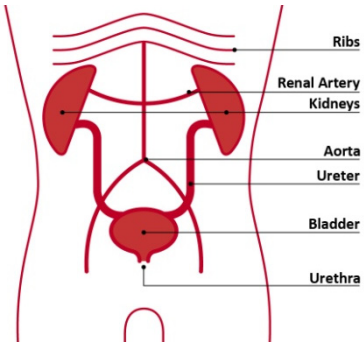
NEPHRITIS - GLOMERULONEPHRITIS

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 filtering units of the kidneys. Inside each nephron is a tiny network of looping blood vessels called the glomerulus. The glomerulus filters your blood allowing excess 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.



WHAT IS NEPHRITIS?

Nephritis is a general term used to describe a group of diseases that cause swelling or inflammation of the glomerulus. 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 an immune reaction in the kidney. Chronic nephritis develops silently over several years and can lead to kidney failure. Sometimes an acute attack can cause chronic nephritis years later. See '*Chronic Kidney Disease*' fact sheet for more information.

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

- **Focal nephritis**

  Less than a half of the filters have scarring, and 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 Nephritis*' fact sheet.

- **Diffuse nephritis**

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

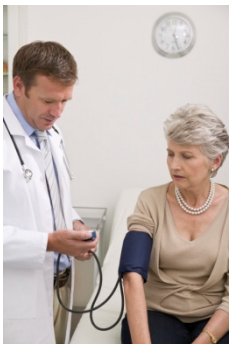
- **Nephrotic syndrome**

  Damage to the filters causes them to leak large amounts of protein into the urine but few red blood cells. As a consequence of the protein leakage, the body becomes depleted of circulating protein, swelling of the tissues occurs, and the cholesterol level rises in the blood. The nephrotic syndrome may be caused by various types of glomerulonephritis and by other conditions, e.g. diabetes and lupus. In children, the nephrotic syndrome is usually due to Minimal Change Disease. It is called minimal change as the disease is associated with only very mild abnormalities of the glomeruli. Although the cause is unknown, it may be the result of an abnormal immune process and usually responds to corticosteroids. 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 (albuminuria or proteinuria) – can cause frothy urine
- high blood pressure (hypertension) – can damage the filters if left untreated
- high cholesterol
- reduced kidney function
- swelling to face, feet, legs and hands (oedema)



See '*Chronic Kidney Disease', 'Blood in the Urine', 'Albuminuria', 'Heart Disease and Chronic Kidney Disease'*, and *'Blood Pressure 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. Tiredness is the most common symptom of chronic nephritis and does not always have a simple explanation.

Swelling may also occur as the reduced function of the kidney interferes with the capacity of the kidney to get rid of the normal load of salt and water. 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.

Anaemia becomes common when the kidney function is reduced to about a third of a normal level. Anaemia means that there are not enough red blood cells in the blood and can cause tiredness and shortness of breath. 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.
- Testing of the urine may include a test for a protein called albumin (albumin:creatinine ratio) and/or a dipstick test for blood. If protein is found in the urine, more urine tests may be needed to more accurately measure the amount of protein.

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 to remove a small piece of kidney tissue for examination under a microscope.
- 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 by examining the sample removed by a kidney biopsy. Many types of nephritis require observation but no treatment, and rarely lead to long-term kidney damage.

Other people may need blood pressure medication. Angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) have proven to be effective treatment for both reducing the amount of protein in the urine and decreasing blood pressure. Reducing blood pressure and the amount of proteinuria is associated with improved outcomes. Several other blood pressure medications that work in different ways are available if necessary. A diuretic (water pill) is often prescribed as well.

For more information about Kidney or Urinary health, please contact our free call Kidney Health Information Service (KHIS) on 1800 454 363. Alternatively, you may wish to email KHIS@kidney.org.au or visit our website www.kidney.org.au to access free health literature.

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