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Low Potassium and Low Phosphate Diet

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Potassium

What is potassium?

Potassium is a mineral that everyone has in their blood. It is represented by the chemical symbol K⁺. It appears naturally in many foods and drinks. When your kidneys are not working properly this potassium cannot be filtered out properly in the urine, so potassium levels can build-up in the blood.

Is a high blood potassium level dangerous?

Yes. A high potassium level in the blood can cause irregular heart beat and increases your risk of having a heart attack. You could be admitted to hospital if your potassium level is high.

How can I control my blood potassium levels?

You need to follow a low potassium diet in order to keep your blood potassium at a safe level. Your Dietitian will discuss your diet with you and tell you which foods you should avoid or cut down on.

Can anything else affect my blood potassium levels other than my diet?

Yes. Other causes of high potassium levels could include: certain medications, bowel habits, blood transfusions, uncontrolled diabetes, how well you are dialysing if on dialysis and other blood results. This will be discussed with you if relevant.

Cooking Tips to Help Lower Your Potassium Intake

Potatoes (including sweet potatoes and yam) and vegetables all contain potassium. You cannot avoid potassium altogether, but boiling potatoes and vegetables helps to reduce the potassium content of these foods. Boiling allows the potassium to come out of the food and into the water. Make sure you then throw this water away.

1. Peel and cut potatoes into small pieces before cooking and boil in a large amount of water. Once cooked, throw the cooking water away. **Do not** use this water for making gravy, sauces or soups. You **do not** need to boil potatoes twice (double boiling), boiling once in a large amount of water is sufficient to lower the potassium content.
2. Microwave, pressure cookers, steamers or stir-frying should **not** be used for cooking potatoes and vegetables from raw, but can be used to reheat food that has already been boiled.
3. Partly boil potatoes for ten minutes before making chips or roast potatoes.
4. Only have potatoes at one meal a day. Rice, pasta, plain couscous and noodles are low in potassium and can eaten instead.
5. Avoid potato products that have not been boiled, e.g.
 - X Ready meals containing potato (unless advised otherwise by your Dietitian)
 - X Chip shop chips/oven chips/frozen roast potatoes
 - X Oven chips or roast potatoes that have not been pre-boiled first
 - X Jacket (baked) potatoes
 - X Potato croquettes
 - X Potato waffles
 - X Hash browns
 - X Potato crisps
 - X Potato bread

Fruit and Vegetables

All Fruit and vegetables contain potassium. It is important to eat fruit and vegetables as they provide a good source of vitamins, minerals and fibre to keep you healthy and to ensure you have regular bowel habits. We do not advise that you avoid eating fruit and vegetables just because they contain potassium as they are an important part of a healthy diet.

Certain fruit and vegetables contain more potassium than others. Some fruits should be avoided altogether as they are very high in potassium. **The tables on the next 2 pages give you the portion sizes for fruit and vegetables which are allowed. It also tells you what fruit and vegetables to avoid altogether.**

Lower potassium fruit and vegetables are coded with a * so these can be eaten in larger quantities.

You should aim for _____ Portions of fruit and vegetables per day.

X Star fruit should be avoided by people with kidney problems as it has been shown to cause neurological problems when eaten by people with a reduced kidney function.

X Avoid all Nuts and Seeds as these are high in both potassium and phosphate

Fruit Portions - All fruit can be raw unless otherwise stated. If you eat tinned fruit, it is important to drain off the fruit juice as this is high in potassium. Tinned fruit is often lower in potassium.

X Avoid X Bananas, sharon fruit, durian fruit, melon, papaya, avocado, figs, pure fruit juices, fruit smoothies, coconut, star fruit, guava, blackcurrants, redcurrants and dried fruit e.g. Raisins/ sultanas/ figs/ dried dates and dried apricots, molasses.

