



Myeloma  
Australia

HEALTH CONDITION INFOSHEET

# Monoclonal gammopathy of undetermined significance (MGUS)


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This infosheet tells you more about **monoclonal gammopathy of undetermined significance (MGUS)**: what it is, how it is diagnosed and monitored, as well as practical things you can do to live well and potentially reduce the risk of progression.

## Things to remember

- **MGUS is not cancer:** It's a condition where abnormal plasma cells make a protein called paraprotein, which doesn't usually cause your body any harm.
- **Most people have no symptoms:** MGUS is often found by chance during routine blood tests.
- **Monitoring is key:** Regular blood and urine tests help check for any changes or the very small chance of progression.
- **Progression is rare:** The risk of MGUS progressing to myeloma or another serious condition is about 1% per year.
- **Reach out for support:** Living with MGUS can sometimes be unsettling. Focus on your new healthy habits, try not to let 'what ifs' take over, and talk with a trusted friend, family member, or our Specialist Myeloma Nurses.
- **Healthy habits can help:** Keeping to a healthy weight, eating a plant-focused diet, staying active, and reducing harmful habits can help support overall health.
  - **Whole plant foods are your heroes:** Aim for a generous amount and a wide variety of plant foods that contain plenty of fibre – wholegrains, legumes, vegetables, fruits, nuts and seeds. These can improve your gut health and body composition, which have many benefits for your overall health.
  - **A healthy gut microbiome** is associated with many health benefits, including an improved BMI, better immune function, and early research suggests it may play a role in reducing the risk of MGUS progressing to active myeloma.

If you're reading a printed version of this infosheet, we've used a magnifying glass symbol  throughout to let you know where you can search for more information in the '**Learn more**' section at the end of this infosheet.

## What is MGUS?

*MGUS, or **monoclonal gammopathy of undetermined significance**, is a non-cancerous condition where a small number of abnormal cells in your bone marrow (the spongy centre of our bones) produces an abnormal protein that is detectable in the bloodstream. This abnormal protein is called paraprotein or M protein.*

The abnormal cells that are responsible for causing MGUS come from plasma cells. Plasma cells are a type of white blood cell found in the bone marrow and form an important part of our immune system. Healthy plasma cells make antibodies (which are also called immunoglobulins), to help fight infection.

In MGUS, some of these plasma cells become abnormal because of DNA changes. Instead of producing useful antibodies, they produce *paraprotein*, which doesn't have any useful function in your body.

Most of the time, MGUS doesn't cause symptoms, and you may only find out you have it by chance when you're having blood tests done for another reason.

If you've been told you have MGUS, you usually won't need any treatment, but your doctor will ask you to have regular blood and/or urine (wee) tests to see if there are any changes in your condition.

Monitoring is important, because each year, about 1% (1 in 100) people with MGUS will slowly progress to develop multiple myeloma, a form of blood cancer that requires treatment. Occasionally, MGUS can progress into other forms of blood cancer such as non-Hodgkin lymphoma. Even more rarely, the paraprotein itself may cause damage to organs such as the nerves, kidneys and heart. This group of conditions is called monoclonal gammopathy of clinical significance (MGCS), and also requires treatment.

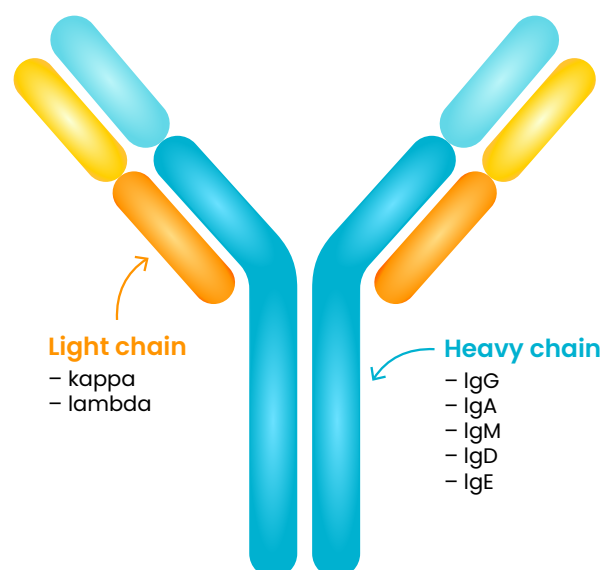
### A bit more about immunoglobulins (antibodies)

Immunoglobulins, which are written as 'Ig' for short, are shaped like a Y and have two parts:

- 1. Heavy chains:** There are five types: IgG, IgA, IgM, IgD, and IgE.
- 2. Light chains:** These can be either kappa or lambda.

