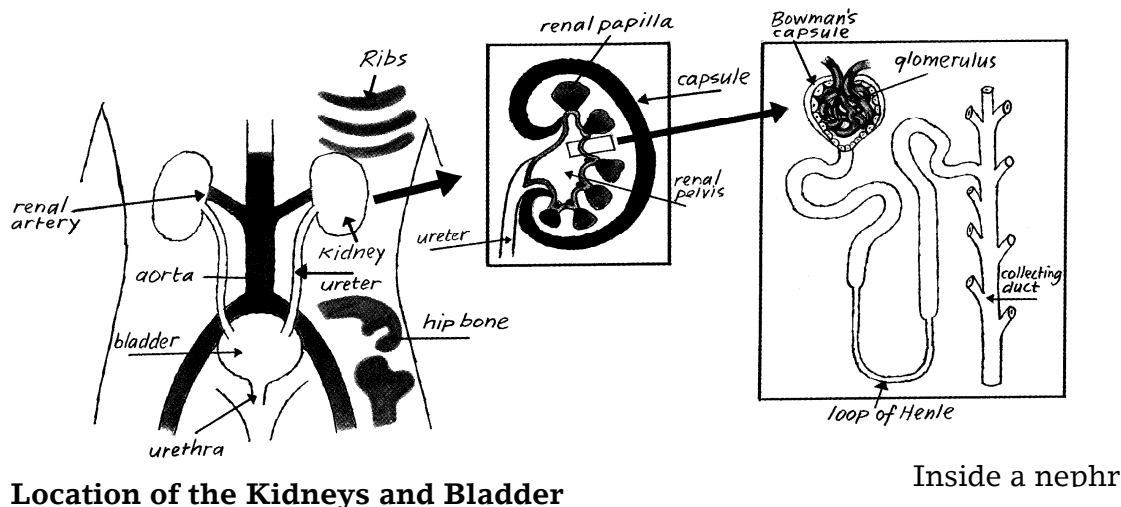


NEPHRITIS - GLOMERULONEPHRITIS

HOW DO THE KIDNEYS WORK?

The kidneys are two, large bean-shaped organs located in your lower back. They each contain up to one million nephrons, the working units of the kidneys. Inside each nephron is a tiny set of looping blood vessels called glomeruli. The glomeruli filter your blood allowing extra fluid and waste to pass into the tubule and become urine. In a healthy nephron, this filter helps to keep blood cells and protein in the bloodstream.



Location of the Kidneys and Bladder

Inside a nephron

WHAT DOES NEPHRITIS MEAN?

Nephritis is a general term used to describe a group of diseases that cause swelling or inflammation of the glomeruli. This inflammation reduces the kidney's ability to filter waste from the blood. Nephritis is often used as an abbreviation for glomerulonephritis. This fact sheet also uses this shorthand.

WHAT CAUSES NEPHRITIS?

Most types of nephritis are caused by the body's immune system responding to an 'insult' of some sort. The 'insult' might be a drug or poison, an infection or a change in the way your body responds to one of the substances in its tissue. Your body's antibodies often damage the kidneys as they respond to this 'insult'. In some cases the body's immune system attacks the filters causing swelling and scarring. Some forms of nephritis have a strong family history but often the cause of nephritis is unclear.

ARE THERE DIFFERENT TYPES OF NEPHRITIS?

There are many different types of nephritis. It can vary from a mild, non-damaging condition to a serious problem causing kidney failure.

Some forms of nephritis appear mild at first but can later cause high blood pressure or become more serious.

Nephritis is often described as acute or chronic. The acute form develops suddenly, sometimes after a throat or skin infection. These infections may need treatment such as antibiotics to prevent them from causing a kidney infection and kidney damage. Kidney infections can also be called pyelonephritis. Chronic nephritis develops silently over several years and can lead to kidney failure. Sometimes an acute attack can cause chronic nephritis years later. See *Urinary Tract Infections* and *Chronic Kidney Disease* fact sheets for more information.

Factors such as your age and the characteristics of your urine are used to help diagnose different types of nephritis, such as:

- Focal nephritis

Less than one half of the filters have scarring. Red blood cells and a mild level of protein are present in the urine. This type of nephritis does not usually show signs of more severe kidney disease. There may not be any symptoms until blood and protein are discovered in the urine during routine tests.

For further information see *IgA Nephropathy* fact sheet.

- Diffuse nephritis

Most of the filters are affected. There are high levels of protein in the urine and other symptoms such as swelling of the limbs and face due to water retention and high blood pressure.