Fruits allowed	Portion size
Apples	1 medium or 3 tablespoons stewed apple
Apricots	1 medium fresh apricot (avoid dried apricot)
Blackberries*	20 berries
Blueberries*	2 handfuls – approximately 200g
Clementines/tangerines/mandarins/satsumas	2 fruits or ½ large tin
Cherries*	15 fresh or 1 large can of cherries
Cranberries*	20 Fresh berries stewed or 20 dried cranberries
Damson	1 fruit stewed
Fruit cocktail	1 small tin (drain off juice)
Grapefruit	½ fresh or ½ tin of grapefruit
Grapes*	15 grapes
Gooseberries	Stewed 140g or raw 75g (¾ cup size)
Kiwi	1 small
Kumquats	5 fruits
Lemons/Limes	No restriction
Lychees*	6 fresh fruits or 1 large tin (drain off juice)
Mango	½ small
Nectarine	1 medium
Orange	1 medium
Passion fruit	4 small passion fruits
Peaches	1 medium
Pears	1 small or tinned 4 pear halves
Pineapple	1 slice of fresh pineapple or 4 tinned rings
Plums	2
Pomegranate	1 fresh
Prunes	3 tinned prunes (discard juice) avoid dried prunes
Raspberries*	20 berries
Rhubarb	2 tablespoons of stewed or ½ tin rhubarb
Strawberries*	½ tin or 8 small strawberries

*indicates lower potassium options

Vegetable portions – all vegetables should be boiled unless otherwise stated

X Avoid X Vegetable juices, bamboo shoots, roasted vegetables, Karela (bitter melon/gourd), seaweed (fresh/dried), Dried mushrooms, tomato puree, sundried tomatoes

Vegetable/Salads allowed	Portion Size
Asparagus	3 spears
Artichoke	1 boiled
Aubergine, fried	6 thin slices
Beetroot	4 slices pickled beetroot or 1 small boiled beetroot
Beansprouts*	Handful of raw or fried beansprouts
Broccoli	2 small spears
Brussel sprouts	5 small sprouts
Butternut squash	¼ squash boiled
Cabbage*	5 heaped tablespoons shredded
Carrots*	2 medium size carrots boiled or 1 medium carrot raw
Cauliflower*	10 small florets
Celeriac	2 tablespoons shredded
Celery	2 sticks
Coleslaw	2 heaped tablespoons
Courgette	1 small courgette boiled (Avoid fried courgettes)
Cucumber *	20 thin slices
Corn on the cob/sweetcorn	1 small cob or 3 heaped tablespoons tinned sweetcorn or 4 babycorn
Coleslaw	2 tbsp
Curly Kale	3 tablespoons shredded
Gherkins*	4 pickled whole gherkins (may be salty if in brine)
Green beans/runner beans*	4 heaped tablespoons
Leeks	1 small stem boiled
Lettuce (all types)	Handful
Marrow *	6 heaped tablespoons boiled
Mushy peas	3 tablespoons tinned/frozen
Olives, fresh or in jar	Can be high in salt, so best to use as a garnish
Onions or Shallots	2 tablespoons fried
Okra	6 fingers fried, 8 fingers if par boiled first
Parsnips	1 tablespoon boiled
Peppers (capsicum)	½ raw/cooked pepper
Peas	2 heaped tablespoons or 4 heaped tablespoons petit pois
Pumpkin	3 tbsp mashed (boiled first) 2 tablespoons roasted
Radish*	10 small radishes raw/cooked
Spinach	2 tablespoons boiled (avoid raw/steamed spinach)
Spring onion*	6 stems
Swede*	8 tablespoons
Turnip	2 tablespoons
Tomato	1 small tomato or 4 cherry tomatoes or 1/4 large tin of tomatoes
Mushrooms (fried) *	9 button mushrooms or 1 large Portobello mushroom
Waterchestnuts	½ small can
Watercress, fresh*	3 handfuls

Phosphate

What is phosphate?

Phosphate is a mineral that is found in your food. Your body needs phosphate to keep your bones strong and healthy. It is represented by the chemical symbol PO_4 . When the kidneys are not working properly they are unable to get rid of the excess phosphate out of your body via your urine.