Each immunoglobulin has one type of heavy chain and one type of light chain.

In MGUS, abnormal plasma cells produce an incomplete or abnormal version of these immunoglobulins, called paraproteins, which have no useful function in the body.



The image above shows the Y shape of immunoglobulins and their heavy and light chains.



*I received a letter from the blood bank saying that the routine test on my latest blood donation had shown a low level paraprotein count and that I should see my GP for further investigation. My GP did further tests and referred me to a haematologist, who confirmed I have MGUS. We found the 'not knowing and waiting' was quite unsettling for both myself and my wife.*

Simon, Tasmania

## What are the different types of MGUS?

There are different types of MGUS, which are named after the type of abnormal protein (paraprotein) being made:

TYPE OF MGUS	FEATURES	EXAMPLE
<b>Heavy chain</b>	Heavy chain MGUS can be IgG, IgA, IgM, IgD or IgE, depending on which heavy chain is overproduced + either the light chain kappa or lambda.	A common heavy chain type is called <b>IgG kappa MGUS</b> .
<b>Light chain</b>	Light chain MGUS is when kappa or lambda light chains break away from the heavy chain and start producing a paraprotein on their own.	A common light chain type is called <b>lambda light chain MGUS</b> .
<b>IgM</b>	This type of MGUS is mostly associated with non-myeloma blood cancers, including non-Hodgkin lymphoma (NHL) and chronic lymphocytic leukemia (CLL).	This is a single type of MGUS, which is called <b>IgM MGUS</b> .

### High-risk MGUS

In some people, MGUS is classified as high-risk. This means that their MGUS has certain characteristics that increase the chance of progression to myeloma or other blood cancers.

The risk is still low, but it does increase with the number of risk factors you have, which include having:

- a non-IgG type of MGUS type (for example, IgA, IgM, IgD or IgE)
- a paraprotein level higher than 15 g/L
- an abnormal balance of kappa to lambda light chains (serum free light chain ratio).



*When I was told that I had high-risk MGUS, it was a shock. I have always said, 'You can't deal with something if you don't understand it.' So I made a point of getting as much information as I could. I tend to focus on what I can do to make things better, and try not to get bogged down with stuff I can't change.*

Simon, Tasmania

## What causes MGUS?

*The cause of MGUS is not yet known, although researchers believe that there are genetic and environmental factors involved.*

We do know that some factors increase the risk of developing MGUS:

- **Age:** MGUS is more common as you get older, especially after 55. Roughly 5% of the population aged over 55 have MGUS.
- **Ethnicity:** MGUS is more common in people of Black ethnicity.
- **Family history:** If someone in your family has MGUS, you have a higher chance of developing it too.

## Does MGUS have symptoms?

*To diagnose MGUS, your doctor needs to be confident that any symptoms you are experiencing are not related to your paraprotein level or changes in your plasma cells.*

To confirm this, they will order a range of tests, which we have described in the next section.

Some people with MGUS might have a slightly higher chance of experiencing some health problems such as osteoporosis, blood clots, and infections. Let your GP or haematologist know if you have any new symptoms or symptoms that you're worried about.

## How is MGUS diagnosed?

*Part of MGUS' definition is that it does not cause any symptoms. This means that MGUS is usually diagnosed when a paraprotein is found by chance when you're having a routine check-up, or tests for other health conditions.*

Once the paraprotein has been found, your doctor will need to do some more tests to rule out other health conditions before they confirm you have MGUS.


These further tests are usually ordered by a haematologist and include:

**1. Blood tests:**

- Serum protein electrophoresis (SPEP): This test identifies the type and level of paraprotein in your blood.
- Other blood tests check your full blood count, kidney and liver function, and calcium level to rule out other conditions like myeloma.

