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General Dietary Advice for Stone Formers

Fluid intake

How much should I drink?

We all have busy lives and most people do not drink enough fluids. Drinking enough fluid is the most important aspect of preventing stone formation and will reduce your risk of stone formation significantly. Not drinking enough fluid can make your urine concentrated and make stones more likely to form. Aim to drink 2-3 litres of fluid each day and to keep your intake distributed evenly throughout the day. As a rough guide you should try to keep your urine colourless throughout the day; this equates to a urine output of at least 2 litres per day. In patients with cystine stones, however, an output of 3.5 litres per day is required.

What should I drink?

The fluid should be in the form of water, squash, diluted apple juice, mineral water with a low concentration of minerals, or herb or fruit tea. Caffeinated tea, coffee can be consumed in moderation but are not as suitable as the above. Cola drinks, lemonades and soft drinks containing sugar, as well as alcoholic beverages are not suitable.

In addition, it may be helpful to try and drink 1 or 2 glasses of water before going to bed and on rising in the morning. This ensures that you are well hydrated throughout the day and night.

Replace lost fluid

Make sure that you keep well hydrated. If you exercise a lot, work in a hot or air-conditioned environment, take lots of long flights, or generally sweat a lot you must ensure that you compensate by drinking more fluids.

Diet

Diet also contributes to your risk of stone formation. For your general health and for your risk of kidney stone formation you should have a well-balanced diet and avoid an excessive amount of calories. This means that the diet should include fresh fruits, salads and vegetables, low fat dairy produce, and whole grain products such as bread or cereals. A high fibre diet is also important, although wheat bran should be avoided due to its high content of oxalate. Finally, a diet low in salt is important.

Do I need to lose weight?

Obesity is a significant risk factor for stones. Your body mass index (BMI) is calculated by the following formula:

$BMI = \text{Weight (kilograms)} / \text{height squared (metres)}$.

E.g. a 80kg man who is 1.8metres tall has a BMI of 24.7

If your BMI is over 30 you have about 2 times the risk of stone formation compared to those with a BMI less than 25.

Can I eat meat and other protein?

Yes, but the intake of protein should be restricted to approximately 100g per day. A high intake of animal protein appears to increase the risk of stone formation. Avoid large portions of red meat particularly.

I've heard that calcium is a bad thing to have in the diet if you have kidney stones. Is this true?

Kidney stones usually contain calcium and traditionally it was thought that it was beneficial to restrict calcium from your diet. However, a big study from Harvard University, USA demonstrated that it is actually better to have a moderate or even slightly higher calcium intake. The reason for this is that calcium binds oxalate in the gut and prevents it being absorbed. If oxalate is absorbed it results in a high urine concentration which promotes stone formation.

As a result, calcium restriction can actually be harmful and increase the risk of stone formation. A daily intake of up to 1000mg per day is recommended for calcium stone formers. It might be important to reduce the calcium in your diet, however, if you have excessive calcium in the urine.

Calcium is found in dairy products such as milk, yoghurt, cream and cheese. A normal, varied diet will give the average person about 500mg of calcium before adding in any dairy products. Milk and yoghurt contain about 120mg per 100g, soft cheese about 400 mg per 100g, and hard cheeses up to 1000 mg per 100g.

Should I avoid oxalate containing foods?

You should **try and avoid** oxalate-rich foods to reduce the amount of oxalate in your urine. The following foods are high in oxalate:

- Rhubarb
- Celery
- Spinach
- Beetroot
- Strawberries
- Nuts (including peanut butter)
- Sesame seeds
- Black Tea
- Chocolate, Cocoa and Carob

It is not necessary to exclude oxalate-rich foods completely; simply eat them in small amounts.

Should I restrict the amount of salt I take?

Yes. A high salt intake can contribute to calcium stone formation. Do not add salt to your food at the table but use pepper, herbs, spices or vinegar as alternative flavourings. You can, however, add a small amount of salt during cooking. You should aim to keep your salt intake to 2,300 - 3000 mg/day. Bear in mind that 1teaspoon of salt contains approximately 2, 500 mg. Try to eat low salt foods. Avoid high-salt, tinned, packet and processed foods (e.g. soups, salted crisps or nuts, tinned meats, meat paste, smoked fish and fish paste).

Are there any other tests that you can do to investigate why I form stones?

Yes. In all patients who have had a kidney stone blood tests are done to check the kidney function and also ensure that the levels of uric acid or calcium in the blood are not too high. In high risk stone formers, or those who have had recurrent stones, then collection of two 24hr urine specimens for analysis is important. Your doctor can tell you more about this.