



# What I tell my patients about diet in chronic kidney disease

Decades ago, when dialysis was unavailable and artificial erythropoietin (the hormone that regulates production of red blood cells) was a dream, relief and control of uraemic symptoms was largely achieved, albeit inadequately, by dietary manipulation. If kidney failure was sufficiently advanced as to reduce adequate excretion of waste products of metabolism, then there had to be strict control of what went in as food and drink.

## Renal-related dietary manipulation

Until the kidneys fail, most people are unaware of just how many tasks they perform. We all know that the kidneys make urine, but they do a lot more besides.

**Protein** is required in the diet, but if somebody eats more than they need, waste products including urea are left over. Usually, the levels of urea in the body are tightly controlled, with any excess being excreted by the kidneys. If the kidneys fail, levels may rise much too high, resulting in unpleasant symptoms that include nausea, vomiting, tiredness and taste changes – symptoms of uraemia. No nutrient can be totally cut out from the diet – everyone needs certain minimum levels of energy and protein, and a range of vitamins and minerals.

Protein cannot, and should not, be eliminated from the diet, but uraemic symptoms may be minimised if the amount of protein in the diet is carefully controlled.

**Phosphate** is a mineral that is important for the bones. Again, minimum levels are required and excess would normally be excreted in urine. If levels rise too high, symptoms are few,

### Box 1. Major sources of phosphate

- Hard cheeses, cheese spread and processed cheese
- Nuts
- Processed meats
- Offal
- Oily fish, such as mackerel and sardines
- Shellfish, such as prawns and scampi



*Healthy eating is always important, but especially so if you have developed chronic kidney disease*

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although some people say they feel itchy. However, the long-term consequences to bone health and blood vessels are significant. Fortunately, many foods that are high in phosphate are also high in protein, so controlling one will help control the other (see Box 1).

**Potassium** is another mineral that can be troublesome if its levels in the blood rise too high. It is involved with the regulation of heart rate, so it is important that levels in the blood stay within strict limits. A variety of foods that are high in potassium, or make a significant contribution to potassium intake when eaten in normal quantities, may need to be limited (see Box 2).

In none of these examples does eating a diet high in protein, phosphate or potassium contribute to the cause or progression of kidney disease. However, all too often the kidney disease itself cannot be reversed and dietary manipulation takes on an important role in the management of symptoms and the control of biochemistry.

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In the early stages of kidney disease, these ‘three Ps’ – protein, phosphate and potassium – usually remain under control. Phosphate tends to be the first one where levels begin to creep up; however, potassium levels can also rise, particularly if certain medications to control blood pressure are prescribed. Regular blood tests will ensure that appropriate action is taken when needed.

## We are what we eat

So, what can be done to prepare for possible changes in kidney function and stay as well and healthy as you can? Many people with early chronic kidney disease (CKD) never progress to the point where dialysis will be needed, but if this is a possibility, there are a number of dietary and lifestyle measures that will minimise this risk.

### Well-balanced diet

Both in sickness, and when you are healthy, the bedrock of optimal health for everyone is a well-balanced diet that includes a wide variety of foods to provide all the energy, protein, vitamins, minerals and fibre that the body needs to function properly.

The next layer is to make any dietary changes that are required as part of the treatment or

management of conditions such as diabetes, heart disease, or kidney disease if you have any of those conditions. The top layer is to try and incorporate foods that are thought to minimise the long-term risks of such diseases.

It is possible to address all three layers, but it is important to ensure a basic well-balanced diet, and to review priorities from time to time. A ‘moderation in all things’ approach will usually accommodate all requirements, including personal likes and dislikes.

Eating a variety of foods from all the groups shown in the ‘eatwell plate’ guide to healthy eating (see Figure 1) will ensure that all the nutrients needed to optimise health are included. This is true for everyone. If a basic daily pattern of 5 – 2 – 2 – 5 portions is followed, a healthy weight will be achieved and maintained, and both protein and phosphate will be taken in moderate quantities.

Portion sizes cannot be specifically prescribed, as different people will require different amounts depending on their age and body size, but broadly speaking, the five portions should each be from the cereals, potatoes and starchy foods group and the fruit and vegetables group and the quantity should fit inside your cupped hand. The two portions should be from the meat, fish and alternatives and from the milk and dairy foods. The portion size for meat and fish should fit on the palm of your hand. For dairy foods, a medium-sized glass of milk, a pot of yoghurt or an individual (small matchbox-sized) cheese portion provide an adequate amount.

### Healthy bodyweight

A healthy bodyweight is well recognised as important for preventing heart disease, diabetes and high blood pressure, but more recently it has been recognised that a body weight that is well above the ideal range can in itself be a cause of kidney damage.