**2. Urine tests:** Paraprotein, especially light chains, may also show up in your urine (wee), so it's likely that a sample of your urine will be sent for testing. Sometimes, a 24-hour urine collection may be performed, where you collect all your urine in a large container for a 24-hour period and it is sent off for testing.

**3. Imaging tests:** You might have X-rays, an MRI (magnetic resonance imaging), or CT (computed tomography) scan to check for bone damage. You may also have a bone density test.

**4. Bone marrow aspiration and trephine (BMAT) biopsy:** If needed, a small sample of bone marrow will be taken from the back of your hip to see how many plasma cells are in your bone marrow, and to look for abnormal plasma cells. 

## How is MGUS managed?

*Current guidelines recommend that MGUS should be actively monitored, but not treated. This is because most people who have MGUS remain well and never develop any symptoms or problems related to it.*

Because a small number of people with MGUS may progress to a more serious condition like myeloma, it's important to keep an eye on your MGUS, catching any changes early. This way, if you do need treatment, it can be started as soon as needed.

Monitoring usually involves blood and/or urine tests to track your level of paraprotein or free light chains.

It's important to know that your paraprotein or light chain levels may go up and down – and this is normal. However, if you have a steady or large increase over time, or new symptoms, you will need more tests.


At first, you might have tests every 3–6 months. If everything stays stable, this usually drops to once or twice a year.

# Progression from MGUS to myeloma

Each year, about 1% (1 in 100) people with MGUS will slowly progress to develop myeloma, or another serious condition such as chronic lymphocytic leukaemia (CLL), non-Hodgkin lymphoma, or AL amyloidosis. This sheet only includes information about progression from MGUS to myeloma.

At the moment, there is no test to predict who will develop myeloma and who will remain stable. Research is continuing to find the causes of progression, which may involve cell changes at a genetic level.

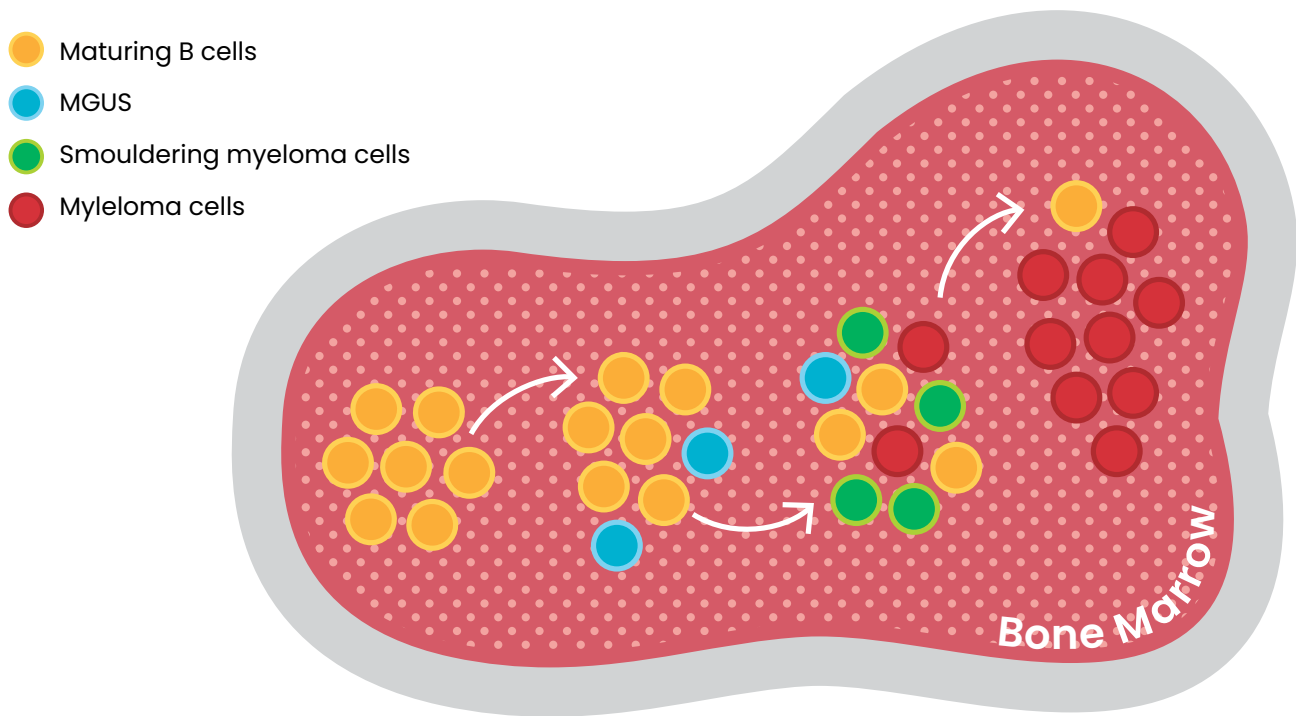
MGUS progresses to myeloma when there is an increase of paraprotein in your blood and/or an increase of plasma cells in your bone marrow.

