

Dietary Management of Kidney Stone (Calcium-oxalate stones)

Diet is a key factor in the management of recurrent kidney stones. It has the ability to promote or inhibit kidney stone formation. The body eliminates waste products of metabolism through the kidneys. Some of these waste products form urinary crystals within the urinary tract. Changes to diet can manipulate the level of waste products being manipulated, and hence, decrease the risk of stone formation.

There are several different types of stone composition, however the most common stone is that made of calcium-oxalate, accounting for 70-80% of all stones formed. Calcium-oxalate stones usually form due to increased levels of calcium and oxalates in acidic urine (low pH). It is important to determine the composition of the kidney stone, as the treatment protocol is dependant on type of composition.

Increase fluids

Increasing fluids in the diet, primarily water, is essential for decreasing the risk of stone formation. A large fluid intake increases the urine volume, diluting the stone-forming products and decreasing their likelihood for crystallizing. A fluid intake (primarily water) of 2-3 litres a day is recommended.

Decrease salt intake

Increased intake of dietary salt (sodium) results in the body excreting more calcium into the urine. Therefore, it is important to identify and avoid high-sodium foods in the diet. Total daily sodium intake should remain well below the recommended daily allowance of 2300mg. Reading food labels and asking about the sodium content of food when eating out is useful for decreasing intake.

Avoid high-oxalate foods

Some foods contain high-levels of oxalates that contribute to increased amounts in the urine, and subsequently stone formation. Not all foods containing oxalates need to be avoided, only those with amounts. Foods that should include:

- Spinach & silverbeet
- Rhubarb
- Chocolate
- Black tea
- Beetroot
- Nuts
- Parsley

Increase dietary fibre

Fibre has the ability to bind with oxalates in the intestines, preventing them from being absorbed into the body. This results in less oxalates being eliminated, therefore, decreasing risk of stone formation.

Reduce simple sugars

Like salt, sugar increases the excretion of calcium through the kidneys, increasing the risk stone formation. Refined carbohydrates (high GI foods) should also be limited as these also raise the level of calcium excretion.

Calcium intake

It is important to maintain an adequate calcium intake, as a calcium-restricted diet does not reduce urinary calcium levels. In fact, calcium restriction may increase stone formation and contribute to lower bone density. Like fibre, dietary calcium binds with oxalates in the intestines, preventing them from being absorbed, resulting in decreased urinary levels. It is recommended that people who form calcium-oxalate stones include 800mg of calcium in their diet each day.

Decrease animal protein

Diets that are high in animal protein are associated with a higher risk of kidney stone formation. Animal protein increases the levels of calcium and oxalates being excreted into the urine. It also decreases the urine's pH, increasing likelihood of stone formation. Animal protein also decreases citrate, which inhibits stone formation. Protein intake should not exceed Australian recommended intakes. The approximate guidelines for daily protein intake (measured in grams per kilogram of bodyweight) is as follows:

- 0.75g/kg for adult women
- 0.84g/kg for adult men

Maintain a health weight

Being overweight increases the risk of kidney stone formation. Therefore, it is advised to maintain a healthy weight through diet and exercise to reduce the risk of kidney stones.

Key Points

- **Increase water intake (2-3L/day)**
- **Limit salt-intake**
- **Limit sugar-intake**
- **Limit refined carbohydrates**
- **Increase fibre**
- **Increase dietary calcium**
- **Avoid high-oxalate foods**
- **Do not over-consume animal proteins**