

The urinary system plays a vital part in maintaining homeostasis of water and electrolyte concentrations within the body. The kidneys produce urine that contains metabolic waste products, including the nitrogenous compounds urea and uric acid, excess ions and some drugs.

The main functions of the kidneys are:
formation and secretion of urine, which regulates total body water, electrolyte and acid–base balance and enables excretion of waste products


Kidney

Location - 12th Thoracic & 1st to 3rd Lumbar vertebrae

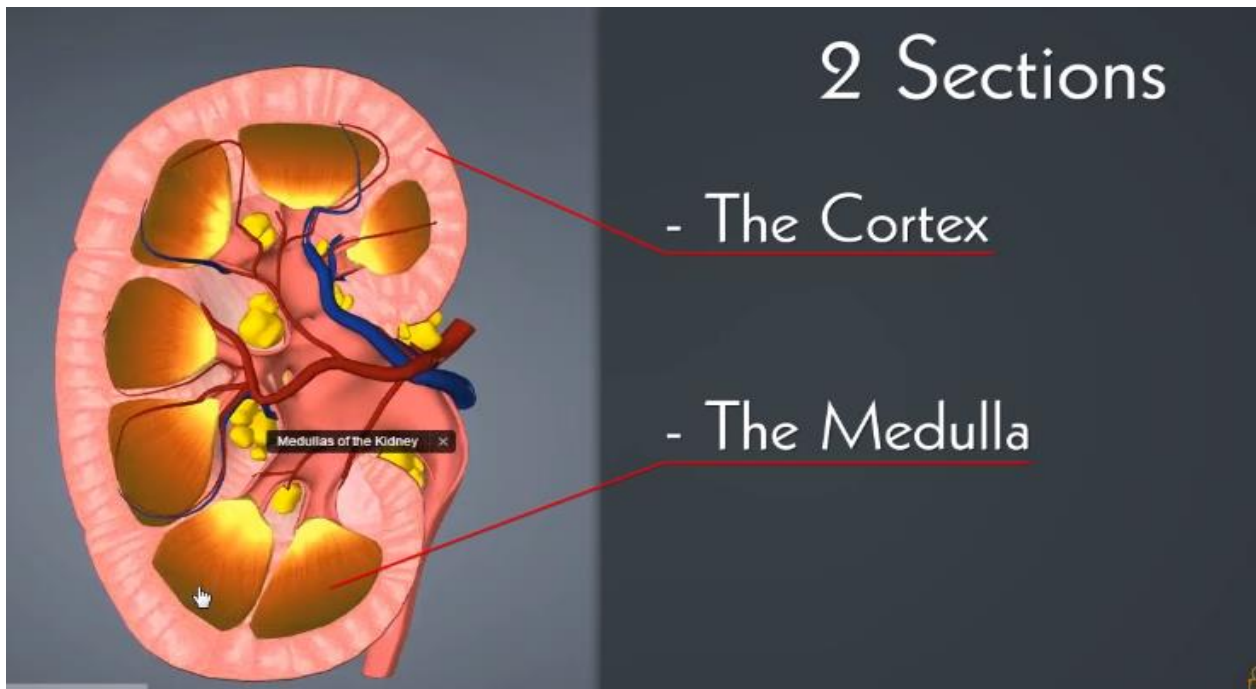
Right Kidney is slightly lower than the left

