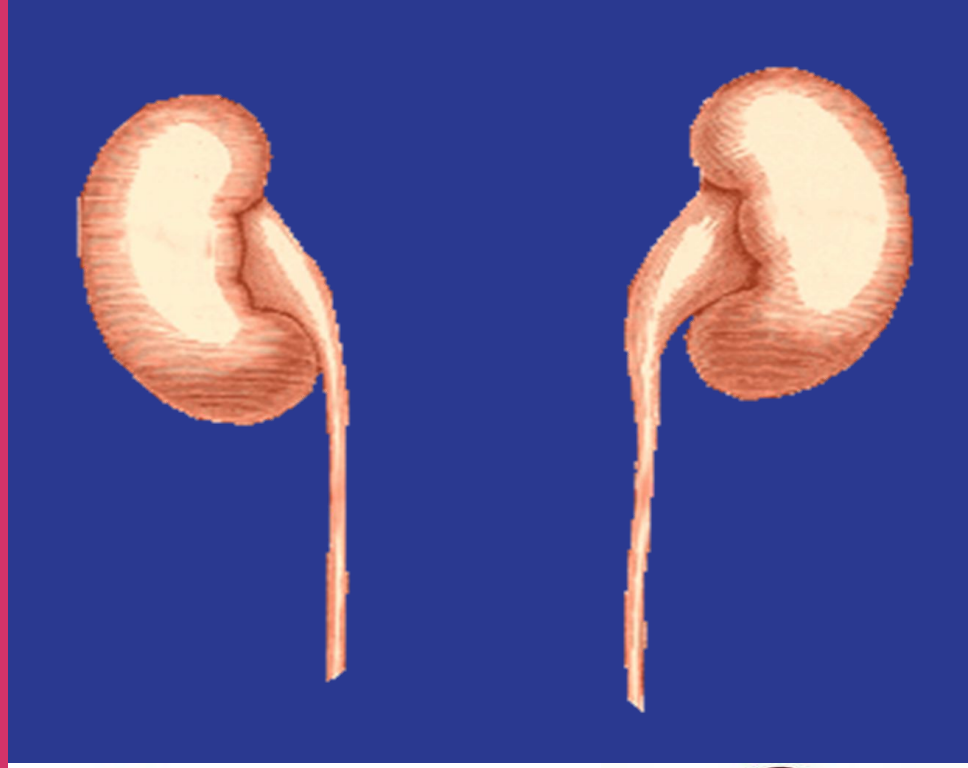
Become Someone's Kidney Keeper

Help Save a Life Through Kidney Transplantation!

Rahmere P., David R., Zaire L.
Fanta K., Markeira W.
Hurriyah E.
Zakira J.



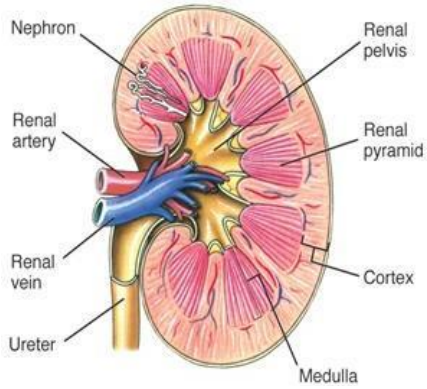
Structure & location

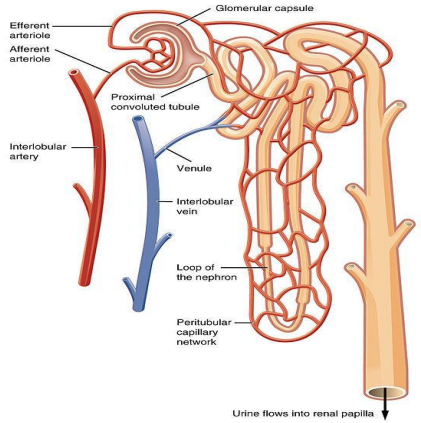
- The kidneys are each the size of a fist.
- The kidneys lies just below the diaphragm

  on either side towards the back of the abdomen)

Kidney Structure

- The kidneys are bean-shaped with the convex side of each organ located laterally and the concave side medial.
- The **renal hilus**, provides a space for the renal artery, renal vein, and ureter to enter the kidney.
- The **renal capsule** provides a stiff outer shell to maintain the shape of the soft inner tissues.
- Deep to the renal capsule is the soft, dense, vascular **renal cortex**.
- Seven cone-shaped renal pyramids form the **renal medulla** deep to the renal cortex.
- The **renal pyramids** are aligned with their bases facing outward toward the renal cortex and their apexes point inward toward the center of the kidney.
- The **nephron** is the basic structural and functional unit of the kidney. It regulates the concentration of





Kidney Functions

- **Waste excretion**: The kidneys filter out toxins, excess salts, and urea, a nitrogen-based waste created by cell metabolism.

