National Comprehensive
Cancer Network®

2026

NCCN Guidelines for Patients®
Cancer care recommendations from leading experts at the
National Comprehensive Cancer Network® (NCCN®)

Multiple Myeloma

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Guiding Treatment. Changing Lives.

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Multiple Myeloma

NCCN Guidelines for Patients®

The essential guide for people facing cancer.

Based on care recommendations from leading cancer experts.

Explains high-quality cancer care provided at state-of-the-art cancer centers.

Reviewed and revised every year.

Did you know that top cancer centers across the United States work together to improve cancer care? This alliance of leading cancer centers is called the National Comprehensive Cancer Network® (NCCN®).

Because cancer care is always evolving, NCCN develops and frequently updates evidence-based cancer care recommendations used by health care providers worldwide. These recommendations are known as the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®).

The NCCN Guidelines for Patients plainly explain these expert recommendations, so you can talk with your care team about the best care for you.

These NCCN Guidelines for Patients are based on the NCCN Guidelines® for Multiple Myeloma, Version 4.2026 — November 26, 2025.

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1

About multiple myeloma

Multiple myeloma is a rare blood cancer that usually starts in white blood cells inside the bone marrow. New treatments for multiple myeloma are giving people more hope and more years to live.

What is multiple myeloma?

Multiple myeloma (also simply called myeloma) is a type of blood cancer that typically begins in the cells of bone marrow. Bone marrow is the soft, sponge-like center inside bones where most blood cells are made. Multiple myeloma occurs when cancerous cells—called myeloma cells—multiply and build up in the bone marrow.

In someone with myeloma, so many myeloma cells build up in the bone marrow that they can crowd out healthy blood cells, causing harmful blood-related problems.

This oversupply of myeloma cells also reduces the number of healthy white blood cells in the body, which can increase the risk of infections. In addition, myeloma cells can release large amounts of abnormal myeloma proteins, which can interfere with the body's normal functions.

Myeloma cells can also cause bones to break down, leading to weakened bones, bone pain, fractures, and high calcium levels in the blood.

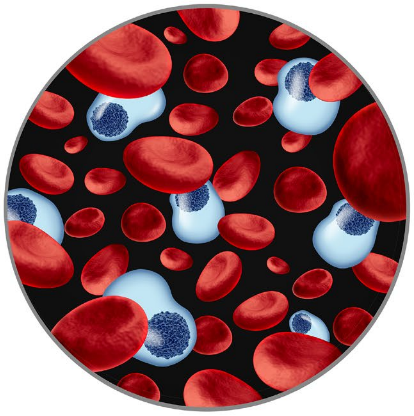
When myeloma cells build up in bone marrow, they can form tumors called plasmacytomas. In most people with this disease, multiple plasmacytomas form in different bones or areas of the body, which is why it's called multiple myeloma.

Myeloma cells

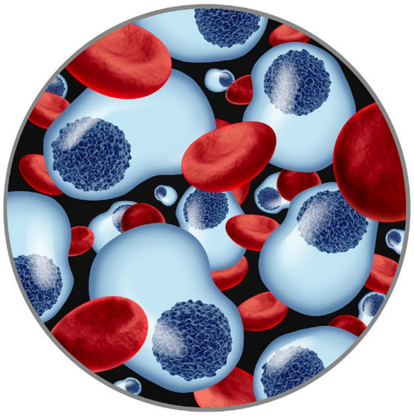
Blood is made up of different blood cells, including white blood cells called plasma cells.

Multiple myeloma happens when normal plasma cells in the bone marrow turn into abnormal myeloma cells. Myeloma cells multiply and crowd out healthy blood cells. When your body has fewer healthy blood cells, symptoms and organ damage can occur.

Normal cells in bone marrow



Myeloma cells in bone marrow



How this guide can help you

Making decisions about cancer care is stressful. There's a lot to learn, and you don't know what the future holds.

Use this guide to get the information and support you need.

Patients, doctors, and other health care professionals trust the NCCN Guidelines for Patients. This guide uses clear, everyday language to explain current cancer care recommendations made by respected experts in the field. Their recommendations are based on the latest research and practices at leading cancer centers.

Your health is unique to you, so your cancer care should be, too. As you read this guide, you'll learn which treatments are likely to provide the best results for you. And you'll be better prepared to talk with your care team.

What causes multiple myeloma?

Experts don't know exactly what causes myeloma cells to form. But they do know that myeloma often starts with an abnormality (mutation) in certain cells called plasma cells.

Plasma cells are a type of white blood cell that fights infection and disease. Plasma cells do this by making antibodies (also called immunoglobulins, shortened to Ig). Antibodies help your body find and kill germs. They're Y-shaped proteins that the plasma cells release into the blood and other body fluids.

Most plasma cells produce antibodies for a few months and then grow old and die—a normal and natural process. But some plasma cells can exist for years or even decades, providing life-long protection against individual infections.

Yet at some point in this process, an abnormal change (mutation) can occur that turns a plasma cell into a myeloma cell.

This myeloma cell can multiply and make millions of new identical myeloma cells, which aren't needed and don't die quickly when old or damaged.

The cancerous myeloma cells grow throughout the bone marrow and sometimes spread outside of the bone marrow.

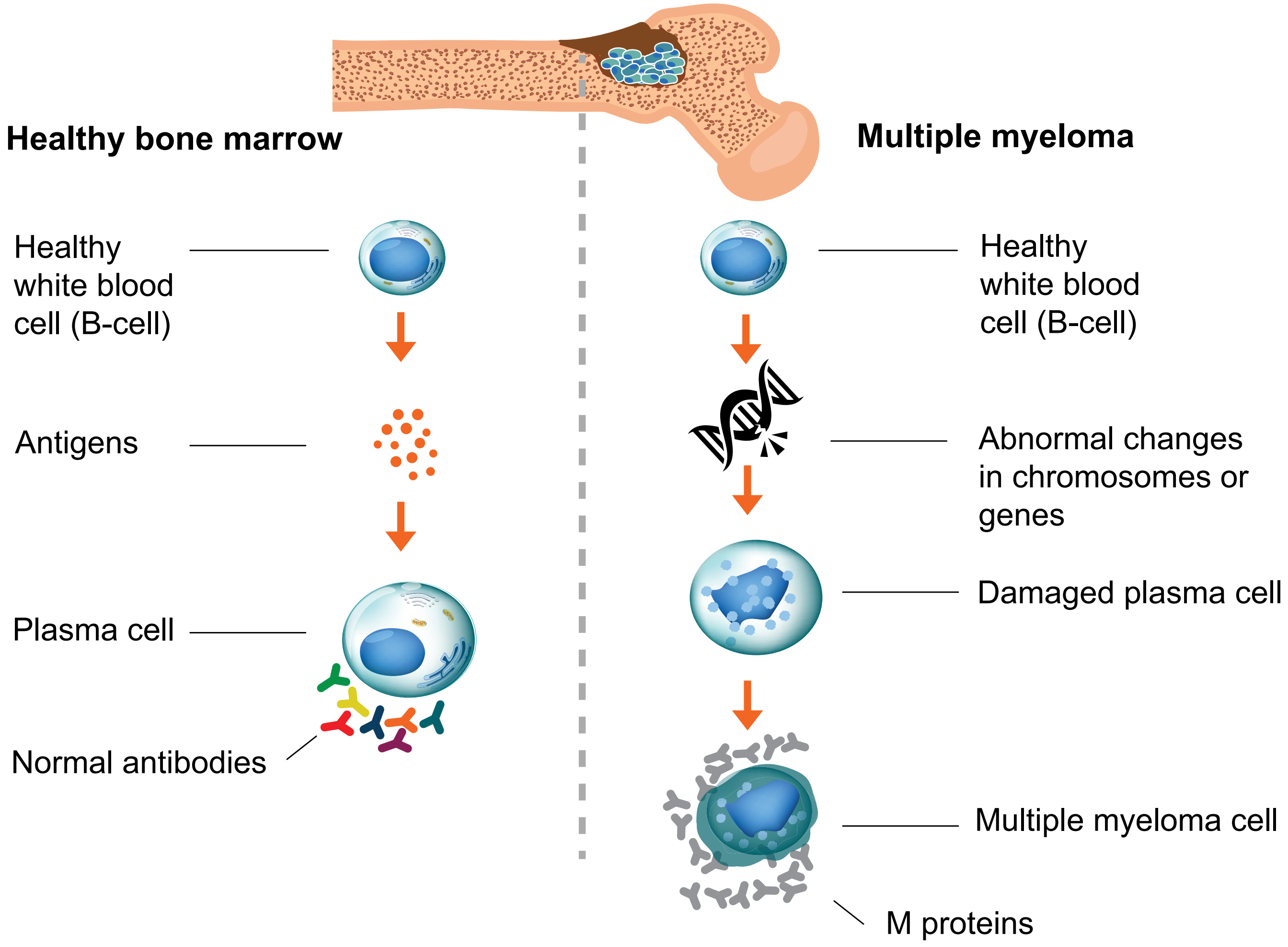
Myeloma cells, like plasma cells, also make antibodies. But the antibodies made by myeloma cells are all copies of a single type. These antibodies are called monoclonal proteins, or M proteins. (The term monoclonal means "one clone" or "one type").

Unlike normal germ-fighting antibodies, M proteins don't help get rid of infections. In fact, your body can't use M proteins for anything and can't easily get rid of them. So they pile up.

Too many M proteins in your body can lead to problems like damage to the kidneys or too few red blood cells (anemia). In addition, people with myeloma don't make enough normal antibodies, which raises their risk for infections.

Where do myeloma cells come from?

When antigens (such as germs) invade the body, healthy white blood cells called plasma cells release germ-fighting antibodies to stop infection and disease. But in multiple myeloma, one or more abnormal changes can cause plasma cells to become multiple myeloma cells. Multiple myeloma cells can multiply and spread rapidly. They also produce a lot of the same abnormal antibody, called monoclonal (M) proteins, which can build up in the bone marrow and cause damage.



The mutations that increase the risk of myeloma aren't typically passed down in families (hereditary). But you may have a slightly higher risk for myeloma if another family member also had myeloma.

How is multiple myeloma treated?

Standard treatments for multiple myeloma include targeted therapy drugs, immunotherapy drugs, chemotherapy treatment, and hematopoietic cell (stem cell) transplant.

Some treatments may be given as a combination of pills, injections under the skin, or an infusion through an IV (intravenous line).

Additional treatments include chimeric antigen receptor (CAR) T-cell therapy and bispecific antibody drugs. Or you may be asked to take part in a clinical trial, which can be a good option.

For many people, treatment can keep myeloma under control and reduce or stop symptoms for a long period of time.

However, myeloma usually comes back at some point and requires additional treatment. People with longstanding multiple myeloma can eventually become resistant to therapies, which makes the cancer more difficult to treat and more dangerous.

Consider going to a cancer specialist, cancer center, or hospital with a program or experience in treating people with multiple myeloma.

But new treatments have resulted in more long-term survivors of myeloma now than ever before. For an increasing number of people, myeloma is a chronic medical problem they learn to live with, not a disease that they die from.

How can I get the best care?

Advocate for yourself. You have an important role to play in your care. Many people feel more satisfied when they actively take part in planning their cancer care.

The NCCN Guidelines for Patients will help you play a larger role in your care. Discuss the recommendations in this guide with your care team. Ask questions about your options and share your goals and concerns.

Don't know what to ask? You're not alone. That's why we include suggested questions to ask at the end of chapters.

Keep reading to find the best care for you.

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Testing for multiple myeloma

If your doctor suspects you have myeloma, you'll need several tests before you receive treatment. These tests help figure out whether you need treatment and which treatment is best for you.

This chapter describes the tests you may have to diagnose your disease and plan your treatment.

What tests will I need?

Some tests check your general health. Other tests are for diagnosing your illness, which will help plan your treatment. Not every person with myeloma will receive every test listed here. See **Guide 1**.

Medical history

Your medical history includes all the health events in your life and any medications you've taken. A medical history is needed for planning your treatment. You'll be asked about any illnesses, injuries, and health problems you've had. Some health problems run in families. So your doctor may also ask about the health of your biological relatives (grandparents, parents, siblings, children).

Myeloma often causes symptoms, and it's important that your doctor knows if you have them. Symptoms may result from a shortage of healthy blood cells. Or they may result from damage to the bones and kidneys, or from myeloma cells collecting in certain parts of the body.

Guide 1
Common tests for multiple myeloma

General health tests

- Medical history
- Physical exam

Blood tests

- Complete blood count with differential
- Immunoglobulin levels
- M proteins in blood
- Free light chain assay
- Complete blood chemistry test

Urine tests

- Total protein in urine
- M proteins and light chains in urine

Bone tissue tests

- Bone marrow biopsy and aspiration
- Other tissue biopsy
- Lab tests for abnormal changes in chromosomes and genes

Imaging tests

- PET/CT scan
- Low-dose CT scan
- Bone survey
- MRI scan

Other tests used in certain cases

The most common symptoms of multiple myeloma are bone pain (often in the back), fatigue, and frequent infections. However, some people may have few or no symptoms at all.

Physical exam

Doctors typically perform a physical exam along with taking a medical history. A physical exam is a “hands on” review of your body for signs of disease.

