

## 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
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#### **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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