York and Scarborough Teaching Hospitals
NHS Foundation Trust

Dietary Advice to Help Prevent Recurrence of Kidney Stones

Information for patients, relatives and carers

ⓘ For more information, please contact:

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Introduction

Kidney stones form when waste products in the blood cause crystals to collect inside the kidneys. Over time the crystals may build up to form a hard stone-like lump.

Kidney stones can develop for a number of reasons. This is more likely to happen if you do not drink enough fluids, if you are taking some types of medication, if you are overweight, if your urine becomes more acidic or if you have a medical condition that raises the levels of certain substances in your urine.

If the urine becomes saturated with these substances over a long period of time the stones will slowly grow in size.

If you have developed a kidney stone you are at higher risk of forming more stones in the future.

Your diet can affect the levels of these substances in the urine as well as the acidity of your urine. The dietary advice in this booklet outlines the general advice to help prevent the recurrence of the most common types of kidney stones, and also gives specific advice relevant to particular types of stones.

Types of kidney stones

Calcium stones

Calcium stones, usually in the form of calcium oxalate, are the most common type of kidney stone and are caused by increased calcium in the urine. Diets low in calcium can increase the risk of stones so you should not restrict your calcium intake. You may also be advised to reduce the amount of oxalate rich foods in your diet. Follow the guidance in this booklet on dietary sources of oxalate and how much calcium to include in your diet.

Uric acid stones

Uric acid is the waste product created when the body breaks down purines (a type of protein found in many foods and all of our cells). The body is not able to break down uric acid, so it can accumulate in the blood and urine. Uric acid can begin to form very small crystals in the urine, which eventually give rise to uric acid stones.

Factors that encourage uric acid stones to form are:

- Producing urine that is more acidic than normal.
- Producing a smaller volume of urine due to drinking less fluid.
- Having a higher level of uric acid due to eating a diet that is high in animal protein and low in fruits and vegetables.

Having urine that is more acidic is thought to be the most important factor. This can be associated with:

- Diabetes.
- ‘Pre-diabetes’ or Insulin resistance.
- Eating a high protein diet.

Struvite stones

Struvite stones are not a common type of stone. These stones are related to chronic urinary tract infections. People who get chronic urinary tract infections are at the highest risk for developing these stones.

Cystine stones

Cystine stones are caused by a rare disorder called cystinuria. The disorder causes a natural substance called cystine to leak into the urine. When there is too much cystine in the urine, kidney stones can form. Most people with cystinuria have recurring stones. It is a lifelong condition that can be controlled but not cured.

Current dietary guidelines

These general dietary factors will help reduce the risk of recurrent kidney stones:

- Staying well hydrated by drinking enough water is the most important aspect of preventing stone formation. Aim for two and a half to three litres daily.
- Add fresh lemon juice to drinking water.
- Eat a healthy diet and aim for weight loss if you are overweight.
- Reduce your salt intake.
- Moderate your protein intake.
- Increase your fruit and vegetable intake.
- Reduce your intake of sugar.
- Avoid cola drinks. Cola is high in phosphate, another chemical which can promote the formation of kidney stones.

In addition, if you have calcium stones:

- Include calcium rich foods on a daily basis.
- Moderate your intake of oxalate rich foods.

These specific dietary factors will be explained in detail in this booklet, and should be included within a balanced diet.

A balanced diet

It is important to eat a wide variety of foods to ensure we get all the nutrients our body needs.

- Eat three regular meals per day.
- Base meals around breads, lower salt breakfast cereals, rice, pasta or potatoes. These foods give us carbohydrates. Choose the higher fibre options of these foods.
- Have a serving of meat, fish, egg, beans, pulses or cheese at two meals. These foods give us protein which is needed every day for repair and replacement of body tissues.
- Eat five portions of fruit and vegetables per day. They give us fibre, and a range of vitamins and minerals.
- Milk and milk products give protein, calcium and some vitamins. Choose low fat options if you are trying to lose weight.

A high fluid intake

Staying well hydrated by drinking enough water is the most important aspect of preventing stone formation. Keeping your urine diluted helps to stop waste products getting too concentrated and forming stones.