During this exam, your doctor or another clinician will listen to your lungs, heart, and abdomen. They’ll feel and apply pressure to parts of your body to see if organs are of normal size, are soft or hard, or cause pain when touched. They’ll look for signs of other problems such as bruising, swollen glands, muscle weakness, or numbness/tingling/pain in your hands or feet (neuropathy). They’ll also check for swelling in your legs and feet.

Your doctor or another clinician will also consider your age and fitness level. Older people (aged 75 and over) and those with physical limitations or complex medical issues may do better with fewer or lower dose medicines.

Blood tests

Your blood can tell doctors a lot about your health. Blood tests and other tests help confirm (diagnose) myeloma.

Blood is made up of 4 main parts—red blood cells, white blood cells, platelets, and plasma. Plasma is the yellowish liquid part of blood that carries the other parts through the body. Plasma also contains many proteins and other chemicals. Different types of blood tests are used to measure these cells and substances in the blood.

Common symptoms of multiple myeloma

Bone damage and pain

Fatigue and weakness

Frequent infections and fever

Bruising or bleeding easily

Thirst and frequent urination

Some blood tests are used to assess the extent or amount of cancer in your body. This is referred to as the tumor burden. Other tests are used to check the health of your bones, kidneys, and other organs. Blood tests will be repeated to find out how well cancer treatment is working and to check for side effects.

For a blood test, a needle is inserted into your vein to remove a sample of blood. The blood sample is then sent to a lab for testing. At the lab, a specialist called a pathologist will look at the blood sample under a microscope and test it to check the levels of certain chemicals in your blood.

Pathologists are experts in examining cells for disease. They may be able to observe myeloma cells and detect myeloma proteins in the blood.

Blood tests used for myeloma include:

CBC with differential

A complete blood count (CBC) is a test that measures the number of blood cells in a blood sample. It includes the number of white blood cells, red blood cells, and platelets. The CBC should include a differential. The differential measures the different types of white blood cells in the sample. Most of the time, myeloma cells aren’t seen in the blood.

Immunoglobulin levels

This test measures the amount of antibodies (IgA, IgG, IgM, and sometimes IgD and IgE) in the blood. It shows if the level of any type of antibody is too high or too low. Abnormal levels of antibodies could indicate multiple myeloma.

M proteins in blood

You’ll have 2 tests to check the M proteins in your blood:

Serum protein electrophoresis (SPEP) measures the **amount of M proteins** in the blood. This test is used for both diagnosis and monitoring.

Serum immunofixation electrophoresis (SIFE) identifies which **type of M proteins** are in the blood. It finds the type by showing which forms of heavy chains (IgG, IgA, etc) and light chains (kappa or lambda) are present.

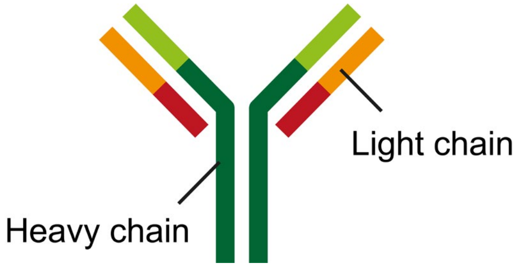
Free light chain assay

This test measures the amount of free light chains in the blood. It's useful for diagnosing myeloma in certain cases where myeloma cells produce only light chains (light chain myeloma). Free light chain assay is also used for monitoring myeloma.

Blood chemical test

A blood chemical test (called a comprehensive metabolic panel) measures the levels of different chemicals in your blood. Chemicals in your blood come from your liver, bone, and other organs and tissues. Abnormal levels of certain chemicals in the blood may be a sign that an organ isn’t working well. These abnormal levels can be caused by cancer or other health problems.

What are antibodies?



Understanding antibodies can help you understand your multiple myeloma diagnosis.

Antibodies (also called immunoglobulins, or Ig) are part of the immune system. They're made by plasma cells to fight infection. Antibodies identify harmful bacteria and viruses, and help the immune system to get rid of them.

Each plasma cell releases only 1 unique type of antibody. And each type of antibody is custom made to attack a specific germ causing an infection or illness.

Antibodies are made up of 2 pairs of protein "chains" that are bound together in a Y shape. This includes 2 identical "heavy" protein chains and 2 identical "light" protein chains.

- **Heavy chains** – There are 5 main types of heavy chains: IgG, IgA, IgM, IgD, and IgE (although IgD and IgE are rare in myeloma).
- **Light chains** – There are 2 main types of light chains: kappa and lambda.

The different types of heavy chains can bond with either type of light chain. Together, they form antibody subtypes such as IgG kappa, IgG lambda, IgA kappa, IgA lambda, and so forth. For example:

IgG heavy chain + **kappa** light chain =
IgG kappa subtype

Myeloma cells also make antibodies, called M proteins. Like normal antibodies, M proteins can be made up of a pair of heavy chains and a pair of light chains. Myeloma cells make very large numbers of M proteins, which are usually all of one subtype. (The most common is IgG kappa.)

In addition to M proteins, some people have extra light chains circulating in their blood. These are called free light chains. Some people have myeloma that only produces free light chains, which raises their risk for kidney damage and other complications.

Knowing your M protein subtype will help you to better understand your test results. You can follow your M protein and free light chain levels to see if they're decreasing, stable, or increasing, which reflects the response to your treatment.

Urine tests

Besides blood, urine also reveals signs of disease. Urine tests can be used to diagnose myeloma, assess if your kidneys are working well, and check the results of cancer treatments. Urine tests are also used to assess the tumor burden—the extent or amount of myeloma in your body.

Total protein in urine

Total protein is a test that measures the total amount and type of protein in your urine. For this test, urine is typically collected over a 24-hour period. Testing urine for protein helps to measure the tumor burden in people with myeloma. This test can also show if you're losing albumin, an important protein, through your kidneys.

M proteins and light chains in urine

Urine protein electrophoresis (UPEP) measures the **amount of M proteins and light chains** in urine. Finding these proteins in urine can be a sign of multiple myeloma. High levels of light chains in the urine indicate a greater risk for kidney damage in people with myeloma. The UPEP test may be repeated after treatment to check how your treatment is working.

Urine immunofixation electrophoresis (UIFE) is a test that identifies the **type of M proteins** present in urine. UIFE is done along with other initial tests when myeloma is first found. UIFE is also used to check how well your treatment is working.

Multiple myeloma, underrepresented patients, and medical studies

Multiple myeloma is twice as common and twice as likely to lead to death in African American individuals than in white patients. However, when African American patients receive similar care for multiple myeloma as white patients, they have outcomes that are as good or better. The same holds true for Hispanic and Asian patients.

Due to many factors, African American, Hispanic, and Asian patients—as well as all patients over 75 years old—are less likely to participate or be enrolled in clinical trials of new treatments. As a result, the findings from medical studies may not be applicable to all patients.

In order to reduce or eliminate health disparities, NCCN experts recommend that clinical trials should be more inclusive and reflect the populations who are most affected.

Find out more about how you can get involved in clinical trials in *Chapter 3: Types of treatment*.

Tissue tests for myeloma

To confirm you have myeloma, a sample of tissue or fluid must be removed from your body and tested for myeloma cells. This is called a biopsy. A biopsy is generally a safe test and can often be done in about 30 minutes.

Bone marrow biopsy and aspiration

Myeloma cells are often found in the bone marrow, so that's where people with myeloma are biopsied. The sample is usually taken out of the pelvic bone (near the hip), which contains a large amount of bone marrow and is close to the surface of the body.

This is a 2-part test that results in 2 samples. A bone marrow biopsy removes a small core of bone containing the bone marrow. An aspiration removes a small amount of liquid bone marrow from inside the bone.

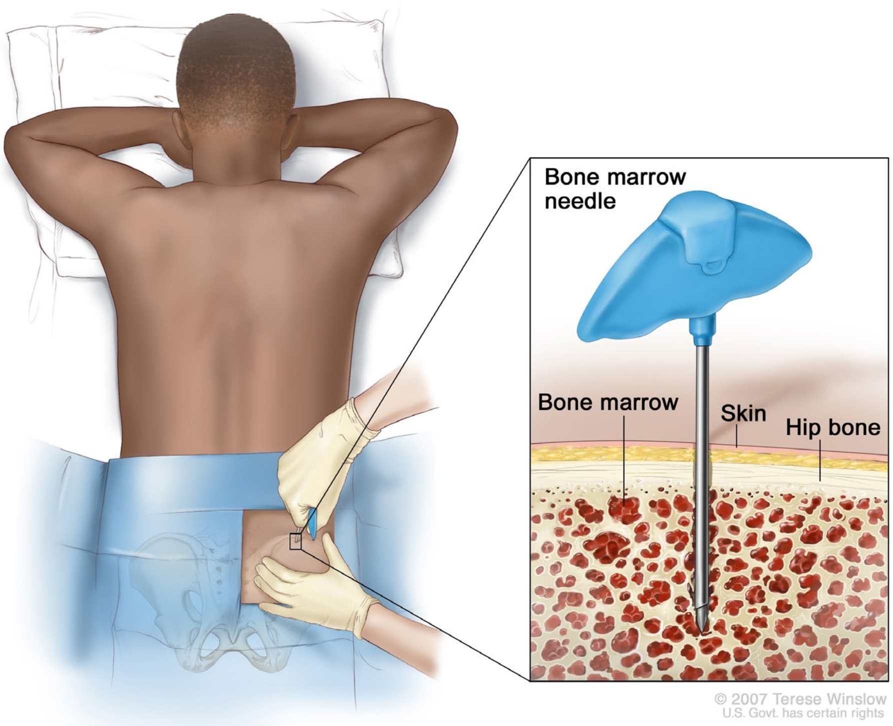
You may be given a light sedative before the test. Your provider will then clean the area of skin where the biopsy will be done. Next, you'll receive local anesthesia to numb the area of skin and bone beneath.

Once numb, a hollow needle will be inserted into your skin and then pushed into the bone to remove the liquid bone marrow with a syringe.

Then the needle will be inserted into the bone to remove the solid bone marrow core sample. You'll notice a feeling of pressure as this is happening and you might feel some pain while the samples are being removed. Afterward,

Bone marrow biopsy and aspiration

Doctors perform a bone marrow biopsy and aspiration to remove samples of solid bone marrow and liquid bone marrow for testing. These samples are usually removed at the same time from the hip bone.



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your skin may be bruised for a few days. There's a small risk of bleeding or infection, but these side effects aren't common.

Other tissue biopsies

Although the bone marrow is the most likely place to find myeloma cells, sometimes myeloma tumors (called plasmacytomas) can grow outside the bones and invade other parts of the body. In such cases, biopsies may be taken from other suspected organs or sites to confirm myeloma.

Lab tests

After the biopsied tissue samples are collected, they'll be sent to a lab for testing. A pathologist will view the samples under a microscope to look for myeloma cells. The pathologist may also perform other tests on the samples. It often takes several days before the test results are known.

The lab tests that may be performed on the tissue samples are:

Immunohistochemistry

This test is used to identify the number and the type of myeloma cells in the bone marrow. A diagnosis of myeloma can be made when at least 10% of cells (1 out of every 10 cells) in the bone marrow sample are abnormal plasma cells.

Flow cytometry

This test can identify abnormal plasma cells in the bone marrow by detecting certain characteristic proteins on the outer surface of the cells. Flow cytometry isn't always done at diagnosis—it might be done after treatment to check for traces of myeloma.

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> **Be your own advocate. Ask a lot of questions, even the ones you're afraid to ask. You have to ensure you make the best decisions for your particular situation."**

FISH

Fluorescence in situ hybridization (FISH) testing looks for abnormal changes in the chromosomes of myeloma cells.

Chromosomes are long strands of genes inside each cell that carry DNA—the body's “instruction manual.” Identifying abnormal genetic changes in chromosomes can help your treatment team better understand your diagnosis and prognosis, and more precisely plan your treatment.

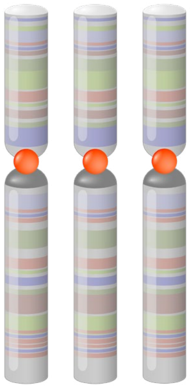
Abnormal genetic changes include deletions and additions to chromosomes, as well as translocations (swapping) of parts between chromosomes. These changes can disrupt genetic functions that can affect myeloma cells.

To that end, FISH testing helps determine whether someone's myeloma might be at higher risk for coming back quickly (relapse) or for not getting better while on treatment (progression).

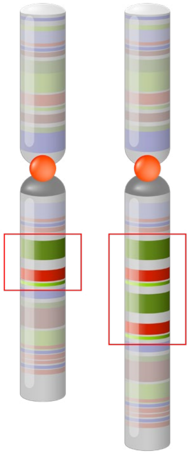
How abnormal changes in chromosomes affect myeloma

Chromosomes are made up of genes that carry DNA, the body's genetic instructions. Abnormal changes in chromosomes can disrupt a gene's function. An abnormality may cause genes to make too many or too few proteins, for example, leading to disease or illness.