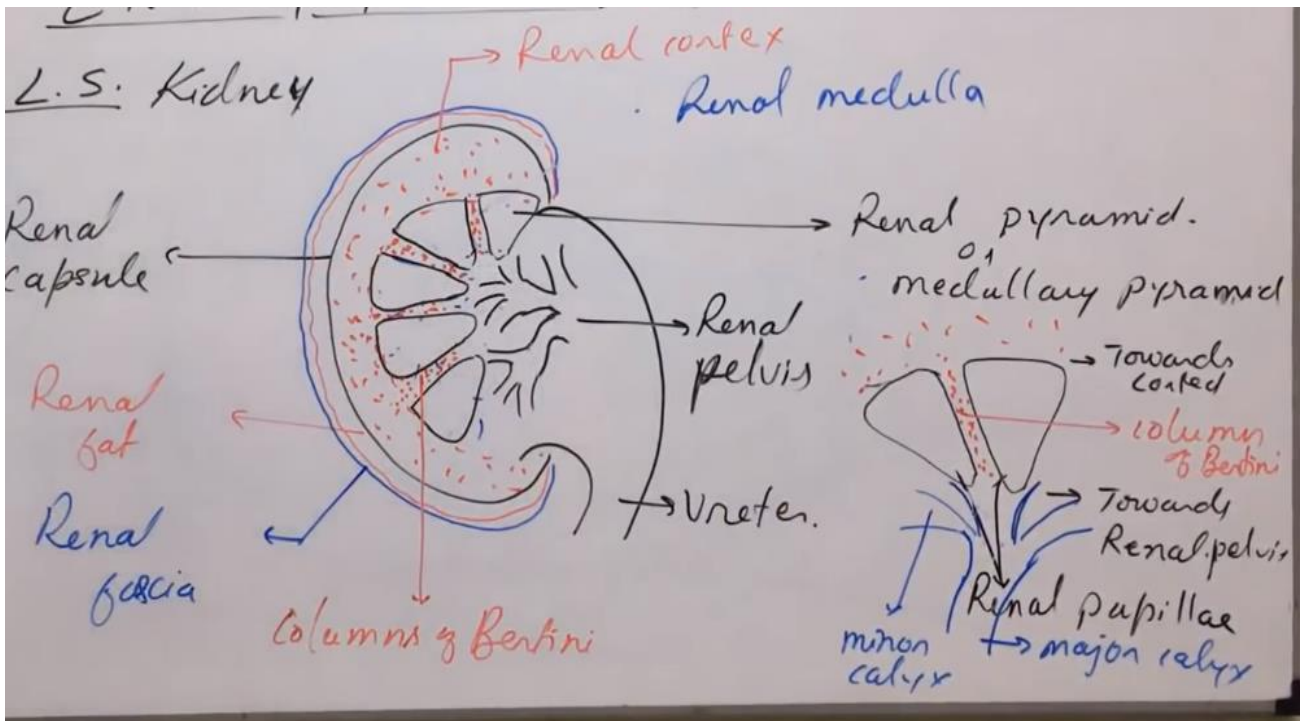
* Right Kidney is pushed by Liver.