Where is phosphate found?

Phosphate is found in lots of protein foods e.g. meat, fish, cheese, offal, milk and eggs. You will be advised on what high phosphate foods to avoid or limit.

What are the symptoms of a high phosphate?

Some people may experience some or all of these:

- Itchy skin
- Bone/joint pain
- Red eyes

Often, a high phosphate level causes no symptoms at all and the only way of checking is by looking at your monthly blood phosphate levels. Your Doctor, Nurse or Dietitian can inform you of your phosphate levels.

What happens if I have a high phosphate over time?

- **Weakened bones** - A high phosphate level causes the bones to lose calcium. This makes the bones weak and brittle and increases the risk of bone breakages.
- **Hardening of blood vessels** - This calcium released from the bones can then build up in the blood vessels. This causes hardening (calcification) of blood vessels which can lead to **heart disease, circulation problems, and an increased risk of strokes or heart attacks.**
- **Hardened blood vessels may not be suitable for kidney transplant operations so it is very important to keep your phosphate levels controlled.**

Phosphate allowances:

Dairy foods (milk, cheese, eggs) are a good source of protein which is important in order to keep you healthy on dialysis. Some dairy foods are high in phosphate, so must only be eaten in the quantities advised below.

Milk: ½ pint (280ml) of milk per day of full fat, semi skimmed or skimmed milk

Or

¾ pint (430ml) of soya or rice milk can be taken as this is lower in potassium and phosphate

Eggs: per week

Hard Cheese: (e.g. Edam, Cheddar, Gouda, Emmental)oz /(g) per week

Soft cheeses are lower in phosphate compared to the hard cheeses, so you may want to choose these instead.

Soft Cheese: (e.g. Cottage cheese, cream cheese, goats cheese, feta)oz/.....(g) per week

..... items from the following list per week:

- 1 small pot of yoghurt/fromage frais
- 1 small bowl of custard
- 1 small bowl of rice pudding
- 2 scoops of plain ice cream

The below items are very high in phosphate and ideally should be avoided.

Offal (e.g. Liver, kidney, sweetbreads, heart)
Sardines, Mackerel, Pilchards, Lobster, Crab

Alternatively, if you really like these foods, limit to a maximum of once a month. It is very important that you take your phosphate binders with these foods. Phosphate binders are discussed on the next page.

Phosphate binders

What are phosphate binders?

These are tablets that help lower phosphate levels. They bind with the phosphate in food when it is in your stomach. This prevents the phosphate from entering your blood stream, which helps to keep your blood phosphate levels within the normal range.

Phosphate binders only work if taken with foods containing phosphate. Phosphate binders **should** be taken with meals or snacks which include meat, fish, eggs, cheese, milk or pulses. Phosphate binders **do not** need to be taken with meals or snacks that do not contain protein, such as toast, jam or salad sandwiches, biscuits or fruit.

You should still aim to take the total number prescribed each day. Your Doctor or Dietitian can discuss how best to take your binders with you.

The table below shows some of the commonly used phosphate binders here at Aintree. You may be prescribed a binder which is not on the list below.

Phosphate binder	How to take
Calcichew, Adcal (calcium carbonate)	Chew tablets and take immediately before a meal
Phosex (calcium acetate)	Swallow tablets immediately before a meal (do not chew)
Renagel (sevelamer hydrochloride)	Swallow tablets immediately before or during a meal (do not chew)
Renvela (sevalamer carbonate) tablets	Swallow tablets immediately before or during a meal (do not chew)
Renvela (sevalamer carbonate) powder	Mix 1 sachet with 60ml water/diluted squash and take immediately before or during a meal
Fosrenol (lanthanum carbonate)	Chew tablets and take either mid-meal or immediately after a meal.
Velphoro	Chew tablets and take either mid or end of the meal.

