

# Type 2 Diabetes and Kidney Disease

*What You Should Know*

## Type 2 diabetes is a major risk factor for kidney disease

### Diabetes

Diabetes is a disease where the amount of sugar in the blood is too high. High sugar can also be found in the urine.

In type 2 diabetes, the body makes insulin, but cannot use it well. The insulin supply-to-demand is thus out of balance. 90% of people with diabetes have type 2 diabetes.

Type 2 diabetes can damage the eyes, nerves, heart and kidneys. It can lead to many health problems, such as heart failure and kidney disease.

### Diabetes and Kidney Disease

Each kidney contains many tiny filtering units (called nephrons). Over time, diabetes can damage these filtering units.

Protein spills into the urine and the kidneys over time cannot filter blood the way they normally should. These events together can lead to kidney disease.

*Approximately 1/3 of people with diabetes develop kidney disease, and diabetes is the leading cause of kidney failure.<sup>1</sup>*

## People with type 2 diabetes should get tested for kidney disease

### Tests for Kidney Disease

- Glomerular filtration rate (GFR): A blood test that checks how well the kidneys are filtering. GFR is calculated from serum creatinine using a formula.
- Albumin-to-creatinine ratio (ACR): A urine test that checks for high protein in the urine, which is a sign of kidney damage.

### Blood Sugar Tests

- Blood glucose and A1C: Tests that are used to diagnose diabetes or monitor glucose levels for people with diabetes. Glucose is a type of sugar.
- A home test can help monitor blood sugar levels.

# Type 2 diabetes and kidney disease can be treated

## Blood Sugar Control



Keeping your blood sugar well controlled is important in managing diabetes and kidney disease. Blood sugar control is usually done with diet, exercise, and if needed, medicine to help lower blood sugar.

These medicines can include:

- Insulin
- Metformin
- Sulfonylureas
- Meglitinides
- Thiazolidinediones
- Alpha-glucosidase inhibitors
- Bile acid sequestrants
- Dopamine agonists
- DPP-4 inhibitors
- GLP-1 receptor agonists
- SGLT2 inhibitors



Your healthcare team will decide if you need medicine and which ones you need.

## Other Treatments

Your healthcare professional may have you take high blood pressure medicines, called ACE inhibitors or ARBs,\* if you have high blood pressure or protein in the urine. These medicines are used to help slow the loss of kidney function in people with diabetes and kidney disease.<sup>2</sup> They can also be used for heart failure and in people with kidney disease without high protein in the urine.



## Research on Newer Treatments

Research on diabetes has led to newer drugs. One of these newer classes of diabetes medicines are known as SGLT2 inhibitors. Examples include canagliflozin, dapagliflozin, empagliflozin and ertugliflozin. Studies have shown that some medications in this drug class may also reduce the risk for heart disease in people with a history of heart disease.<sup>3</sup> They have also been shown to reduce the need for hospitalization for heart failure.



These drugs are also being studied for their possible use in slowing kidney disease. One recent clinical trial showed that canagliflozin helped slow the loss of kidney function in people with type 2 diabetes and kidney disease while taking an ACE inhibitor or ARB.<sup>4</sup> Clinical trials for other drugs in this class are ongoing.

# Steps can be taken to manage health and reduce risk

## Diet and Lifestyle



- Manage your sugar intake and eat healthy meals. A dietitian can help with a meal plan for diabetes and kidney disease that balances carbohydrate and protein intake.
  - » Avoid sugary, processed and “junk” foods.
  - » Eat more fresh vegetables, fruit, and unprocessed grains.
  - » Drink water instead of soda or juice.
- Manage blood pressure and control your intake of salt.
- Manage weight and get enough physical activity. You can speak with your healthcare team for help in deciding which lifestyle changes are best for you.



## Medicines

- Avoid overuse of NSAIDs\*, such as ibuprofen and naproxen, which can harm kidneys.
- Avoid herbal supplements. Many herbal products can harm the kidneys.
- Take all medicines as instructed by a healthcare professional, and do not miss any appointments.
- Speak with a healthcare professional about treatments and which ones are best for you, based on your individual medical situation.



### Sources

1. CDC National Chronic Kidney Disease Fact Sheet, 2017. [www.cdc.gov/kidneydisease](http://www.cdc.gov/kidneydisease). Accessed September 16, 2019.
2. de Zeeuw D, et al. *Kidney Int.* 2004;65:2309-2320
3. Zelniker T, et al. *Lancet.* 2019;393:31-39.
4. Perkovic V, et al. *N Engl J Med.* 2019;380:2295-2306.

\* ACE, Angiotensin converting enzyme. ARB, Angiotensin receptor blocker. NSAIDS, Nonsteroidal anti-inflammatory drugs.