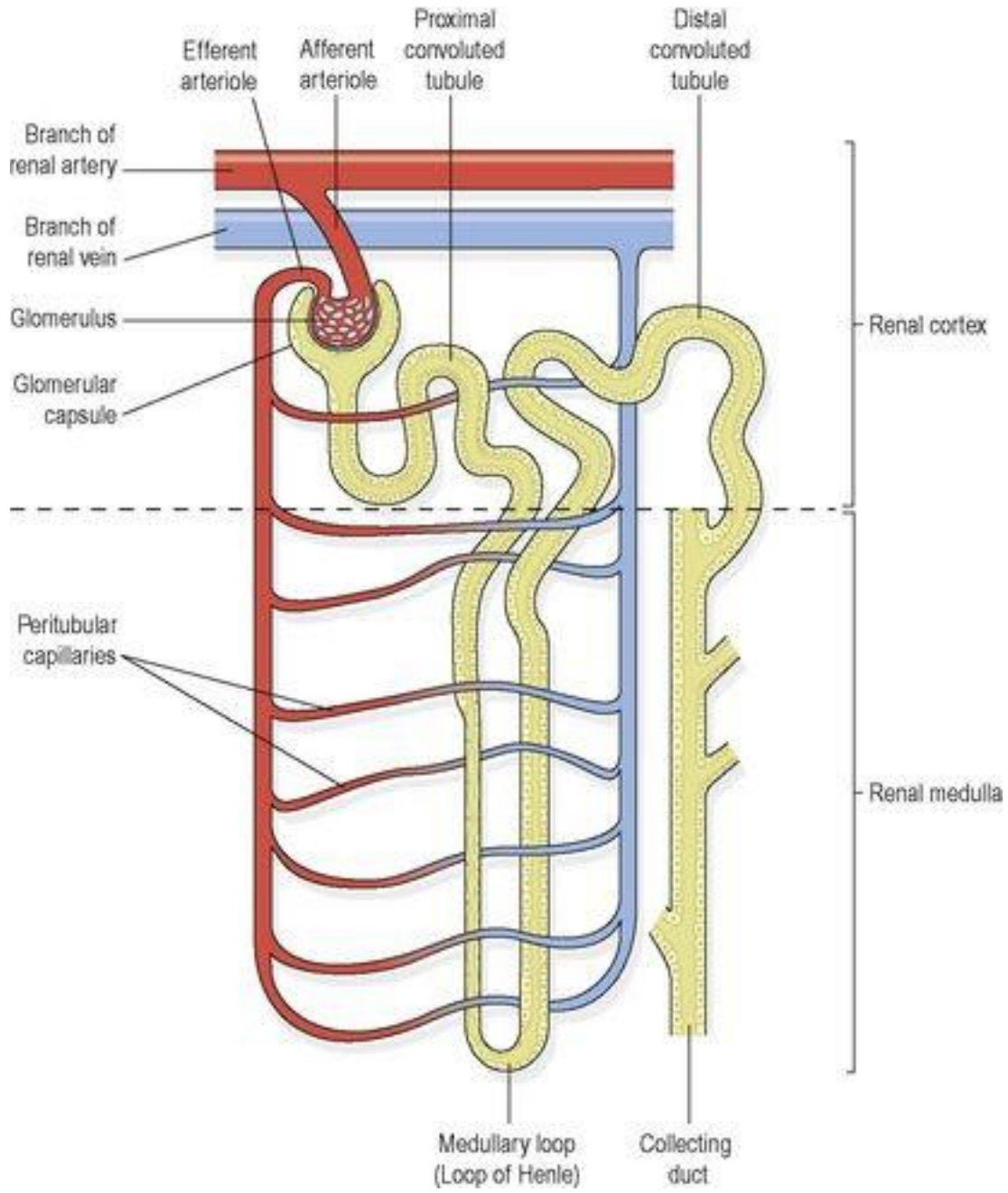
Size - 5 inches long.

Shape = Bean shape. 

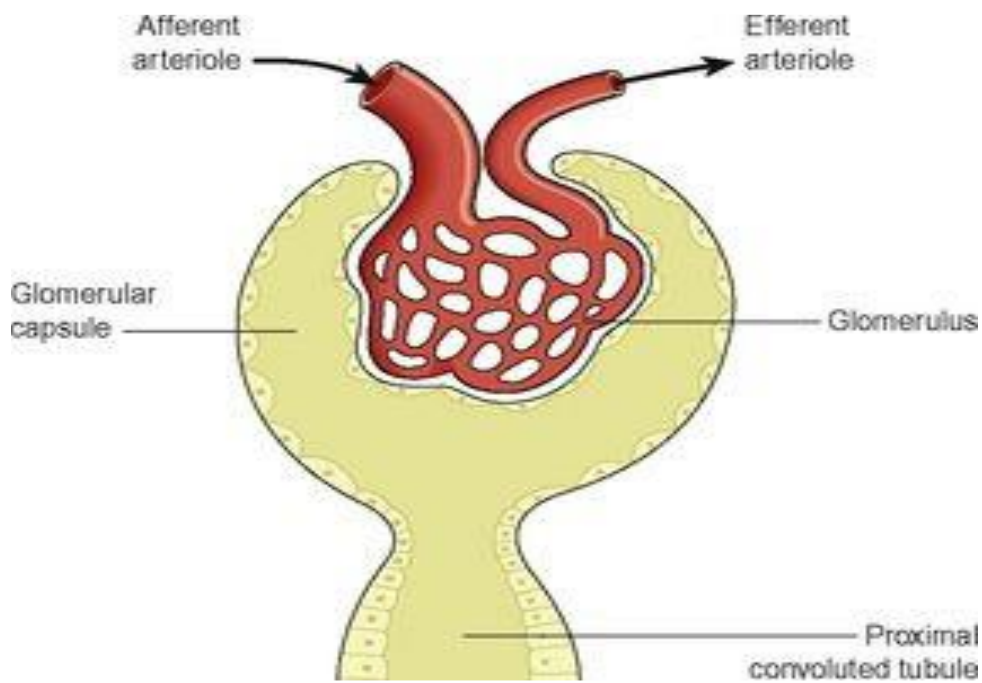
Wt = 120 gm - 170 gm → ♂
120 " - 140 " → ♀