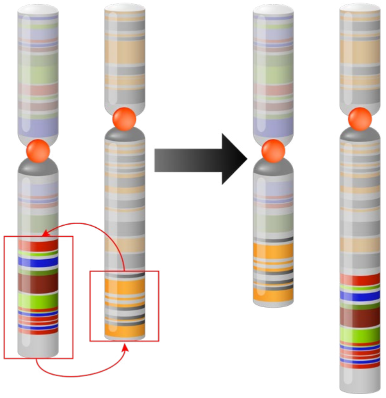
Abnormal changes that are important in multiple myeloma include:



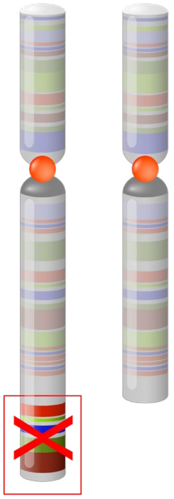
Trisomy
Chromosomes normally come in pairs. Trisomy occurs when an extra copy of a chromosome joins a normal pair, resulting in a set of 3 chromosomes in a myeloma cell. Trisomy is found in about half of all people with multiple myeloma.



Duplication/ amplification
A duplication is when part or all of a chromosome is repeated. An amplification is when those genes are duplicated multiple times. Amplification of a part of chromosome 1 (1q21) may be linked with more aggressive myeloma.



Translocation
A translocation is when part of one chromosome breaks off and switches places with part of another chromosome. For example, a translocation between part of chromosome 4 and part of chromosome 14 is associated with high-risk myeloma.



Deletion
A deletion is a loss of part of a chromosome. For example, a deletion of all or part of chromosome 17p may indicate more aggressive myeloma.

High risk is associated with having any of the following abnormal changes. Very high risk is associated with having 2 or more of these changes:

- Extra copies (duplication/amplification) or deletion of parts of chromosome 1
- Deletion of part or all of chromosome 17
- Mutations in chromosome 17
- Translocation between parts of chromosomes 4 and 14
- Translocation between parts of chromosomes 14 and 16
- Translocation between parts of chromosomes 14 and 20
- Translocation within the *MYC* gene
- High level of beta-2-microglobulin

Genetic testing

Genetic testing uses a DNA sample from your bone marrow biopsy to check for mutations in certain genes that are linked to multiple myeloma. Specifically, a mutation in the *TP53* gene is associated with multiple myeloma that grows faster, is harder to treat, and relapses earlier.

Imaging tests

Imaging tests take pictures (images) of the inside of your body. The images can show the size, location, and other features of myeloma in your bones.

Because myeloma cells may develop inside any bone in your body, it's important that your whole body be scanned in order not to miss the diagnosis. After diagnosis, imaging can also show how well your treatment is working or if the myeloma is growing.

PET/CT scan

Imaging instruments, like this PET/CT scanner, can show what's going on inside your body. During the scan, you'll lie on a table that moves into the tunnel of the machine. The scan can detect even small amounts of cancer.

Types of whole-body imaging scans include PET/CT, low-dose CT, x-ray, and MRI:

PET/CT scan

PET and CT are two types of imaging tests. These tests are often done at the same time. When used together, it's called a PET/CT scan. A PET/MRI is also possible.

A whole-body PET/CT scan is very good at showing where active myeloma is located in the body, both in the bones and elsewhere. And the CT part of PET/CT can help show bone damage from myeloma. Since bone lesions are common in people with multiple myeloma, an imaging test such as PET/CT scan is strongly recommended.

To create images, a radiotracer first needs to be injected into your body through a vein. The radiotracer is absorbed by body tissues and metabolized, releasing a small amount of energy that's detected by the PET scanner. The radiotracer makes myeloma cells appear brighter than other body parts in the images. The most commonly used radiotracer is called FDG. NCCN experts recommend using FDG for PET/CT scans for multiple myeloma.

FDG is a substance similar to glucose (sugar). If you have diabetes, the scan can't be done if your blood sugar is too high.

Low-dose CT scan

CT takes many pictures of a body part from different angles using x-rays. A computer combines all the pictures to make a series of cross-sectional images. The amount of radiation used for this type of scan is much lower than standard doses of a CT scan.

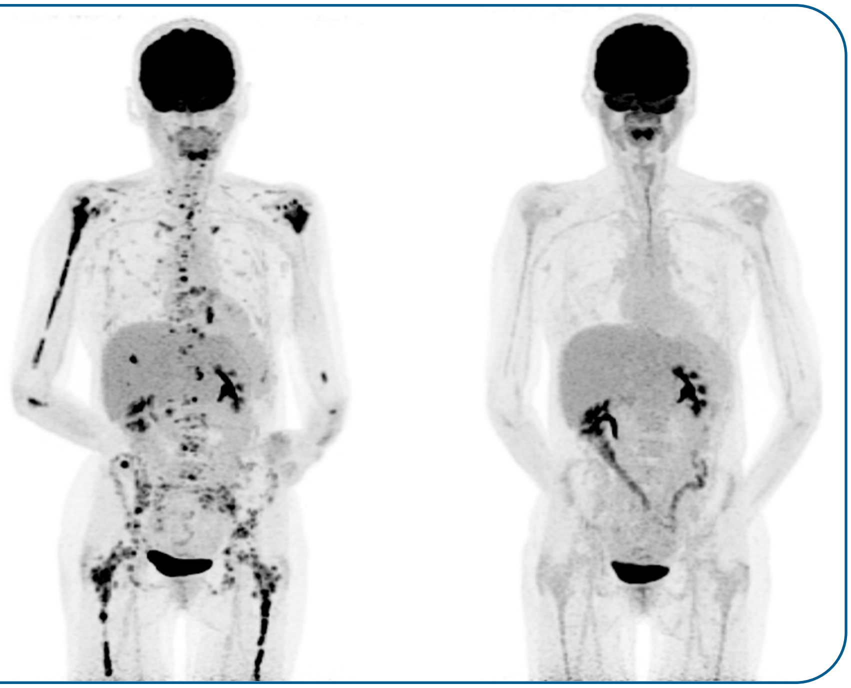
A whole-body low-dose CT scan may be used to check the whole body for lytic bone lesions. Lytic bone lesions look as if the bone has holes in it. These lesions may cause pain, weaken the bones, and lead to cracks and fractures.

PET scans

PET scans highlight areas of the body that have busy cellular activity, like the brain, kidneys, and bladder. Cancer cells are also very active and are highlighted on PET scans, too.

This PET scan (left) shows a patient with many areas of myeloma in the bones. After CAR T-cell therapy, the areas affected by myeloma are nearly eliminated (right).

Image: National Cancer Institute



Bone survey

A bone survey uses x-rays to take pictures of your entire skeleton to look for broken or damaged bones.

Bone surveys have mostly been replaced by PET/CT or whole-body low-dose CT scans, which show bone lesions much better than regular x-rays. However, whole-body x-rays may still be done at some medical centers if other imaging tests aren't available.

MRI scan

MRI uses radio waves and powerful magnets to take pictures of the inside of the body. It makes images of bone and bone marrow. This type of scan may show abnormal areas where myeloma cells have replaced bone marrow.

MRI is particularly useful for telling the difference between multiple myeloma and smoldering myeloma, and for looking at soft tissues in the body. It's also used to distinguish between bone fractures due to myeloma and those due to osteoporosis.

"Myeloma is a cancer for which we have dozens of available treatment options. If we partner with skilled myeloma specialists to make intelligent treatment decisions, we can expect to live many years of quality life."

Other tests used in certain cases

Not everyone requires every test. These tests are only used in certain circumstances:

Blood viscosity

Blood viscosity is a test that measures the thickness of your blood. Having a lot of M proteins in your blood can make your blood very thick—a rare condition called hyperviscosity. Hyperviscosity is associated with myeloma that produces a higher number of immunoglobulins.

Hyperviscosity can lead to neurological symptoms, headaches, vision problems, shortness of breath, bleeding, and damage to your kidneys and other organs.

Echocardiogram

An echocardiogram is an ultrasound of the heart. This test is used to view the structure of your heart and check how well it's pumping blood. An echocardiogram is sometimes used because multiple myeloma and some of its treatments can affect heart function in some people.

Light chain amyloidosis biopsy

Light chain amyloid (or AL amyloid) is a rare protein found in people with abnormal plasma cells that make abnormally folded light chains. AL amyloid can collect and build up in tissues and organs throughout the body. The buildup of AL amyloid proteins, called AL amyloidosis, can damage organs, especially the heart and kidneys.

Tests for AL amyloidosis can be done on a sample of bone marrow, the fat pad (fat from just under the skin of the belly), or an organ that is likely to have amyloid deposits in it.

Key points

- Cancer tests are used to make a diagnosis, plan treatment, and check how well treatment is working.
- Blood and urine tests check for signs of disease.
- Samples of tissue and fluid from the bone marrow are tested to confirm myeloma.
- Myeloma cells may exist inside any bone in your body, so imaging is used to scan your whole body for signs of the disease.

Questions to ask

- Where do I go to get tested? How long will the tests take? Will any of the tests hurt?
- How often are these tests wrong?
- How soon will I know the results and who will explain them to me?
- Will my biopsy tissue be saved for further testing? Can I have it sent to another facility for additional testing?
- How can I get a second opinion?

What's next?

After all these tests, your doctor will talk to you and explain your diagnosis and discuss your treatment plan. You may want to ask another doctor who's an expert in myeloma to review your test results and treatment plan. This is called getting a second opinion.

The next chapter provides an overview of the many different treatment options for multiple myeloma.

3

Types of treatment for multiple myeloma

Your care team may recommend drug therapy as your first treatment followed by a hematopoietic cell transplant. You and your team will work together to figure out the best treatment for you.

This chapter explains many of the treatments available for multiple myeloma. You'll likely receive several different treatments. See **Guide 2**.

Another way to receive treatment is by participating in a clinical trial, which can provide access to newer treatment options and an opportunity to contribute to scientific research.

You'll also receive treatment to help relieve the symptoms of myeloma and the side effects of myeloma therapy.

Know that many types of treatment are available. So if one therapy doesn't work for you, you can try a different one. However, no one with myeloma will receive every treatment described in this chapter.

Guide 2 Common treatments for multiple myeloma
Multi-drug therapy
Hematopoietic cell (stem cell) transplant
Supportive care (available with any treatment)

Multi-drug therapy

The first treatment given for multiple myeloma often involves a combination of up to 4 medications, sometimes called quadruplet therapy. Some people who are in poor health may start with a 2- or 3-drug treatment and step up to a 4-drug treatment as they improve.

Multi-drug therapy typically includes:

- A targeted therapy
- An immunomodulator
- A monoclonal antibody
- A corticosteroid

These aren't the only medications for multiple myeloma, though. Different types of therapies treat myeloma in different ways. See **Guide 3**. You may be given a chemotherapy drug instead of an immunomodulator, for example.

All treatments listed in this guide are recommended and appropriate. When helpful, NCCN experts also assign a level of preference to their recommendations for systemic (whole-body) drug therapies:

- **Preferred therapies** have the most evidence that they may work better and be safer than other therapies.
- **Other recommended therapies** can provide effective results but may have less evidence, more side effects, or may not work quite as well as preferred therapies.
- **Therapies used in certain cases** work best for individuals with specific cancer features or health circumstances.

Guide 3
Medications for multiple myeloma

Generic name	Brand name	Type of treatment
Bortezomib	Velcade	proteasome inhibitor
Carfilzomib	Kyprolis	proteasome inhibitor
Ixazomib	Ninlaro	proteasome inhibitor
Daratumumab	Darzalex	monoclonal antibody
Daratumumab, hyaluronidase-fihj	Darzalex Faspro	monoclonal antibody
Elotuzumab	Empliciti	monoclonal antibody
Isatuximab-irfc	Sarclisa	monoclonal antibody
Lenalidomide	Revlimid	immunomodulator
Pomalidomide	Pomalyst	immunomodulator
Thalidomide	Thalomid	immunomodulator
Dexamethasone	Decadron	steroid
Bendamustine	Bendeka	chemotherapy
Cisplatin	Platinol	chemotherapy
Cyclophosphamide	Cytoxan	chemotherapy
Doxorubicin hydrochloride	Adriamycin	chemotherapy
Doxorubicin hydrochloride liposome	Doxil	chemotherapy
Etoposide	Etopophos	chemotherapy
Ciltacabtagene autoleucel	Carvykti	CAR T-cell therapy
Idecabtagene vicleucel	Abecma	CAR T-cell therapy
Belantamab mafodotin-blmf	Blenrep	antibody-drug conjugate
Venetoclax	Venclexta	small molecule inhibitor
Selinexor	Xpovio	nuclear export inhibitor
Elranatamab-bcmm	Elrexfio	bispecific antibody
Linvoseltamab-gcpt	Lynozyfic	bispecific antibody
Talquetamab-tgvs	Talvey	bispecific antibody
Teclistamab-cqyv	Tecvayli	bispecific antibody

No matter what the drug combination is, the goal is to control disease and improve symptoms.

After multi-drug therapy, you may have a hematopoietic cell (stem cell) transplant or another therapy. Not every person with myeloma will have a stem cell transplant, though.