If MGUS does progress, it happens in stages, with a stage in-between MGUS and active myeloma that's called *smouldering myeloma*. You can read more about [smouldering myeloma](#) in our separate infosheet. 

The table below shows each stage and the features that go with it.

FEATURE	MGUS	SMOULDERING MYELOMA (SMM) (also called <i>asymptomatic myeloma</i> )	ACTIVE MYELOMA (also called <i>multiple myeloma</i> or simply <i>myeloma</i> )
<b>Paraprotein</b>	Less than 30g/L OR an abnormal free light chain ratio	More than 30g/L OR an abnormal free light chain ratio	More than 30g/L OR an abnormal free light chain ratio
<b>Plasma cells in bone marrow</b>	Less than 10%	10–60%	10% or more
<b>Symptoms</b>	None	None	Yes
<b>CRAB Symptoms</b>	None	None	Yes
<b>Treatment needed?</b>	No – monitoring only	No – monitoring only unless high-risk* (see the next row)	Yes – treatment recommended
<b>*No symptoms but considered high-risk SMM</b>		Some people with SMM who have high-risk disease features are now considered to have active myeloma even though they don't have any CRAB symptoms. It is recommended that these people start treatment.	
<b>Diagnosis changes to active myeloma when you have CRAB symptoms</b>		CRAB stands for: <b>C</b> - Calcium (high levels in the blood) <b>R</b> - Renal (kidney) problems <b>A</b> - Anaemia (low red blood cell count) <b>B</b> - Bone disease (fractures or lesions)	

The image below gives a visual guide to the differences between MGUS, smouldering myeloma, and active myeloma.






## Is there anything I can do to help stop my MGUS from progressing?

We don't fully understand the factors that lead MGUS to progress, and so there is no guaranteed way to stop it progressing.

The good news is that there are clear guidelines that can help everyone to reduce their overall cancer risk, and some that may specifically help to prevent MGUS from progressing.

The World Cancer Research Fund and the results of recent clinical trials on MGUS and smouldering myeloma progression and diet suggest that these healthy lifestyle tips are worth trying:

- 1. Keep to a healthy weight:** Recent research suggests a potential link between having a high body mass index (BMI), obesity, and the progression of MGUS and smouldering myeloma. Staying within a normal BMI may reduce the risk of progression to myeloma. BMI is a way of measuring whether you are a healthy weight for your height, but it's worth keeping in mind that BMI has some limitations. A dietitian can talk with you about different ways to measure your body composition and help you develop an eating plan that's tailored to your health needs and food preferences.
  - Visit [World Cancer Research Fund](#) to learn more about a healthy weight and how to work out your BMI. 
- 2. Eat a balanced, whole food diet:**
  - Build your diet around wholegrains, vegetables, legumes (beans, lentils and peas), fruits, nuts, seeds, and plant-based proteins.
  - Limit sugary drinks, processed foods, red meat and processed meats.

