CONDITION

Multiple myeloma

Multiple myeloma is a blood cancer caused by abnormal plasma cells growing in the bone marrow.

WHAT IT IS
Cancer of plasma cells in bone marrow

BODY SYSTEM
Blood, bone marrow, bones, kidneys, and immune system

MAIN SYMPTOMS
Bone pain, tiredness, repeated infections, unexplained fractures

WHAT CAUSES IT
Acquired plasma-cell changes; exact trigger unknown

HOW IT IS DIAGNOSED
Blood and urine tests, bone marrow biopsy, imaging

MAIN TREATMENT
Combination cancer medicines, sometimes stem cell transplant

CAN IT BE CURED?
No - usually controlled rather than cured

IS IT AN EMERGENCY?
Sometimes - new weakness or severe infection signs

LONG-TERM OUTLOOK
Often treatable for years, with remissions and relapses

Overview

Multiple myeloma is a blood cancer that develops in plasma cells. Plasma cells are white blood cells that normally make antibodies to help fight infection. They are made in the bone marrow, the soft tissue inside many bones.

In multiple myeloma, abnormal plasma cells multiply and crowd out healthy blood-forming cells. They often make an unusual antibody or part of an antibody, called a monoclonal protein, M protein, or paraprotein. This protein can be found in blood or urine and may harm the kidneys.

The abnormal cells can also weaken bones, lower blood cell counts, raise the calcium level in the blood, and reduce the body's ability to fight infection.

Multiple myeloma is usually treatable but is not generally considered curable. Treatment can reduce the amount of cancer, ease symptoms, protect organs, and produce remissions lasting months or years. A remission means that tests show little or no active myeloma; it does not always mean that every abnormal cell has gone.

Related conditions include monoclonal gammopathy of undetermined significance, or MGUS, and smouldering myeloma. These conditions do not meet the criteria for active multiple myeloma and often require monitoring rather than immediate treatment.

Symptoms

Multiple myeloma may cause no symptoms at first. It is sometimes found after a blood test done for another reason.

Possible symptoms include:

Bone pain happens because myeloma can create weakened areas in bones. Anaemia means there are too few red blood cells to carry oxygen. High blood calcium can develop when damaged bone releases calcium into the bloodstream.

These symptoms have many possible causes. Having one or more does not mean that you have multiple myeloma, but persistent or unexplained symptoms should be assessed.

- Persistent pain, often in the back, ribs, hips, or shoulders
- Tiredness, weakness, breathlessness, or looking pale from anaemia
- Repeated, severe, or slow-to-clear infections
- Broken bones after a minor injury
- Unusual thirst, constipation, nausea, confusion, or frequent urination
- Reduced appetite or unplanned weight loss
- Bruising or bleeding more easily than usual
- Foamy urine, swelling, or changes in how much urine you pass

Causes and risk factors

Multiple myeloma begins when a plasma cell develops changes in its genetic material. These changes allow the cell and its copies to grow when they should not. The reason this happens is usually unknown.

The condition is not caused by an infection, and it cannot spread from one person to another.

Factors associated with a higher chance of developing multiple myeloma include:

Most people with these risk factors never develop multiple myeloma. Many people who do develop it have no family history.

MGUS is a non-cancerous condition in which a small amount of monoclonal protein is present without organ damage or other signs of active myeloma. Only a minority of people with MGUS progress to multiple myeloma, so monitoring does not mean that cancer is expected.

- Older age
- Being male
- Being Black
- Having a close relative with multiple myeloma
- Having MGUS or smouldering myeloma
- Certain previous exposures, although no single exposure explains most cases

Diagnosis

Diagnosis usually involves several tests because no single result gives the whole picture.

Blood tests can measure:

Urine tests may look for abnormal light chains and check kidney function.

A bone marrow biopsy is usually needed. A clinician takes a small sample of liquid marrow and a tiny core of tissue, often from the back of the hip bone. Local anaesthetic is used to numb the area. The laboratory checks how many plasma cells are present and looks for features that may affect treatment planning.

Imaging is used to look for bone damage or collections of myeloma cells. This may include a low-dose whole-body CT scan, MRI, or PET-CT. Standard X-rays are less sensitive for some types of bone damage.

Active multiple myeloma is diagnosed when abnormal plasma cells or a plasma-cell tumour are present together with defined signs of organ damage or specific high-risk test findings. Organ damage may include high calcium, kidney impairment, anaemia, or bone lesions.

Further laboratory tests examine the chromosomes and genes within the myeloma cells. These are acquired changes in the cancer cells, not necessarily changes that can be passed to children. The results help estimate how the condition may behave and which treatments may be suitable.

- Monoclonal proteins and free light chains, which are antibody fragments
- Red cells, white cells, and platelets
- Kidney function
- Calcium and other body salts
- Albumin and other markers used to assess the condition

Treatment and management

Treatment is tailored to the activity of the myeloma, test results, symptoms, general health, kidney function, and personal priorities.

Active multiple myeloma is usually treated with a combination of medicines. These may include targeted medicines that interfere with cancer-cell processes, antibody treatments that help the immune system recognise myeloma cells, immune-modifying medicines, steroids like prednisone or hydrocortisone , and sometimes chemotherapy. Treatment is commonly given in planned cycles with regular blood tests.

Some people have an autologous stem cell transplant after initial treatment. Their own blood-forming stem cells are collected and stored. High-dose treatment is then used to reduce the myeloma, and the stored cells are returned to rebuild the bone marrow. This can produce a longer remission, but it is not suitable or necessary for everyone and is not usually a cure.

