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Diet and Kidney Stones

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What are kidney stones?

Your kidneys act as a filter to remove waste products and excess minerals from the body via the urine.

If there is too high a concentration of minerals in your urine, this can cause crystals to form. Over time, these crystals can stick together and form a hard stone in the kidney or urinary tract.

What are the different types of kidney stone?

There are many different types of kidney stones; it depends what minerals made the crystals and stones.

Your doctor will work out what type they are based on 24 hour urine tests. **Calcium oxalate stones** are the most common type of kidney stone.

Diet has been shown to help people with calcium oxalate stones. Diet cannot cure these stones, but can help slow down how quickly they grow or re-occur.

Another type of kidney stone is uric acid stones. A high intake of purines can increase the amount of uric acid in the urine, leading to uric acid stones.

Some people who suffer from uric acid stones may also have gout, although this is not always the case.

If you need low purine dietary advice, your dietitian can give you additional dietary information on the low purine diet.

Cystine stones (cystinuria) is a rare genetic condition where a build-up of cystine amino acid protein occurs in the urine causing cystine kidney stones.

A low methionine amino acid diet has been proposed to treat cystine stones; however there is not enough scientific evidence to support this dietary treatment at present. Following a moderate protein diet is all that we recommend.

In summary what can I do with my diet?

- Increase fluid intake to 2-3 litres a day
- Reduce salt intake
- If you have calcium oxalate stones, reduce your intake of high oxalate foods
- Eat a moderate amount of calcium
- Ensure a moderate protein intake
- Lose weight if you are overweight

What other treatment is there for kidney stones?

Some medications can help slow down the rate at which kidney stones form.

Certain medication can help widen the vessels the stones are passing down to make it more comfortable.

If you have cystine stones, your Doctor may prescribe medication to make your urine less acidic.

If you have larger stones, you may need laser or sound wave treatment to break them into smaller pieces so they are easier to pass out in urine. Occasionally, larger stones may need surgical removal.

Fluids

A good fluid intake is very important to help dilute the urine you pass and stop stones forming or reforming.

You should drink 3 litres of fluid a day (5 pints/15 cups a day) unless your doctor advises you differently.

It is especially important to drink more in hot weather or if you are exercising excessively. The aim is to drink enough to pass 3 litres of urine a day.

Fluids allowed freely

- ✓ Water/ Flavoured water
- ✓ Fruit squashes (try reduced sugar or diet varieties).
- ✓ Fizzy drinks (try reduced sugar or diet varieties).
- ✓ Fruit and herbal teas.

Fluids to have in moderation

- Fruit juices. Limit to 2-3 glasses a day as they contain Vitamin C which can be converted to oxalate.
- Tea. Limit to 2-3 cups a day as it is high in oxalate.
- Coffee. Limit to a maximum of 3 cups a day as it contains moderate amounts of oxalate.

Fluids to avoid

- Oxo, Bovril or Marmite drinks as they are high in salt
- Grapefruit juice has also been shown to increase kidney stone formation

I am struggling to drink so much, have you any tips to help?

- Fill a water bottle and keep it next to you and take regular sips.
- Keep bottles of drinks handy; in your bag, in the car, in your desk etc.
- In the summer freeze some squash or fizzy drink into ice pops for a change.
- Have a bed time drink so your urine does not become too concentrated overnight.
- Remember, if you have diabetes, choose diet/reduced sugar drinks.

Oxalate

You only need to avoid high oxalate foods if you have been found to have calcium oxalate kidney stones.

Oxalates are chemicals found in plant foods. Eating certain high oxalate foods can increase the amount of oxalate in the urine where it combines with calcium to form calcium oxalate stones.

We have listed the main high oxalate foods to avoid below. You cannot avoid oxalate altogether as it is found in many foods, but following this advice will help lower your intake of oxalates.

Below are the main foods high in oxalates that are best avoided:

- Chocolate and hot chocolate
- All nuts and peanut butter
- Malted milk drinks e.g. Horlicks, Ovaltine
- Strawberries
- Rhubarb
- Beetroot (all types)
- Spinach
- Celery
- Parsley (can limit to garnish only)
- Bran cereals/products e.g. Allbran, Branflakes, Wheatbran

Calcium

Both high and low calcium intakes can cause kidney stones to form.

