

# Cancer Association of South Africa (CANSA)



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## Nutritional Guidelines for Individuals Diagnosed with Multiple Myeloma

### Introduction

Patients diagnosed with Multiple Myeloma often have questions about diet and nutrition – about what type of foods are best to eat or should be avoided. Many patients also want to know if there are alternative diets they should try. Despite the interest in special diets, none have been scientifically studied so their effects are unknown and unproven. The lack of evidence does not support an alternative diet for myeloma patients. Myeloma patients should, therefore, follow the same basic principles of healthy eating.

[Picture Credit: Multiple Myeloma]



Eating a healthy and balanced diet will help to maintain muscle tone and strength, increase energy levels and may aid recovery after treatment. A balanced diet is also rich in essential vitamins and minerals which helps the immune system to function more effectively.

Multiple myeloma is a type of cancer that affects plasma cells, which are a part of your immune system.

The side effects of chemotherapy may cause individuals diagnosed with Multiple Myeloma to lose their appetite and skip meals. Feeling overwhelmed, depressed, or scared about the condition can also make it hard to eat.

However, getting good nutrition is important, especially while undergoing treatment. Multiple myeloma can leave one with damaged kidneys, reduced immunity, and anaemia. Some simple diet tips may help one feel better and give one the strength one needs to fight back.

### Anaemia

Anaemia, or low red blood cell count, is a common complication in people with Multiple Myeloma. When the cancerous plasma cells in the blood marrow multiply, there is not enough room for the red blood cells. The cancer cells crowd out and destroy the healthy

cells. A low red blood cell count can cause a variety of problems, including fatigue, weakness, and feeling cold.

Low levels of iron in the blood can also cause anaemia. If someone has developed anaemia because of Multiple Myeloma, the doctor may suggest to eat more foods containing iron. A boost in iron levels can help one feel less tired, and it also helps the body make more healthy red blood cells.

Without sufficient iron, one's body cannot produce enough haemoglobin, a substance in red blood cells that makes it possible for blood to carry oxygen to the body's tissues and carbon dioxide back to the lungs. As a result, one may feel weak, tired, and irritable.

When one eats food with iron, iron is absorbed into the body mainly through the upper part of the small intestine.

There are two forms of dietary iron: haem and non-haem. Haem iron is derived from haemoglobin. It is found in animal foods that originally contained haemoglobin, such as red meats, fish, and poultry. The body absorbs the most iron from haem sources. Non-haem iron is from plant sources.

Good sources of haem iron:

- Lean beef
- Lean lamb
- Chicken liver
- Clams, molluscs, mussels and oysters
- Halibut, haddock, perch, salmon, or tuna
- Sardines canned in oil
- Lean red meat including ham and veal
- Turkey
- Chicken

Good sources on non-haem iron:

- Lentils and dried beans
- Chick peas or split peas
- Iron-fortified cereals, breads and pastas
- Spinach
- Tofu
- Pumpkin, sesame, or squash seeds
- Dried apricots
- Stalk of broccoli
- Peanuts, pecans, walnuts, pistachios, roasted almonds, roasted cashews, or sunflower seeds
- Seedless raisins, dried peaches, or prunes
- Green pepper
- kale
- Brussels sprouts
- sweet potatoes
- tropical fruits, such as mango, papaya, pineapple, and guava

(WebMD; Myeloma UK; Mayo Clinic).

## Avoid Certain Foods

Individuals diagnosed with Multiple Myeloma have a higher risk of infection while they are undergoing treatment for Multiple Myeloma. This is because the immune system has been weakened by both cancer and chemotherapy treatment. Washing hands often and staying away from family and friends who are sick can help keep one from catching colds and other viruses.

When immunity is reduced, even fruits and veggies that have not been peeled can pose a risk to one's health. Cooking food to the minimum recommended internal temperatures kills any bacteria that may be present, and may prevent one from having a food-borne illness (food poisoning).

Tips on how to shop:

- buy cold or frozen food at the end of the shopping trip
- check the 'best before' date on all food – buy as fresh as possible
- check fruits and vegetables to avoid buying items that are bruised or damaged
- avoid spreading bacteria from raw food to ready-to-eat food by:
  - putting raw food in individual plastic bags (which can be found in the produce section and at some meat counters)
  - keeping raw meat, poultry, fish and seafood away from other food in the grocery cart
  - labelling using the same bag or bin for raw meat, poultry, fish and seafood and labelling the bag or bin
- refrigerate or freeze raw meat, poultry, fish and seafood as soon as one gets home from the grocery store
- perishable food should not be left out for more than:
  - 1 hour during summer outdoor activities
  - 2 hours at room temperature
- wash reusable grocery bags often, especially if carrying raw meat, poultry, fish and seafood