- 3. Boost your gut health:** Aim to eat 30+ different plant foods a week and 30g of fibre every day. Remember to aim for quantity *and* variety. A diet focused on fibre-rich whole plant foods supports your gut microbiome – the trillions of microorganisms that live in your gastrointestinal tract. A healthy gut microbiome is associated with many health benefits, including an improved BMI, better immune function, and early research suggests it may play a role in reducing the risk of MGUS and smouldering myeloma progressing to active myeloma.
- Find out more about the ongoing research in this area in the ‘Learn more’ section at the end of this infosheet.
  - Download OnCore Nutrition’s free [Plant Variety Checklist](#) to help you explore, track and expand the different plant foods you eat. 
  - Read our [Nutrition and myeloma](#) infosheet, which includes lots of tips for healthy eating that apply to people with MGUS too. 



- 4. Stay active:** Regular exercise has many health benefits, including helping you keep to a healthy weight, improve bone and muscle strength and immune function, reduce inflammation, and boost your mood, sleep and gut health.

It can be helpful to see an accredited exercise physiologist (EP) or physiotherapist (physio) so they can prescribe an individualised exercise program to meet your needs and goals.

- Read more about the World Cancer Research Fund’s [recommendations for exercise](#). 

- 5. Limit harmful habits:** Don’t smoke, limit alcohol, get good quality sleep, and manage stress.

All of these strategies work together to help keep you healthy, so do your best to include as many of these as you can.

- Read more about the World Cancer Research Fund’s [recommendations for cancer prevention](#). 

## The Nutrivation trial

The Nutrivation trial was a pilot intervention trial in 20 people with MGUS or smouldering myeloma who had a BMI over 25 (classified as overweight). People in the trial ate a whole-food plant-based diet for 12 weeks and had health coaching for 24 weeks.

The trial showed improvements in quality of life, BMI, insulin resistance, microbiome diversity, and immune markers. After 1 year, two people who had a significant reduction in their BMI showed a potential reduced risk of progression to myeloma.

There is now a larger Nutrivation trial to better understand how eating a whole-food plant-based diet may delay progression of MGUS and smouldering myeloma.

You can read more about the trial [here](#). 



*I found it quite stressful just watching and monitoring my MGUS. I felt I had no control, so I concentrated on something I could do! I now pay more attention to improving my health by going to the gym twice a week and focusing on healthy eating, including increasing my fibre, fruit and vegetable intake.*

Maria, Western Australia

## What are the signs that my MGUS might be progressing?

It's important to keep up with your blood and/or urine testing to monitor your MGUS.

You'll also need to let your doctor know as soon as you notice any symptoms that are new or getting worse – don't wait for your next blood test or appointment.

### Contact your doctor if you notice:

- an unexpected broken bone (from only a small or unknown injury)
- unexplained pain, especially in your back or ribs
- unexplained bruising or bleeding
- feeling tired, light-headed or breathless
- tingling or numbness in your hands or feet
- losing weight without trying
- frequent infections or infections that don't get better easily
- feeling less healthy overall.

### In your blood or urine tests, your doctor will be looking for:

- increased calcium levels
- reduced kidney function
- anaemia (low red blood cells)
- increasing paraprotein or light chain levels.

# Living well with MGUS

*We understand that being diagnosed with MGUS can be unsettling and cause anxiety. It's normal to worry about having a health condition that you are not having active treatment for and has a (very small) chance of progressing to something more serious. People with MGUS tell us that they are often most anxious when they are first diagnosed and then each time as they are waiting for the results of their monitoring tests.*

It's important to remember that most people with MGUS never develop a serious health condition. The regular monitoring from your doctor means that any changes will be found early, helping them to take any action as soon as needed.

## Here are some ideas for finding support and staying positive:

- **Talk to someone:** Share your feelings with a trusted friend, family member, or your doctor. See the last page of this infosheet for Myeloma Australia support services.
- **Focus on what you can control:** Living a healthy lifestyle – like eating well, staying active, and prioritising your sleep – can boost both your physical and mental wellbeing.
- **Take it one step at a time:** Try not to let the 'what ifs' take over. Stay present and focus on the people and activities that bring you joy.

If you ever feel anxious or overwhelmed, don't hesitate to reach out to your treating team or our Specialist Myeloma Nurses for support. They're here to help you every step of the way.



