Diet and kidney stones

Kidney stones are rock-like crystals of different shapes and sizes that are made from minerals in the urine. They often form when there is too little urine and a lot of mineral waste.

There are 4 main types of kidney stones:
1. Calcium stones: They occur in 2 forms: calcium oxalate (the most common kidney stone) and calcium phosphate;
2. Uric acid stones form when the urine is acidic. A diet rich in purines increases uric acid in urine;
3. Struvite stones form in infected bladders or kidneys;
4. Cystine stones are rare and hereditary.

Knowing the type of stone you have or have had helps determine your treatment and prevention options. If you pass a stone try and retrieve it and consult your doctor. A 24 hour urine analysis will also help guide your kidney stone treatment and prevention. Following the dietary guidelines below may help to reduce the risk of kidney stone formation.

For all types of kidney stones:
1. Drink plenty of fluid
   - Drinking water helps to flush out the kidneys and dilute stone-forming substances, making stones less likely to form.
   - Drink at least 2.5 litres, or 10 cups, of fluid daily. At least half of this should be water (soda, mineral, spring or plain tap water).
   - Have a cup of fluid (250mL) each hour during waking hours, and a large glass of water before going to bed. Drink a glass of water if you wake up during the night.
   - Spread out your fluid intake during the day.
   - Avoid sugary drinks. Choose juices that are 100% fruit juice.
   - Lemon juice is a good source of citrate which helps to prevent stones forming. Drink 100ml of lemon juice daily (could be added to water).
   - Caffeinated drinks (except tea) have shown to prevent kidney stones. However limit to 3 cups per day.

2. Try and lose weight if you are overweight or obese
If you have calcium oxalate stones,

1. Limit salt
   - Salt (sodium) increases the amount of calcium in your urine. Limit sodium intake to less than 2300mg per day (i.e. Approximately 1 teaspoon of salt).
   - To reduce salt /sodium: Buy fresh foods, or foods without salt: fruit, fresh vegetables, fresh meats, chicken, fish, eggs, porridge, rice, and pasta.
   - Most sodium (75%) comes from processed foods. Limit processed foods high in salt e.g. soup, Bonox, processed meats, sauces, gravy, potato crisps and snack foods.
   - “Low salt” or “no added salt” foods are the best choices. Look for food with sodium content less than 150 mg per serve as a guideline. Note that some “reduced salt” products can still contain high levels of sodium.
   - Do not add salt at the table or in cooking.

What can I use instead?
   - Freshly ground pepper, dry mustard powder;
   - Lemon juice, lime juice, vinegar;
   - A sprinkle of dried herbs or chopped fresh herbs;
   - Garlic, curry, chilli, onion, fresh ginger, spring onion.

2. Limit foods high in oxalate
   - Reducing oxalate in your diet helps to reduce the amount of oxalate in your urine.
   - Limit intake of:
     - Rhubarb, spinach, silverbeet, beetroot, eggplant, sweet potato, celery, leeks;
     - Nuts, peanut butter;
     - Strong black tea. If you like tea, try drinking herbal tea instead such as lemon, camomile, mint or peppermint tea;
     - Chocolate;
     - Soy, wheat bran and wheat germ;
     - Berries (e.g. strawberries, blackberries), dried figs, and star fruit.
   - New research has suggested that eating and drinking high calcium and oxalate foods/drinks together allows the minerals to bind together and reduces the risk of kidney stone formation.

3. Include adequate calcium in your diet
   - When your diet is very low in calcium, your body will absorb more oxalate. Hence having sufficient calcium is important.
Dietary calcium is important for your bones and teeth. Adequate dietary calcium intake of 1200mg per day is recommended.

Include 3 choices daily from the following list:
- 250mL milk (e.g. Trim, skim, full cream, calcium-fortified soy milk);
- 200mL high calcium milk (e.g. Physical);
- 200g (small tub) yoghurt;
- 40g cheese (2 slices);
- 125mL (1/2 cup) ricotta cheese.

4. Include only a moderate amount of animal protein
- Limit protein from meat, seafood, fish, chicken, eggs to a moderate serve (120-150g) daily (cooked) (note 60g meat = 2 eggs).

5. Vitamin supplements
- Avoid vitamin C supplements (also known as ascorbic acid, calcium ascorbate).
- Avoid Vitamin D supplements or cod liver oil
- Vitamin B supplements have not shown to be harmful to people with kidney stones

6. Choose wholemeal and wholegrain foods
- Eating foods higher in fibre can decrease the risk of stone formation by reducing the amount of calcium and oxalate you absorb.
- Choose wholemeal and wholegrain breads, flour, cereals, pasta, biscuits and crackers.

If you have uric acid stones,
1. Limit high purine foods
- Red meat, organ meats, gravies and meat extracts
- Mackerel, anchovies, herring
- Shellfish

2. Limit alcohol intake
- Alcohol interferes with the removal of uric acid from your body.

3. Limit sugar sweetened food and drinks

4. Increase fruit and vegetable intake
Eating less animal-based protein and eating more fruits and vegetables will help decrease urine acidity which will help reduce the chance of stone formation.
**Remember:**

- Less urine + more stone forming minerals = kidney stones
- More urine + less stone forming minerals = no kidney stones
- Drink more fluids and the right type of fluid

This information sheet is not meant to substitute your Doctor or Dietitian’s advice. Please consult a Dietitian for further dietary advice.

To find an Accredited Practising Dietitian visit: [www.daa.asn.au](http://www.daa.asn.au)

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