



Royal Berkshire
NHS Foundation Trust

Eating well on peritoneal dialysis

Information for patients

This leaflet is for people on peritoneal dialysis and their families or carers. It explains relevant food-related issues you may face and includes dietary advice and tips on how to eat well.

Reasons to think about what you eat

When your kidneys are not working well, there may be a build up of your body's waste products and certain minerals in your blood.

Many of these are harmful if present in excess (e.g. too much urea, phosphate or fluid). Peritoneal dialysis (PD) removes a significant amount of waste products and excess minerals from your blood to help keep levels from rising too high.

Usually, however, it is also necessary to follow certain dietary guidelines to reduce the risk of other problems.

Eating and drinking sensibly can help to:

- Keep you well-nourished
- Keep you feeling as fit and strong as possible
- Maintain a healthy weight
- Keep your heart and blood vessels healthy
- Keep your bones healthy
- Control your blood pressure

The guidance on food and fluids that follows reflects the types of issues that are most likely to arise but bear in mind that there are many factors to take into account and dietary requirements will vary.

Your dietitian will advise you on which parts of your diet to focus on most, according to your own particular needs, in order to help keep you as healthy as possible.

Protein

Protein is an essential part of your diet to help build and repair body tissue, especially muscle. During PD, some protein is lost from the body. To counteract this loss, it is important to have plenty of protein in your diet.

Examples of high protein foods include:

- Animal proteins; *red meat, poultry, white fish, tuna, salmon, cottage cheese and eggs (see phosphate section).*
- Vegetable proteins; *pulses e.g. beans/lentils, soya products, Quorn, tofu.*

Try to include a good-sized portion of a food high in protein at two meals every day. Your dietitian can advise you about the amounts of these foods you require.

Potassium

Potassium is a naturally occurring mineral found in many foods. You may have previously been advised to follow a low potassium diet, as it is common for potassium levels in the blood to rise when your kidneys are failing. High levels of potassium in the blood can cause an abnormal heart rhythm.



PD is very good at removing potassium from the blood, so once PD is established, a low potassium diet is usually no longer needed. Sometimes, blood potassium levels can fall too low, causing muscle weakness, aches and cramps and heart palpitations. This can be corrected by increasing potassium in your diet by eating more foods such as dried apricots, raisins, jacket potatoes, orange juice and bananas. Normal potassium levels are around 3.5 - 5.5mmol/l.

Phosphate

Phosphate is found in a wide variety of foods and is normally removed from the body by the kidneys. When kidney function is worsening, phosphate levels in the blood can become too high. Ideally your phosphate level should be kept between 1.1-1.7mmol/l.

If you have high phosphate levels in your blood, this may cause:

- Damage to your heart and blood vessels, increasing the risk of heart disease, strokes and poor blood supply to your legs and skin.
- Weakened/ brittle bones and aching joints.
- Itchy skin and itchy eyes.

Limit milk

Almost all high protein foods contain phosphate but milk is especially high so milk or yoghurt need to be limited to 1/3 pint or 200ml/day, though organic rice or oat milks are good low phosphate alternatives. Most cheeses are also high phosphate except cottage or cream cheese.

Other foods to avoid on the whole include:

- Liver (and liver pate) and other offal meats
- Certain fish, especially where bones are edible, e.g. pilchards, sardines, seabass, whitebait, monkfish
- Fresh crab, crayfish, scampi, mussels, oysters
- Malted milk drinks
- Cola drinks
- Nuts and seeds
- Chocolate (all types)
- Foods containing lots of baking powder or self-raising flour, e.g. scones, crumpets, naan bread
- Foods using gram flour (e.g. Bombay mix, chevda, samosas & bhajis)
- Foods very high in bran, muesli, Readybrek
- Lagers, stout

Phosphate additives

Phosphates are often used as a preservative or as an ingredient in processed foods and can contribute significantly to your total phosphate intake. Check the labels of foods and avoid any of the following:

- Phosphoric acid
- Dicalcium phosphate
- Monocalcium phosphate
- Pyrophosphates
- Hexametaphosphate
- Polyphosphates
- Sodium phosphate.

Choosing fresh, unprocessed food will avoid this problem.

Phosphate binders

In addition to diet changes, you may also be prescribed some tablets known as *phosphate binders*. These tablets should be taken when you eat. They work by “binding” to phosphate in your food and reducing the amount of phosphate your body can digest and absorb from it. The most commonly prescribed phosphate binders are shown below:

- Phosex or Renacet (calcium acetate) to be taken with food
- Calcichew (calcium carbonate) to be taken before food
- Renagel (sevelamer hydrochloride) to be taken with food
- Fosrenol (lanthanum carbonate) to be taken with or after food

Always make sure you have a supply of binders with you wherever you are and re-order well before you run out.