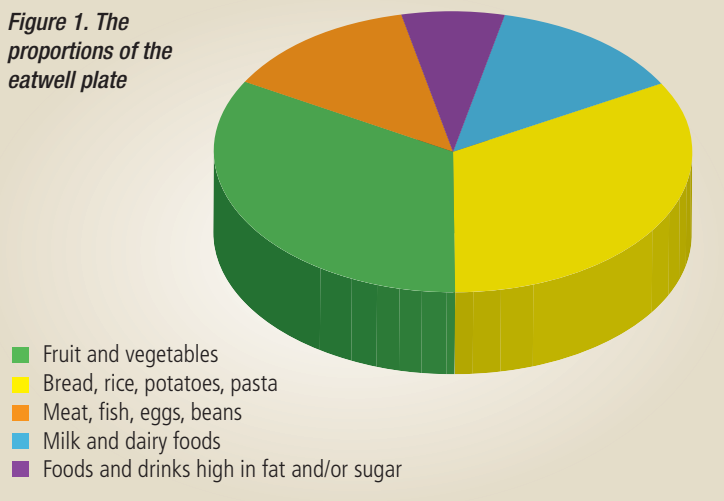
A healthy bodyweight is important for optimal blood pressure control, and 10% weight loss may result in a reduction in blood pressure of around 6 mmHg. In diabetes, weight loss of 5–10% has been shown to improve blood sugar control by reducing insulin resistance, thereby enabling the body to more efficiently utilise insulin.

It is important that any weight loss is achieved sensibly, by combining a well-balanced, structured eating programme with regular exercise. Following the eatwell plate model and paying particular attention to portion size will result in a steady weight loss for most people.

## Box 2. Major sources of potassium

- Some fruit and vegetables
- Potatoes – particularly chips and jacket potatoes
- Some breakfast cereals, such as bran cereals and muesli
- Some bread, cakes and biscuits, such as those containing dried fruit
- Fresh, tinned and packet soups
- Savoury snacks, such as potato crisps and nuts
- Some drinks, such as coffee and pure fruit juice
- Salt substitutes, such as LoSalt or Selora

Figure 1. The proportions of the eatwell plate





Many people eat the right foods but in larger quantities than their body needs. Others eat too many things from the small slice of the plate that represents sweet and fatty foods and alcohol, which contain few essential nutrients. Most people do a bit of both!

It is always possible to combine achieving the recommended number and size of portions from each section of the eatwell plate with dietary modification aimed to help control protein, potassium, phosphate and sodium if necessary.

People should set realistic weight-loss goals, such as 5–10% of initial bodyweight. Weight loss should be achieved steadily at a rate of around 0.5–1 kg (1–2 lb) per week, as a faster rate of weight loss leads to muscle loss rather than loss of fat. Restrictive diets that do not adopt a healthy eating approach and claim to promote faster weight loss are not encouraged.

It is also important to remember that people who are underweight should try to achieve a healthy bodyweight to ensure that they remain as well as possible, particularly if kidney function starts to decline. The unpleasant symptoms that are often associated with reduced kidney function, including nausea, vomiting, tiredness and taste changes, may in themselves affect appetite and cause unnecessary weight loss if not addressed.

### Diabetes and high blood pressure

Two of the most common causes of renal failure are diabetes and high blood pressure. Diet plays an important role in both conditions, so it is worth trying to ensure that the dietary and lifestyle advice you have been given if you have either diabetes or high blood pressure, or both, becomes part of your everyday eating pattern. Well-controlled blood pressure, together with well-controlled blood sugar levels in diabetes, will minimise further damage to kidneys and slow the rate at which kidney function deteriorates.

#### Blood pressure

A healthy lifestyle is important to help control blood pressure, with various measures contributing towards good blood pressure control (see Box 3).

#### Cut back on salt

As well as achieving a healthy bodyweight, salt is one of the most important dietary factors in blood pressure control. The good news is that reducing your salt intake alone can help to reduce blood pressure.

### Box 3. Lifestyle measures for reducing blood pressure

- Achieve a healthy bodyweight
- Reduce salt intake
- Limit alcohol consumption to  $\leq 3$  units/day for men and  $\leq 2$  units/day for women
- Try to exercise regularly
- Eat 5 portions of fruit and vegetables daily
- Reduce intake of total fat and saturated (animal) fat

As a population, we eat too much salt. The average daily salt intake in the UK is 8–9 g, even though the recommended maximum salt intake is just 6 g per day. This is due mainly to our reliance on processed foods. Many people believe that they follow a low-salt diet, as they do not add salt to food in cooking or at the table. However, approximately 75% of salt in the UK diet comes from salt in processed foods, so most of us eat more salt than we realise.