Important points

- Remember to keep a supply of phosphate binders with you when eating away from home. A pill box is useful for carrying your binders. Your Dietitian may be able to supply you with one.
- Always take the dose you have been prescribed.
- Phosphate binders should always be taken with food unless advised otherwise by a Doctor.
- If you are on iron tablets, take these two hours apart from your phosphate binders as these can reduce the effectiveness of your iron tablets.
- If you are having difficulty taking your binders, please ask your Doctor, Dietitian, Pharmacist or nurse for an alternative. You may be able to use a tablet crusher if you have problems chewing or swallowing the binders. Please ask your Doctor, Dietitian or Pharmacist about this.

Foods to avoid and suitable alternatives

Please note if you have diabetes then not all of the foods in these groups will be suitable for you. Sugar free, diet or reduced sugar varieties are available for many of the foods and drinks outlined.

Food Group	Avoid X	Suitable alternatives ✓
<p>Cereals</p> <p>If you have diabetes, avoid sugary cereals</p>	<p>Ready Brek All Bran, Wheat bran, Branflakes, Sultana Bran Muesli, Raisin Split Cereals containing chocolate, cocoa, coconut, dried fruit or nuts. Cereal bars containing dried fruit/nuts/bran e.g. Alpen bars, cocopop bars, granola bars.</p>	<p>Porridge oats Weetabix, Shredded Wheat, Shreddies Cornflakes, Special K, Rice Krispies, Ricicles, Frosties, Crunchy nut cornflakes – small bowl Cereal bars without nuts/dried fruit e.g. Special K, Rice Crispie Squares, Nutrigrain, Yoghurt Breaks</p>
<p>Breads</p>	<p>Scones Pain au chocolate Bread containing a lot of seeds and nuts Potato bread Malt loaf</p>	<p>Limit Naan bread to ½ Naan a day Pancakes, croissants, crumpets pitta bread, rye bread, bagels, wheaten/soda bread, chapattis, tortilla wraps, white/brown/wholemeal/ granary bread, breadsticks, melba toast</p>
<p>Cakes and puddings</p>	<p>Malt bread, banana loaf, banoffee, chocolate cake and biscuits, fruit cake (e.g. Tea loaf, mince pies), date and walnut loaf, coconut cake, Eccles cake, fruit scones, egg custard, Chelsea buns, Bakewell tart, cakes made with large amounts of baking powder, e.g. scones, rock buns. Angel Delight, Bread and butter pudding, Oatcakes, Marzipan</p>	<p>Plain/jam sponge, Madeira, cherry cake, cream horn, doughnut, apple slice, Danish pastry, lemon meringue pie, meringue, plain biscuits, shortbread. Some chocolate coated biscuits are lower in potassium and phosphate, but must only be eaten in small quantities. E.g. Jaffa cakes, bourbons once or twice a week.</p>
<p>Other savoury foods</p>	<p>Poppadoms Tinned pasta in tomato sauce e.g. Ravoli, Spaghetti hoops Pot noodle, Potato crisps, Vegetable crisps, Twiglets, Oatcakes Nuts and seeds Vegetable pakora Biscuits containing nuts and/or chocolate Bombay Mix Twiglets Nut roast</p>	<p>Yorkshire puddings, Dumplings Pastry, Sago, tapioca, semolina, flours, Taco shells Pasta, Rice Plain couscous (no dried fruit) Plain fresh/dried noodles Unsalted rice cakes e.g. Snack a Jacks, Corn crisps (eg. Wotsits, Monster Munch, Doritos, Wheat Crunchies, Plain popcorn, Pretzels (unsalted), water biscuits, unsalted crackers, melba toast Limit Ryvita to 2 slices a day. (some of these foods are high in salt so limit these)</p>