Here's a look at the different types of medications used for multi-drug therapy, starting with targeted therapy:

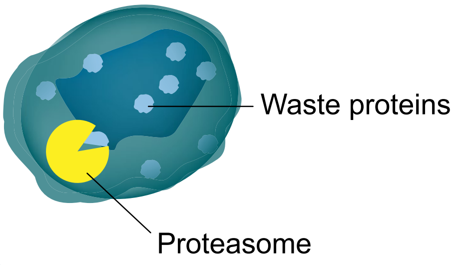
Targeted therapy

Targeted therapy drugs identify specific features of cancer cells to find and attack them. The most common targeted therapy options to treat myeloma are proteasome inhibitors and antibody drugs, but a variety of medications are available:

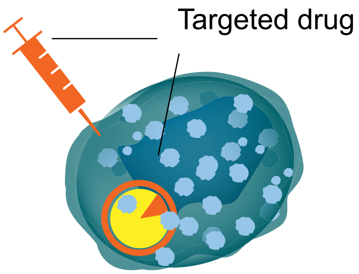
- **Proteasome inhibitors** protect a protein that blocks proteasomes, which are mechanisms that help myeloma cells survive and grow.
- **Monoclonal antibodies** are artificial antibodies that attach to proteins on cancer cells. Monoclonal antibodies invite other immune cells to attack cancer cells.
- **Small molecule inhibitors** are drugs whose molecules are so small that they can penetrate inside cancer cells. Once inside, the drug latches onto proteins or other molecules and prevents them from working, causing the cancer cell to break down. This drug is only used when myeloma has returned (relapsed) or is resistant (refractory). Refractory means it won't go away with current treatment.

How targeted therapy works: One example

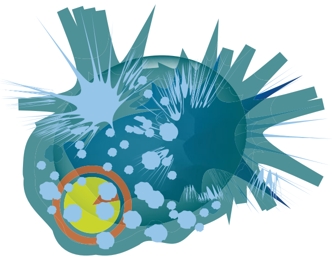
Targeted therapy drugs work in different ways. One way is by blocking a process that keeps the myeloma cell alive. One such process: Proteasomes that clear out waste proteins in myeloma cells.



A targeted drug can block proteasomes from carrying out this process. If the proteasomes are halted, then the waste proteins build up inside the cells.



Eventually, the myeloma cells become overloaded with waste proteins and self-destruct.



- **Nuclear export inhibitors** prevent proteins from leaving the nucleus of cancer cells, which stops the cancer cells from functioning. This drug also is only used for relapsed or resistant multiple myeloma.
- **Bispecific antibodies** are drugs that seek 2 targets. A bispecific antibody can attach to both a T cell and a myeloma cell. This brings the cells together so that the T cell can directly attack and destroy the myeloma cell. Bispecific antibodies currently aren't available until after you've had other therapies first.
- **Antibody drug conjugates** combine 2 drugs in 1 medicine. The first drug is a monoclonal antibody that finds and binds to myeloma cells. The second drug submerges into the myeloma cells, where it destroys the cells from the inside out. Antibody drug conjugates can only be used for relapsed or resistant multiple myeloma.

Side effects of targeted therapy

A side effect is an unhealthy or unpleasant physical or mental condition caused by treatment. Any treatment for myeloma can cause side effects.

Side effects can depend on the drug and the dose. Some people have many side effects while others have few. Some side effects can be very serious while others can be unpleasant but not serious.

Most side effects appear soon after treatment starts and go away after treatment ends. Other side effects are long-term or may appear years later.

Common side effects of targeted therapy medications include fatigue, drowsiness, weakness, headache, chills, loss of appetite, nausea, vomiting, diarrhea, constipation, and fatigue. Some of these medications can also lower the level of important minerals and electrolytes in the body.

Targeted therapy drugs may also reduce the number of red blood cells, white blood cells, or platelets in your body. A low white blood cell count can lower immunity and increase the risk of infection. A low platelet count can increase the risk of bruising and bleeding.

Other common side effects are blood clots, shortness of breath, skin rash, common cold, muscle aches, heart issues, and numbness or tingling in the hands or feet (called peripheral neuropathy).

Not all side effects of different targeted therapies are listed here. Ask your treatment team for a complete list of common and rare side effects.

If a side effect bothers you, tell someone on your treatment team. There may be ways to help you feel better. There are also ways to prevent some side effects.

Immunomodulators

Immunomodulatory drugs, often called immunomodulators, treat multiple myeloma in a few different ways.

Immunomodulators can:

- Target specific proteins within myeloma cells causing them to die.
- Stop the growth of myeloma tumors by cutting off their blood supply.
- Boost the body's immune response so it's better at finding and killing myeloma cells.

Immunomodulators are oral drugs that are often prescribed for many months or even years.

Side effects of immunomodulators

Different immunomodulators cause different side effects. These include drowsiness, fatigue, constipation, diarrhea, rash, low blood cell counts, serious blood clots, and peripheral neuropathy.

Immunomodulators can also lead to birth defects, so avoid becoming pregnant, volunteering to be a sperm donor, or getting someone pregnant while using them.

Steroids

Corticosteroids (often just called steroids) are used to relieve swelling and inflammation. Some steroids also have anti-cancer effects. Steroids are often used with chemotherapy, targeted therapy, or both to treat myeloma. Steroids may be given as a pill, a liquid, or an IV injection.

Side effects of steroids

Common side effects of steroids are feeling hungry, trouble sleeping, slow wound healing, upset stomach, muscle weakness, weight gain, and swelling in the ankles, feet, and hands. Steroids may also significantly increase blood sugar levels. Changes in mood can happen from day to day.

When used for a long time, steroids can lead to weakening of bones, thinning of skin, bruising, and increased risk of diabetes, cataracts, ulcers, and infections.

Most side effects of steroids go away after you stop taking them.

Chemotherapy

Chemotherapy (or chemo) is a drug therapy that kills fast-growing cells throughout the body. Cancer cells are fast-growing cells, but some normal cells are fast-growing too.

Different types of chemotherapy drugs work in different ways to kill cancer cells or stop new ones from being made. Many chemotherapy drugs are liquids that are slowly injected into a vein (IV infusion) or underneath the skin (subcutaneous). Some are pills that are swallowed. The drugs travel in the bloodstream to treat cancer throughout the body.

Chemotherapy is given in cycles. Each cycle has days of treatment followed by days of rest. This allows the body to recover before the next treatment cycle. Cycles vary in length depending on which drugs are used. Often, the cycles are 14, 21, or 28 days long. The number of treatment days per cycle and the total number of cycles given also vary based on the chemotherapy used and your overall treatment plan.

Side effects of chemotherapy

Like other therapies, the side effects of chemotherapy depend on many factors. These include the drug, the dose, and the person.

Different myeloma treatments cause different side effects. Some side effects are more common than others. But not all patients have the same side effects from the same drug.

In general, side effects of chemotherapy are caused by the drug attacking normal cells, particularly in places where normal cells are fast growing like in the bone marrow and the intestinal tract.

Some chemotherapies used to treat myeloma may cause nausea, vomiting, diarrhea, mouth sores, loss of appetite, hair loss, and low blood cell counts. Feeling very tired (fatigue) or weak is also common.

Not all side effects of chemotherapy are listed here. Be sure to ask your treatment team for a complete list of common and rare side effects for the medications you'll be receiving.

If a side effect bothers you, tell your treatment team. There may be ways to help you feel better. There are also ways to prevent some side effects. Your doctor can also adjust the

Myeloma care takes a team

Treating multiple myeloma takes a team approach. Your team should communicate and work together to bring the best knowledge from each specialty. This is called multidisciplinary care.

Your multidisciplinary team is made up of a number of cancer specialists and care providers. These include:

A medical oncologist treats cancer using drug therapies such as chemotherapy and immunotherapy. A medical oncologist will often coordinate your care with other team members. If not, ask who will coordinate your care.

A radiation oncologist prescribes and plans radiation therapy.

An interventional radiologist uses image-guided tools to perform minimally invasive techniques to diagnose or treat disease.

A diagnostic radiologist reads the results of PET/CT scans and other imaging tests.

An orthopedic surgeon treats fractures in the vertebrae and other bones.

Your primary care doctor handles medical care not related to your cancer. Your primary doctor can help you express your thoughts about treatments to your cancer care team.

treatment plan to meet your specific needs and physical reactions.

Hematopoietic cell transplant

Cancer and its treatment—especially when used in high doses—can damage and destroy cells in the bone marrow. A hematopoietic cell transplant replaces the damaged or destroyed cells with healthy blood stem cells. It's also called a stem cell or bone marrow transplant.

The healthy blood stem cells typically come from the patient's own blood. A blood stem cell is a special kind of cell that can develop into any type of blood cell. After a stem cell transplant, the healthy blood stem cells grow new blood cells and bone marrow.

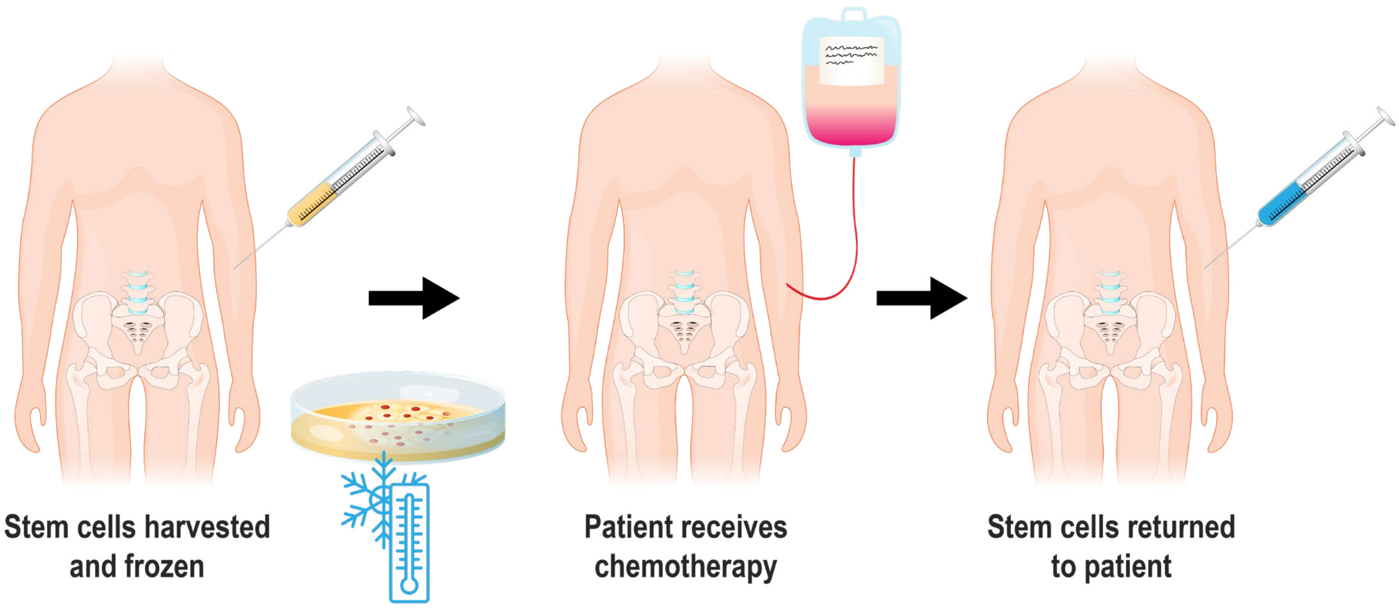
Stem cell transplants are a common treatment for multiple myeloma, but they're not for everyone. A hematopoietic cell transplant is an intense treatment. The transplant process can take several weeks, and recovery spans several months.

How a hematopoietic cell transplant is done

First, you'll receive injections that will boost the amount of blood stem cells in your body. Then the blood stem cells are removed (harvested) from your blood.

Second, the harvested blood stem cells are concentrated and frozen for preservation. Meanwhile, you'll receive high-dose chemotherapy to destroy any myeloma cells in the bone marrow.

Lastly, the blood stem cells are returned (reinfused) to your body, where they'll grow healthy new blood cells in the bone marrow.



Your treatment team will consider many factors when deciding if you can benefit from this procedure. Some of these factors include your fitness level, health status, vital organ function, cancer stage, previous treatments, other medical conditions, available supportive care, and additional factors—including your goals and wishes.

Here's a step-by-step description of a hematopoietic cell (stem cell) transplant:

Collecting blood stem cells

The first step is to collect, or harvest, the stem cells in your blood. Beforehand, you'll be given injections (shots) of growth factors that will boost the amount of blood stem cells in your body.

The main procedure is called apheresis, which uses a special machine to collect stem cells from your bloodstream. Your doctor may put a special catheter into a vein to collect the stem cells. Some people require a number of apheresis procedures to obtain enough blood stem cells.

The blood stem cells are often frozen and stored until they're needed. Your doctor or care team may recommend collecting additional cells for a second transplant in the future if your myeloma comes back.

High-dose chemotherapy

The next step is receiving high-dose chemotherapy. Chemotherapy destroys any myeloma cells in your bone marrow. But it also destroys normal cells in your bone marrow. This greatly weakens your immune system, leaving you very vulnerable to infections.

You'll receive antibiotics and take other precautions to avoid infection for the next few weeks. Some centers may ask you to stay in the hospital during this part of the recovery.

Replacing blood stem cells

A day or two after chemotherapy, you'll have a transfusion to put your blood stem cells back into your body. A transfusion is a slow injection into a large vein. This process can take several hours to complete.

The transplanted blood stem cells will quickly travel to your bone marrow and begin to settle in and grow. This is called engraftment. It usually takes about 2 to 4 weeks for your blood cells and bone marrow to return to minimum safe levels.

Until then, you'll have little or no immune defense. It may take a few weeks or months for the blood cells to fully recover so that your immune system is back to normal. While the new blood stem cells grow, you'll be given transfusions of platelets and red blood cells to restore and maintain your blood counts.