Rather avoid or limit:

Prepared foods straight from the package, without further heating

Non-dried deli meats, such as bologna, roast beef and turkey breast

Raw or lightly cooked eggs, or egg products that contain raw eggs, including some salad dressings, cookie dough, cake batter, sauces, and drinks (like homemade eggnog)

Raw or undercooked meat or poultry, such as steak tartar

Raw seafood, such as shushi

Raw oysters, clams and mussels

Refrigerated, smoked seafood

Raw or unpasteurised dairy products

Unpasteurised and pasteurised soft cheese, such as Brie and Camembert

Unpasteurised and pasteurised blue-veined cheeses

Raw sprouts such as alfalfa, clover, radish and mung beans

Refrigerated pâtés and meat spreads

Unpasteurised fruit juice and cider

(Healthy Canadians).

## Curcumin

Many people suffer from nausea and vomiting as a side effect of chemotherapy. Bland foods may be easier on one's stomach. But, if one can handle meals with a little more spice, try a curry made with turmeric containing enough curcumin or curcumin on its own. Mustard and some types of cheese also contain curcumin.



[Picture Credit: Curcumin]

Cancer is a hyperproliferative disorder that is usually treated by chemotherapeutic agents that are toxic not only to tumour cells but also to normal cells, so these agents produce major side effects. In addition, these agents are highly expensive and thus not affordable for most. Moreover, such agents cannot be used for cancer prevention. Traditional medicines are generally free of the deleterious side effects and usually inexpensive. Curcumin, a component of turmeric (*Curcuma longa*), is one such agent that is safe, affordable, and efficacious.

Curcumin has a diverse range of molecular targets, supporting the concept that it acts upon numerous biochemical and molecular cascades. Curcumin physically binds to as many as 33 different proteins, including thioredoxin reductase, cyclooxygenase-2, (COX2), protein kinase C, 5-lipoxygenase (5-LOX), and tubulin.

Curcumin has been shown to inhibit the proliferation and survival of almost all types of tumour cells. Accumulating evidence suggests that the mode of curcumin-induced cell death is mediated both by the activation of cell death pathways and by the inhibition of growth/proliferation pathways

A phase 1 Clinical Trial looked at giving curcumin to 25 patients with pre-cancerous changes in different organs. This study showed that curcumin could stop the precancerous changes becoming cancer.

Research has also shown that there are low rates of certain types of cancer in countries where people eat curcumin at levels of about 100 to 200mg a day over long periods of time. A number of laboratory studies on cancer cells have shown that curcumin does have anticancer effects. It seems to be able to kill cancer cells and prevent more from growing. It has the best effects on breast cancer, bowel cancer, stomach cancer and skin cancer cells. A 2007 American study that combined curcumin with chemotherapy to treat bowel cancer cells in a laboratory showed that the combined treatment killed more cancer cells than the chemotherapy alone.  
(Ravindran, *et al.*; Cancer Research UK).

## Stick to a Kidney-friendly Diet

An antibody made by myeloma cells can harm the kidneys. This can lead to kidney damage and even kidney failure.

Excess protein and calcium in the blood put a strain on the kidneys as they try to keep up with filtering all of the unwanted material out of the blood. A study published in the journal *Nephrology Dialysis Transplantation* states that around 50 percent of people with myeloma will experience some level of kidney failure.

With multiple myeloma, the malignant plasma cells in the bone marrow set off a chain reaction of processes in the body. Kidney failure is one of the final links in this chain. Rapid growth of malignant cells prevents the bones from rebuilding themselves. Since the bones cannot rebuild themselves, they begin to degenerate.

Degenerating bones release high amounts of calcium and protein into the bloodstream. The kidneys try to process all of the calcium and protein, but they cannot, and they get overworked. If the kidneys are overworked for too long, kidney failure occurs.

Luckily there are several ways that the kidneys can be kept healthy in people with myeloma, especially when the condition is caught early. Drugs called bisphosphonates, most commonly used to treat osteoporosis, can be taken to reduce bone damage and hypercalcemia. Patients can get fluid therapy to rehydrate the body, either orally or intravenously. Anti-inflammatory drugs called glucocorticoids can reduce cell activity. Dialysis can take some of the strain off the kidney function. Finally, the balance of drugs administered in chemotherapy can be adjusted so as not to further harm the kidneys.

Kidney failure is a common effect of multiple myeloma. When the condition is identified and treated in its early stages, damage to the kidneys can be minimal. When damage does occur, there are treatment options to help reverse the cancer's effects on the kidneys.