***My husband has been a constant source of support and comes to all my appointments. It helps having another person there to listen to and process everything being said. I also found reading up on MGUS helped me feel like I had a better understanding of the condition.***

**Divya, South Australia**

## Questions to ask your treating team

Here are some suggested questions you might like to ask your treating team to help you understand more about your MGUS:







- How often will I need to have blood or urine tests?
- What symptoms should I be monitoring for?
- Who do I contact if I have a new or worsening symptoms?
- At what point would you consider starting treatment?
- What support is available to me?

Many people also find it helpful to ask for a printout of their test results so they can keep track of any changes. Store these in a folder that you keep within easy reach and take these along to each doctor's appointment to help guide your discussion.



## Learn more

You'll find more helpful information in these resources available from [myeloma.org.au](https://myeloma.org.au).

RESOURCE	NAME	LINK
INFOSHEETS	<ul style="list-style-type: none"><li>→  <a href="#">'Smouldering myeloma</a> infosheet'</li><li>→  <a href="#">'Understanding paraprotein in myeloma</a> infosheet'</li><li>→  <a href="#">'Understanding bone marrow tests in myeloma</a> infosheet'</li><li>→  <a href="#">'Understanding the bone marrow biopsy procedure in myeloma</a> infosheet'</li><li>→  <a href="#">'Nutrition and myeloma</a> infosheet'</li></ul>	<p>Go to:</p> <p><a href="https://myeloma.org.au">myeloma.org.au</a></p> <p>Search for the document using the name following the  icons</p>
RECORDED SEMINARS	<ul style="list-style-type: none"><li>→ <a href="#">Investigating the impact of dietary interventions in progression of MGUS &amp; smouldering myeloma to active myeloma</a><ul style="list-style-type: none"><li>- Learn about the research into diet, gut health, MGUS and smouldering myeloma by listening to haematologist Dr Urvi Shah's online seminar recorded for Myeloma Australia.</li></ul></li></ul>	<p>Go to:</p> <p><a href="https://myeloma.org.au/resources/recorded-seminars/">myeloma.org.au/resources/recorded-seminars/</a></p> <p>Scroll down the page to find the seminar.</p>



## More information and support

- **World Cancer Research Fund** has lots of helpful information about [cancer prevention](#), [healthy weight](#) (including how to calculate your BMI), and [staying active](#).
  - 🔍 Go to [wcrf.org](http://wcrf.org) and search for 'Our recommendations'.
  - 🔍 Go to [wcrf.org](http://wcrf.org) and choose 'Preventing cancer' and then choose 'Weight and obesity' from the topics list.
  - 🔍 Go to [wcrf.org](http://wcrf.org) and choose 'Preventing cancer' and then choose 'Physical activity' from the topics list.
  
- **Download OnCore Nutrition's free [Plant Variety Checklist](#)** to help you explore, track and expand the different plant foods you eat.
  - 🔍 Go to [store.oncorenutrition.com](http://store.oncorenutrition.com) and search for 'Plant Variety Score'.
  
- **Read more about the [Nutrivention trial](#)** where people with MGUS or smouldering myeloma ate a whole-food plant-based diet and experienced improved quality of life and other benefits.
  - 🔍 Enter 'Nutrivention trial' into your search engine.
  
- **Our Specialist Myeloma Nurses** are available on our Telephone Support Line to talk with you about living with MGUS and any concerns you may have.  
To book a 30- or 60-minute call with a Specialist Myeloma Nurse:
  - 📞 call **1800 MYELOMA** (1800 693 566)  
Monday–Friday, 9am–5pm AEST/AEDT, or
  - 🖱 go to [myeloma.org.au](http://myeloma.org.au) and click on the  
'Book a call with a Specialist Myeloma Nurse' button.
  - ✉ email [nurses@myeloma.org.au](mailto:nurses@myeloma.org.au) to contact a Specialist Myeloma Nurse at any time.

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We hope this infosheet has helped you to understand more about MGUS and feel confident about your monitoring and living well with this condition.



The information in this sheet is not intended to replace medical care or the advice of your treating team. Please talk to your team about the monitoring and management plan they recommend for you.