<p>Dairy</p>	<p>Cheeses: Processed cheeses, e.g. Primula, Dairylea, cheese strings, cheese slices</p> <p>Milks: Evaporated, condensed milk and dried milk powder.</p> <p>See phosphate allowances for more information</p>	<p>Spreads: Butter, margarine</p> <p>Creams: double cream, single cream, whipping cream, clotted cream, crème fraiche</p> <p>See phosphate allowances for details of amounts of dairy foods you can eat.</p>
<p>Meat and meat products</p>	<p>Pigeon, Game, e.g. goose, pheasant Veal White and black pudding Shish and Doner kebab meat</p> <p>Offal (liver, heart, sweetbreads, tripe, haggis) are high in phosphate. If you eat these, limit to one item a month.</p> <p>See phosphate food allowances for more information</p>	<p>Lamb, beef, pork, chicken, turkey, duck, venison.</p> <p>Limit ham to once or twice a week. Try to use less processed meats and choose off deli counter.</p> <p>Processed meats are salty and can also be high in phosphate (some preservatives contain phosphate). Some also contain potassium in the form of salt replacers, e.g. Potassium chloride. It is best to use fresh meat off the bone or deli meat if possible.</p> <p>Limit processed meats e.g. Luncheon meat, corned beef, tongue, spam, sausage rolls to 1-2 of these items a week.</p>
<p>Meat alternatives</p>	<p>No restriction.</p>	<p>Quorn/Soya mince, Tofu, vegeburgers</p>
<p>Fish</p>	<p>Avoid: Anchovies, whitebait, Smoked 'yellow' fish and fish tinned fish in brine. Paté, fish paste Fishcakes Fish roe and taramasalata</p> <p>High phosphate fish – limit to once a month only kippers, hoki, pilchards (sardines), crab, mackerel, herring</p> <p>See phosphate food allowances for more information</p>	<p>Lower phosphate fish include: Cod, haddock, plaice, skate shrimps, crabsticks, whiting, calamari Mussels and cockles are salty, so limit to once a month only.</p> <p>Medium phosphate fish (limit to 1-2 of the below items a week) Sole, tuna, trout, squid, fish fingers Jellied eel, halibut, salmon (fresh/tinned) Turbot</p> <p>See phosphate food allowances for more information</p>

<p>Beans and lentils (e.g. Chickpeas, baked beans, red lentils, refried beans)</p>	<p>Beans, lentils, pulses are all high in potassium. They can be eaten at a meal only if you are not eating meat or fish at that meal. E.g. If you are vegetarian beans and lentils are a good source of protein and can be eaten as part of your main meal.</p>	<p>They can be eaten at a meal only if you are not eating meat or fish at that meal.</p>
<p>Drinks</p> <p>Choose reduced sugar/diet drinks if you have diabetes or watching your weight Remember your fluid allowance</p>	<p>Cocoa</p> <p>Malted drinks, e.g. Horlicks, Ovaltine and Bournvita</p> <p>Drinking chocolate,</p> <p>Milkshakes, Lassi, Complian, Build-Up drinks</p> <p>Fresh fruit juices (except for cranberry juice), Hi Juice cordial, tomato/other vegetable juices</p> <p>Soya/black bean drinks</p>	<p>One cup of coffee per day</p> <p>Camp coffee (low in potassium, but high in sugar, so avoid if you have diabetes)</p> <p>1 small glass of cola a day (higher in phosphate than other fizzy drinks)</p> <p>All types of tea (including fruit, peppermint and herbal teas)</p> <p>Cordial and squash</p> <p>Fizzy drinks soda, tonic, mineral water.</p> <p>Limit Ribena to 1-2 glasses or 1 small carton a day</p> <p>Limit cranberry juice to 1 small 150ml glass a day (count as 1 portion of fruit and veg)</p>
<p>Alcohol</p> <p>(Remember some medicines do not mix with alcohol. Ask your doctor or pharmacist if you are not sure. Do not drink alcohol if your Doctor has advised you not to.)</p>	<p>Red wine, beer, bitter, lager, cider, port, stout.</p> <p>Government guidelines on alcohol recommend:</p> <p>Men: 3-4 units/day maximum 21 units per week with 2-3 alcohol free days a week, Women: 2-3 units/day maximum 14 units per week with 2-3 alcohol free days a week.</p> <p>You can find more information on http: www.drinkaware.co.uk</p>	<p>Spirits, sherry, sparkling wine, e.g. Champagne, Cava, Lambrusco</p> <p>Spirits tend to be lower in potassium. Wines, sherry and ale do still contain potassium, so only have these in very small amounts. Your Dietitian can discuss this with you.</p> <p>Remember your fluid allowance and alcohol guidelines.</p> <p>Follow your doctor's advice on alcohol as some medications can interact with alcohol.</p>
<p>Confectionary (if you have diabetes, avoid these foods)</p>	<p>Chocolate, toffee, black treacle, liquorice, fudge</p> <p>Marzipan, creamed coconut.</p> <p>Nut brittle. Asian sweets containing condensed milk.</p>	<p>Jam, honey, golden/maple syrup, marmalade, lemon curd, sweets, e.g. boiled sweets, mints, marshmallows, chewing gum, Turkish Delight, fruit pastilles, jellies, wine gums. cough sweets</p>

