

## Complications

# Kidney Disease (Nephropathy)

Kidneys are remarkable organs. Inside them are millions of tiny blood vessels that act as filters. Their job is to remove waste products from the blood.

Sometimes this filtering system breaks down. Diabetes can damage the kidneys and cause them to fail. Failing kidneys lose their ability to filter out waste products, resulting in kidney disease.

## How does diabetes cause kidney disease?

When our bodies digest the protein we eat, the process creates waste products. In the kidneys, millions of tiny blood vessels (capillaries) with even tinier holes in them act as filters. As blood flows through the blood vessels, small molecules such as waste products squeeze through the holes. These waste products become part of the urine. Useful substances, such as protein and red blood cells, are too big to pass through the holes in the filter and stay in the blood.

Diabetes can damage this system. High levels of blood sugar make the kidneys filter too much blood. All this extra work is hard on the filters. After

many years, they start to leak and useful protein is lost in the urine. Having small amounts of protein in the urine is called microalbuminuria.

When kidney disease is diagnosed early, during microalbuminuria, several treatments may keep kidney disease from getting worse. Having larger amounts of protein in the urine is called macroalbuminuria. When kidney disease is caught later during macroalbuminuria, end-stage renal disease, or ESRD, usually follows.

In time, the stress of overwork causes the kidneys to lose their filtering ability. Waste products then start to build up in the blood. Finally, the kidneys fail. This failure, ESRD, is very serious. A person with ESRD needs to have a kidney transplant or to have the blood filtered by machine (dialysis).

## Who gets kidney disease?

Not everyone with diabetes develops kidney disease. Factors that can influence kidney disease development include genetics, blood sugar control, and blood pressure.

The better a person keeps diabetes and blood pressure under control, the lower the chance of getting kidney disease.

## What are the symptoms?

The kidneys work hard to make up for the failing capillaries so kidney disease produces no symptoms until almost all function is gone. Also, the symptoms of kidney disease are not specific. The first symptom of kidney disease is often fluid buildup. Other symptoms of kidney disease include loss of sleep, poor appetite, upset stomach, weakness, and difficulty concentrating.

It is vital to see a doctor regularly. The doctor can check blood pressure, urine

(for protein), blood (for waste products), and organs for other complications of diabetes.

## How can I prevent it?

Diabetic kidney disease can be prevented by keeping blood glucose in your target range. Research has shown that tight blood glucose control reduces the risk of microalbuminuria by one third. In people who already had microalbuminuria, the risk of progressing to macroalbuminuria was cut in half. Other studies have suggested that tight control can reverse microalbuminuria.

## Treatments for kidney disease

### Self-care

Important treatments for kidney disease are tight control of blood glucose and blood pressure. Blood pressure has a dramatic effect on the rate at which the disease progresses. Even a mild rise in blood pressure can quickly make kidney disease worsen. Four ways to lower your blood pressure are losing weight, eating less salt, avoiding alcohol and tobacco, and getting regular exercise.

### Drugs

When these methods fail, certain medicines may be able to lower blood pressure. There are several kinds of blood pressure drugs, however, not all are equally good for people with diabetes. Some raise blood glucose levels or mask some of the symptoms of low blood glucose. Doctors usually prefer people with diabetes to take blood pressure drugs called ACE inhibitors.

ACE inhibitors are recommended for most people with diabetes, high blood pressure and kidney disease. Recent studies suggest that ACE inhibitors, which include captopril and enalapril, slow kidney disease in addition to

lowering blood pressure. In fact, these drugs are helpful even in people who do not have high blood pressure.

## Diet

Another treatment some doctors use with macroalbuminuria is a low-protein diet. Protein seems to increase how hard the kidneys must work. A low-protein diet can decrease protein loss in the urine and increase protein levels in the blood. Never start a low-protein diet without talking to your health care team.

## Kidney failure

Once kidneys fail, dialysis is necessary. The person must choose whether to continue with dialysis or to get a kidney transplant. This choice should be made as a team effort. The team should include the doctor and diabetes educator, a nephrologist (kidney doctor), a kidney transplant surgeon, a social worker, and a psychologist.

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