At some centers, people can receive a stem cell transplant as an outpatient procedure so they can go home the same day. But they'll still go to the clinic nearly every day for about 2 weeks while recovering.

Side effects of hematopoietic cell transplant

High-dose chemotherapy can result in nausea, vomiting, diarrhea, hair loss, loss of appetite, and mouth sores.

You'll likely feel tired and weak after the transplant and while waiting for the new blood stem cells to grow in the bone marrow. This weak and unpleasant feeling might last for several weeks after you go home, too.

CAR T-cell therapy

Chimeric antigen receptor (CAR) T-cell therapy is a treatment made from T cells, typically your own. A T cell is a type of white blood cell that hunts and destroys cancer cells, infected cells, and other damaged cells.

CAR T-cell therapy is an intense therapy that's only given after you've tried other treatments first. For more information about CAR T-cell therapy, see *Chapter 6: Treatment for progression and relapse*.

Surgery

Surgery is an operation to remove or repair a part of the body. It's rarely used to treat multiple myeloma. But minimally invasive surgical procedures can be used in some cases to fix fractures in bones or stabilize fractures in the vertebrae that may be affecting the spinal cord.

Radiation therapy

Radiation therapy involves a large machine that sends out high-energy rays to a specific area of cancer cells in your body. This either kills the cancer cells or stops new cancer cells from being made.

For myeloma, radiation therapy is most commonly used to treat a painful area of bone damage, a plasmacytoma that's causing pain (palliative treatment), or a bone that may break.

Radiation therapy is also sometimes used as the only treatment for a solitary plasmacytoma (a single mass of myeloma cells).

Radiation that treats the cancer itself requires a series of treatments that takes several weeks. Radiation therapy for pain relief involves daily treatments over several days.

Side effects of radiation therapy

Side effects of radiation therapy depend on the dose, the length of treatment, and what part of the body received the radiation.

Patients who receive a short course of treatment for pain relief may not have any side effects except redness of the skin or slight irritation in the treated area.

Clinical trial

Participating in a clinical trial can be another way to get treatment.

A clinical trial is a type of medical research study. After being developed and tested in a lab, potential new ways of fighting cancer need to be studied in people. If found to be safe and effective in a clinical trial, a drug, device, or treatment approach may be approved by the U.S. Food and Drug Administration (FDA).

Everyone with cancer should carefully consider all of the treatment options available for their cancer type, including standard treatments and clinical trials. Talk to your doctor about whether a clinical trial may make sense for you.

Phases

Most clinical trials focus on treatment and are done in phases.

- **Phase 1** trials study the safety and side effects of an investigational drug or treatment approach.
- **Phase 2** trials study how well the drug or approach works against a specific type of cancer.
- **Phase 3** trials test the drug or approach against a standard treatment. If the results are good, it may be approved by the FDA.
- **Phase 4** trials study the safety and benefit of an FDA-approved treatment

Finding a clinical trial

In the United States

NCCN Cancer Centers
NCCN.org/cancercenters

The National Cancer Institute (NCI)
cancer.gov/about-cancer/treatment/clinical-trials/search

Worldwide

The U.S. National Library of Medicine (NLM)
clinicaltrials.gov/

Need help finding a clinical trial?

NCI's Cancer Information Service (CIS)
1.800.4.CANCER (1.800.422.6237)
cancer.gov/contact

Who can enroll?

It depends on the clinical trial's rules, called eligibility criteria. The rules may be about age, cancer type and stage, treatment history, or general health. They ensure that participants are alike in specific ways and that the trial is as safe as possible for the participants.

Informed consent

Clinical trials are managed by a research team. This group of experts will review the study with you in detail, including its purpose and the risks and benefits of joining.

All of this information is also provided in an informed consent form. Read the form carefully and ask questions before signing it. Take time to discuss it with people you trust. Keep in mind that you can leave and seek treatment outside of the clinical trial at any time.

Will I get a placebo?

Placebos (inactive versions of real medicines) are almost never used alone in cancer clinical trials. It's possible to receive either a placebo with a standard treatment or a new drug with a standard treatment. You'll be informed, verbally and in writing, if a placebo is part of a clinical trial before you enroll.

Are clinical trials free?

There is no fee to enroll in a clinical trial. The study sponsor pays for research-related costs, including the study drug. But you may need to pay for other services, like transportation or childcare, due to extra appointments. During the trial, you will continue to receive standard cancer care. This care is often covered by insurance.

We want your feedback!

**Our goal is to provide helpful and easy-to-understand information on cancer.
Take our survey to let us know what we got right and what we could do better.
NCCN.org/patients/feedback**

Your treatment goals

Everyone's myeloma and life situation are different. Here's a step-by-step self-assessment to help you think about what matters most to you, so you can talk with your doctors and care team about your goals for treatment.

Step 1: Understanding shared decision-making

Your doctor is the expert on myeloma and its treatments. You are the expert on **you**—your body, values, and life priorities. Working together with your doctors and care team helps create a plan that fits both your medical needs and your personal goals. This is called shared decision-making.

Step 2: What matters most to you?

Below are examples of common treatment goals. Check (✓) any that are important to you or add your own in the blank spaces.

Step 3: Questions to ask your care team

Use the questions at the end of each chapter of this guide to begin conversations with your doctors and care team.

Step 4: Review and revisit your goals

Your goals may change over time as your treatment and life circumstances evolve. Revisit this self-assessment regularly and share updates with your care team.

Your health and treatment goals

☐ Get rid of all the myeloma, or as much as possible
☐ Prevent or control symptoms such as pain, fatigue, or nausea
☐ Live as long **and as well** as possible
☐ Prevent the myeloma from returning
☐ Keep treatment side effects manageable
☐ Preserve my ability to have future treatment options (like stem cell transplant)

Your quality of life goals

☐ Maintain my daily activities, work, or education
☐ Spend quality time with my family and friends
☐ Manage the financial cost of treatment
☐ Keep my independence and mobility
☐ Take care of my emotional and mental well-being
☐ Feel informed and involved in every treatment decision

Add your other personal goals or concerns

☐ ______________________________
☐ ______________________________
☐ ______________________________

> **“Without clinical trials, our treatment wouldn’t change. It would always remain the same. Some people refer to clinical trials as receiving tomorrow’s best treatment today.”**

Key points

- There are many types of treatment for myeloma. If one therapy doesn’t work for you, you can try a different one.
- Multi-drug therapy—a combination of several different medications—is typically the first treatment given for multiple myeloma.
- A hematopoietic cell (stem cell) transplant often follows multi-drug therapy.
- A stem cell transplant replaces damaged or diseased cells in the bone marrow with healthy blood stem cells.
- A clinical trial studies an investigational treatment to see how safe it is and how well it works.

Questions to ask

- Are you suggesting treatment options from the NCCN Guidelines, or have you modified the treatment approach in my situation?
- How do my age, overall health, and other factors affect my options?
- Are my chances any better for one option than another? Less time-consuming? Less expensive?
- What side effects am I going to have from these treatments, and how are they going to affect my daily functioning and quality of life?
- Is there a clinical trial that might fit my situation?

What’s next?

This chapter provided an overview of the many treatment options available for multiple myeloma. The next chapter explains primary treatment—the first treatment you’ll receive to try to rid your body of myeloma.

4

Primary treatment for multiple myeloma

The previous chapter discussed the many possible treatment options for multiple myeloma. This chapter explains how the treatment process will begin for you.

Primary treatment is the first treatment used to rid the body of cancer. Primary treatment is different for each of the 3 types of multiple myeloma:

- **Active (or symptomatic) multiple myeloma** causes symptoms and affects organs. Myeloma that's causing symptoms should be treated.
- **Solitary plasmacytoma** consists of a single mass of myeloma cells in bone or soft tissue. It often causes bone pain or fractures. Solitary plasmacytoma requires treatment to the affected area.
- **Smoldering myeloma** isn't active, doesn't cause any symptoms or organ problems, and often doesn't need treatment.

We'll talk first about primary treatment for active multiple myeloma. Later in this chapter we'll discuss treatment for solitary plasmacytoma and smoldering myeloma.

Active multiple myeloma

Active multiple myeloma is when myeloma cells are found in many sites throughout the bone marrow (more than 1 site at least). It's also called symptomatic multiple myeloma because it can cause many symptoms, including bone lesions and organ damage.

Active multiple myeloma needs to be treated. There are many good treatments for active myeloma—and new ones are being developed all the time. Treatment focuses on fighting the cancer as well as relieving symptoms. Your specific treatment will depend on the extent or aggressiveness of the myeloma, your health, your related symptoms, and other considerations.

Your treatment team will first try therapy that has shown the greatest chance of success in people whose myeloma is like yours. This is called primary treatment. If primary treatment doesn't stop or slow the myeloma, you can have additional treatment.

Primary treatment

Primary treatment for active multiple myeloma usually includes several treatments that are given during the same time: multi-drug therapy, bone-building therapy, and supportive care.

- **Multi-drug therapy** is the usual primary treatment to attack and destroy myeloma cells. A combination of 3 or 4 different drugs is common. This combination may include a targeted therapy, an immunomodulator, a monoclonal antibody drug, and a steroid. People who aren't able to take a 3- or 4-drug combination can start with 2 medications.

Guide 4
Common multi-drug combination options for primary treatment

Preferred combinations	
Having a hematopoietic cell transplant	Daratumumab, Lenalidomide, Bortezomib, Dexamethasone
	Isatuximab-irfc, Bortezomib, Lenalidomide, Dexamethasone
Not having a hematopoietic cell transplant	Daratumumab, Lenalidomide, Dexamethasone
	Daratumumab, Bortezomib, Lenalidomide, Dexamethasone
	Isatuximab-irfc, Bortezomib, Lenalidomide, Dexamethasone
Other recommended combinations	
Having a hematopoietic cell transplant	Bortezomib, Lenalidomide, Dexamethasone
	Carfilzomib, Lenalidomide, Dexamethasone
	Daratumumab, Carfilzomib, Lenalidomide, Dexamethasone
	Isatuximab-irfc, Carfilzomib, Lenalidomide, Dexamethasone
Not having a hematopoietic cell transplant	Bortezomib, Lenalidomide, Dexamethasone
	Carfilzomib, Lenalidomide, Dexamethasone
	Isatuximab-Irfc, Lenalidomide, Dexamethasone

- **Bone-building therapy** strengthens bones and protects them from damage, which is very common in people with multiple myeloma. The recommended treatments are bisphosphonates or denosumab. You should have a dental visit before you start any bone-building therapies because they can cause significant side effects in people who have dental risk factors such as a tooth infection, gum disease, or recent oral surgery.
- **Supportive care** can ease the symptoms of myeloma and the side effects of myeloma treatment. Care is based on the symptoms and side effects you have. You may receive radiation therapy to reduce bone pain, for example. Or, if you're taking medications that can cause blood clots, you may be given blood thinners to lower the chances of getting a clot.

Primary treatment, including the choice of drugs and the number of treatment cycles, depends on whether a hematopoietic cell transplant might be part of your treatment plan.

Preferred multi-drug combinations as well as other recommended multi-drug combinations for primary treatment are listed in **Guide 4**.

Testing for hematopoietic cell transplant

Because a hematopoietic cell transplant may be a major part of your treatment plan, testing to find out if you can have the procedure is done soon after you start primary treatment.

The transplant itself, which usually includes high-dose chemotherapy, typically occurs right after completing primary treatment.

Follow-up tests

Follow-up tests let your care team know if primary treatment is working. Many of the tests used for follow-up are the same ones used to diagnose myeloma.

Common follow-up tests include:

- Blood tests such as CBC with differential and metabolic panel
- Free light chain assay
- Tests for immunoglobulins and M proteins in your blood
- Tests for proteins and light chains in your urine
- Whole-body imaging with PET/CT, low-dose CT, or MRI

Follow-up tests indicate whether the treatment has had an effect on the cancer. This is called a treatment response.

Treatment response

A treatment response is a measurable improvement caused by treatment. See **Guide 5**. The response is defined by how well treatment destroys myeloma cells or reduces bone lesions. Symptoms usually improve with a response to treatment, too.

How well your myeloma responds to primary treatment can determine your next step. It may indicate you're ready for a stem cell transplant or maintenance therapy.

If your myeloma doesn't respond to treatment, it has become progressive disease. See *Chapter 6: Treatment for progression and relapse*.

Hematopoietic cell transplant

Treatment for active myeloma may or may not include a hematopoietic cell (stem cell) transplant.

A stem cell transplant isn't a treatment option for everyone. This treatment destroys cells in the bone marrow with chemotherapy and then replaces them with healthy blood stem cells. Your care team will look at a number of factors to decide if it's the right choice for you.

If your doctor thinks you'll have a stem cell transplant, then your blood stem cells will be removed (harvested) after 4 to 6 cycles of primary treatment, when the number of myeloma cells is low.

Collecting blood stem cells when you're ready but delaying the transplant until you need it may also be an option. Or, if you might have a second transplant as later treatment, enough blood stem cells should be collected for 2 transplants.

After the transplant, you'll have follow-up tests to see how well the treatment worked. Tests to measure the level of M proteins in your blood and urine should be done at least every 3 months.

If your myeloma responds to the transplant and your level of M proteins goes down drastically or completely, you've hit a major milestone. Take time to celebrate and appreciate the outcome. Next, you'll move on to maintenance therapy.