If you need more advice about lowering your phosphate level, your dietitian can give you more detailed advice.

Salt (sodium chloride)

A low salt (or low sodium) diet is very important when your kidneys are no longer able to produce unlimited amounts of urine. Salty foods make you more thirsty and can lead to fluid retention (‘oedema’) and high blood pressure. If you need to limit your fluid intake, a low salt diet is essential.

- Cut back as much as you can on salt added during cooking and at the table. Your taste buds soon get used to less.
- Instead, use alternative flavourings such as herbs and spices, pepper, onions and garlic, chilli, honey, lemon or lime, vinegars, wine, apple sauce, redcurrant jelly, mustard powder.
- Avoid processed foods as much as possible, e.g.
 - Processed meat products such as bacon, ham, salami, tinned meats, sausages, meat pies and pasties
 - Smoked or salted fish
 - Many tinned and packet savoury foods, including foods tinned in brine, soups, meat and vegetable extracts (Bovril, Marmite)
 - Salted nuts, salted biscuits or crackers, crisps
 - Most stock cubes, gravy mixes and ready-made sauces, pickles and chutneys



- Most cheeses
- Many ready meals

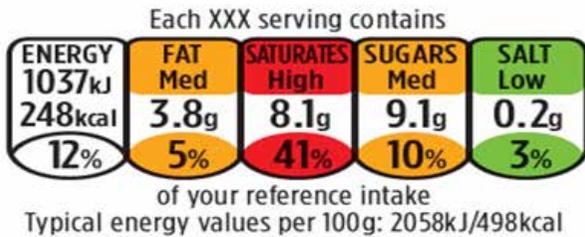
Perhaps most importantly, check food labels for salt information.

You may need to aim for as little as 4g of salt per day, certainly no more than 6g per day.

Use this table for guidance when choosing manufactured foods:

	suggested maximum per 100g	suggested maximum per meal
SALT	0.8g	1.1 - 1.7g

Where food packaging uses a ‘traffic light’ system, try to choose foods that are ‘green’ for salt, indicating a low salt content.



Fluid (liquid)

On dialysis, you may need to limit your fluid or liquid intake to some degree. Fluid is removed from your body mainly when you pass urine and when you have dialysis. If you take in more fluid than your kidneys and dialysis can remove, you will become “overloaded” with fluid.

Drinking too much liquid can cause a rapid increase in weight, shortness of breath, swelling of feet and lower legs and high blood pressure. This is harmful to your heart as it then has to work much harder to deal with the extra fluid. Over time, fluid overload gives your heart more work to do and eventually leads to heart failure, a very serious condition.

Your fluid balance can change over time and will depend on the volume of urine you produce and on your dialysis regimen as well as how much you drink.

Try to keep your fluid intake to a maximum ofdaily
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Best foods to choose

Meat, fish and alternatives

All fresh, unprocessed, lean meat, e.g. beef, chicken, lamb, mutton, pork, turkey, venison.

Fresh, unprocessed white fish (e.g. cod, haddock, plaice, skate, sole), tuna – fresh or tinned in oil or spring water, fresh or no added salt tinned salmon.

Beans, lentils, chickpeas, soya mince/pieces, tofu

Milk and dairy foods

Organic oat/rice milk, cottage cheese, cream cheese e.g. Philadelphia.

Starchy carbohydrate foods

Homemade reduced salt bread, chappatis, plain white or wholewheat pasta, white or brown rice, rice noodles, porridge, Weetabix, Shredded Wheat, Shreddies. Matzo crackers, no added salt rice cakes, wheat flour, cornflour, potatoes, sweet potatoes, cassava, yam.

Fruit and vegetables

Eat all types of fruit and vegetables as long as your blood potassium levels are normal and the vegetables have had no salt added in processing. If you have diabetes you still need to consider the effects of fruit on your blood sugar levels.

Foods high in fat and/or sugar

Limited unless you need to gain weight.

Drinks

Coffee, tea (all types, including green tea, herbal teas), squashes, cordials and barley waters, mineral or tap water, flavoured waters, sugar-free fizzy drinks.

Miscellaneous

All herbs and spices, garlic, pepper, mustard powder, vinegars, apple sauce, cranberry sauce, home-made or low salt vinaigrettes/dressings, tomato puree if no added salt.

Low salt stock cubes e.g. Kallo very low salt range, Schwartz 'Simply Shake No Added Salt' range.

Natex savoury spread (in some health stores).