- You should aim to drink two and a half to three litres (five to six pints) of fluid per day.
- If you are overweight you should drink a minimum of three litres per day (six pints) or up to four litres (eight pints) in hot weather.
- Try to ensure that your fluid intake is spread out over the day, evening and during the night if possible.
- Add 85ml of fresh lemon juice to 1000ml of water and drink throughout the day. Lemons contain citrate which is a chemical that prevents calcium stones from forming. Citrate can also break up small stones, allowing them to pass more easily.
- If you are drinking adequate amounts of fluid your urine should be pale in colour. If it begins to look dark and concentrated then you are not drinking enough.
- It is particularly important that fluid intake is high in the evening to prevent your urine becoming too concentrated overnight.

Which fluids are best?

Drink freely:

- Water - (tap or bottled) preferably with added fresh lemon juice.
- Fruit squashes (low sugar versions).
- Herbal and fruit teas.

In moderation:

Sugary drinks, fruit juices (grapefruit, cranberry, orange and apple juice) and strong alcoholic drinks (spirits) increase your risk of further stones. Other than Cola, fizzy drinks do not increase the risk of stones provided they are sugar-free.

- Fresh fruit juices, 120 ml per day maximum.
- Wines, beer & spirits, not more than the recommended units of alcohol per week.
- If you need to reduce your oxalate intake:
  Tea and coffee contain a moderate amount of oxalate; aim to have no more than two to three cups per day. Adding milk to tea and coffee decreases the oxalate absorption.

Avoid:

- Cola is high in phosphate, another chemical which can promote the formation of kidney stones.
- Oxo and Bovril as these are very salty.

Alcohol

Both men and women are advised to drink no more than 14 units of alcohol per week on a regular basis.

If you do drink as much as 14 units per week, it is best to spread this evenly over three days or more.

If you wish to cut down the amount you're drinking, a good way to help achieve this is to have several alcohol free days each week.

How many units do drinks contain?

- 125ml of 12% wine = 1.5 units
- 175ml of 12% wine = 2 units
- 250ml of 12% wine = 3 units
- Pint of lower strength lager/beer/cider (3.6%) = 2 units
- Pint of stronger lager/beer/cider (5.2%) = 3 units
- Can of lager/beer/cider (440ml 5%) = 2 units
- Single measure/25ml of spirit (40%) = 1 unit

Please note: drinks with higher percent (%) of alcohol will contain more units of alcohol.

Are you a healthy weight?

It is not good for your health to be either overweight or underweight.

If you are underweight or if you are unintentionally losing weight you may not be getting enough of all the nutrients that your body requires. If this is the case, please ask your doctor to refer you to a Dietitian.

If you are overweight you are more likely to develop kidney stones. It would be beneficial for you to make changes to your lifestyle to help with weight loss.

If you are overweight

Weight loss should be steady and slow – aiming for 0.5 to 1 kilogram (kg) (one to two pounds) per week.

Try to make the following changes to your diet:

- Avoid fried foods.
- Use semi-skimmed or skimmed milk.
- Cut down on cakes, pastries and biscuits.
- Cut down on sweets and chocolates.
- Use diet or no added sugar drinks.
- Don’t add sugar to tea and coffee.
- Cut the fat off meat and take the skin off chicken.
- Have smaller portion sizes.

- Eat slowly and chew food well.
- Eat regular meals. Aim to have three meals per day.
- Don’t miss meals – avoid becoming too hungry and have fruit in between meals if necessary.

Reduce your salt intake

Most of us eat too much salt. Recent research suggests that people who have kidney stones are particularly “sensitive” to salt and a high salt intake can contribute to stone formation. The Thiazide medication given for treatment of high calcium losses in the urine may be less effective when the salt intake is high.

The healthy eating recommendation is that we consume no more than six grams of salt per day (one teaspoon).

Are there any types of salt that are better than other?

All types of salts have the same effect on your health. Sea, rock, crystal, flaked, coloured, and flavoured salts are all still sodium chloride.

How can I reduce my intake of salt?