When one's kidneys are not working as well as they should, waste and fluid build up in the body. Over time, the waste and extra fluid can cause heart, bone and other health problems. A kidney-friendly meal plan limits how much of certain minerals and fluid one eats and drinks. This can help keep the waste and fluid from building up and causing problems.

How strict a meal plan should be depends on the stage of kidney disease. In the early stages of kidney disease, one may have little or no limits on what you eat and drink. As the kidney disease gets worse, the doctor may recommend that the patient limits:

- Potassium
- Phosphorus
- Fluids

Potassium - potassium is a mineral found in almost all foods. The body needs some potassium to make the muscles work, but too much potassium can be dangerous. When the kidneys are not working well, the potassium level may be too high or too low. Having too much or too little potassium can cause muscle cramps, problems with the way the heart beats and muscle weakness.

If someone has kidney disease, he/she may need to limit how much potassium they take in. Ask a doctor or Registered Dietitian on how to limit potassium.

Use the list below to learn which foods are low or high in potassium. The dietitian can also help to safely eat small amounts of one's favourite foods that are high in potassium.

Rather eat the following lower-potassium foods:

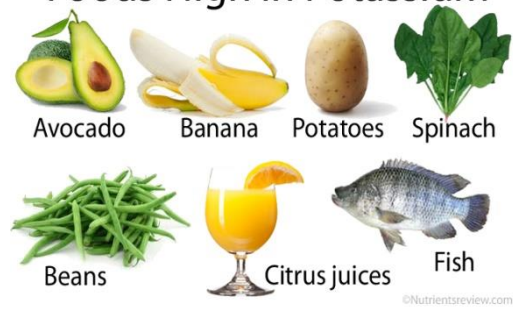
- Apples, cranberries, grapes, pineapples and strawberries
- Cauliflower, onions, peppers, radishes, summer squash, lettuce
- Pita, tortillas and white breads
- Beef and chicken, white rice



Reduce intake or avoid the following higher-potassium foods:

- Avocados, bananas, melons, oranges, prunes and raisins
- Artichokes, winter squash, plantains, spinach, potatoes and tomatoes
- Bran products and granola
- Beans (baked, black, pinto, etc.), brown or wild rice

## Foods High in Potassium



[Picture Credit: Foods High in Potassium]

The doctor may also tell patients to take a special medicine called a potassium binder to help the body get rid of extra potassium.

**Phosphorus** - phosphorus is a mineral found in almost all foods. It works with calcium and Vitamin D to keep the bones healthy. Healthy kidneys keep the right amount of phosphorus in the body. When the kidneys are not working well, phosphorus can build up in the blood. Too much phosphorus in the blood can lead to weak bones that break easily.

Many people with kidney disease need to limit phosphorus intake. Ask a Registered Dietitian for advice on how to limit phosphorus.

Depending on the stage of kidney disease, the doctor may also prescribe a medicine called a phosphate binder. This helps to keep phosphorus from building up in the blood. A phosphate binder can be helpful, but patients will still need to watch how much phosphorus they consume. Ask a doctor if a phosphate binder is right for you.

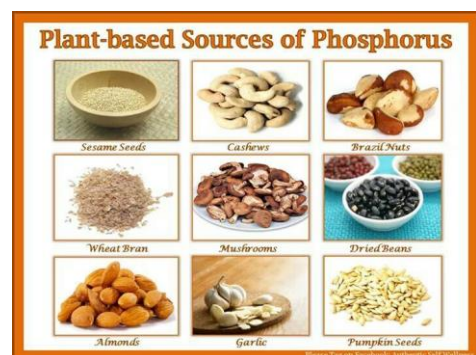
Use the list below to get some ideas about how to make healthy choices if in need to limit phosphorus intake.

Rather eat the following lower-phosphorus foods:

- Italian, French or sourdough bread
- Corn or rice cereals and cream of wheat
- Unsalted popcorn
- Some light-coloured sodas and lemonade

Reduce intake or avoid the following higher-phosphorous foods:

- Whole-grain bread
- Bran cereals and oatmeal
- Nuts and sunflower seeds
- Dark-coloured colas



[Picture Credit: Foods Rich in Phosphorus]

**Fluids** - one needs water to live, but when one has kidney disease, one may not need as much fluid. This is because damaged kidneys do not get rid of extra fluid as well as they should. Too much fluid in the body can be dangerous. It can cause high blood pressure,

swelling and heart failure. Extra fluid can also build up around the lungs and make it hard to breathe.