#### How can we eat less salt?

Reducing the salt in your diet is certainly possible, but it may take some effort and commitment. You should try to:

- Limit the amount of high-salt and processed foods consumed, and choose more freshly-prepared foods where possible (see Table 1)
- Avoid adding salt to food at the table
- Minimise the amount of salt used in cooking
- Use pepper, vinegar, herbs and spices to add flavour to food
- Remember that gravy, ketchup, sauces and pickles often contain salt, so only use them in small quantities.

Salt substitutes should not be used as they still contain some sodium. More worryingly, they also contain a high level of potassium, which could be harmful for people with CKD. Salt substitutes do not reduce the taste for salt, so it is far better for people to lose the taste for salt and become used to eating less salty foods. Your taste buds will quickly adapt to using less salt on your food, so it is worth persevering if you find food a little bland initially.

#### Diabetes

Diabetes is one of the major causes of CKD, and well-controlled blood sugar levels are crucial for preventing the complications of diabetes. It is important that you carefully follow any dietary and lifestyle advice given previously to help control diabetes. Healthy eating in diabetes is based around the eatwell



**Table 1. Alternatives to high-salt foods**

Salty foods to cut down on	Suitable alternatives
<b>Meat and meat products</b> Bacon, gammon, black pudding, tinned meat (eg corned beef, ham, Spam), pâté, salami, sausages, beef burgers, meat pies and most ready-made meat dishes	Plain meat (eg roast meats, chops, steaks and chicken), homemade meat pies
<b>Fish and fish products</b> All smoked fish, tinned fish in brine (eg tuna, sardines, anchovies), prawns, fish paste	Fresh fish (eg cod, haddock, halibut, lemon sole, plaice, salmon, trout), tinned fish in spring water or oil
<b>Cheese</b> Hard cheeses (eg cheddar, Cheshire, edam), soft cheeses (eg brie, feta), processed cheese (eg cheese slices and cheese spread)	Cottage cheese, cream cheese
<b>Savoury snacks</b> Crisps, maize, corn and wheat snacks, salted nuts, most other savoury snacks (eg Twiglets, Bombay mix, pork scratchings, salted popcorn, salted crackers)	Unsalted crisps, nuts and crackers, plain popcorn
<b>Soups</b> Packet, canned and fresh soups	Homemade soups
<b>Miscellaneous</b> Soy sauce, Bovril, Marmite, gravy granules, stock cubes, olives in brine	Herbs, spices, vinegar, small amounts of chutney, pickles and bottled sauces, salad cream, mayonnaise

plate model, paying particular attention to portion size of carbohydrate foods. It is important to regulate consumption of foods that are high in sugar and refined carbohydrate, and instead choose more filling foods such as whole grain cereals and fruit and vegetables. A healthy diet for patients with diabetes should also be combined with achieving a healthy bodyweight and cutting back on salt intake to help protect the kidneys further.

## Key points

- A balanced diet is important to ensure good health, whether or not you have a long-term illness.
- In chronic kidney disease (CKD) the body's ability to process and remove excess protein, phosphate and potassium is compromised, resulting in side-effects.
- Dietary intake of protein, phosphate or potassium will not cause or exacerbate CKD, but dietary control may become necessary to manage symptoms.
- Maintaining good blood pressure and lowering salt intake are also important in patients with CKD.

## Further advice

Different units and hospitals around the country offer dietary advice in a variety of settings depending on local policy and distribution of dietitians between renal units, diabetes centres and the community.

Your own doctor should be able to refer you for appropriate professional help when you need it.

The following leaflet and websites are also helpful and reliable:

*Eating Well for your Kidneys*. (Available on the internet at [www.britishrenal.org/getattachment/CKD-Forum/Educational-Resources/CKD--Nutrition-Leaflet.pdf.aspx](http://www.britishrenal.org/getattachment/CKD-Forum/Educational-Resources/CKD--Nutrition-Leaflet.pdf.aspx))

British Renal Society – [www.britishrenal.org](http://www.britishrenal.org)  
 British Dietetic Association – [www.bda.uk.com](http://www.bda.uk.com)  
 Food Standards Agency – [www.eatwell.gov.uk](http://www.eatwell.gov.uk)

## Conclusion

If you have CKD, you should follow dietary and lifestyle advice focusing on: eating a varied diet, reducing phosphate when indicated, lowering salt intake, achieving a healthy bodyweight and taking regular physical activity ■



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