- Avoid adding salt to your food.
- Try not to use salt or reduce the amount used in cooking – flavour with pepper or herbs and spices.
- Reduce your intake of processed foods.
- Cut down on salted meats, e.g. bacon, ham and other processed meats.
- Cut down on salty snacks such as crisps and nuts.
- Stock cubes and meat extracts, e.g. Oxo, Bovril, or Marmite and gravy granules are very salty so use less or try making your own stocks, using herbs and spices for flavour.
- Where possible choose tinned foods in water rather than in brine.
- Canned, packet and instant soups are very high in salt so only have occasionally.
- Takeaways such as Chinese meals may be very high in salt so only have occasionally and avoid soy sauce.

Where does salt come from?

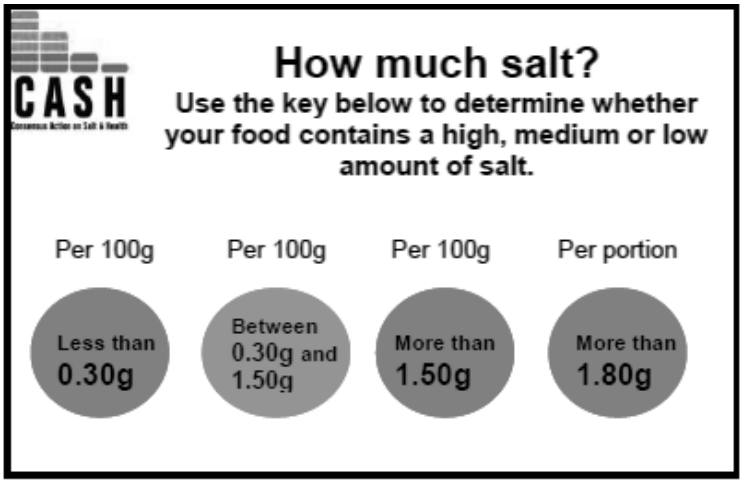
The salt that occurs naturally in fresh foods is enough to provide the small amount of salt that your body needs.

About three quarters of the salt we eat is hidden in processed foods. Manufacturers add salt to many foods as a preservative and flavour enhancer. These foods do not necessarily taste salty and it is therefore important to look at the food labels to help you make lower salt choices.

Making sense of the labels?

Nutrition labels are usually found on the back or the side of food packaging. The full nutritional information is provided per 100g of the product. Sometimes they also tell you the information per serving or per pack.

Some products combine colour coding with the nutritional information. Colour coded labelling makes it easy to see at a glance if a product is high (red), medium (amber) or low (green) in certain nutrients including salt. Aim to mainly choose products where salt is coded green, have amber products occasionally and limit the number of red products.



Source: Consensus Action on Salt and Health

Moderate your protein intake

It is important that you eat enough protein to meet your body's needs. However research has shown that a diet high in animal protein can:

- Increase the amount of calcium in the urine.
- Cause the urine to become more acidic.
- Increase the risk of kidney stone formation in some people.

The main protein sources in the diet are:
Meat, poultry, fish, eggs, cheese, beans, pulses, nuts and dairy foods. Aim to have a small serving of protein foods at two meals each day.

Sensible portion sizes for protein foods are:

- 50g of meat, fish, chicken, or 30g of cheese or one egg at a small meal.
- 100-125g of meat, fish or chicken, or two eggs at a main meal.

Choose more vegetarian options or meals based on beans or pulses to help reduce your intake of animal protein.

Meat substitutes like soya burgers and sausages, mycoprotein (sold as Quorn), and seitan can often be high in salt so have them in moderation.

Increase your intake of fruit and vegetables

Increasing your intake of fruit and vegetables (with the exception of those with high oxalate content, if you have calcium oxalate stones) increases citrate excretion and gives protection against the risk of stone formation.

Citrus (lemons, oranges, and lime) and non-citrus fruits are natural sources of dietary citrate, and several studies have shown the potential of these fruits in raising urine citrate levels.

Aim for five servings of fruit and vegetables per day.

Reduce your sugar intake

Sugar (sucrose) and fructose syrups increase your risk of getting kidney stones. These sugars are often added to processed foods and drinks.