Foods in moderation

Meat, fish and alternatives

Fish in breadcrumbs/batter (but can be salty), prawns, shrimps, squid, cockles and winkles if not high salt. Eggs – up to about 5/week (but egg whites unlimited)
Houmous (check salt), Quorn products (check salt).

Milk and dairy foods

Cows' milk – up to 200ml (1/3 pint) or organic soya milk up to 300ml (1/2 pint) daily.
Custard, ice cream, milk puddings, yoghurt (include in milk allowance). Cream, crème fraiche.

Starchy carbohydrate foods

Corn Flakes, Frosties, Rice Krispies, Cheerios, Special K (preferably below 1.0g salt/100g), Breads - including pitta bread, rolls, croissants, tortilla wraps and bagels, English muffins, cream crackers, crispbreads, oatcakes, breadsticks (check salt).

Fruit and vegetables

If your blood potassium levels are a little high, speak to your dietitian for further advice.

Foods high in fat and/or sugar

Most oils (eg olive/sunflower), butter or spreads, potato/rice/wheat/corn-based snacks (check salt), sugar, jam, marmalade, honey, most sweets, biscuits/cakes, desserts.

Drinks

Fruit juices, alcohol within generally recommended limits (though beers and ciders may be best avoided if you have a fluid restriction), most regular fizzy drinks.

Miscellaneous

Mayonnaise/salad dressings (check salt), reduced salt gravy/bouillon, mustard, horseradish sauce, no added salt tomato ketchup.

It is recommended that all patients with renal disease avoid star fruit as it contains a harmful toxin.

Foods to try to avoid where possible

Meat, fish and alternatives

Bacon, ham, gammon, tinned meats, sausages, salami, frankfurters, beefburgers, meat pies, processed / 'formed' packet meat slices, sausage rolls / pasties, liver, kidneys, pate.

Fish if smoked / salted / tinned in brine, pilchards, sardines, whitebait, seabass, mussels, crab, scampi, fish paste, taramasalata.

Baked beans, quiche, pizza, most Quorn products, nuts and seeds.

Milk and dairy foods

Hard cheese, soft cheese (eg Brie), processed cheese, cheese spreads (e.g. Dairylea), feta, cheese sauces.

Condensed/evaporated milk, coconut cream/milk.

Starchy carbohydrate foods

Processed potato products, e.g. oven chips, croquettes, wedges, instant mash.

Couscous, instant noodle or pasta products, naan bread, crumpets, self-raising flour, gram flour, cereals high in bran, nuts or chocolate (eg All Bran, Sultana Bran, Branflakes, muesli), Readybrek.

Fruit and vegetables

Unless your blood potassium levels are high, eat all fruit and all vegetables except those processed with salt, e.g. olives and some tinned vegetables.

Foods high in fat and/or sugar

Chocolate, cereal bars, scones, pancakes, chocolate cake, Bombay mix and similar Asian snacks, samosas, pakoras, bhajis, potato crisps and most other savoury snacks, inc. salted popcorn or crackers.

Drinks

Bovril, dark fizzy drinks (cola drinks or Dr Pepper), malted drinks, hot chocolate/cocoa, milkshakes.

Miscellaneous

Baking powder, most soups, Marmite, soy sauce, ordinary stock cubes, peanut butter, chocolate spread, gram flour (besan).

If you are overloaded with fluid, stronger dialysis bags may be needed to remove more fluid from your body. Stronger bags contain more glucose (sugar) and can cause additional weight gain, higher blood sugars and peritoneal membrane damage. It is better to control your fluid intake so that you can stay on “weaker” bags for your dialysis.

Managing your fluid intake

When calculating your intake of fluids, remember that many foods have a high fluid content. For example, sauces and gravies, milk puddings, jelly, ice cream and ice lollies may contribute significant amounts of fluid to your overall intake so try to allow for these 'hidden fluids'.

More top tips

- Use a small cup (perhaps ideally around ¼ pint/140ml maximum).
- Use an ice cube in place of a drink (try freezing a little lemon/lime juice in with the ice cube).
- Try freezing small pieces of fruit to suck on (e.g. mandarin segments, pineapple chunks or berries).
- Help to stimulate saliva and stop your mouth feeling dry by sucking a slice of lemon or lime, using sugar free gum/mints or boiled sweets.
- Try to take drinks that quench your thirst so avoid very sweet or salty drinks, which are less refreshing.
- Sip your drinks. Use a straw with cold drinks to slow you down.
- If you rinse your mouth out with cold water and spit it out rather than swallowing, this can help take the edge off your thirst.
- Clean your teeth between meals to freshen your mouth.
- If you are going out in the evening and are likely to want to drink more, try to drink less in the daytime to ‘save up’ your fluid allowance.