- **Water level balancing**: As water intake decreases, the kidneys adjust accordingly and leave water in the body instead of helping excrete it.

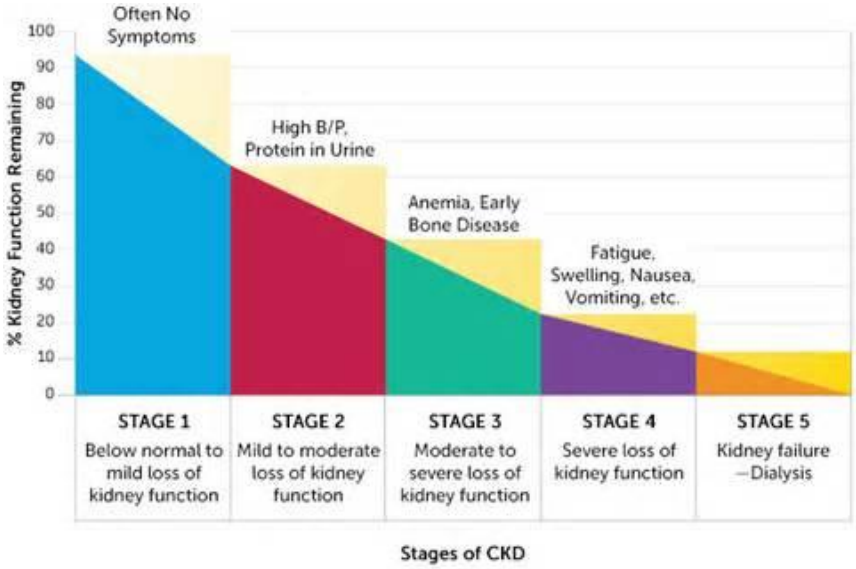
- **Blood pressure regulation**: When it drops too low, the kidneys increase the pressure. One way is by producing a blood vessel-constricting protein (angiotensin) that also signals the body to retain sodium and water. Both the constriction and retention help restore normal blood pressure.

- **Red blood cell regulation**: When the kidneys don't receive enough oxygen, they send out for erythropoietin, a hormone that stimulates the bone marrow to produce more oxygen-carrying red blood cells.

- **Acid regulation**: As cells metabolize, they produce acids. Foods we eat can either increase the acid in our body or neutralize it. If the body is to function properly, it needs to keep a healthy balance of these chemicals.

“Fall Guys” for End Stage Kidney Disease & Failures

A kidney transplant becomes dire in the end stages of kidney diseases and failures. Kidney disease occurs when the nephrons in the kidney become extremely damaged and lose their filtering abilities. Lost of these filters allows unwanted and dangerously high levels of chemicals and waste to travel the body. The end stage of kidney disease transpire when 90% of the filtering abilities are lost.



Many factors can contribute to end stage kidney disease.

- **Diabetes:** high blood sugar can damage filters & can lead to kidney failure. This is called diabetic nephropathy.
- **Hypertension/ High blood pressure:** high blood pressure in the blood vessels damages and prevents proper filtering processing
- **Renal Artery Stenosis:** arteries responsible for bringing blood to the kidneys can be blocked over time. This causes end stage renal disease.
- **Systemic Lupus Erythematosus:** Occurs when the immune system rejects and attacks the kidney as a response to failure of recognition

Chronic Kidney Disease

Chronic kidney disease is when there is a gradual loss of kidney function over time.

The two main causes of chronic kidney disease are diabetes and high blood pressure.

About 26 million American adults have chronic kidney disease.

Some symptoms can be poor appetite, having to urinate more often, muscle cramping at night, and swollen feet and ankles.

Stages of CKD

Stage	Description	GFR, mL/min per 1.73m²	Action
1	Kidney damage with normal or high GFR	>90	Diagnosis and treatment, slowing progression, CVD risk reduction
2	Kidney damage with mild decrease in GFR	60-89	Estimating progression
3	Moderate decrease GFR	30-59	Evaluating and treating complications
4	Severe decrease in GFR	15-29	Preparation for kidney replacement therapy
5	Kidney failure	<15 or dialysis	Kidney replacement (if uremia present)

The patients GFR is 2.9 thus, belongs to stage 5

Polycystic kidney disease (PKD)

PKD is a genetic disease, which causes cysts inside the kidneys.

Cysts are sacs of fluid make the kidneys to be larger than they should be damaging the functional tissues.

Focal Segmental Glomerulosclerosis

One of the most major kidney diseases.

It is a disease that is contracted from scarred or damaged tissue of the glomerulus.

Only occurs in sections of the glomerulus.

Numerous people don’t experience symptoms of the disease until adulthood.

