

Diabetes and Kidney Disease: Time to Act

Your Guide to Diabetes and Kidney Disease



International Diabetes Federation



Diabetes is fast becoming a world epidemic

Diabetes is reaching epidemic proportions worldwide. Every year more people are diagnosed with diabetes, yet there are still many people who have diabetes and do not know it. There are currently more than 177 million people with diabetes worldwide. WHO figures estimate that this will rise to 300 million by 2025. Diabetes is the fourth main cause of death in most developed countries.

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One of the main complications of diabetes is kidney disease. This occurs in about one third of people with either type 1 or type 2

Diabetes is the most common cause of kidney disease

diabetes and adds enormously to the morbidity, mortality and cost of treatment. It is extremely important to draw attention to the consequences of diabetes and kidney disease, encourage early detection and evaluation, and try to prevent what is essentially a preventable disease.

This guide is aimed at all public, people with diabetes, people at risk of getting diabetes, people who may have diabetes without knowing it, but also their families, healthcare providers, governments and health decision makers.

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What is diabetes?

Diabetes is a chronic condition that occurs as a result of problems with the production and/or action of insulin in the body.

When a person has diabetes, either their pancreas does not produce the insulin they need (this is type 1 diabetes), or their body cannot make effective use of the insulin they produce (this is type 2 diabetes).

There are two main types of diabetes: type 1 and type 2.

Type 1 diabetes can affect people of any age, but is the most common type in children and young adults. People with type 1 diabetes are unable to produce enough insulin. As a result they need injections of insulin in order to control the levels of glucose in their blood. If people with type 1 diabetes do not have access to insulin, they die. Type 1 diabetes accounts for 5-10% of all people with diabetes worldwide.

Type 2 diabetes is most common in older people, particularly those who are overweight. However, as a consequence of increased obesity and

inactivity among the young, type 2 diabetes is now affecting children and young adults. People with type 2 diabetes do not always require injections of insulin. Often, they can control their diabetes by controlling their food intake, losing weight if necessary and taking regular physical exercise. In addition, they may be treated with tablets. Type 2 diabetes accounts for 90-95% of all people with diabetes worldwide.

Complications of diabetes

When insulin is not used effectively by the body, glucose cannot be processed in the same way as in people without the condition. Glucose stays in the blood instead of being used by the body as energy. This often leads to the amount of glucose in the blood increasing. This high concentration of glucose or “high blood sugar” level is called hyperglycaemia. This can result in short and long-term complications, many of which, if not prevented and left untreated, can be fatal, and all of which have the potential to reduce the quality of life of people with diabetes and their families.

If uncontrolled, diabetes can cause serious long-term complications. The most significant are:

- **Nephropathy** (diabetic kidney disease) which may result in total kidney failure
- **Retinopathy** (eye disease), which may ultimately lead to blindness
- **Neuropathy** (nerve damage), which combined with blood circulation problems may cause ulcers of the legs and feet and also gangrene, which in turn may lead to amputation
- **Cardiovascular disease**, which affects the heart and blood vessels and may cause fatal complications such as coronary heart disease (leading to a heart attack) and stroke (a common cause of disability and death in people with diabetes).

Symptoms of diabetes

The onset of type 1 diabetes is usually sudden and dramatic and can include symptoms such as:

- Frequent urination
- Abnormal thirst and a dry mouth
- Extreme tiredness / lack of energy
- Constant hunger
- Sudden weight loss
- Blurred vision
- Recurrent infections

The onset of type 2 diabetes is gradual and therefore hard to detect. However the symptoms of type 1 diabetes, in a less marked form, may also affect people with type 2 diabetes.

Some people with type 2 diabetes have no early symptoms and are only

diagnosed many years after the onset of the condition. In about half of these cases various diabetic complications are already present.

Are you at risk of getting diabetes?

Everybody is at risk of getting diabetes. Some people may be more at risk of developing type 2 diabetes if they present these factors:

- Family history of diabetes
- Excess weight, obesity, particularly abdominal obesity
- Over 45 years of age
- A sedentary lifestyle
- Previous diabetes during pregnancy
- Previously demonstrated abnormalities of glucose metabolism, e.g. impaired fasting glucose (IFG) or impaired glucose tolerance (IGT).

However, since there are often no early symptoms of type 2 diabetes, it is important to get tested and diagnosed at the onset of the condition, before any complications have set in.

Though there is no cure for diabetes, effective treatment exists. With a timely diagnosis, access to the appropriate medication, quality of care and good medical advice in combination with a healthy lifestyle, a person with diabetes should be able to lead an active life and reduce the risk of developing complications.

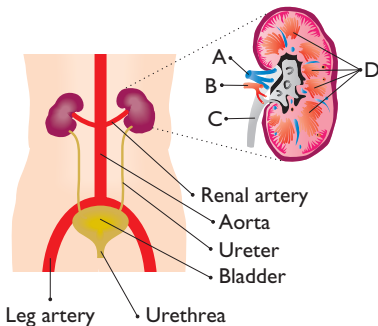
Diabetic kidney disease develops in one third of all people with diabetes

Diabetes could cost you your kidneys

What are the kidneys? How do they work?

