allogeneic stem cell transplant (SCT)** may be part of your post-remission therapy. Doctors transfer a healthy person's (donor) stem cells into your body to slow the growth of myeloma. The goal is to restore your body's ability to make normal immune cells following chemotherapy.
  - **Potential side effects:** low white blood cell count (increased risk of infection), low platelet count (increased risk of bleeding or bruising), low red blood cell count (causes fatigue, dizziness, shortness of breath, and feeling unwell), pain and issues with your digestive system, skin and hair problems, issues with your organs or central nervous system, and possible graft-versus-host disease (GvHD) or veno-occlusive disease (affecting the small vessels leading to your liver)
- **Combination drug therapy** uses two or more medications to treat myeloma for people who are not candidates for a stem cell transplant.
- **Supportive care** helps manage any complications of myeloma and the side effects of treatments. There are treatments to help with:
  - Bone pain
  - Poor circulation and joint pain, kidney problems, and skin lesions
  - Fatigue
  - Thickened blood that interferes with blood flow and the delivery of oxygen to tissues (hyperviscosity syndrome)
  - Infections
  - Peripheral neuropathy
  - Interruption in the bone marrow producing red and white blood cells and platelets (myelosuppression)
  - Reduced kidney function
  - Blood clots in the veins and arteries of the legs (thrombosis) and lungs (embolism)

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
- If you have other conditions, such as heart or kidney disease, diabetes, or neuropathy
- Your ability to tolerate intensive therapy
- The stage and characteristics of the disease
- How fast the disease is progressing
- Your lifestyle and preferences

Long-term or late effects of treatment

Medical follow-up is important after treatment for myeloma. You may need blood tests, bone marrow tests, imaging tests, or a combination of these to determine if you need further treatment. Your medical team will provide a care plan listing follow-up visits and the tests you will have at those visits. In a minority of patients, myeloma is associated with an increased risk of developing other blood cancers such as acute myeloid leukemia, especially after receiving treatment with certain chemotherapy drugs.

You may experience long-term or late effects of your treatment:

- **Long-term side effects** can last for months or years after treatment ends. Examples include chronic fatigue and brain fog.
- **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 issues, thyroid problems, trouble concentrating, or chronic fatigue.

Living with myeloma 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, a common illness that should be treated even when you’re undergoing treatment for myeloma. Treatment for depression has important benefits for people living with cancer. Remember, you are not alone.

LLSC gratefully acknowledges Dr Jean Roy, hematologist, Université de Montréal and Maisonneuve-Rosemont Hospital, for contributing to the content of this publication.

This publication was made possible thanks to the support of Sanofi.

LEUKEMIA & LYMPHOMA SOCIETY OF CANADA®

Never hesitate to contact us, we’re here to help!

1 833 222-4884 • info@bloodcancers.ca • bloodcancers.ca