Keep an eye on the amount of sugar you eat, in processed foods, such as cake, in soft drinks, and in juices. Other common added sugar names include corn syrup, crystallized fructose, honey, agave nectar, brown rice syrup, and cane sugar.

Where possible choose sugar-free or ‘Diet’ alternatives.

Calcium

In the past the main treatment for calcium stones was a strict calcium restriction, e.g. avoidance of all dairy products. However, we now know that this is not necessary and may even be harmful.

A low calcium diet can cause stone formation by increasing absorption of oxalate in the gut. This results in higher oxalate levels in the urine and an increased risk of stone formation.

Try to include calcium rich foods, aiming for 700-1200mg (milligrams) daily.

If you find it difficult to eat calcium rich foods a calcium supplement can be taken at mealtimes to help reduce the absorption of oxalate and lower the risk of stone formation.

Sources of Calcium

Sources of calcium	Quantity	Calcium (mg)
Cow's milk (all types)	200ml	240
Calcium enriched milk alternatives e.g. rice, soya, oat, nut and coconut	200ml	240- 380
Cheddar Cheese* Cottage Cheese	30g 30g	222 38
Yoghurt	120g	181
Soya bean curd/tofu (Only if set with calcium chloride (E509) or calcium sulphate (E516), not nigari)	100g	350-400
Calcium fortified cereals	30g	136-174
Hot chocolate (try to choose 'light' options	25g serving in 200ml water	200
Sardines (with bones)	half tin or 60g	273-407
Pilchards (with bones)	60g	150

*NB – this is a high salt food

See the British Dietetic Association Calcium Food Fact Sheet for more detailed information on the calcium content of foods.

Oxalate

If your kidney stone is caused by too much calcium in the urine, you may be advised to reduce the amount of oxalate in your diet. Only a small amount of urinary oxalate comes from the diet which means it is not necessary to avoid oxalate containing foods. Having an adequate calcium intake will limit oxalate absorption.

Avoid high doses of Vitamin C as this may affect oxalate production in the body.
The foods listed below are high in oxalate and should be eaten in small quantities:

- Beetroot
- Almonds
- Rhubarb
- Spinach

These foods contain some oxalate and would not be recommended in large quantities:

- Berries (e.g strawberry, blackberry, blueberry)
- Cocoa and chocolate
- Nuts
- Nut butters e.g. peanut or cashew nut butters
- Parsley
- Soy products - including soy milk, cheese and tofu
- Tea and coffee contain a moderate amount of oxalate; aim to have no more than two to three cups per day. Adding milk to tea and coffee decreases the oxalate absorption.

What about vitamin supplements?

It is best to check with your healthcare professional or dietitian for advice on the use of vitamin C, vitamin D, fish liver oils or other mineral supplements containing calcium as some supplements can increase the chances of stone formation in some individuals.

What if you have a poor appetite?

It is always important to maintain an adequate nutritional intake and to stay well nourished. If you have been asked to make specific changes to your diet and fluid intake but you have a poor appetite, then you could find it difficult to make any changes.

Please ask your doctor to refer you to a Dietitian for more help and information.

Useful websites

NHS website:
For information on healthy eating and NHS weight loss plan

https://www.nhs.uk/live-well/eat-well/
[January 2026]

Consensus Action Salt and Health

http://www.actiononsalt.org.uk
[Accessed January 2026]

http://www.actiononsalt.org.uk/resources/how-to-eat-less-salt/recipes/
[Accessed January 2026]

NHS website :
Salt: the facts

http://www.nhs.uk/Livewell/Goodfood/Pages/salt.aspx
[Accessed January 2026]

British Dietetic Association -
Calcium: Food Fact Sheet

https://www.bda.uk.com/resource/calcium.html
[Accessed January 2026]

Cystinuria UK -
http://www.cystinuriauk.co.uk
[Accessed January 2026]

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We hope that you found this leaflet helpful. If you would like to tell us what you think, please contact:
Admin Team, York Hospital, Wigginton Road, York, YO31 8HE, telephone 01904 725269 or email yhs-tr.NutritionandDietetics@nhs.net.

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PALS can be contacted on 01904 726262, or email yhs-tr.patientexperienceteam@nhs.net.

An answer phone is available out of hours.

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