The kidneys are the body's filtering and waste removal mechanisms. Kidneys are composed of millions of tiny filtering units called glomeruli, which contain very small blood vessels called capillaries. In the filtering process, blood flows through the capillaries and the waste substances that are not needed by the body are filtered out into the urine and passed on to the bladder.

- A.** Vein: clean blood goes out of kidney
- B.** Artery: blood and waste come into kidney
- C.** Ureter: waste and fluids go out in urine
- D.** Glomeruli: tiny filters throughout kidney



Three functions of the kidneys:

- Remove wastes from the blood via the urine and return the cleaned blood back to the body
- Regulate the levels of water and different minerals needed by the body for good health
- Produce hormones that control other body functions.

Diabetic kidney disease

Diabetic kidney disease (diabetic nephropathy) is a chronic, progressive kidney disease that develops in one third of all people with diabetes. This is approximately 60 million worldwide. High blood glucose levels in the blood affect small vessels in the whole body. These vessels can become damaged and not work properly. When the small vessels in the kidneys are damaged, the filtering process is affected. Wastes build up in the blood whereas other valuable substances such as proteins “leak” out into the urine. If this progresses, kidney damage can become kidney failure, also called end-stage renal disease (ESRD). At this time, the kidneys almost completely stop cleaning wastes out of the blood. Unless the disease is treated, wastes build up in the blood to poisonous levels and can cause death.

Risk factors for diabetic kidney disease

- Smoking
- High blood pressure
- Hyperglycaemia (high levels of glucose in the blood)
- Family history of diabetic kidney disease

Signs and symptoms of diabetic kidney disease

You could have kidney damage without even being aware of it. There are often no symptoms of diabetic kidney disease until the kidneys fail completely. However, there are some early signs or risk factors for you and your doctor to watch for:

- Protein in the urine
- High blood pressure
- Declining kidney function
- Leg swelling, leg cramps
- Increased need to urinate, especially at night
- Less need for insulin or anti-diabetic pills
- Nausea and vomiting
- Weakness, pallor and anaemia

Kidney disease treatment

When the kidneys have become damaged and no longer fulfil the process of filtering the blood, action must be taken. The main treatment options for the person with end-stage kidney disease are:

- Haemodialysis
- Transplantation

Haemodialysis

In haemodialysis, the person is attached to a blood dialysis machine for several hours 2 or 3 times a week. The blood circulates round an artificial filter in the dialysis machine, so that waste products and toxins are removed and the 'cleaned' blood can be returned to the person. Most people receive dialysis treatment at hospital although some have dialysis machines at home.

Transplantation

For people with end-stage kidney disease, there is the option of receiving a kidney transplant. A healthy kidney is transferred from one person to another person. Usually the kidney is transferred from a live donor. However, a transplanted organ will immediately be recognized as 'foreign' by the body's immune system, leading to organ rejection and failure. To prevent this, large doses of drugs that suppress the body's immune system (immunosuppressants) are given to prevent rejection of the new kidney.

Cost of treatment

Both haemodialysis and transplantation are extremely expensive. Dialysis costs around \$35,000 per person per year. The cost for a kidney transplant is approximately \$15,000 for the first year and then \$6,000 per year thereafter. Therefore efforts to prevent the development of end-stage kidney disease are extremely important. Action **MUST** be taken to prevent diabetic kidney disease.

Dialysis costs around \$35,000 per person per year.

Diabetes could cost you your kidneys: Act now!

prevent kidney disease

The Way Forward

The problems posed by diabetic kidney disease are alarming. It is a major cause of illness, death and healthcare costs. It is also clear that these problems are global in perspective and are worsening rapidly. Although a cure for diabetic kidney disease has not been found, the good news is that it is now possible to take action to slow or stop the development of diabetic kidney disease.

Investment in national programmes and educational campaigns

Decision makers need to be made aware of the importance of diabetic kidney disease. If measures are not taken to prevent diabetes and diabetic kidney disease, a global explosion of end-stage kidney failure due to diabetes is waiting to happen. National programmes aimed at primary and secondary prevention of diabetes and diabetic kidney disease as well as educational campaigns should be implemented.

Early screening for diabetes and diabetic kidney disease

Early detection of diabetic kidney disease can help prevent the progression to end-

stage kidney failure and the need for haemodialysis or transplantation.

Public awareness

Many people with diabetes do not get diabetic kidney disease, and having diabetic kidney disease does not necessarily mean that the kidneys will fail. However, people need to be aware of the risk factors of diabetic kidney disease and the measures that can be taken to decrease or delay their chance of developing it.

Ways to prevent diabetic kidney disease include:

- Maintaining good control of blood sugar levels
- Controlling blood pressure to 130/80 mm/Hg and having regular checks
- Reducing dietary protein intake
- Avoiding smoking and drinking alcohol
- Treating urinary tract infections
- Having urine albumin excretion checked at least once a year
- Taking regular physical exercise and losing weight if necessary (under the supervision of a physician)

This guide is intended for general information only.
For **further advice** contact your national diabetes or kidney association,
or speak to a healthcare practitioner.

More detailed information on diabetes and kidney disease can be found in
the publication *Diabetes and Kidney Disease: Time to Act*.

This and other IDF publications are available from:

International Diabetes Federation

Executive Office

19, Avenue Emile De Mot

B-1000 Brussels

Belgium

telephone +32-2-5385511

telefax +32-2-5385114

info@idf.org

www.idf.org

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