Patients experience abdominal pain, blood while urinating, and brain aneurysms.

End-stage renal disease leads to transplant.

What is Organ Donation?

Organ donation is the process of giving an organ or a part of an organ for the purpose of transplantation into another person.

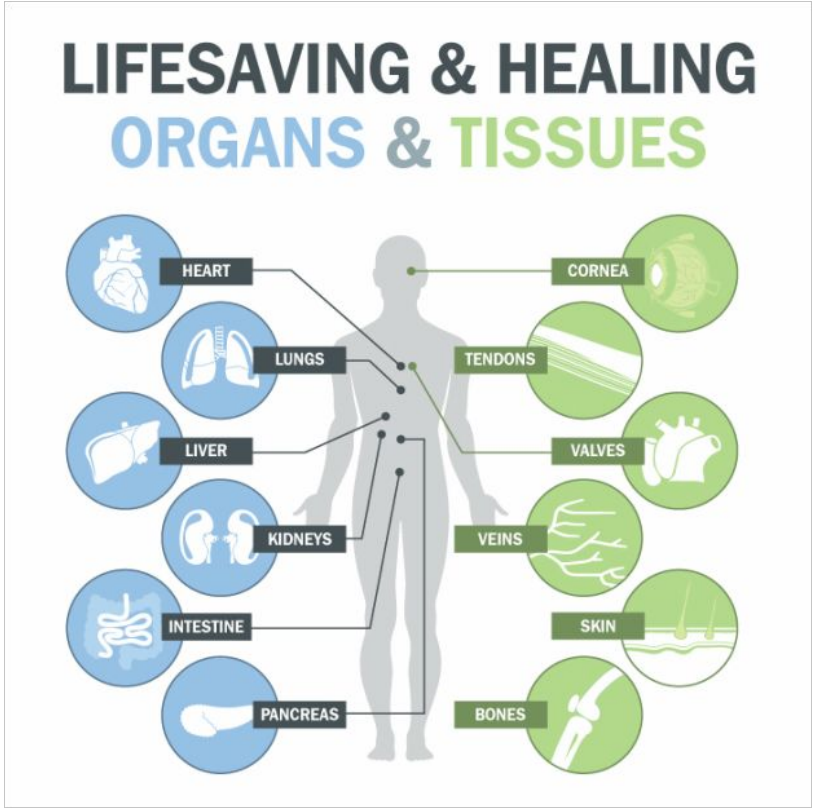
Organs from one donor can save or help as many as 50 people.

Organs you can donate include:

- Internal organs: kidneys, heart, liver, pancreas, intestines, lungs
- Tissues: skin, cartilage, corneas, fascia, heart valves, ligaments, pericardium, tendons, veins

Organ donation can occur with:

- a deceased donor, who can give kidneys, pancreas, liver, lungs, heart, intestinal organs
- a living donor, who can give a kidney, or a portion of the liver, lung, intestine, or pancreas



What is kidney transplant?

A kidney transplant is an operation in which a person with kidney failure receives a new kidney. The new kidney takes over the work of cleaning the blood.

History

1902 - The first successful experimental kidney transplants were performed at the Vienna Medical School in Austria with animals.

1909 - The first kidney transplant experiments were performed in humans in France using animal kidneys.

1933 - The first human-to-human kidney transplant was performed.

1954 - Joseph E. Murray and his colleagues at Peter Bent Brigham Hospital in Boston performed the first truly successful kidney transplant from one twin to another. This was done without any immunosuppressive medication.

Procedure of the Transplantation

Before:

1. Individual first needs to be evaluated and approved for a kidney transplant.
    - Blood tests and imaging studies are required to determine approval.
        - These tests determine the compatibility between an individual and future potential donors.
2. Individual will be placed on a waiting list if a living potential donor is not found.
    - The average wait for a kidney transplant is 2 years; although one could wait 1-6 years.
    - During this wait, it is vital that the patient maintains a healthy and clean diet.

*However, because of complications, patients with : widespread cancer, active infection, liver/heart disease, aids- are incapable of successful kidney transplant.

Procedure of the Transplantation (cont.)

During:

Just like any other surgical procedure, the patient well be under general and special incision pain-blocking anesthetics.

1. An incision will be made in the lower abdomen and the transplant kidney will be placed near the bladder.
2. Blood supply is restored connecting blood vessels to the new kidney.
3. A tube that connects the bladder and kidney is attached.
4. Old kidneys are never removed.

Actual footage of kidney transplant : https://www.youtube.com/watch?v=xJsNvWfmfgY

Conclusion

Overall, kidney transplant is a very important and difficult procedure. However, the number of needed kidney transplants outnumbers the amount of organ donors needed to perform the transplant. This is why we need your help. Now, it's up to you to become a kidney keeper and to save the lives of many!!