

A Single Functioning Kidney

This information is aimed at children who have a single, otherwise healthy kidney. Some of the information may be relevant to children who have other abnormalities of the urinary tract.

What is normal?

Most people are born with two fist-sized kidneys that each drain via a small muscle-lined tube (ureter) into the bladder. The kidneys are a *vital* organ; this means they are essential for life). They are unable to regenerate after injury.

The kidneys are well protected by their location high up at the back of the abdomen under the ribcage. They have an excellent blood supply (25% of the heart's output) because their main job is to clean or filter the blood of waste products.

The blood is strained by millions of microscopic filters (roughly one million per kidney) known as glomeruli. The filters lose some function with time and normal ageing processes. There is usually a good safety margin, such that you have more than enough kidney function for a normal lifespan.

Who does this happen to?

Some people are born with only one kidney. Others lose a kidney in early life.

Finding a single kidney in early life happens in roughly 1 in every 750 people, for one reason or another. It is more common in males than in females. Typically it is something you have no control over and could not have been predicted or prevented.

Sometimes there are other abnormalities in the urinary tract that place the remaining kidney at risk of ongoing damage and these may need to be dealt with.

How does this happen?

For reasons we do not completely understand, some children are born with only one kidney (renal agenesis) or one kidney shrinks (involutus) either in very early life or in childhood. The condition that this 'shrinking' most often occurs with is a multicystic dysplastic kidney (MCDK).

In other situations a kidney may be removed due to trauma or surgery (tumour, bleeding or kidney donation).

In a slightly different situation, the total amount of functioning kidney tissue across the two kidneys is reduced due to injury or abnormalities in development. This may be asymmetrical, such that there is essentially only one properly functioning kidney.

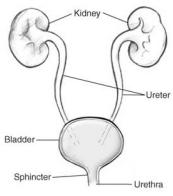
This information sheet applies to the single kidney setting where the single remaining kidney is thought to be normal.

Why?

A strong family history, diabetes during pregnancy, blockage in the urinary tract, tumours or trauma predispose you to losing one kidney - but it can happen to anyone.

A variety of genetic and inherited states may predispose you to only having one kidney. There may be a DNA problem causing the abnormal urinary tract (genetic mutation), however this does not mean it has necessarily been inherited from the parents.

Although genetic testing has come a long way, we cannot test for many of these suspected mutations.



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The problem

If someone has only one kidney, they have half the number of working filters. They have even fewer filters if the single remaining kidney is abnormal as well. These filters adapt, up to a point, and most of the time you can live a perfectly healthy life with one functioning kidney (with a few small modifications). In fact, this is exactly what happens when someone donates a kidney for a kidney transplant. However it is vitally important to protect the remaining filters in the kidney from further damage and strain.

It can be difficult to predict how much kidney tissue is needed before someone's health becomes affected. Kidney disease is typically silent and slow, so it is important to have regular check ups (see below). Even with a healthy single kidney, high blood pressure (hypertension) and proteinuria (protein in the urine) may develop, so annual check ups should continue for life.

What can we do?

Attend regular check ups for blood pressure, blood tests, kidney ultrasounds and urine tests (usually once per year if the single kidney is healthy). If the kidney filters are becoming strained there may be high blood pressure or protein leak through the filters into the urine.

Make sure the remaining kidney grows well in childhood - it should grow more than a normal sized kidney.

Minimise chances of kidney damage due to diabetes or hypertension through:

- Maintaining a healthy body weight
- Avoid smoking/alcohol
- Regular exercise
- Avoid high blood pressure

Minimise chance of injury to single kidney by avoiding potentially traumatic situations such as very physical contact sports, and Bungy jumping.

It is possible to have a kidney shield made to fit under clothing to protect the kidney whilst playing sport. This costs between \$150-200.

More information?

Please speak to your General Practitioner or Paediatric Nephrologist.