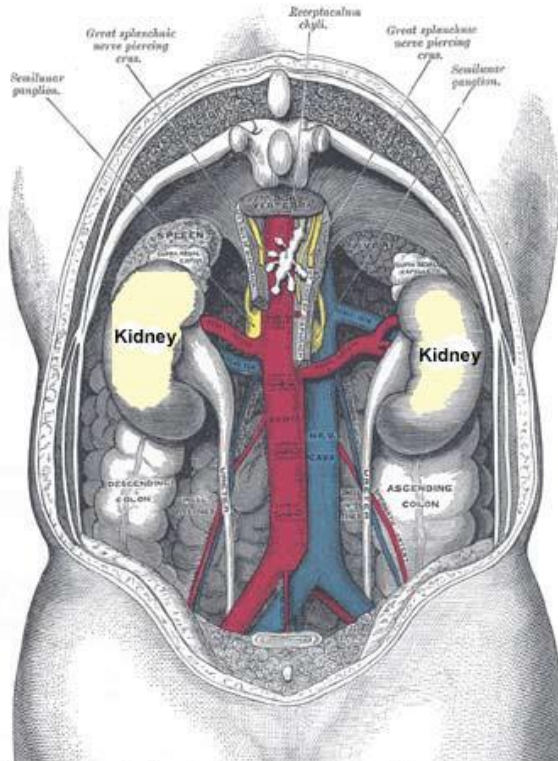


Kidneys are vital to health

Fun facts about the kidney



This is a reproduction of a lithograph plate from *Gray's Anatomy*. This image is in the public domain because its copyright has expired.

Each kidney weighs about **4 ounces**

Each kidney is approximately the size of your **fist**



Each kidney contains about 1 million tiny blood filters called **nephrons**. This roughly comes to about 140 miles of tubules in each kidney.

The **nephron** is the filtering unit of the kidney. The blood is cleansed as it passes through these millions of nephrons. The newly cleansed blood returns to the bloodstream by way of veins. Waste products and excess fluid passes from the kidney through the ureter and enters the bladder, where it is stored as **urine**. When the bladder becomes full, urine passes out of the body through the urethra.

Our bodies are always working. Even as we sleep, our cells are breaking down food, oxygen, and water called metabolism to replenish the energy, restore and repair themselves, so the body can function at peak efficiency. As a result of all this work, there are left over compounds called **waste products**, discharged into the blood.

Some of these waste products are toxic, and it is just one of the many functions of the kidneys to filter the blood and remove toxic **waste products**. In addition, the kidneys clear **medications and other ingested materials** that are not needed in the body or removed from the blood so that they do not build up in the body and cause toxicity.

Kidney plays a vital role in the regulation of **salt and fluid levels** in the body, affecting blood pressure and hydration. The kidneys produce hormones that help control blood pressure.

They also produce a substance called **erythropoietin** that stimulates the production of red blood cells, which are used to carry oxygen to different parts of the human body.

The kidneys also convert the **vitamin D** into active form, which is critical in keeping your bones and teeth strong and healthy.

Kidneys balance the levels of the vitamins, minerals, and maintain acid-base status in the body to maintain a homeostatic milieu.

In a nutshell What do kidneys do:

Filter blood and remove waste products

Balance the fluid levels in the body

Produce erythropoietin needed to make red blood cells

Produce renin that regulates blood pressure

Activate vitamin D that helps to maintain calcium and phosphorus levels in the body

Maintain acid-base levels to keep a tight control of pH level in the blood

So what happens when the kidneys don't work:

Changes the urination, it is possible a person could be urinating in small amounts or the urine could change in color, could become foamy, there could be blood in the urine.

Nausea and vomiting and bad taste in mouth (uremia)

Shortness of breath

Feeling cold/chilled

Lack of concentration

Swelling of the legs, ankles, feet, face or hands

Fatigue, itching could be seen in late stages of kidney failure.

Common conditions that affect kidneys:

Diabetes mellitus type I and type II

Hypertension (high blood pressure)

Glomerulonephritis (inflammation of the filtering subunit of the nephron)

Congenital kidney diseases/defects

Hereditary kidney diseases

Kidney stone disease

Prostatic hypertrophy, causing obstruction

How is kidney function monitored?

The optimum way of measuring the kidney function is complex and so is not routinely done in clinical practice. As a surrogate for the optimal measurement a 24 hour urine collection is done to approximately measure the kidney function. Most of the common tests that are done to measure the kidney function measure the function of both the kidneys. To obtain the function of each kidney your physician uses a radiological test in special circumstances and is not commonly needed in systemic kidney disease.

Routinely your nephrologist measures to blood tests called serum creatinine and BUN that help the physician to determine the abnormalities in kidney function. These 2 tests or part of a panel called comprehensive metabolic panel (CMP), a renal function panel, basic metabolic panel (BMP). Your physician usually orders one of these panels to obtain the values for serum creatinine and BUN. Nowadays most of the laboratories report a calculated measure called eGFR (estimated glomerular filtration rate). This is a calculation of the renal function from the serum creatinine that is obtained from these panels.

Serum creatinine - a waste product of muscle activity

Blood urea nitrogen (BUN)-a waste product of protein breakdown