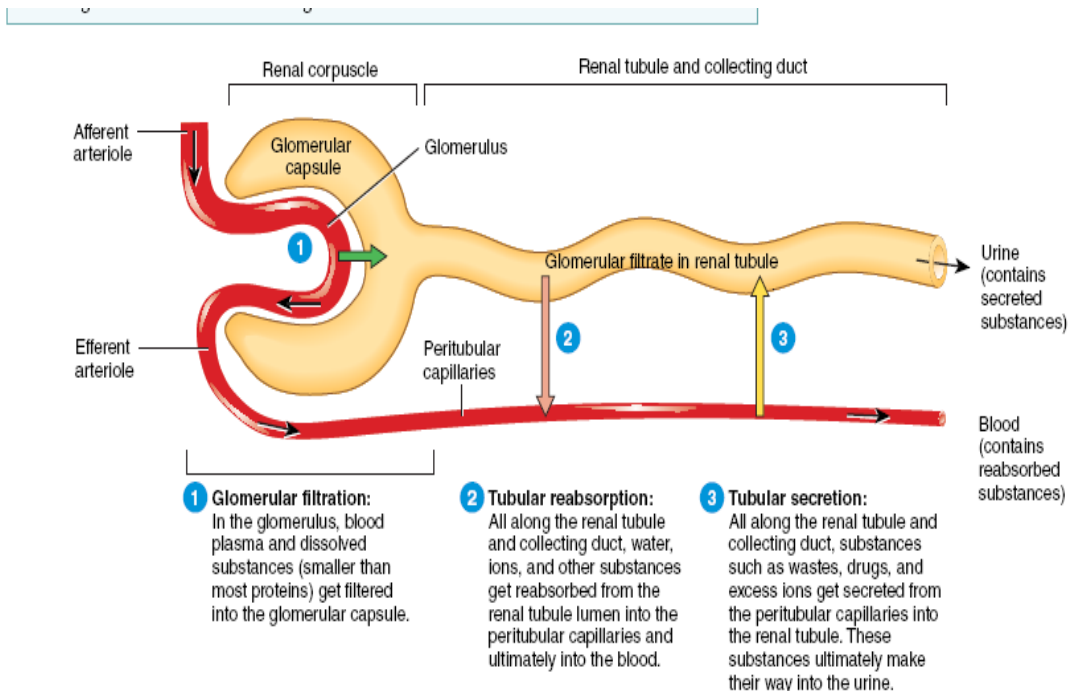


A nephron and associated blood vessels.



The glomerulus and glomerular capsule.

Physiology of urine formation



To produce urine, nephrons and collecting ducts perform three basic processes—glomerular filtration, tubular reabsorption, and tubular secretion

Glomerular filtration. In the first step of urine production, water and most solutes in blood plasma move across the wall of glomerular capillaries, where they are filtered and move into the glomerular capsule and then into the renal tubule.



Tubular reabsorption. As filtered fluid flows through the renal tubules and through the collecting ducts, tubule cells reabsorb about 99% of the filtered water and many useful solutes. The water and solutes return to the blood as it flows through the peritubular capillaries and vasa recta.

term *reabsorption* refers to the return of substances to the bloodstream. The term *absorption*,

Tubular secretion. As filtered fluid flows through the renal tubules and collecting ducts, the renal tubule and duct cells secrete other materials, such as wastes, drugs, and excess ions, into

the fluid. Notice that tubular secretion *removes a substance from the blood*. Solutes and the fluid that drain into the minor and major calyces and renal pelvis constitute urine and are excreted.

RAAS

- RAAs- renin angiotensin-adosterone system
- Bp falls
- Liver secret angiotensinogen
- 
- angiotensin I
- 
- angiotensin II
- Act on adrenal gland--- Aldosterone
- Aldosterone ---Vasoconstriction, Na reabsorption, Increase in BP