

**Patient Education**

# Kidney Function

The kidneys do much more than just produce urine. Your kidneys are important organs that perform many functions to keep your blood clean, free of toxins, and perfectly balanced

## About the kidneys

Most people have two kidneys. Your kidneys are bean-shaped organs, each about the size of your fist. They are located near the middle of your back, just below the rib cage.

Every day, your kidneys process about 200 quarts of blood to filter out about 2 quarts of waste products and remove extra water. The waste and extra water become urine.

The urine flows into the bladder through long thin tubes called ureters. Your bladder stores urine until you go to the bathroom and pass the urine.



## What do the kidneys do?

- Make urine
- Filter and remove waste
- Regulate the body's water content and chemicals in the blood such as sodium, potassium, calcium and phosphorus
- Release hormones to assist in the following functions:
  - Control your blood pressure
  - Keep your bones healthy
  - Stimulate the bone marrow to make red blood cells

The main task of the kidneys is to remove the potentially harmful waste products from your blood. Waste is formed when your body breaks down food, toxins and medications. Your body uses the food you eat for energy and self-repair. After your body has taken what it needs from food, waste is released into the blood. If your kidneys do not remove this waste, it builds up to harmful levels in the blood and damages your body.

The filtering of waste occurs in tiny units inside your kidneys called nephrons. Every kidney has about one million nephrons. In the nephron, a glomerulus - a small blood vessel, or capillary - intertwines with a urine-collecting tube called a tubule. A complicated exchange takes place, as waste materials and water leave your blood and enter your urinary system.

At first, the tubules receive a combination of waste and chemicals that your body can still use. Your kidneys measure out chemicals like sodium, phosphorus, and potassium. They give back to the blood what is needed by the body. The rest will be eliminated in the urine. In this way, your kidneys regulate the body's level of these substances. The right balance is necessary for life, but excess levels can be harmful.

In addition to removing waste, your kidneys release three important hormones:

- erythropoietin (eh-RITH-ro-POY-eh-tin), or EPO, which stimulates the bone marrow to make red blood cells
- renin (REE-nin), which regulates blood pressure
- calcitriol (kal-suh-TRY-ul), the active form of vitamin D, which helps maintain calcium for strong bones and normal chemical balance in the body

## **What is kidney function?**

When your kidneys are working properly, and are free of disease, you have adequate renal (kidney) function. You can even live a normal, healthy life with just one kidney. It is important to understand that chronic kidney disease happens slowly and is usually caused by damage to the kidneys from disease. It may take months or years before your kidney function declines to the point of needing dialysis or a transplant.

During the early stages of your kidney disease, your nephrologist (kidney doctor) will monitor the function of your kidneys. His or her goal is to keep your kidneys working as long as possible. Your doctor will prescribe certain things to help your body adjust to the slowing down of your kidney function.

Content courtesy of DCI.