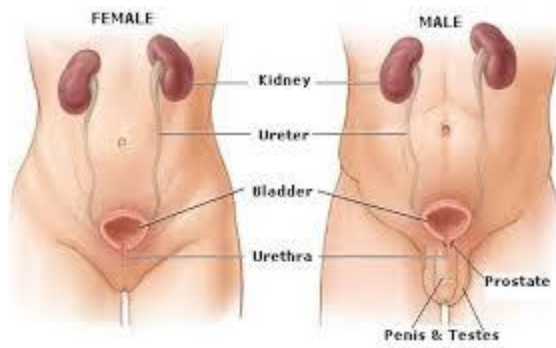


Kidney Problems – Renal Insufficiency

Kidney problems can develop after some types of cancer treatment. Sometimes kidney problems happen as a late effect of treatments for cancer during childhood.

How the kidneys work



The kidneys are part of the urinary system. They filter waste products from your blood, control blood pressure, and stimulate the production of red blood cells.

Blood is filtered in tiny units inside the kidneys (nephrons). Each kidney has about 1 million nephrons. After the blood is filtered, the extra water and the waste products leave the body as urine. (Urine travels from kidneys to bladder through ureters and from the bladder, urine exits the body through the urethra.)

Kidney Function

Kidney function is measured in percentages. When both kidneys are working normally, it is referred to as 100% kidney function. One kidney working normally is about 50%. A person can lead a normal life with one healthy kidney. If kidney function drops below 50%, there is a risk of health problems.

Treatments for cancer, including some types of chemotherapy, radiation therapy, and cell therapy/transplant, can cause kidney problems.

- If a drug is harmful to the kidneys, it is called nephrotoxic. Cisplatin, carboplatin, and methotrexate are three chemotherapy drugs that can harm the kidneys.
- Radiation therapy to areas close to the kidneys or total body irradiation (TBI) can cause damage.
- TCT: If you are being prepared for a cellular therapy or transplant, you will likely receive high doses of chemo and possibly total body irradiation, and both can harm the kidneys. Certain medications used after the transplant can also harm the kidneys.
- Other factors that may increase your risk of kidney problems include vascular (blood vessel) disease, which causes low blood flow to kidneys; kidney or bladder surgery; certain antibiotics and antifungal drugs; diabetes, high blood pressure; frequent urinary tract infections (UTIs); and cancer in both kidneys.

Kidney problems after cancer

- Renal insufficiency, which means the kidneys aren't working as well as they should
- High blood pressure
- Chronic kidney disease
- Kidney failure

Symptoms

Kidney damage can be mild to severe and may become permanent. Severe damage can lead to kidney failure. Tell your doctor right away if you have symptoms that are getting worse or that don't go away.

Signs and symptoms that may mean the kidney is damaged or not working normally include:

- swelling of the hands, ankles, feet or other areas of the body
- high blood pressure
- urinating (peeing) more or less often or change in amount of urine when you pee
- anemia, fatigue
- rapid heart rate and/or rapid breathing
- metal-like taste in the mouth or bad breath
- itchy skin
- nausea or vomiting
- headache

What you can do

If you have damaged kidney function from your cancer treatment, take precautions to protect your kidneys. Taking the following steps may help to prevent kidney problems:

- Drink 2-3 liters every day, water is best. Watch for symptoms of dehydration: Dry mouth, very thirsty, dark urine, less frequent urination (and sweating), dry skin, feeling tired, dizziness. Avoid alcohol and caffeine as they can contribute to dehydration.
- You can lose electrolytes (sodium, potassium, calcium, chloride) if you are urinating often or in large amounts. You can replace lost electrolytes by drinking coconut, bottled water with added electrolytes, or sports drinks (avoid those high in sugar). You can get some electrolytes from citrus fruits, spinach dairy, and bananas. Talk with a registered dietitian for more suggestions.
- If you have high blood pressure (hypertension), follow your doctor's instructions and take medication(s) as directed.
- Talk to your doctor or pharmacist before taking any new medicines.
- If you have symptoms of a urinary tract infection (UTI), seek treatment right away. Symptoms may include pain or burning when you urinate (pee), feeling you need to urinate very frequently, urine that looks cloudy or has a bad smell, pain in your back or side below your ribs. Note, the elderly may be more susceptible to UTIs and if the infection comes on quickly and or causes an electrolyte imbalance, symptoms may include confusion, unusual behavior, agitation, hallucinations, and loss of coordination and dizziness that may cause falls.
- Talk to your doctor before taking part in contact sports.
- Keep your doctor and lab appointments so your doctor can monitor your kidney function.

For information about the stages of chronic kidney disease and what to do at each stage, visit the American Kidney Fund at:

<https://www.kidneyfund.org/kidney-disease/chronic-kidney-disease-ckd/stages-of-chronic-kidney-disease/>