

Teach Backs: Kidney Complications (Nephropathy)

The kidneys are two bean-shaped organs located at the level of the waist on the back. The kidneys filter blood and eliminate impurities through the urine.

Group Activity: The kidneys are like filters or strainers

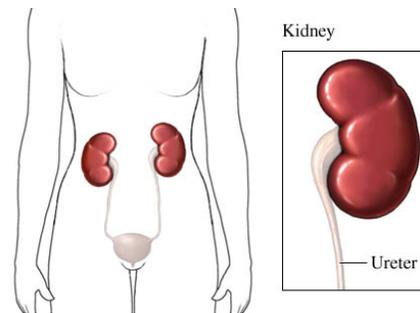
Duration: 15 minutes

Purpose:

To demonstrate the function of the kidneys when affected with diabetes and how to detect early damage.

Steps to follow:

- 1) Prepare 3 kitchen colanders or strainers. The first strainer is intact. The second has some dots of paint with some perforations. The last strainer has paint covering the whole strainer.
- 2) Show the participants the three strainers or colanders and explain that the first one works like a healthy kidney; the second one begins to show damage due to diabetes; and the last one shows what happens when the kidney is no longer functioning.
- 3) Take the water jug and mix in some uncooked rice grains. Tell the participants that the water represents blood, and the rice grains represent the proteins in the blood.
- 4) Put the strainers over 3 transparent glasses and pour the water with the rice into each of them.
- 5) Show the participants the results.
- 6) Show the first glass, which has only water, and indicate that it is only liquid— like normal urine.
- 7) Show the second glass, which should contain water with a few rice grains. Tell them that this is like the urine of a person with diabetes who is beginning to develop a kidney complication (microalbuminuria).
- 8) Show the third glass, in which there is no rice or little water and explain that it is when the kidney stops functioning (renal insufficiency).
- 9) Then ask the participants: “Does the kidney tell us it is being harmed?”
- 10) Explain the role of microalbuminuria in the prevention of greater kidney damage.



What is Nephropathy? What is Microalbuminuria?

Kidney damage is called nephropathy. Diabetic nephropathy is the medical term to refer to some kidney complications due to diabetes.

When the kidneys are damaged, they stop working as filters. Whereas they normally retain albumin from the blood, when kidneys are damaged, they let albumin pass through. Instead of retaining albumin, they retain substances they should be discarding. A urine test that measures **albumin** will detect kidney damage.

Kidneys that have been damaged by diabetes begin to let small amounts of albumin pass into the urine, between 30 and 299 mg/dl in 24 hours (called “microalbuminuria,” *micro*-=small). When the damage to the kidneys is greater, they let pass larger quantities of albumin, more than 300 mg/dl in 24 hr (called “macroalbuminuria”, *macro*- =big or large).

The presence of microalbuminuria indicates that a person with diabetes is starting to develop a kidney complication. Even if the person has macroalbuminuria, which indicates greater kidney damage, they should take preventive measures to avoid further complications.

When the damage progresses and creatinine level begins to rise, it is called **renal insufficiency**. In this condition, the kidneys do not produce urine, and the affected person must receive dialysis, an artificial filtering process. Besides eliminating toxic waste in the urine, the kidneys also produce hormones that regulate blood pressure. Damage to the kidneys due to diabetes or any other cause, may lead to hypertension and renal insufficiency. Hypertension on its own accelerates the course of kidney disease. If the person smokes, the damage increases even more. Overtime, as kidney function becomes worse and the kidneys stop filtering blood, it is called End Stage Renal Disease (or ESRD). In this condition, the kidneys produce very little, or no urine and the affected person must receive dialysis, an artificial filtering process.

How can people with diabetes prevent or improve kidney complications?

It has been shown that a person with diabetes can prevent damage to the kidneys and even improve their condition by doing the following:

1. Control glucose levels through healthy eating, exercise and taking diabetes medication as indicated.
2. Control blood pressure by taking medication as indicated and making changes in lifestyle.
3. Take a urine test at every medical check-up to detect the presence of albumin (proteins). The presence of protein in the urine is a sign that diabetes is harming the kidneys.

4. Take a blood test once a year to measure creatinine levels to evaluate for kidney disease (renal insufficiency).
5. Quit smoking if they smoke. Smoking accelerates the vascular damage to the kidneys.
6. Get medical attention and follow instructions carefully to prevent renal failure.

In people with diabetes and nephropathy, new medicines for high blood pressure have been shown to reduce the progress of nephropathy. Antihypertensive medicines, like ACE inhibitors or angiotensin receptor blockers (ARBs), can reduce blood pressure as well as protect the kidneys. Patients should ask their doctor about these medications.

The doctor may prescribe a reduction of protein in the diet of a person who has nephropathy. Only a medical doctor can determine if this is appropriate, and this will require consultation with a nutritionist. Unless advised differently by a medical doctor, it is important to eat normal amounts of protein, following the guidelines on proper nutrition (module 5).

A person with diabetes who has damage to both kidneys and receives dialysis may discuss with a nephrologist the possibility of a kidney transplant.

The **nephrologist** is the specialist that can treat kidney complications. The **urologist** is the specialist that could help manage erectile dysfunction (impotence).