Depending on the stage of kidney disease and one's treatment, the doctor may tell the patient to limit fluid. If the doctor says so, the patient will need to cut back on how much fluid they drink. The patient may also need to cut back on some foods that contain a lot of water. Soups or foods that melt, like ice, ice cream and gelatine, have a lot of water. Many fruits and vegetables are high in water, too.

Ask a doctor or Registered Dietitian on how to limit fluids.

If one do need to limit fluids, measure the fluids and drink from small cups to help keep track of how much one has to drink. Limit sodium to help cut down on thirst. At times, one may still feel thirsty. To help quench thirst, try to:

- Chew gum
- Rinse your mouth
- Suck on a piece of ice, mints or hard candy (patients with diabetes should remember to choose sugar-free candy)

(American Kidney Fund; Healthline; Oxford Journals).

### **Reduce Sodium Intake**

When it comes to dietary sodium, less is certainly best. Diets high in sodium increase blood pressure levels. High blood pressure damages the kidneys over time, and is a leading cause of kidney failure. To help reduce salt intake to the ideal one teaspoon per day, the National Kidney Foundation offers the following tips to reduce sodium in one's diet:

- Use fresh, rather than packaged, meats. Fresh cuts of beef, chicken or pork contain natural sodium, but the content is still much less than the hidden extra sodium added during processing in products like bacon or ham. If a food item keeps well in the fridge for days or weeks, that is a tip off that the sodium content is too high.
- Choose fresh fruit and vegetables, as well, since they are very low in sodium. Canned and frozen fruits are also low in sodium.
- When buying frozen vegetables, choose those that are labelled 'fresh frozen' and do not contain added seasoning or sauces.
- Begin reading food labels as a matter of course. Sodium content is always listed on the label. Sometimes the high sugar content in a product like apple pie can mask the high sodium content so it is important to check every label for sodium content.
- Compare various brands of the same food item until one is found that has the lowest sodium content, since this will vary from brand to brand.
- Select spices or seasonings that do not list sodium on their labels, i.e. choose garlic powder over garlic salt.
- Before dining out, do research. Visit the restaurant's website which should list the sodium content of various dishes served there. Alternatively, when at the restaurant and ready to order, request that the dish be served without salt.
- Beware of products that do not taste especially salty but still have high sodium content, such as cottage cheese.
- Salt preference is an acquired taste that can be unlearned. It takes about 6-8 weeks to get used to eating food with much lower quantities of salt, but once it is done, it

becomes actually difficult to eat foods like potato chips because they taste way too salty.  
(National Kidney Foundation).

### **Some Additional Nutritional Guidelines**

Eat 5-6 small meals or snacks throughout the day - Smaller amounts of food are easier for the body to digest and absorb. It will also help to minimise nausea. Make sure that meals and snacks are balanced, nutritious and include a source of protein. Eat the largest meal when you feel the most hungry. Avoid eating too close to bedtime.

Eat foods that contain healthy fats - Avoid fried, greasy and fatty foods. These foods are hard to digest with an altered pancreas. Choose baked, broiled, or grilled foods instead. Healthy fats include monounsaturated and polyunsaturated fats such as canola oil, olive oil, nuts, and nut butters.

Eat as healthy as possible as allowed by the digestive system - Fruits, vegetables, lean protein, and whole grains are all nutrient dense foods. Nutrient dense foods are foods that contain protein, complex carbohydrates, healthy fat, vitamins, and minerals all needed by the body to function optimally. Consult a registered dietitian for specific recommendations based on one's level of food tolerance.

No single food will supply all the nutrients a body needs, so good nutrition means eating a variety of foods. It is important to eat foods from each group at each meal every day.

Avoid excess sugar and sweets - Since the pancreas plays a key role in the digestion of sugar, there is an increased chance that one will not digest overly sweet foods well. These foods also tend to provide the body with kilojoules but few nutrients.

If excessive weight loss becomes an issue, one's body may need more kilojoules and it is fine if some of them come from sugar as long as one is able to tolerate sweet foods.

Try to eat with others when possible - Typically this makes meal times more enjoyable and may encourage one to eat more than eating alone.

Eat slowly and chew food really well - Digestion begins in the mouth. Smaller food particles are much easier to digest and are less likely to cause discomfort during the digestion process.

Be as active as possible - Exercise may help to stimulate appetite and endorphin production. Being able to eat more and having an enhanced feeling of wellbeing will make your treatments more bearable.