Useful measures to help you add up how much you are drinking:

	Average measure	Your home measure
Disposable plastic cup	150ml	
Tea cup	180ml	
Can of soft drink	330ml	
Glass	200ml	
Mug	200-250ml	
Ice cube	20ml	
Soup bowl	200ml	

750ml = $\frac{3}{4}$ litre = $1\frac{1}{3}$ pints

1000ml = 1 litre = $1\frac{3}{4}$ pints

1500ml = $1\frac{1}{2}$ litres = $2\frac{2}{3}$ pints

Fibre

Constipation can be a common problem for people on PD and can lead to poor drainage of dialysis fluid. Where possible, try to eat fibre-rich foods to help prevent constipation.

Good sources of fibre are:

- Wholemeal, granary or high fibre white bread
- Shredded Wheat, Weetabix, Shreddies, porridge
- Brown rice, wholewheat pasta
- Pulses, beans, lentils, dahl
- Dried fruit, fresh fruit and vegetables. Aim for 5 portions a day, as long as your potassium level is well controlled.

Some of these foods contain phosphate, but in a form that is not absorbed well by the body. This means they are safe to eat, with the exception of foods very high in bran, which are a bit too high in phosphate for us to recommend freely.

Maintaining a healthy body weight

Many people notice that their appetite improves once they start dialysis, and that their body weight starts to rise. For some people, this may be a welcome sign that they are eating better and regaining body weight than had previously been lost. For others, weight gain is less desirable.



One of the reasons you may gain flesh weight is the dialysis bags contain glucose (sugar) and this is absorbed in to your body. This provides you with extra calories (energy) that you haven't had the pleasure of eating!

The stronger, higher strength bags contain more glucose, so even more calories are absorbed.

If you find you are gaining unwanted weight, you may need to make some changes to your diet to tackle this problem and your dietitian can help you with this.

A high protein diet

People with kidney disease on dialysis need a high protein diet.

It is very important that you eat enough high protein foods to avoid malnutrition, which is associated with muscle loss, weakness and immobility, makes you more likely to pick up infections and delays recovery from illness (e.g. peritonitis).

Some people on PD find that their appetite is poor. A loss of appetite or a feeling of fullness is not uncommon.

If you are worried that you are not eating enough, contact your dietitian for advice on increasing your calorie and/or protein intake. He/she can advise you about nutritional supplements that can be prescribed by a doctor.

Diabetes

If you have diabetes, your blood glucose levels may increase when you start dialysis, due to the glucose you will absorb from the bags. You may need to do more regular monitoring for a while and your diabetes treatment may need to alter. If you need help doing this, speak to a member of staff.

Vitamins and minerals

Some Vitamin C and various B vitamins are lost from the body during dialysis, so you may be advised to take a daily vitamin supplement called 'Renavit'.

Too much of some vitamins can be harmful to dialysis patients, so it is not advisable to take other supplements unless you have checked with your doctor, dietitian or pharmacist.

Example meal plan outline

**Binders
to take**

Breakfast

Fruit

Breakfast cereal and milk (from allowance)

Bread / toast with butter / margarine / low fat spread /
jam / marmalade

Tea

Mid-morning (if desired)

Tea or coffee

Main meal

_____oz / _____g meat/ poultry/tuna/salmon OR

_____oz / _____g white fish OR

_____ tablespoons pulses e.g. beans/lentils/chickpeas

Potatoes / rice / pasta

Vegetables / salad

Fresh / tinned fruit or yoghurt (from allowance)

Mid-afternoon (if desired)

Tea or soft drink

Snack meal

Bread

Butter / margarine / low fat spread

_____oz / _____g lean meat/poultrytuna/salmon OR

_____tablespoons cottage cheese OR

_____ eggs (from allowance)

Salad

Fruit

Further information

National Kidney Federation

www.kidney.org.uk

The NKF is the National Kidney Patient charity in the United Kingdom. The charity is run by Kidney Patients for Kidney Patients

Kidney Research UK

www.kidneyresearchuk.org

Kidney Research UK is the leading UK charity funding research that focuses on the prevention, treatment and management of kidney disease. The charity also dedicates its work to improving patient care and raising awareness of kidney disease.

Kidney Patient Guide

www.kidneypatientguide.org.uk

This website provides information for renal patients, their partners and families, health care professionals and anyone else who is interested in kidney disease.

A variety of cookbooks are available. Ask your dietitian for more details.

More information about the Trust can be found at
www.royalberkshire.nhs.uk

Useful contacts

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