High blood pressure. Kidney disease and extra water in the body can cause high blood pressure. This increases the risk of further kidney disease, and also the risk of heart attack and stroke. Drugs may be needed to control the blood pressure.

**What is the treatment of nephrotic syndrome?**

The underlying kidney disease may be treatable with drugs. The type of treatment depends on the cause. Information is contained in the sections on each individual disease (see above for the types of kidney diseases).

Fluid retention can be treated by reducing the amount of salt and water taken in your diet each day. Some cases also require drugs to make the kidneys produce more urine.

Blood clots can be treated with drugs to thin the blood. In severe nephrotic syndrome, preventative injections of a drug called heparin may be given. If a blood clot develops, three or six months treatment with a drug called warfarin may be required. If your kidney specialist thinks the risk of a blood clot is extremely high, treatment with warfarin may be recommended to prevent a blood clot.

A high cholesterol level may be treated with dietary control (eating less fat), and in some cases with cholesterol lowering drugs.
Nephrotic Syndrome in Adults

What is nephrotic syndrome?

Nephrotic syndrome is a kidney disease with a build up of water in the body and leakage of protein from the blood into the urine. The next few paragraphs will explain what protein is, how it gets into the urine and what doctors can do to deal with any problems caused by this.

What is protein, and how does it get into the urine?

Protein is one of the three main types of chemical that make up our body (the others are fats and sugars). Protein is an important part of diet, and is contained in most types of food. Meat and fish contain large amounts of protein. After you eat protein, it is dissolved in the stomach and absorbed into the body. The protein is then modified and distributed throughout the body in the blood. Protein is an important part of the plasma (watery part) of the blood, and the body does not want to lose protein. Therefore, when the body eliminates waste through the kidneys, protein should be kept in the bloodstream.

The kidneys make urine by filtering the blood. Normally no protein passes into the urine when the blood is filtered, because protein in the blood is too large to pass through the tiny holes in the kidney filters. However, the filter can be damaged in kidney disease, so that protein can pass into the urine. The filter in the kidney is called a glomerulus, and many of the kidney diseases that cause nephrotic syndrome are called glomerulonephritis.

What are the symptoms of nephrotic syndrome?

Nephrotic syndrome causes water to build up in the body. The extra water can cause ankle swelling, or swelling in the hand (rings go tight on fingers) or around the eyes. Severe swelling can develop all the way up the legs and around the back. There may be swelling of the tummy or breathlessness due to water around the lungs.

What are the causes of nephrotic syndrome?

Many different conditions can cause nephrotic syndrome. These are the most common:-

- Minimal Change Nephropathy
- Focal glomerulosclerosis (FSGS)
- Membranous nephropathy
- Diabetes
- Amyloid

How is nephrotic syndrome diagnosed?

Water retention in the body is most commonly caused by heart disease, so the first thing a doctor will check is the heart. Sometimes heart tests seem to delay the diagnosis of a kidney condition. This is often understandable because heart disease is important and much commoner than kidney disease.

The main clue to nephrotic syndrome is protein in the urine. This can be detected by a simple ‘dipstick’ test on a small urine sample. This dipstick test is very sensitive, but cannot measure exactly how much protein is in the urine. To get an exact measurement, some urine needs to go to the laboratory. This can be done with a single urine specimen, in which the laboratory measure the levels of protein and creatinine (‘protein-creatinine ratio’ or PCR for short). A collection of a whole days urine output (24 hour collection) into a container was the standard method for measuring protein in the urine for many years, but is now being replaced by the far more convenient PCR test. Nephrotic syndrome may be present when the PCR level is greater than 300mg/mmol, or the 24 hour urine excretion is greater than 3 g/24hr.

If the urine test confirms nephrotic syndrome, a kidney specialist will then be involved, and further blood tests and an X-ray of the kidneys will be performed.

To make a firm diagnosis of the cause of nephrotic syndrome, it is usually necessary to perform a kidney biopsy. This is the removal of a small fragment of kidney using a needle, so that the kidney can be examined under a microscope.

What are the complications of nephrotic syndrome?

Extra water in the body. Fluid build up around the ankles, or in the hands, can be uncomfortable but does not cause serious problems. However, in some cases of severe nephrotic syndrome, fluid can build up around the lungs and cause breathlessness.

Blood clots. Nephrotic syndrome can make the blood sticky, leading to blood clots. These can occur in the veins of the leg and cause swelling. If one leg gets much more swollen than the other, you should see your doctor. Blood clots can go into the lungs, and cause chest pain, breathlessness or coughing up blood. These symptoms are serious, and a doctor must be seen without delay if they develop.

High cholesterol. In nephrotic syndrome, high levels of cholesterol (a type of fat) are found in the blood in many cases. The kidney specialist will check the cholesterol level in all cases of nephrotic syndrome. If the cholesterol level is high over a period of years, there is an increased risk of a heart attack. If the nephrotic syndrome is cured quickly, the cholesterol level will go down on its own. However, in some cases where a rapid cure is not possible, drugs to reduce the cholesterol may be needed.