<p>Sauces and miscellaneous</p>	<p>Salt substitutes, e.g. Losalt, Selora Bovril, Marmite, Oxo Pot Noodles Gravy mixes Packet soups Potash Coconut milk Satay sauce Soy sauce/fish sauce – high in salt, avoid/limit if possible</p> <p>Many processed foods can contain potassium chloride (KCl), read labels to check if this is the case and avoid. Your dietitian can help you with this.</p>	<p>Bottled sauces, e.g. tomato ketchup, BBQ sauce – use sparingly Garlic, Mayonnaise, salad cream – use sparingly Bisto Gravy Browning, Gravy powders – choose reduced salt varieties if possible Herbs, vinegar, spices, pepper (as long as they do not contain salt) Mustard, horseradish, chilli sauce, curry powder, mint sauce, apple sauce, cranberry sauce Homemade white sauce/parsley sauce, tomato sauce made from tinned tomatoes (1/4 tin is 1 portion of your fruit and vegetable allowance)</p>
<p>Spreads and Dips</p>	<p>Nutella/chocolate spreads Peanut butter Guacamole Paté Tahini paste Taramasalata Hummus Yeast extract (Marmite, Vegemite) Tomato puree</p>	<p>Limit below to 2-3 tablespoons: Tomato salsa Sour cream Crème Fraiche Mango chutney/other chutneys Lime pickle/other Indian pickles Tzatziki</p>

Additional Information

We have a number of diet sheets available which may be relevant to you. These include:

- Renal Recipes
- Recipes for the Festive season
- Guide to eating well with a small appetite for those with kidney problems
- Meal Delivery Booklets (Oakhouse and Wiltshire Farm Foods) and list of suitable foods from these booklets
- Renal Nutrition Group Diet sheets: Low potassium diet sheets – South Asian, Chinese, African and Caribbean foods and some translations available
- Renal inpatient renal menu information
- Weight management resources for those wanting to lose weight

Please ask your Dietitian if you would like any of the diet sheets above.

- **Additional information:** Star fruit should be avoided by people with kidney problems. This has been shown to cause neurological problems when eaten by people with a reduce kidney function.

Useful websites:

Kidney Patient Guide Dietary Information

<http://www.kidneypatientguide.org.uk/site/diet.php>

Edinburgh Renal Unit Dietary Information

<http://www.edren.org/pages/edreninfo/diet-in-renal-disease.php>

Lawrence Keogh's rediscovering foods and flavours recipes:

<http://www.kidneyresearchuk.org/file/Cookbook.pdf>

Information on alcohol and unit measurements:

www.drinkaware.co.uk

This diet sheet has been produced by Aintree Renal Dietitians and is based on information from the Renal Nutrition Group of the British Dietetic Association and Dietary Analysis Programmes.



If you require a special edition of this leaflet

This leaflet is available in large print, Braille, on audio tape or disk and in other languages on request. Please contact:

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