

Produced by Dr. David Voss, Specialist Renal Physician
in the interest of public health education.

www.kidney.net.nz

"What are the kidneys?" Information Sheet

Where are the kidneys?

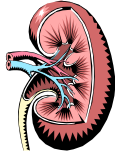
Most of us are born with two kidneys, one on each side, high up in the back of the abdomen, partly hiding behind the ribs. About one in every 500 people is born with only one kidney, and live a healthy and normal life with that one kidney. Each kidney is about the size of your fist and weighs about 150g.

What do the kidneys do?

Kidneys have six main roles:

1. Filter the blood of waste products. Clean the blood of any water soluble (dissolve in water) waste products from body metabolism. Potassium, urea and creatinine are some of these. Urea and creatinine are usually tested for when the doctor needs to assess how well kidneys are functioning. The kidneys also remove many poisons, drugs and medications from the blood.
2. Control acid / base balance. Maintaining the pH (acid concentration) of the blood is very important to allow the body to function normally. The kidneys and lungs together are charged to keep the pH at 7.4. When someone has kidney failure, the pH usually drops (too much acid).
3. Control fluid balance. The kidneys control the amount of sodium and water in the body. The control of sodium (sodium chloride is salt, often sodium is incorrectly called salt) is paramount to our survival. The kidney senses how much water is "on board". Dark coloured, small volumes of urine reflect the kidney is working hard to conserve water, and you need to drink more fluid.
4. Control blood pressure. Through sodium balance, water balance, and release of blood pressure controlling hormones, the kidneys help control blood pressure. Most people with kidney failure have high blood pressure. Most people with high blood pressure, however, have normal, or near normal, functioning kidneys.
5. Control of haemoglobin. In response to a lack of oxygen in the body, the kidneys release the hormone erythropoietin. This hormone tells the bone marrow to make more red blood corpuscles - the oxygen carrying "cells" of the blood. Almost everyone with kidney failure is anaemic. Only a small number of people with anaemia, however, have kidney failure.

This information sheet is produced as introductory information on the kidneys for the consumption of the general public seeking further information; and families and patients suffering from kidney disease in the interest of general education. This information sheet is not a replacement for good medical advice and care. This information should be used as an adjunct to any reputable therapy and information from your health professional. The information herein is written expressly for consumption within the practice of medicine and nephrology within New Zealand. Whilst much of its content may be applicable to the practice of nephrology in other countries or situations, it should be read with this limitation in mind.



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6. **Make vitamin D.** Vitamin is partly formed in the skin and liver before being finally activated in the kidney. A lack of vitamin D leads to weak bones and teeth.

What are the symptoms something is wrong with my kidneys?

Unfortunately there are very few symptoms, and no early symptoms. Often kidney damage is identified by routine blood tests (performed for a medical examination, or general check-up) or investigation of high blood pressure. Secondly, many of the symptoms of kidney failure are non-specific - eg. tiredness, lethargy, nausea, loss of appetite, weight loss, muscle and bone aches, headaches and do not lean themselves to someone first thinking about the kidneys being in trouble. 80% or more of kidney function can be lost before any of these symptoms are noticed.

Symptoms more suggestive of urinary tract or kidney disease are:

Swelling of the body, usually first noticed around the eyes, wrist and ankles. The medical term for this swelling is oedema.

Blood or coffee or "Coke" coloured urine. Not to be confused with the dark colour of concentrated urine when you are short of fluid ("dehydrated").

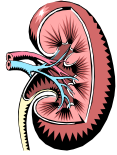
Burning sensation when passing urine, or the urge to pass urine often.

Pain in the back near the kidneys. Not to be confused with the pain of sore muscle and bones in the lower back.

Women more commonly suffer from urinary incontinence. A loss of control of the passing urine, leading to wetting the clothing - eg. stress incontinence (cough, or sneeze, or even just getting up from the chair); or urge incontinence where there is too little time between the feeling (the urge) of needing to pass urine and getting to the toilet. Often kidney function is not affected by incontinence, but it may reflect a kidney problem. Get it checked out. Incontinence can occur from child birth damaging the muscles in the pelvic floor; or be associated with / caused by urinary infections.

Women more commonly suffer from urinary infections. Urinary infections and cystitis are more common in women - some studies have reported up to 50% of women in their lifetime will have at least one urinary tract infection. Urinary

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infections may indicate kidney disease, or kidney problems. If suffering from symptoms of urinary infection - get it checked out early!

Men commonly suffer from prostate enlargement, or prostatism. Once over 50 years of age, prostatism is more frequently a problem, and a prostate check annually is recommended once over 50 years of age. Three in every ten men will suffer from troublesome prostatism leading difficulty in passing urine, requiring medication and / or surgery.

What can I do to care for my kidneys?

Prevention is better than cure. Drink plenty of fluid each day - at least 2 litres of water per day. Sometimes, when kidneys are failing drinking a lot of fluid is not a good thing. Check with your doctor first.

Get your blood pressure checked regularly, several times a year is well worth it. High blood pressure has no symptoms until severely elevated, when headaches may develop. High blood pressure unchecked destroys kidneys. Good blood pressure control can protect kidneys from further damage and deterioration. Report any hint of kidney pain, change in urine colour or frequency, or urinary infection symptoms to your doctor. Men should have their prostate checked. People who suffer from kidney stones should have regular checks of their kidney function.

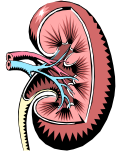
Some kidney diseases are hereditary. If someone in your extended family has kidney disease, get your blood pressure checked and have a blood and urine test - have a "kidney check".

What is involved in a kidney check?

A complete history of health, including the family history, and medications taken is important. Many kidney problems are caused by medications taken for the treatment of other non-kidney diseases.

Blood pressure. It should be normal. Evidence now suggests in people with kidney disease, the systolic (higher number of the two) pressure should be about 130 - 140; and the diastolic (lower number) should be below 80mmHg.

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Urine test for blood and protein. Small amounts of blood can appear in the urine as an early warning sign of kidney disease, yet this blood is too little blood to see with the naked eye. Protein in the urine indicates inflamed kidneys. Sometimes all the urine passed in a twenty-four hour period (including that passed overnight) needs to be collected to measure protein, creatinine (to assess kidney function) or other waste products.

Blood test for kidney function, and sometimes tests for common causes of kidney disease. Urea and creatinine are the two waste products that build up in the blood with kidney failure. Creatinine and urea blood tests are the corner stone of estimating and monitoring kidney function.

Ultrasound scan of the kidneys. This scan uses sound waves to look inside the body at the kidneys. Ultrasound scans are painless, harmless and reveal a large amount of information about the kidneys. Ultrasound of the kidneys revolutionised the practice of kidney medicine.

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