Advice for Patients’ Prevention of Kidney Stones

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Introduction

The kidneys are responsible for the production of urine. Urine drains into the bladder via two hollow tubes called ureters, The urethra connects to the base of the bladder and drains the urine outside the body. The kidneys, ureters, bladder and urethra are collectively known as the urinary system or urinary tract.

Stones, also known as calculi, can form in any part of the urinary tract. 50% of patients presenting with a stone will develop further stones over the next 10 years. It is therefore important to try to minimise the risk of further stone formation by following certain advice.
It is worth remembering that different people may form different kinds of stone. The information contained here consists mainly of general advice for all stone formers. More specific advice may be applied to patients where the type of stone is known. Your stone would need to be sent away for analysis in order to determine the kind of stone present. We would encourage you to try to catch your stone if possible by sieving your urine. This would allow us to send your stone for analysis. Some patients will be referred for more detailed tests, especially if there is a strong family history, early age at onset or recurrent stone formation.

Prevention

General Advice

1. Fluids
It is important to drink plenty of fluid, especially in the summer months or when in a warm climate. You should aim to drink enough fluid to produce two litres of urine per day. This usually means drinking two and a half litres of fluid a day. The type of fluid does not really matter although excessive amounts of milk and tea should be avoided as these contain calcium and a stone forming substance called oxalate. It is particularly important to keep well hydrated at night when urine is normally most concentrated. It is advisable to drink fluids before bedtime and once during the night to prevent the urine becoming too concentrated.
Alcohol, when taken in moderation, is safe in people who form stones. The recommended guidelines are 14 units per week for women and 21 units per week for men (1 unit = 125ml glass of wine, half pint of beer or lager, or a single shot of spirits).

2. Exercise
People who are more active are less likely to get stones. Obese patients are particularly at risk for stones, mainly due to increased water loss in the form of sweat. **Exercise and weight loss are important in the prevention of stones.**

3. Sodium
Sodium is a salt found in many foods. The kidney eliminates excess sodium from the body alongside calcium; therefore high sodium diets increase the sodium and calcium levels in the urine. This can predispose to stone formation. **It is recommended that patients known to form stones should follow a low sodium diet.** This can be achieved by avoiding foods rich in salt, for example, crisps, smoked and tinned foods and instead choosing “low salt” varieties. Salt should not be added to foods during cooking or at the table.

For more information, visit: http://www.bpassoc.org.uk/information/lifestyle/salt.htm

4. Calcium
In the past, doctors commonly recommended that people with a history of kidney stones restrict calcium intake. More recent studies suggest that this is not advisable and may even be dangerous. Dietary calcium restriction may contribute to the risk of osteoporosis as well as increasing the absorption of oxalate (see paragraph on oxalate stones). Patients who have been shown to have abnormally high calcium concentrations in the blood will require further investigation to find the cause to allow treatment. **Unless told otherwise, you should take normal healthy amounts of calcium rich foods in your diet, for example, cheese and milk.**
5. Protein
High protein diets may be associated with stone formation. Proteins increase urinary calcium, oxalate and uric acid excretion by making the urine more acidic. It is recommended that patients known to be stone formers should not eat excessive amounts of animal proteins, for example red meat, eggs and cheese. In general, eat more vegetables as vegetable proteins tend to make the urine less acid.

6. Fibre
Fibre is well known to be good for your health. It reduces the absorption of calcium from the gut and so decreases the amount in urine. It can be found in many fruits, vegetables, whole-wheat bread and high fibre cereals. High fibre diets are thought to decrease the risk of urinary tract stone formation.

Specific Advice

Other preventative measures can be directed towards the particular type of urinary tract stone:

1. Oxalate Stones
Three quarters of stones contain a substance called oxalate. If your stone contains oxalate, you should avoid foods containing high levels, for example, beetroot, chocolate and cocoa, carbonated drinks, grapefruit, almonds, peanuts, beans, spinach, strawberries and rhubarb.

2. Cystine Stones
It is essential to ensure a high fluid and low salt intake in the presence of a cystine stone. You may be given tablets, for example, penicillamine to prevent stone formation.
3. Uric Acid Stones
Again it is essential to ensure a high fluid intake with these stones as dehydration pays a large part in their formation. Patients with stones containing uric acid should eat less meat, fish and poultry. You may also be asked to make your urine less acidic using tablets. In some cases, your doctor may prescribe a drug called allopurinol to control the level of uric acid in the blood or urine.

4. Triple Phosphate or “Struvite” Stones
These stones are associated with chronic bacterial infections. They are only seen in a small proportion of patients, about 6%. In these patients the urine needs to be kept free of infection and this may require long term antibiotics.

Suggested Dietary Modifications

- High fluid intake
- High fibre diet
- Low sodium diet
- Low oxalate diet
- Low animal protein diet
- Normal calcium intake unless specifically told otherwise
The information provided in this booklet is also available on the Bristol Urological Institute’s website. The web address is: http://www.bui.ac.uk

References


References and Further Information

NHS Constitution. Information on your rights and responsibilities. Available at www.nhs.uk/aboutnhs/constitution
If you or the individual you are caring for need support reading this leaflet please ask a member of staff for advice.

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