Royal United Hospitals Bath
NHS Foundation Trust

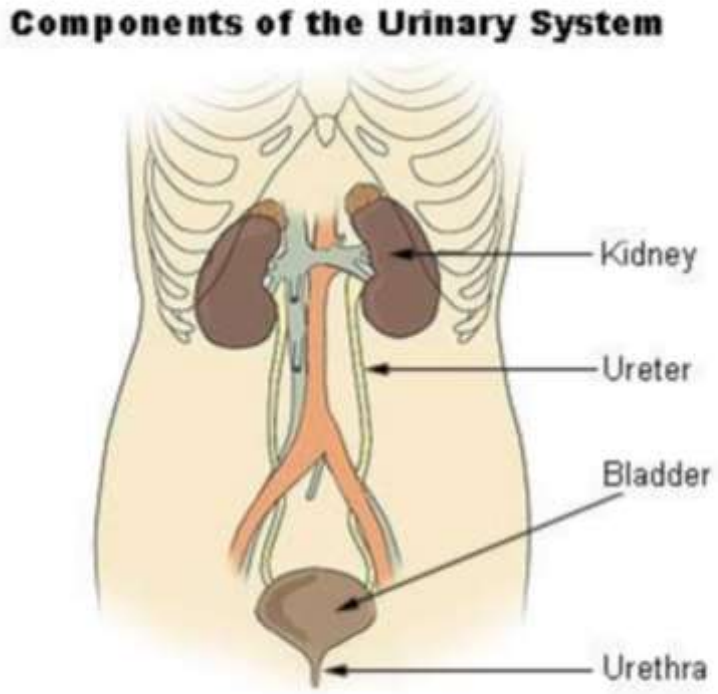
# Prevention of Kidney Stones

This leaflet will cover:

- Introduction
- Prevention of kidney stones
- General advice on exercise, fluids and suggested dietary modifications.
- Specific advice for different types of kidney stones.

## Introduction

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




Kidney stones, also known as calculi, can form in any part of the urinary tract. Half of all patients who have a stone will develop further stones over the next 10 years. It is therefore important to try to minimise the risk of developing further stones by following the advice in this leaflet.

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 (people who form kidney stones). More specific advice may be applied to patients if the type of stone is known. If it is important to know the type of stone that you have, we will need to send it away for analysis. Please try to catch your stone if possible by sieving your urine and storing any kidney stone caught in a container to bring to your next clinic appointment. We are most likely to need to send your stone for analysis and further tests if you have a strong family history of kidney stones, are relatively young to have a kidney stone, or if you keep having kidney stones.

# Prevention

## General Advice

### 1. 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.

### 2. 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. You should drink some of this fluid before bedtime and once during the night to prevent your urine from 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).

### 3. Suggested dietary modifications

## 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 make stone formation more likely. It is recommended that patients known to form stones should follow a low sodium diet. You can achieve this by avoiding foods rich in salt, for example, crisps, smoked and tinned foods and instead choosing “low salt” varieties. You should not add salt to foods during cooking or at the table.

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

## Calcium

In the past, doctors often recommended that people with a history of kidney stones reduce their calcium intake. More recent studies suggest that this is not advisable and may even be dangerous. Reducing the calcium you eat and drink may increase the risk of osteoporosis (weak bones) and the absorption of oxalate (see paragraph below 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 for the high calcium. **Unless told otherwise, you should eat normal healthy amounts of calcium rich foods in your diet, for example, cheese and milk.**

## 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. 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. For more information on recommended protein in your diet see “Are you having a nutritionally adequate diet” which can be found at http://www.ruh.nhs.uk/patients/services/clinical_depts/dietetics/index.asp.

## 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 for different types of kidney stones

Other preventative measures can be used for your particular type of urinary tract stone (if known):

1. **Oxalate Stones**
   Three quarters of stones contain a substance called oxalate. If your stone contains oxalate, you should avoid foods containing high levels of oxalate, for example, beetroot, chocolate and cocoa, carbonated drinks, grapefruit, almonds, peanuts, beans, spinach, strawberries and rhubarb.
2. **Cysteine Stones**
   It is essential to ensure a high fluid and low salt intake if you have a cysteine stone. You may be given tablets to prevent stone formation.

3. **Uric Acid Stones**
   Again it is essential to ensure a high fluid intake if you have 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 your 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 you may require long term antibiotics.

## Contact information

If you need further information or have any questions, please contact: Monday to Friday 9am to 5pm:

Urology Outpatients Reception 01225 825990

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If you would like this leaflet in email form, large print, braille or another language, please contact the Patient Support and Complaints team on 01225 825656.

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