Drink sufficient fluids to avoid dehydration - Choose beverages that contain nutrients and kilojoules. A good starting point is to strive for nutritious beverages. Only take small sips with



meals to avoid excessive bloating, gas or feeling too full to eat. The best time to drink fluids is an hour before or after a meal. Choose beverages that contain kilojoules and nutrients such as juices, smoothies, and liquid nutrition supplements.

A registered dietitian can provide recommendations for which liquid nutrition supplement and how much is best.

Avoid all alcoholic beverages - Alcohol is a Group 1 cancer causing agent according to the International Agency for Research on Cancer (IARC) and is best avoided.

Keep a journal - Record eating times, foods consumed, and any effects to track and determine which foods are best tolerated.

Be observant of changes in bowel habits - One may experience symptoms of fat malabsorption which can be determined by the frequency of bowel movements and the appearance of stools. Fat containing stools are often bulky, frequent, foul smelling, and have an oily appearance. These symptoms warrant the need for vitamin A, D, E, and K supplements as well as a multivitamin. One may also need a calcium supplement. One's healthcare team can advise on choosing these as well as the correct dosage. Ask the treating oncologist about vitamin B<sub>12</sub> injections and iron to avoid becoming anaemic.

Take medication as prescribed – It is essential to take medicines regularly as prescribed.

Maintain a good mass (weight) - It is normal to lose some weight after being diagnosed with pancreatic cancer and beginning on treatment. If losing more than ½ to 1Kg per week continuously, consult a registered dietitian immediately for recommendations on increasing kilojoule intake.

If there are any specific questions regarding any of the guidelines, please contact a registered dietitian.  
(Pearlpoint Cancer Support; Medscape.)

### **Medical Disclaimer**

These Nutritional Guidelines are intended to provide general information only and, as such, should not be considered as a substitute for advice, medically or otherwise, covering any specific situation. Users should seek appropriate advice before taking or refraining from taking any action in reliance on any information contained in these Guidelines. So far as permissible by law, the Cancer Association of South Africa (CANSA) does not accept any liability to any person (or his/her dependants/estate/heirs) relating to the use of any information contained in these Guidelines.

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## **ADDITIONAL SUPPORT**

For individualised nutritional advice, consult a registered dietitian in your area by visiting:  
<http://www.adsa.org.za/Public/FindARegisteredDietitian.aspx>

## Sources and References

### American Kidney Fund

<http://www.kidneyfund.org/kidney-disease/chronic-kidney-disease-ckd/kidney-friendly-diet-for-ckd.html?referrer=https://www.google.co.za/>

### Cancer Research UK

<http://www.cancerresearchuk.org/about-cancer/cancers-in-general/cancer-questions/cancer-turmeric-prevent-bowel-cancer>

### Curcumin

<http://curcuminreview.org/>

### Foods High in Phosphorus

<https://za.pinterest.com/pin/501166264761384923/>

### Foods High in Potassium

<http://www.nutrientsreview.com/minerals/potassium-kalium.html>

### Healthline

<http://www.healthline.com/health/cancer/multiple-myeloma-kidney-failure#EffectsofMultipleMyeloma2>

### Healthy Canadians

<http://healthycanadians.gc.ca/eating-nutrition/healthy-eating-saine-alimentation/safety-salubrite/vulnerable-populations/immune-immunitaire-eng.php>

### Mayo Clinic

<http://www.mayoclinic.org/diseases-conditions/iron-deficiency-anemia/basics/prevention/con-20019327>

### Medscape

[http://www.medscape.com/viewarticle/773158\\_3](http://www.medscape.com/viewarticle/773158_3)

### Multiple Myeloma

<https://za.pinterest.com/jennieclark/my-hero-my-momma/>

### Myeloma UK

<https://www.myeloma.org.uk/wp-content/uploads/2013/09/Myeloma-UK-Diet-and-nutrition-Infosheet.pdf>

### National Kidney Foundation

[https://www.kidney.org/news/ekidney/june10/Salt\\_june10](https://www.kidney.org/news/ekidney/june10/Salt_june10)

### Oxford Journals

<http://ndt.oxfordjournals.org/content/15/3/301.full>

### Pearlpoint Cancer Support

<https://pearlpoint.org/blog/pearls-wisdom/15-tips-optimize-nutrition-during-and-after-treatment-pancreatic-cancer>

**Ravindran, J., Prasad, S. & Aggarwal, B.B.** 2009. Curcumin and cancer cells: how many ways can curry kill tumor cells selectively? *AAPS J.* 2009 Sep; 11(3): 495–510. Published online 2009 Jul 10. doi: 10.1208/s 12248-009-9128-x. PMID: PMC2758121.

**WebMD**

<http://www.webmd.com/diet/iron-rich-foods>