A normal calcium intake is advised to limit stones from forming and keep your bones healthy.

What is a normal calcium intake?

A normal calcium intake for adults is approximately 800mg per day. Many foods contain calcium but dairy foods and some tinned fish are the richest sources.

The following foods contain approximately 250mg of calcium each. Aim for 3 of the following portions of calcium-rich foods below:

Milk (skimmed, semi or full fat)	200ml glass
Calcium enriched soya milk	200ml glass
Yogurt standard pot	125g/5oz
Hard/French Cheese	25g/1oz = a match box/individual mini size
Milk pudding	200g/8oz = ½ a large can
Sardines or pilchards	50g/2oz = ½ a can

Protein

A high protein intake can increase stones forming. Foods that are high in protein include milk, cheese, eggs, meat, fish and chicken/poultry. You should aim for a **moderate** protein intake.

Too much animal protein (meat, poultry, eggs, fish, offal e.g. liver) can increase your risk of kidney stones. Purines in these foods break down into uric acid in the urine, which increases the risk of uric acid kidney stones.

You do not need to become vegetarian, but reduce your intake of animal protein and replace some with vegetable proteins such as pulses, soya protein and mycoprotein e.g. Quorn or soya Tofu.

What portion sizes for animal protein foods do you recommend?

Light meal	50g/2oz of meat/poultry e.g. Chicken, turkey Or 75g/3oz of fish Or 1-2 eggs Or 50g/2oz of cheese
Main meal	100g/4oz of meat/poultry Or 125g/5oz of fish Or 2-3 eggs

Have you any other tips for ensuring a moderate protein intake?

- Keep cooked breakfasts for an occasional treat.
- Avoid snacking on nuts and seeds.
- Avoid snacking on slices of cold meat like ham and salami.
- Avoid snacking on cheese.
- Limit milk to $\frac{1}{2}$ a pint a day. Avoid glasses of milk, hot chocolate and malted drinks which may increase your intake over this amount.
- Add pulses, beans or chickpeas to meat dishes such as stews, casseroles and curries and add less meat.
- If you are vegetarian or would like to use less animal protein, Quorn, soya, tofu or pulses are suitable.

How does my weight affect kidney stone formation?

Being overweight increases the risk of uric acid and calcium kidney stones.

If you are overweight losing weight through healthy eating and exercise may help reduce the risk of kidney stones.

Salt (Sodium)

A high salt intake increases the amount of calcium in the urine which increases calcium stone formation.

In the UK today, we eat an average of 9-12g of salt a day. Current guidelines recommend that we should have a **maximum of 6g of salt per day (2.4g sodium)**.

This is the equivalent to just one teaspoon of salt a day. Eating a diet high in salt can also lead to high blood pressure and other health problems.

Tips to reduce your salt intake

- Avoid adding salt at the table, only use a pinch in cooking at most
- Avoid smoked foods or foods tinned in brine, choose un-smoked foods or foods tinned in water/oil instead
- Try adding other herbs/spices to food to add flavour e.g. pepper, garlic, fresh/dried herbs
- Limit salty foods such as tinned/packet soups and gravies. Choose reduced salt varieties if possible or make home-made soup.

Look at the figure on food labelling for salt per 100g as this will give you an idea of whether it is high in salt.

Some labels also give the figure for salt as sodium.

High = more than 1.5g salt per 100g (or 0.6g sodium per 100g)

Low = 0.3g salt or less per 100g (or 0.1g sodium per 100g)

If the amount of salt or sodium is between these figures then that is a medium level of salt. Please ask your dietitian if you would like more information on reducing your salt intake.

Supplements

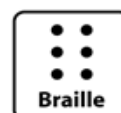
Should I take a vitamin and mineral supplement?

No. Some supplements can increase stones forming. We recommend you avoid taking supplements containing Vitamin C, Vitamin D and Calcium unless your doctor has recommended them.

This includes cod liver oil. If you are eating a well balanced diet you should not need additional vitamin and mineral supplements.

Other diet sheets available on request:

- Low purine diet
- Reducing your salt intake
- Weight management dietary resources



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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