Guide 5
Possible results of primary treatment

Response	When the signs and symptoms of myeloma decrease or disappear. A response may be partial or complete.
Relapse	When myeloma improves for a while but then comes back.
Progression	When myeloma doesn't improve or becomes worse after treatment.

If your myeloma doesn't improve after the transplant, your disease is progressing. But this doesn't mean you're out of options. There's still much that can be done. See *Chapter 6: Treatment for progression and relapse.*

Maintenance therapy

Maintenance therapy is medication that's given in lower doses or on a less frequent basis to keep (maintain) the good results of prior treatments.

The preferred maintenance treatment after a hematopoietic cell transplant is lenalidomide, an immunomodulator.

Other recommended maintenance treatments include carfilzomib and lenalidomide or daratumumab and lenalidomide.

Be sure to discuss with your care team the benefits and risks of having maintenance therapy. One risk, for instance, is that maintenance therapy (especially with lenalidomide) slightly increases your chance of developing another cancer.

Continuing therapy

If you aren't able to have a stem cell transplant, or you don't want a transplant right away, then another option is to continue receiving primary treatment or maintenance treatment, depending on your situation.

If the treatment stops working, you can try another type of treatment.

More follow-up tests

After a hematopoietic cell transplant, or during maintenance or continuing therapy, you'll have regular follow-up tests to determine whether the myeloma is getting worse or getting better.

These tests also check whether your treatments are having any toxic (harmful) effects on your body. Many of these follow-up tests will be the same ones you've had before.

Relapse

For many people, proper treatment can control multiple myeloma for many months or years. But even with the best therapy, myeloma often comes back (relapses) at some point after primary treatment.

If your multiple myeloma relapses, you can have additional therapy that's different from your primary treatment. Read about additional treatment in *Chapter 6: Treatment for progression and relapse*.

So far, this chapter has discussed primary treatment for active multiple myeloma. Now let's talk about treatment for the other, less common types of myeloma—solitary plasmacytoma and smoldering myeloma.

Solitary plasmacytoma

A solitary plasmacytoma is a single mass of myeloma cells in a bone or soft tissue. It often occurs in the bones of the spine, skull, or rib cage.

Solitary plasmacytoma can cause symptoms and eventually turn into multiple myeloma. So it needs treatment.

Primary treatment

Because there's only one cancer mass, a solitary plasmacytoma requires local therapy. Local therapy treats a specific area or part of the body, not the whole body. The primary local treatment for a solitary plasmacytoma is radiation therapy.

Sometimes surgery is also required if the myeloma has caused a part of the body to be unstable, such as the bones of the spine.

Some people with a solitary plasmacytoma also have a small amount of myeloma cells in their bone marrow or a small amount of M protein in their blood or urine. These individuals have a much higher risk for their solitary plasmacytoma to become multiple myeloma. Their primary treatment is usually radiation therapy. They may also be given an additional therapy such as surgery or chemotherapy. Or in specific cases, surgery might be the primary therapy with or without radiation therapy.

Clinical trial

A clinical trial is also a primary treatment option for people with solitary plasmacytoma. NCCN experts encourage people with solitary plasmacytoma to consider trying to enroll in a clinical trial.

Follow-up tests

After primary treatment, regular follow-up testing is key to detect any signs that you might be developing active multiple myeloma.

You can expect to have follow-up visits every 3 to 6 months. Blood tests are necessary at each visit. Imaging should be done on an annual basis. Other follow-up tests are given as needed.

If myeloma is progressing

If follow-up tests indicate that the plasmacytoma is progressing (growing) even after treatment, then further testing is necessary. This includes all the tests required for diagnosing multiple myeloma.

If you're diagnosed with multiple myeloma, you can go back to the beginning of this chapter and read about primary treatment for active multiple myeloma.

It's important to know that about half of people with solitary plasmacytoma never progress to multiple myeloma.

Smoldering myeloma

Myeloma that isn't causing symptoms or damaging organs is called smoldering myeloma.

Smoldering myeloma is not a type of active multiple myeloma. So it rarely needs treatment right away if it isn't causing symptoms.

In most people, smoldering myeloma can exist for years before becoming active myeloma. However, in certain patients, smoldering myeloma may show signs that it has a high risk of becoming active myeloma in a short time.

You may still want to see a myeloma specialist to make sure your smoldering myeloma does not need treatment.

Observation

Observation without treatment is an option for many people with smoldering myeloma. Observation means that you'll have regular follow-up visits so your care team can look out for any cancer growth or symptoms.

However, smoldering myeloma can sometimes turn into multiple myeloma. So people with high-risk smoldering myeloma may require more frequent follow-up visits or even treatment.

Clinical trial

A clinical trial is a preferred primary treatment option for people with smoldering myeloma. Myeloma experts strongly encourage people with smoldering myeloma to enroll in a clinical trial if one is open and is the right fit.

Follow-up tests

Many of the tests used for follow-up are the same as those used to confirm active myeloma and assess symptoms. During this time, you should have follow-up blood tests every 3 to 6 months and whole-body imaging once a year.

If myeloma is progressing

If smoldering myeloma grows and starts causing symptoms, that means it has progressed to active (symptomatic) myeloma. From this point, it should be tested and treated as multiple myeloma.

If you're diagnosed with multiple myeloma, you can go back to the beginning of this chapter and read about primary treatment for active multiple myeloma.

Let us know what you think!

Please take a moment to complete an online survey about the NCCN Guidelines for Patients.
NCCN.org/patients/response

Key points

- Treatment for active multiple myeloma focuses on fighting the cancer as well as relieving symptoms.
- The choice of medications used for primary treatment is based on whether a hematopoietic cell transplant is part of your overall treatment plan.
- Supportive care helps manage myeloma symptoms and side effects of treatment.
- Maintenance therapy is given less often or in lower doses than primary treatment. Its goal is to keep up the good results of previous treatment.
- Solitary plasmacytoma usually requires only local therapy to treat the single mass.
- Smoldering myeloma doesn't usually need treatment right away. It often takes months or years to turn into active multiple myeloma.

Questions to ask

- Are you suggesting treatment options from the NCCN Guidelines, or have you modified the treatment approach in my situation?
- How will we know if the treatment is working?
- What are my options if the myeloma returns or my treatment isn't working?
- How much will the treatment cost? What can I do if the treatments are too expensive?
- Can I stop treatment at any time? What will happen if I stop treatment?

What's next?

This chapter explained primary treatment and follow-up care for myeloma. It also briefly discussed supportive care.

The next chapter provides a deeper look at how supportive care can help with myeloma symptoms and the side effects of myeloma treatment.

If your myeloma has lessened partly or completely after primary treatment, take time to appreciate your life and enjoy your health. And remember to take care of your health by eating well, being active, and going to follow-up visits.

5

Supportive care

Supportive care helps manage the symptoms of myeloma and the side effects of its treatment. Supportive care doesn't treat the cancer, but it aims to improve your quality of life. It can even prevent some life-threatening complications.

What is supportive care?

Supportive care is an important part of cancer care. The goal is to improve your quality of life during and after cancer treatment. Supportive care is for everyone with cancer and their families, not just for those at the end of life. It's also known as palliative care.

Supportive care includes a wide range of services. Supportive care prevents or manages the symptoms of cancer and the side effects of cancer treatment, like pain and cancer-related fatigue. It also addresses the mental, social, emotional, and spiritual concerns faced by people with cancer.

Supportive care provides help with additional needs, such as:

- Making treatment decisions
- Coordinating your care
- Paying for care
- Planning for advance care and end of life

Read more about the types of support you may receive in *NCCN Guidelines for Patients: Palliative Care*, available at [NCCN.org/patientguidelines]() and on the [NCCN Patient Guides for Cancer]() app.

NCCN Guidelines for Patients®

Palliative Care

Here are some ways supportive care can help with common problems caused by myeloma and myeloma treatment:

Reducing bone damage

Multiple myeloma often makes bones less dense, thinner, and weaker. This leads to holes in the bones called lytic lesions. Weakening of the bones can lead to problems such as bone pain, bone fractures, and compression of the spine. Medications are available to help strengthen bones and reduce the risk of fractures and pain.

Bisphosphonates are one type of medication that can improve bone health. Bisphosphonates lessen bone pain and help slow down the destruction of bone caused by myeloma cells. They're given as a liquid that's injected into a vein (IV infusion).

Bisphosphonates for people with multiple myeloma include pamidronate (Aredia) and zoledronic acid (Zometa). They're typically given for 2 years from the time of diagnosis. And they can be restarted if you have a relapse.

A different type of drug called denosumab (Xgeva) can also help prevent serious bone problems in people with multiple myeloma. Denosumab is given as a shot (injection) under the skin every 4 weeks.

NCCN experts recommend that either bisphosphonates or denosumab be given to anyone receiving primary treatment for myeloma. For people whose kidneys don't work very well, denosumab may be a better choice than bisphosphonates.

Bisphosphonates and denosumab can cause side effects such as rotting of the jawbone in the mouth (osteonecrosis). So it's very important to see your dentist before starting this kind of treatment. It's also very important to have good dental care before and during treatment with these medications.

Bone damage can also be painful. You may receive radiation therapy to relieve this pain.

To help prevent or treat a bone fracture, you may be referred to an orthopedic surgeon. Surgeons can prevent bone fractures by placing a rod to support the bone and hold it in place. Surgery may also be used to treat fractures in the bones of the spine (vertebrae).

Two surgical procedures that may be used are vertebroplasty and kyphoplasty.

Vertebroplasty and kyphoplasty

Vertebroplasty or kyphoplasty may be used to treat compression fractures in the vertebrae. A compression fracture is a break in a vertebra caused by the collapse of bones in the spine. Interventional radiologists often perform these procedures.

Vertebroplasty involves injecting a special orthopedic cement into the vertebra. The cement supports and strengthens the bone for pain relief and to hold it in place.

Kyphoplasty involves a balloon-like device that's placed in the fractured vertebrae and then inflated. This spreads out the vertebrae to restore the normal shape and height of the spine. Then the balloon is removed, and orthopedic cement is injected to support the vertebrae and hold them in place.

Decreasing kidney damage

Myeloma cells cause your bones to break down, which releases calcium into the bloodstream. A high level of calcium in the blood is dangerous for the kidneys. If this happens, you'll be treated with IV fluids and drugs to help your kidneys flush out the excess calcium.

Very high levels of M proteins can cause the blood to become very thick (especially with bulky M proteins such as IgM). This is called hyperviscosity. Very thick blood can damage the kidneys and other organs. Hyperviscosity can be treated with a process called plasmapheresis. This treatment filters blood through a machine to remove the M proteins. Chemotherapy is then used to reduce the production of M proteins.

High levels of abnormal M proteins, including light chains, can also damage the kidneys. The damage is called myeloma kidney or cast nephropathy. Prompt treatment of myeloma is required to prevent permanent kidney damage.

To prevent kidney failure, your care team may recommend staying hydrated. This means drinking plenty of fluids, especially water.

You'll also be told to avoid using certain medications like NSAIDs (such as ibuprofen and naproxen) and IV contrast, which is often given before an imaging test. Your care team will watch you closely for signs of kidney damage, especially if you're taking bisphosphonates for a long time.

Avoiding infections

Myeloma and certain myeloma treatments can increase your risk of infection. You can greatly reduce this risk by getting vaccinated for infections that are common in people with myeloma, including pneumonia, the flu, and COVID-19.

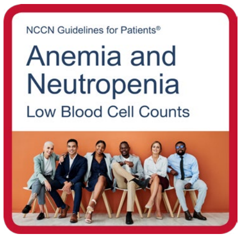
Another infection is shingles, which causes a painful skin rash. Shingles can be a side effect of bortezomib, carfilzomib, ixazomib, and daratumumab. If you're receiving any of these medicines, you'll also be given pills to prevent shingles.

Treating anemia

Myeloma cells crowd out the normal blood cells in the bone marrow. This can cause anemia—a condition in which the number of red blood cells is too low. Sometimes anemia may be treated with erythropoietin. This is a natural hormone made by the kidneys that's essential for the bone marrow to make more red blood cells.

If you're being treated with drugs to increase erythropoietin, you should have frequent checkups to test for possible blood clots.

You can read more about anemia and low blood cell counts at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



NCCN Guidelines for Patients®
Anemia and Neutropenia
Low Blood Cell Counts

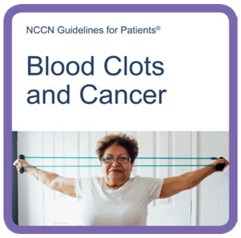
Preventing blood clots

People with myeloma have a much higher risk of forming blood clots in their bodies (especially in the first 6 months after being diagnosed). A blood clot that travels to the lungs, heart, or brain can be dangerous, even deadly.

Some drugs used for treating myeloma—particularly carfilzomib, lenalidomide, pomalidomide, and thalidomide—further increase the high risk of causing blood clots.

Blood thinners are medications that thin out the blood to lower the risk of blood clots. NCCN experts recommend taking either blood thinners or aspirin (an anti-platelet drug) while being treated for myeloma, depending on your risk of clotting.

You can read more about blood clots and cancer at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



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Blood Clots and Cancer

Fighting fatigue

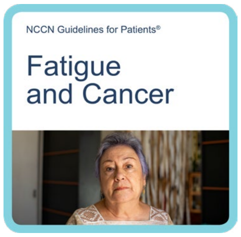
Fatigue is a common problem for people with multiple myeloma. Fatigue is tiredness and lack of energy despite getting enough sleep and nutrition. It can last for months or even years.