- Nephrotic syndrome

Damage to the filters causes them to leak large amounts of protein into the urine but few red blood cells. It is harder to diagnose this syndrome because the symptoms and signs can also be caused by other conditions eg diabetes and lupus. Swelling and high cholesterol can also be a sign of nephrotic syndrome. In children, nephrotic syndrome is called Minimal Change Disease. It is called 'minimal change' as the disease is due to normal or very mild abnormalities of the glomeruli. Although the cause is unknown, it may be the result of an abnormal immune process. Minimal Change Disease can sometimes occur in adults as a result of medications or as a result of other conditions such as cancer.

WHAT ARE THE COMPLICATIONS OF NEPHRITIS?

Some forms of nephritis have very few complications. However, most people with nephritis have at least one of the following problems:

- Blood in the urine (haematuria) - can make urine pink or cola-coloured
- Protein in the urine (proteinuria) - can cause frothy urine
- High blood pressure (hypertension) - can damage the filters if left untreated and cause headaches, dizziness and a flushed face
- High cholesterol
- Reduced kidney function
- Swelling to face, feet, legs and hands (oedema)

See *Chronic Kidney Disease*, *Blood in the Urine*, *Proteinuria*, *Heart Disease* and *Chronic Kidney Disease* fact sheets for more information.

The complications depend on the cause and amount of kidney damage. For example if the kidney's ability to concentrate urine overnight is damaged, you may feel tired as your sleep is interrupted by having to pass urine.

When there is a large amount of protein in your blood, some of this fluid leaks out of the bloodstream and into your tissues causing the swelling or oedema. This swelling may be more noticeable in your legs after you have been standing and in the tissue under your eyes when you first wake up in the morning.

Serious kidney damage can also cause anaemia. Anaemia means that there are not enough red blood cells in the blood and can cause tiredness and shortness of breathe. Breathlessness can also be increased if fluid builds up in the lungs. See *All about Anaemia* fact sheet for more information.

HOW IS NEPHRITIS DETECTED?

Unfortunately, nephritis may not be discovered until significant damage has been done to the kidneys. It is often found by routine health checks including:

- An investigation into the cause of raised blood pressure
- A blood test to learn more about kidney function. This is often reported as eGFR which stands for 'estimated glomerular filtration rate' and is a guide to kidney function.
- A urinalysis, which is an examination of a sample of urine, may include a dipstick test for protein, cell counts and a culture to help decide if there is an infection. It will also provide information on red blood cells. If changes are found in the urine such as increased levels of protein or albumin, nephritis is often the cause. Note that vitamin C can affect the dipstick and give a false negative result.
- A 24-hour urine collection or a spot urine protein/creatinine ratio if urine protein is found on the dipstick. They are used to measure the amount of protein more precisely and identify whether kidney damage is mild, moderate or heavy. Creatinine is a waste made during muscle activity normally removed by your kidneys.

Sometimes further tests used to find the type of kidney damage may include:

- Kidney biopsy - A needle is passed through your skin into the kidney. A small piece of kidney tissue is removed for examination under a microscope.
- An ultrasound - An examination of the kidneys using sound waves to outline the structure of organs.
- Computerised Tomography (CT) Scan or Magnetic Resonance Imaging (MRI) - Uses radio-frequency wavelengths and a strong magnetic field rather than x-rays to provide clear and detailed pictures of internal organs and tissues.

HOW IS NEPHRITIS TREATED?

There are many types of nephritis and as each behaves differently, the best course of treatment can only be decided after the nephritis has been identified. While many types require observation but no treatment and rarely lead to long-term kidney damage, you may need blood pressure medication. In recent years

use of an angio converting enzyme (ACE) inhibitor or an angiotensin receptor blockers (ARB) have proven effective treatment for high blood pressure.

These drugs lower blood pressure by widening your arteries. They also help to protect kidney function. Other medication called beta-blockers or calcium-channel blockers reduce your heart rate. A diuretic (water pill) and steroids are often prescribed as well.

**For more information about kidney health or this topic, please contact Kidney Health Australia:
Kidney Information Line (freecall) on 1800 682 531 or visit website
www.kidney.org.au**

This is intended as a general introduction to this topic and is not meant to substitute for your doctor's or Health Professional's advice. All care is taken to ensure that the information is relevant to the reader and applicable to each state in Australia. It should be noted that Kidney Health Australia recognises that each person's experience is individual and that variations do occur in treatment and management due to personal circumstances, the health professional and the state one lives in. Should you require further information always consult your doctor or health professional.

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