Diabetes and kidney disease
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What is diabetes?

Diabetes is a disease that is caused by a lack of insulin in the body or the body’s inability to properly use normal amounts of insulin.

Are there different types of diabetes?

There are several types of diabetes. The most common ones are Type 1 and Type 2.

Type 1 - Juvenile Onset Diabetes
- Develops mainly in young people
- Is caused by an inability of the pancreas to produce insulin
- Requires regular insulin injections

Type 2 - Adult Onset Diabetes
- Can develop at any age
- Usually (but not always) seen in people who are overweight
- The pancreas can produce insulin, but the body has difficulty using it properly
- Treatments include diet, exercise and medication (pills, insulin injections or both)
What does insulin do?

The body converts some food that we eat into sugar (glucose). The body uses this sugar as a source of energy to perform its functions. The pancreas produces a hormone called insulin that regulates the amount of glucose (sugar) in the blood, and helps glucose get into cells to be used as a source of energy. If the body does not make enough insulin or does not use the insulin properly, then this imbalance results in high blood sugar. Eventually many unhealthy changes can occur in different body organs, including the kidneys.

What are the kidneys?

The kidneys are the master chemists of the body. Normally, there are two of them, one on either side of the spine under the lower ribs. They are reddish brown in colour and shaped like kidney beans. Each kidney is about the size of your clenched fist.
What do the kidneys do?

Healthy kidneys do many essential things. They remove wastes from the blood via the urine and return the cleaned blood back to the body. They regulate the levels of water, salts, acids and different minerals the body needs for good health. They produce hormones that control other body functions. Many other organs depend on the kidneys in order to work properly.

How does diabetes affect the kidneys?

Damage to the filters in the kidneys
People who have had diabetes for some time can suffer from damage to the filters in the kidney. Each kidney contains almost a million tiny filters that clean the blood and produce urine. In the early stages, kidney damage can be detected by finding more protein than usual in urine test results. At later stages, damage to the filters and other parts of the kidney can worsen, and kidney function can be lost. This can be found when blood tests of kidney function are worse than usual. But some people who have diabetes and high blood pressure can have kidney damage and loss of kidney function without finding extra protein in the urine.

Kidney damage usually does not cause noticeable symptoms until about 75% or more of kidney function is lost.
Symptoms related to low kidney function include swelling (especially of the feet and legs), low energy, poor appetite, a bad taste in the mouth, nausea and generally feeling unwell. After a number of years, the kidneys can become so damaged by diabetes that they fail. To survive, a person with kidney failure must have dialysis treatments or receive a kidney transplant.

**Damage to nerves**
Diabetes can also damage the nerves in many parts of the body. When the bladder is affected, it may be difficult to pass urine. The pressure from urine building up in the bladder can damage the kidneys.

**Infections**
The urine of people with diabetes can have a high sugar content. This encourages the growth of bacteria and kidney infections may occur.

People with diabetes must take special care to avoid infections and have them treated immediately.

■ **What are your chances of developing kidney disease?**

Half or more of people with diabetes can show signs of early kidney damage. If left untreated, this could lead to more kidney damage or kidney failure.

You could have serious kidney damage without being aware of it. There are usually no symptoms of kidney disease
until the damage is severe. If you have diabetes, you should be tested once a year to see if diabetes has affected your kidneys. Your doctor can arrange a urine test for protein (a random urine test for albumin to creatinine ratio), and a blood test to check how well your kidneys are working (the serum creatinine).

■ What happens if the kidneys fail?

When kidney function is low, you might experience tiredness, nausea and vomiting. You could also retain salt and water, which could cause swelling and shortness of breath. You may also find that you need less insulin than usual.

When the kidneys fail, wastes and fluids will accumulate in your body and you will need dialysis treatments or a kidney transplant. You may be referred to a nephrologist (kidney specialist) to help manage the kidney disease.

■ What can you do to prevent kidney damage?

There are special treatments including proper food choices and medications. These can either slow down kidney damage from diabetes, or deal with low kidney function. These treatments work best when started early, and usually need to be continued for the rest of a person’s life.
There are many things you can do to help your kidneys:

- Have your urine, blood and blood pressure checked regularly by your doctor
- Maintain good control of your blood sugar
- Control high blood pressure (usually less than 130/80 on most readings)
- If you have high blood pressure, you should get a home blood pressure monitor and regularly check your blood pressure at home
- Some blood pressure medications have special protective effects for the kidney. Ask your doctor about this.
- Stop smoking
- Exercise regularly
- Make proper food choices
- Avoid too much alcohol
- See your doctor if you think you have a bladder infection
- Ask your doctor about any new developments in the treatment of diabetes
OUR MISSION

The Kidney Foundation of Canada is the national volunteer organization committed to reducing the burden of kidney disease through:

- funding and stimulating innovative research;
- providing education and support;
- promoting access to high quality healthcare; and
- increasing public awareness and commitment to advancing kidney health and organ donation.

Since 1964, our fundraising campaigns have allowed us to contribute millions of dollars to research, and to provide services to individuals living with chronic kidney disease and related conditions.

For further information, or if you wish to help us in our efforts, please contact The Kidney Foundation of Canada office in your area. You can also visit our Web site at: www.kidney.ca.

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