Maintenance treatment may be offered after the first phase of therapy or a transplant. Its aim is to keep the myeloma controlled for longer.

If myeloma returns or stops responding, other medicine combinations may be used. Options for some people include CAR T-cell therapy or bispecific antibodies, which redirect immune cells toward myeloma cells. Access and suitability depend on previous treatment, health, local approvals, and specialist assessment.

Supportive treatment is also important. It may include:

Smouldering myeloma is usually monitored closely instead of treated immediately, although selected people at high risk of progression may be offered treatment or a clinical trial. MGUS is monitored less intensively according to its features.

- Medicines that reduce further bone damage
- Pain relief or radiotherapy for a painful bone area
- Treatment for anaemia or kidney problems

- Antibiotics or antiviral medicines when needed
- Vaccination and infection-prevention planning
- Procedures to support or repair weakened bones
- Blood-clot prevention when treatment increases clot risk

Complications

Multiple myeloma and its treatment can lead to complications, but not everyone develops them.

Weakened bones can cause fractures or collapse of the bones in the spine. A damaged vertebra can occasionally press on the spinal cord or nerves.

Kidney injury may result from monoclonal proteins, high calcium, dehydration, infection, or some medicines. Early treatment can sometimes improve kidney function.

Low blood counts can cause anaemia, infections, bruising, or bleeding. Myeloma also interferes with normal antibody production, so infections may occur even when the white blood cell count is not very low.

Other possible problems include blood clots, nerve pain or numbness, high blood calcium, and treatment-related side effects. Your care team will monitor for these problems and may adjust treatment if they occur.

Prevention

There is no established way to prevent multiple myeloma. The genetic changes that cause it are usually acquired by chance, and most known risk factors cannot be changed.

Routine screening is not recommended for people without symptoms or a known related condition. If you have MGUS or smouldering myeloma, attending planned blood tests can identify progression before serious complications develop. Monitoring does not prevent myeloma, but it can support timely treatment.

General measures such as avoiding tobacco, staying active within your abilities, and eating a balanced diet support overall health but have not been shown to prevent multiple myeloma.

Living with it and what to expect

Multiple myeloma often follows a pattern of treatment, remission, and relapse. Some remissions are long, while others are shorter. The course is influenced by the myeloma's genetic features, kidney health, response to treatment, age, general health, and available therapies.

During treatment, you may have frequent appointments and blood tests. Side effects such as tiredness, nausea, bowel changes, infection risk, or numbness may affect daily life. Many side effects can be reduced by changing supportive care, timing, or treatment, so report them rather than assuming they must be tolerated.

During remission, appointments may become less frequent, but monitoring continues. Some people return to many usual activities, while others have lasting fatigue, pain, nerve symptoms, or limits caused by bone damage. Gentle, regular activity may help strength and wellbeing, but activities that put weakened bones at risk may need specialist advice.

Relapse does not mean that no further treatment is available. Several treatment classes now exist, and a different combination may control the myeloma again.

Emotional effects can also change over time. Uncertainty around test results or relapse may be difficult. Practical support, counselling, peer groups, rehabilitation, and palliative care can all help. Palliative care means support for symptoms and quality of life; it can be provided alongside active cancer treatment.

When to get medical help

Arrange a routine appointment if you have persistent bone pain, unexplained tiredness, repeated infections, unexplained weight loss, unusual bruising, or changes in urination. These symptoms are not specific to multiple myeloma, but they deserve assessment if they continue.

If you already have multiple myeloma, contact your care team promptly about new or worsening pain, treatment side effects, reduced urine, poor fluid intake, or signs of infection. Follow the specific infection instructions given by your treatment centre.

Seek urgent medical advice for:

Call emergency services for new weakness or numbness in the legs, loss of bladder or bowel control, or numbness around the buttocks or genitals. These can be signs of pressure on the spinal cord.

Emergency help is also needed for severe breathing difficulty, chest pain, collapse, marked confusion, or uncontrolled bleeding.

- Fever, shaking chills, or feeling suddenly very unwell during treatment

- A sudden increase in thirst, vomiting, drowsiness, or confusion
- New severe bone pain or a suspected fracture
- Passing much less urine than usual
- New swelling, redness, or pain in one leg

Common questions

Is multiple myeloma a type of leukaemia?

No. Both are blood cancers, but they start in different cells and behave differently. Multiple myeloma begins in plasma cells and mainly affects the bone marrow, bones, kidneys, and immune function.

Can multiple myeloma be cured?

It is not generally considered curable with standard treatment. However, many people have long periods when the condition is well controlled. New treatments have created more options when myeloma returns.

Is multiple myeloma hereditary?

It is not usually inherited directly. Having a close relative with multiple myeloma slightly increases risk, but most relatives will not develop it. Genetic changes found inside myeloma cells are usually acquired and are not the same as inherited changes.

How fast does multiple myeloma progress?

There is no single rate. Some myelomas respond for years, while others return sooner. Smouldering myeloma may remain stable for a long time or progress to active myeloma. Blood tests, imaging, bone marrow findings, and genetic features help estimate risk.

What is the life expectancy with multiple myeloma?

Life expectancy differs widely. It is affected by age, general health, kidney function, the biology of the myeloma, response to treatment, and access to later treatments. Population statistics describe groups and cannot predict one person's outcome.

Can I exercise with multiple myeloma?

Many people can benefit from suitable activity, including walking and supervised strength or balance work. Bone damage may make some lifting, bending, twisting, or high-impact activities unsafe. A physiotherapist or myeloma team can help identify safer options based on imaging and fracture risk.

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