Fatigue often has more than one cause. It may be due to your cancer, your cancer treatment, another medical condition, or a combination of these problems. Likewise, fatigue often requires more than one remedy.

Being treated for anemia may be the first step. Learning how to conserve energy may also help. If depression is making fatigue worse, seek the help of a mental health professional. Eating healthy foods and getting good nutrition is also important.

Exercise can also lessen fatigue and help prevent depression. Plus, exercise is critical for staying healthy. Almost every person with myeloma can do some sort of exercise.

You can read more about fatigue and cancer care at [NCCN.org/patientguidelines]() and on the [NCCN Patient Guides for Cancer]() app.



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Fatigue and Cancer

Reducing anxiety and depression

Anxiety and depression are very common in people with cancer. These emotions can be overwhelming. They can leave you feeling helpless and distressed, and prevent you from taking part in your daily life.

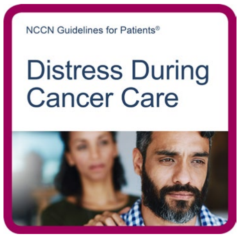
These feelings should not go untreated. If you're feeling depressed or anxious, be sure to ask your treatment team for help.

Medication, counseling, and regular exercise are some ways to lessen these symptoms. Making sure you have a connection with other people—family, friends, and other acquaintances—is equally important.

Support groups

Many people diagnosed with cancer find support groups to be very helpful. Support groups often include people at different stages of treatment. Some people may be newly diagnosed, while others may be finished with treatment. If your hospital or community doesn't have support groups for people with cancer, check out the online resources listed on page 60 of this guide.

You can read more about distress and cancer care at [NCCN.org/patientguidelines]() and on the [NCCN Patient Guides for Cancer]() app.



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Distress During Cancer Care

Key points

- Supportive care is for any stage of myeloma treatment, not just for when cancer has advanced.
- Multiple myeloma increases the risk for bone damage. In addition to primary treatment, you can also receive bone-strengthening drugs.
- Kidney problems are common in people with multiple myeloma. Treatment is based on what's causing the kidney problem.
- Myeloma and certain myeloma treatments can increase your risk of infection. Getting medications and vaccinations greatly reduces the risk of infections.
- People with myeloma have a higher risk for blood clots. Blood thinners and anti-clotting medicines can reduce this risk.
- If you're feeling depressed or anxious, ask your treatment team for help. These feelings should not go untreated.

Questions to ask

- Which side effects are most common and how long do they usually last?
- Do any medications worsen side effects?
- Are there any long-term or permanent side effects?
- What symptoms should I report right away, and who should I contact?
- Do any side effects lessen or worsen in severity over time?

What's next?

As you know by now, multiple myeloma often returns months or years after effective treatment. It's the nature of the disease.

The next chapter explains that you still have many treatment options if your myeloma comes back or doesn't go away after primary treatment.

6

Treatment for progression and relapse of multiple myeloma

The previous chapter discussed the options for supportive care. This chapter explains the treatments available when myeloma worsens or comes back.

Even with the best treatment, sometimes multiple myeloma doesn’t go away but remains stable or gets worse (progression). Often, it may get better after primary treatment but then it comes back again (relapse) months or years later.

Although relapse is expected, it’s never easy. It’s normal to feel disappointment, frustration, and hopelessness. Allow yourself some time to absorb the news and get adjusted.

But also be aware that there are many other available therapies for myeloma progression and relapse that are different from your primary treatment.

What is progression?

Progressive disease means that the myeloma has remained or has grown even with treatment. Progression can occur with or without symptoms. It’s mainly indicated by different test results, such as:

- An increase in M proteins in your blood or urine
- An increase in plasma cells in your bone marrow or bloodstream
- An increase in the number or size of bone lesions

Having progressive disease doesn’t mean you’re out of treatment options. Your treatment team will suggest trying something new, such as a different combination of medications or a clinical trial.

What is a relapse?

A relapse is when cancer improves for a while after treatment, but then it comes back and usually needs to be treated again.

Sometimes a relapse is just the reappearance of abnormal myeloma proteins without any new symptoms. In any case, most people with multiple myeloma can expect to have multiple relapses over the course of their treatment.

A relapse can happen within a few months or up to years after starting different treatments. Signs of a myeloma relapse are when myeloma cells are detected, M proteins increase, symptoms come back, or new symptoms begin. A relapse can sometimes cause new or worse symptoms than when the myeloma first appeared.

The fear of having a relapse is likely the most common psychological difficulty that occurs after cancer treatment. So stressing out about a relapse is understandable. If this kind of stress is bothering you, ask your care team for help.

Fortunately, there are many treatment options for multiple myeloma, even if it has relapsed.

Revisit your preferences and goals

Being faced with progression or relapse can be a good time to pause and consider your preferences and goals again.

It's important to have an open and honest conversation with your team about your goals for treatment right from the time of diagnosis.

But your treatment plan may change because of new information. Tests may find new results. How well the treatment is working may change. Or you may change your mind about treatment. Any of these changes will require a new treatment plan.

Think about what you want from treatment. Weigh your options and share your concerns with your care team. You may find it helpful to review your treatment goals in the self-assessment on page 34.

Guide 6 **Treatments for relapsing or progressive multiple myeloma**
Clinical trial (if eligible)
Medication combinations you haven't tried before
Chimeric antigen receptor (CAR) T-cell therapy
Hematopoietic cell transplant
Bispecific antibody drugs
Supportive care (available with any treatment)

Treatment options for relapse or progression

Additional treatments for relapsed or progressive myeloma include a clinical trial, medications you haven't tried before, a hematopoietic cell transplant, and possibly bispecific antibody drugs or CAR T-cell therapy. See **Guide 6**.

Clinical trial

A clinical trial is a potential treatment option for people with multiple myeloma. Clinical trials give people access to investigative treatment options that they couldn't usually receive otherwise.

Joining a clinical trial may be even more important for someone who has relapsed or progressive myeloma. Ask your treatment team how you might be able to find and enroll in a clinical trial.

Medications you haven't tried

Additional treatment includes medications or therapies you haven't already tried or those you haven't used for at least 6 months.

A variety of options are available for previously treated multiple myeloma, depending on which therapies you've already tried and how well they worked. Preferred multi-drug combinations for previously treated multiple myeloma are listed in **Guide 7**.

Preferred therapies have the most evidence they work better and may be safer than other therapies. But other recommended therapies are also available.

Talk to your treatment team about which treatment options may be better for you. They can explain the reasons for choosing one combination of medications over another.

Some therapies may put you at risk for serious side effects. Certain medications are stronger than others and may be harmful to people who are frail or elderly. Some drugs are given only after you've had 1 or more prior treatments.

Your team can discuss the side effects that may occur. They'll consider these things, along with the extent of your disease, when working with you to decide your next treatment.

If treatment stops working

Sometimes a treatment doesn't work against a person's cancer. Or the treatment works at first but then the cancer becomes resistant to it over time. When resistance happens, a different medication—or a different combination of medications—can be tried in place of the resistant one.

For a person with advanced multiple myeloma, resistance can become a serious problem. A person's cancer can become resistant to several medications or even entire drug classes. This level of resistance can make it more difficult to keep the cancer under control.

Guide 7
Preferred multi-drug combination options for additional treatment

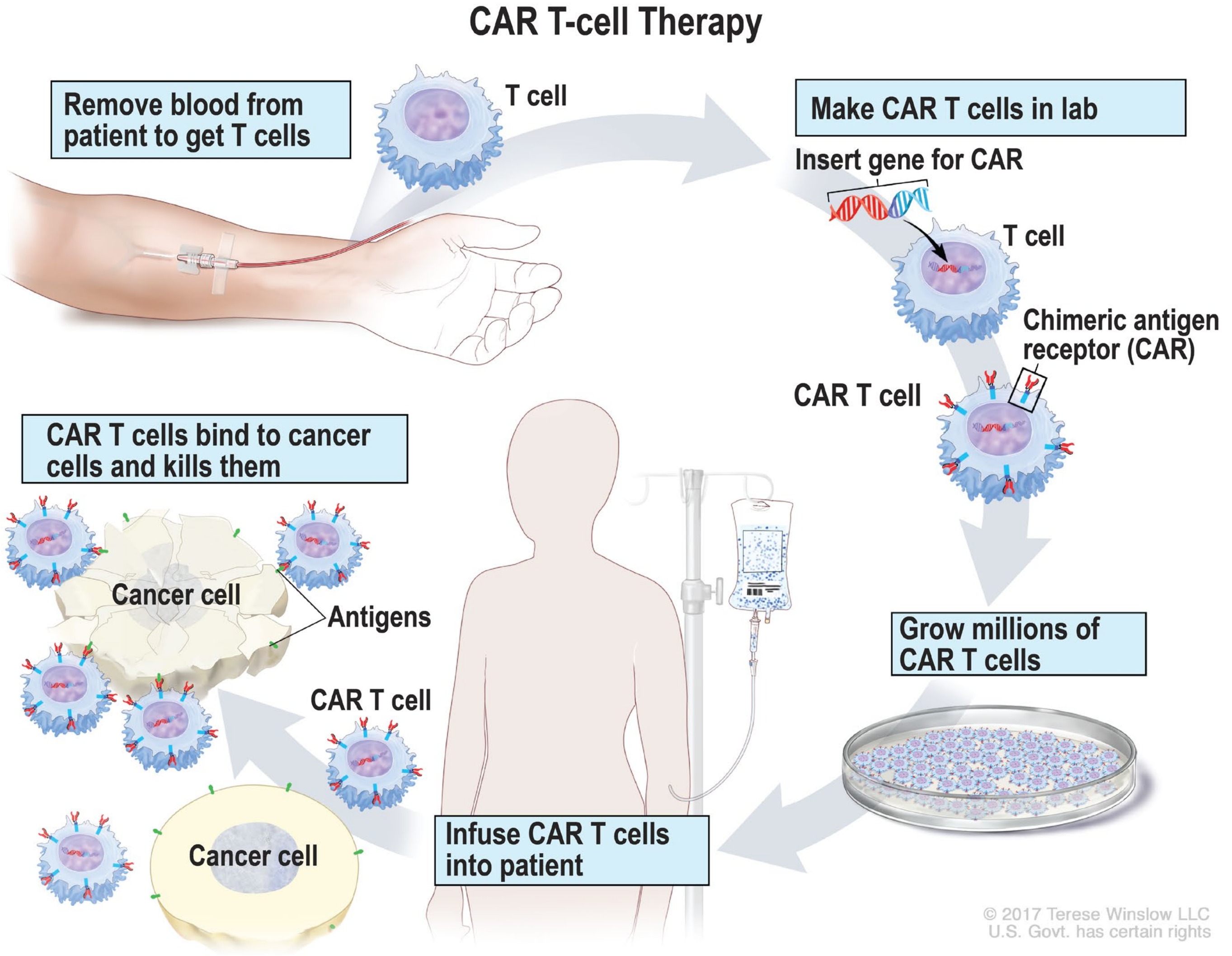
There are many medication combinations for previously treated multiple myeloma. Some of the more common combinations are (in alphabetical order):
Carfilzomib, Lenalidomide, Dexamethasone
Carfilzomib, Pomalidomide, Dexamethasone
Daratumumab, Bortezomib, Dexamethasone
Daratumumab, Carfilzomib, Dexamethasone
Daratumumab, Lenalidomide, Dexamethasone
Daratumumab, Pomalidomide, Dexamethasone
Elotuzumab, Pomalidomide, Dexamethasone
Isatuximab-Irfc, Carfilzomib, Dexamethasone
Isatuximab-Irfc, Pomalidomide, Dexamethasone
Ixazomib, Pomalidomide, Dexamethasone
Pomalidomide, Bortezomib, Dexamethasone

However, there will likely be one or more other therapies and medications still available depending on the person, their cancer, and various other factors.

After you've tried several different therapies, or your myeloma isn't under control with primary treatment, the next treatment options for relapsed or resistant multiple myeloma may be CAR T-cell therapy or targeted therapy using bispecific antibodies. (CAR T-cell therapy may be considered even sooner in some cases.) Other recommended treatments are also available.

CAR T-cell therapy

Chimeric antigen receptor (CAR) T-cell therapy is a preferred treatment option for certain people with relapsed or resistant myeloma who've tried at least 1 or more other therapies.



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CAR T-cell therapy is a special type of immunotherapy. It changes some of your body's immune cells (T cells) to help them find and kill cancer cells better.

To create CAR T cells, immune cells are first removed from your blood. In a lab, the cells are modified to grow chimeric antigen receptors (CARs) on their surface. These receptors are like hooks that can latch onto cancer cells.

Next, these CAR T cells are multiplied in the lab. At this time, you'll have a short course of chemotherapy (called "bridge" therapy), which will help the treatment to work more effectively. Then the CAR T cells will be infused back into your body. Once in the blood, the CAR T cells have an improved ability to identify a specific protein on cancer cells, latch onto the cancer cells, and then destroy them.

The two CAR T-cell therapies available for multiple myeloma are:

- Ciltacabtagene autoleucel (Carvykti)
- Idecabtagene vicleucel (Abecma)

Both CAR T-cell therapy and bispecific antibodies (described next) can trigger a dangerous condition called **cytokine release syndrome**. This condition can occur when your immune system releases too many inflammation-causing proteins (cytokines) too fast.

Cytokine release syndrome can cause fever, chills, nausea, headaches, racing heartbeat, low blood pressure, and trouble breathing. However, this condition can usually be reversed and controlled.

You can read about the immunotherapy side effects of CAR T-Cell Therapy at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.

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Immunotherapy Side Effects
CAR T-Cell Therapy

Bispecific antibodies

A bispecific antibody drug is a different type of targeted therapy. It's able to latch onto 2 different cells at the same time, such as a myeloma cell and a T cell (an immune cell that fights cancer cells). The drug brings the 2 cells together so the T cell can directly attack and destroy the myeloma cell.

Bispecific antibodies are only used to treat certain cases of relapsed or resistant multiple myeloma. These drugs include:

- Elranatamab-bcmm (Elrexfio)
- Linvoseltamab-gcpt (Lynozyfic)
- Talquetamab-tgvs (Talvey)
- Teclistamab-cqyv (Tecvayli)

Hematopoietic cell transplant

A hematopoietic cell (stem cell) transplant may be an option for someone who hasn't already had one.

A stem cell transplant is also sometimes an option for someone with relapsed or progressive multiple myeloma who had a long-lasting response (such as 2 years or more) to an earlier cell transplant.

Follow-up tests

Shortly after you receive treatment for progression or relapse, you'll have follow-up tests to see if the treatment is working or if it's causing any side effects. Surveillance is a key part of your follow-up plan. Be sure to continue to go to follow-up visits, get tested regularly, and stay in touch with your treatment team.

Supportive care

If tests show progressive disease during or after additional treatment, then supportive care is also recommended. Supportive care (sometimes called palliative care) is given to relieve the symptoms of cancer and the side effects of cancer treatment. You can receive supportive care at any stage. For specific information about supportive care for myeloma, see *Chapter 5: Supportive care*.

Advance care planning and other supportive care

Other types of supportive care—including emotional or spiritual support, financial guidance, and family counseling—may also be available to you.

This includes advance care planning, which involves making decisions now about the care you would want to receive if you became unable to speak or act for yourself.

Read more about supportive (palliative) care at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.

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Palliative Care

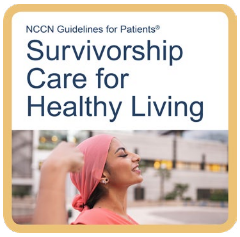
Survivorship

Survivorship focuses on the health and well-being of a person with cancer from diagnosis until the end of life. This includes the physical, mental, emotional, social, and financial effects of cancer that begin at diagnosis, continue through treatment and recovery, and arise afterward.

Survivorship also includes concerns about follow-up care, late effects of treatment, cancer recurrence, age-appropriate preventive care, and quality of life. Support from family members, friends, and caregivers is also an important part of survivorship.

Newer treatment options, such as CAR T-cell therapy and bispecific antibodies, have contributed to better long-term outcomes for an increasing number of myeloma patients, allowing them to go without continuous treatment for many years.

Read more about survivorship at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.



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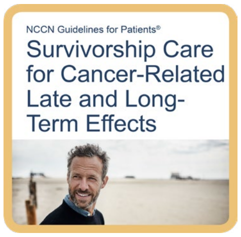
Survivorship Care for Healthy Living



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Survivorship Care for Cancer-Related Late and Long-Term Effects

You’re not alone

Some people have myeloma that eventually becomes resistant to any therapy. It’s normal at this stage to feel many different emotions, such as disbelief, frustration, fear, anxiety, or anger—sometimes all at once. Caregivers and loved ones can also feel these strong emotions.

After months or years of tests and treatments, it can feel defeating if myeloma comes back again or just won’t go away. It’s not something that you can prepare for or know exactly how to deal with.

But you’re not alone, even though you may feel that way sometimes. As noted before, supportive care can help. Supportive care is not just for relieving symptoms and side effects. Supportive care specialists can assist you emotionally, mentally, physically, and spiritually.

Also, if you haven’t already joined a support group, this is a good time to consider joining one.

If you need more information about supportive care, reach out to your care team and ask questions. Some medical centers have patient navigators or other staff members who coordinate nonclinical supportive care.

Key points

- Progression is when myeloma continues to grow even with treatment.
- A relapse is when cancer improves for a while after treatment but then comes back with new symptoms or organ damage.
- Most people with multiple myeloma can expect to have relapses.
- CAR T-cell therapy is a special type of immunotherapy that changes some of the body’s immune cells (T cells) to find and kill cancer cells better.
- A bispecific antibody drug is a type of targeted therapy that can bind with 2 different cells at the same time.
- Cancer can become resistant to a number of medications or even entire drug classes.

Questions to ask

- What are the chances of my myeloma worsening or returning?
- Am I able to have CAR T-cell therapy or bispecific antibody therapy?
- How do you know if my treatment is working?
- What are my options if treatment stops working?

7

Other resources

Want to learn more? Here's how you can get additional help.

What else to know

This guide helps you know your options so you can make informed decisions and improve your cancer care. But it's not the only resource that you have.

Ask for as much information and help as you need. Many people are interested in learning more about:

- Finding a specialist who's an expert in myeloma diagnosis and treatment
- Details of their myeloma treatment and its side effects
- Informing friends, family, coworkers, or employers they have myeloma
- Getting financial help
- Coping with other health problems besides myeloma

What else to do

Your health care center can help you with next steps. It often has onsite resources to help meet your needs and find answers to your questions. Health care centers can also inform you of resources in your community.

In addition to help from your providers, the resources listed next provide support for people with multiple myeloma and similar diseases.

Where to get help

Look through the list below and visit the provided websites to learn more about these organizations.

AnCan Foundation
ancan.org

Blood Cancer United
bloodcancerunited.org

BMT InfoNet
bmtinfonet.org

Cancer*Care*
cancercare.org

Cancer Hope Network
cancerhopenetwork.org

GRACE
cancergrace.org

HealthTree Foundation
healthtreefoundation.org

Imerman Angels
imermanangels.org

International Myeloma Foundation
myeloma.org

National Bone Marrow Transplant Link (nbmtLINK)
nbmtlink.org

NMDP
nmdp.org

PAN Foundation
panfoundation.org

Stupid Cancer
stupidcancer.org

The Multiple Myeloma Research Foundation
themmrf.org

Triage Cancer
triagecancer.org

Questions to ask

- How might treatment affect my daily life, work, or family?
- Who can I talk to about help with housing, food, and other basic needs?
- What help is available for transportation, childcare, and home care?
- How can I connect with others and build a support system?
- Who can I talk to if I don’t feel safe at home, at work, or in my neighborhood?

Words to know

active (symptomatic) multiple myeloma
When abnormal plasma cells (myeloma cells) have increased in the bone marrow and are causing symptoms such as kidney problems and bone damage.

amyloidosis
A health condition in which a protein called amyloid builds up in and damages organs.

anemia
A health condition in which the number of red blood cells is low.

antibody
A protein made by plasma cells to help fight off infections. Also called immunoglobulin.

antigen
A substance (such as a virus, bacteria, allergen, or toxin) that triggers a response from the body's immune system.

aspiration
A procedure that removes a small amount of liquid bone marrow to be tested for a disease.

biopsy
A procedure that removes fluid or tissue samples to be tested for a disease.

bisphosphonates
Drugs that help improve bone strength and prevent loss of bone mass.

blood stem cell
An immature cell from which all other types of blood cells are made.

bone lesion
An area of bone damage or abnormal tissue in the bone.

bone marrow
The soft, sponge-like tissue in the center of most bones where blood cells are made.

chemotherapy
Cancer drugs that stop the cell life cycle so cells don't increase in number.

chromosomes
The structures within cells that contain coded instructions for cell behavior.

clinical trial
A type of research that assesses how well health tests or treatments work in people.

complete blood count (CBC)
A test that measures the number of blood cells in a blood sample. It includes the number of white blood cells, red blood cells, and platelets.

corticosteroids
A class of drugs used to reduce redness, swelling, and pain, but also to kill cancer cells. Often called steroids.

CT scan
A test that uses x-rays from many angles to make a series of cross-sectional images of the inside of the body.

diagnosis
An identification of an illness based on tests.

flow cytometry
A test that measures myeloma cells in the bone marrow.

fluorescence in situ hybridization (FISH)
A lab test that uses special dyes to look for abnormal changes in a cell's genes and chromosomes.

fracture
A crack or break in a bone.

free light chain
The unattached, shorter fragments of M proteins that are made by myeloma cells.

heavy chain
The longer protein chain that is part of an antibody.

hematopoietic cell transplant
Treatment that uses chemotherapy to destroy cells in the bone marrow and then replaces them with healthy blood stem cells. Also called stem cell transplant and bone marrow transplant.

high-dose chemotherapy
An intensive drug treatment to kill cancer and disease-fighting cells so transplanted blood stem cells aren’t rejected by the body.

hyperviscosity
A condition in which the blood becomes very thick because of too many proteins in the blood.

immunoglobulin
A protein that is made by plasma cells to help fight off infection. Also called an antibody.

intravenous (IV)
A method of giving drugs by a needle or tube inserted into a vein.

light chain
The shorter protein chain that is part of an antibody.

light chain myeloma
A condition in which myeloma cells make only free light chains and no complete M proteins.

MRI
A test that uses radio waves and powerful magnets to view parts of the inside of the body and how they’re working.

maintenance treatment
Medication that’s given in a lower dose or less often to keep (maintain) good results of prior treatments.

M protein
An abnormal antibody made by myeloma cells that doesn’t fight germs. Also called monoclonal protein.

mutation
An abnormal change in the genetic code (DNA) of a gene within cells.

pathologist
A doctor who’s an expert in testing cells and tissue to find disease.

plasma cell
A type of white blood cell that makes germ-fighting proteins called antibodies.

plasmacytoma
A mass formed by abnormal plasma cells (myeloma cells).

PET scan
A test that uses a radiotracer to see the shape and function of organs and tissues inside the body.

primary treatment
The main treatment used to rid the body of cancer.

prognosis
The likely or expected course and outcome of a disease.

progression
The growth or spread of cancer after being tested or treated.

radiation therapy
A treatment that uses high-energy rays (radiation) to destroy cancer cells.

relapse
The return of myeloma signs or symptoms after a period of improvement.

side effect
An unhealthy or unpleasant physical or mental response to treatment.

smoldering myeloma
Myeloma that isn’t causing symptoms or damaging organs.

solitary plasmacytoma
Cancer that is a single mass of myeloma cells.

supportive care
Treatment for symptoms of cancer or for the side effects of cancer treatment.

systemic therapy
Drugs used to treat cancer cells throughout the body.

tumor burden
The extent or amount of cancer in the body.

NCCN Contributors

This patient guide is based on the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Multiple Myeloma, Version 4.2026. It was adapted, reviewed, and published with help from the following people:

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City of Hope National Medical Center
Duarte, California

Dana-Farber/Brigham and Women's Cancer Center |
Mass General Cancer Center
Boston, Massachusetts

Duke Cancer Institute
Durham, North Carolina

Fox Chase Cancer Center
Philadelphia, Pennsylvania

Fred & Pamela Buffett Cancer Center
Omaha, Nebraska

Fred Hutchinson Cancer Center
Seattle, Washington

Huntsman Cancer Institute at the University of Utah
Salt Lake City, Utah

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Comprehensive Cancer Center
Indianapolis, Indiana

Johns Hopkins Kimmel Cancer Center
Baltimore, Maryland

Mayo Clinic Comprehensive Cancer Center
Phoenix/Scottsdale, Arizona
Jacksonville, Florida
Rochester, Minnesota

Memorial Sloan Kettering Cancer Center
New York, New York

Moffitt Cancer Center
Tampa, Florida

O'Neal Comprehensive Cancer Center at UAB
Birmingham, Alabama

Robert H. Lurie Comprehensive Cancer Center
of Northwestern University
Chicago, Illinois

Roswell Park Comprehensive Cancer Center
Buffalo, New York

Siteman Cancer Center at Barnes-Jewish Hospital
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St. Louis, Missouri

St. Jude Children's Research Hospital/
The University of Tennessee Health Science Center
Memphis, Tennessee

Stanford Cancer Institute
Stanford, California

The Ohio State University Comprehensive Cancer Center -
James Cancer Hospital and Solove Research Institute
Columbus, Ohio

The UChicago Medicine Comprehensive Cancer Center
Chicago, Illinois

The University of Texas MD Anderson Cancer Center
Houston, Texas

UC Davis Comprehensive Cancer Center
Sacramento, California

UC San Diego Moores Cancer Center
La Jolla, California

UCLA Jonsson Comprehensive Cancer Center
Los Angeles, California

UCSF Helen Diller Family Comprehensive Cancer Center
San Francisco, California

University of Colorado Cancer Center
Aurora, Colorado

University of Michigan Rogel Cancer Center
Ann Arbor, Michigan

University of Wisconsin Carbone Cancer Center
Madison, Wisconsin

UT Southwestern Simmons
Comprehensive Cancer Center
Dallas, Texas

Vanderbilt-Ingram Cancer Center
Nashville, Tennessee

Yale Cancer Center/Smilow Cancer Hospital
New Haven, Connecticut

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Cancer care recommendations from leading experts at the
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Multiple Myeloma

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