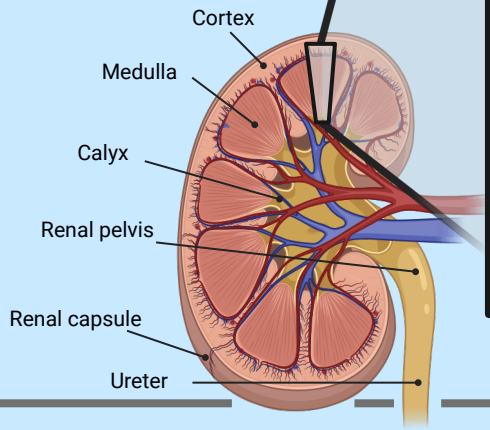
# Renal Anatomy

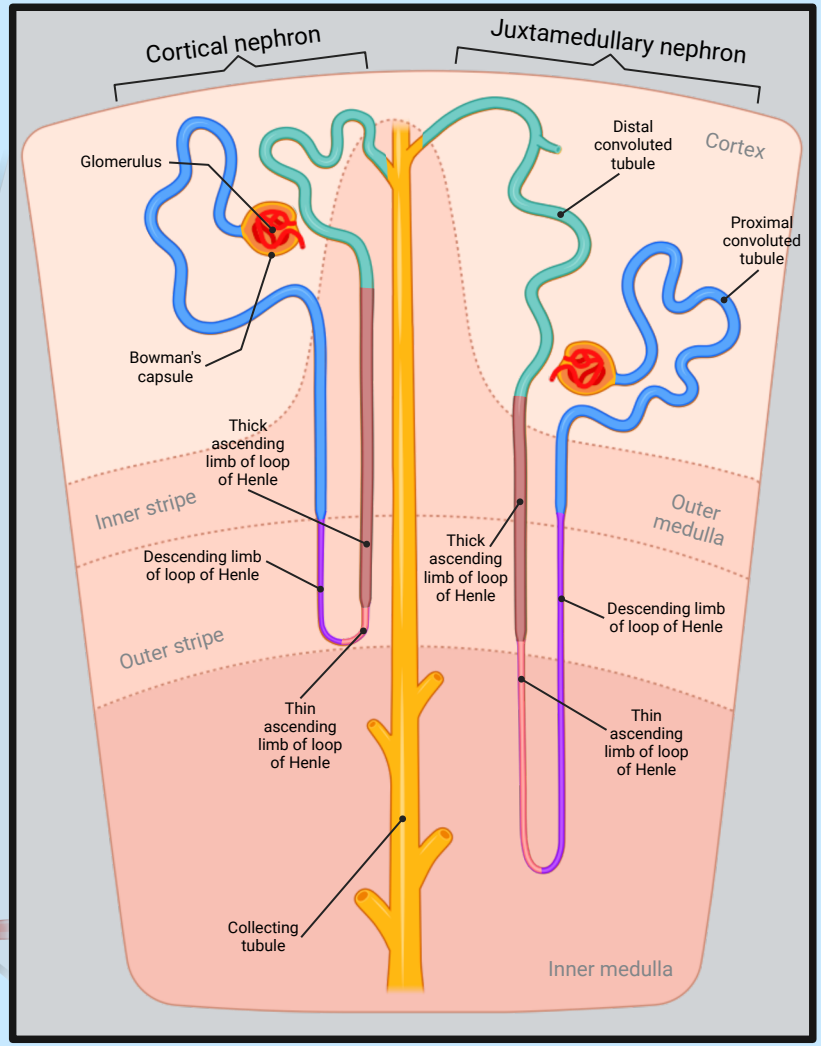
The functional unit of the kidney that is *responsible for filtration of water, electrolytes, toxins, and wastes as well as resorption back into the blood* is called a **nephron**

**Glomerulus-** Specialized bundle of capillaries found in Bowman's capsule. It is the **filtering unit of the kidney**. Movement of water across these capillaries is controlled by **Starling forces**.

**Proximal convoluted tubule** - begins at the renal pole of the Bowman's capsule to the beginning of the loop of Henle.The PCT is *responsible for the reabsorption of 50-60% of glomerular ultrafiltrate* (high volume reabsorption).The PCT's primary function is to *actively reabsorb nearly all organic nutrients (glucose, polypeptides amino acids and electrolytes such as **sodium**, all plasma proteins and vitamins)* The proximal tubule is the **only site for glucose reabsorption.**

**Descending limb of loop of Henle** -*High permeability to water* with a moderate urea permeability and *low permeability to ions such as sodium and chloride*. There is a strong osmotic gradient from the descending limb to the medulla causing a **dramatic increase in the concentration of urine.**




**Cortical nephron** - Found in the renal cortex and has a **short loop of Henle.**

**Juxtamedullary nephron** - Found in the medullar region and has a **long loop of Henle.** Have *larger intraglomerular volume* in comparison to superficial nephrons.

**Thin ascending limb of loop of Henle** - Impermeable to water. Reabsorption of some sodium ions occurs here likely through passive diffusion

**Thick ascending limb of the loop of Henle-** Plays a vital role in regulation of extracellular volume and urinary concentration. Maintains homeostasis for $Ca^{2+}$ and $Mg^{2+}$ as well as $HCO_3$ and ammonium. Urinary protein composition is also regulated here.

**Distal convoluted tubule** - Immediately downstream from the **macula densa**. Important in *sodium, potassium and pH homeostasis*.The DCT play a key role in regulation of extracellular fluid volume.DTC is the **target area of thiazide diuretics**.

**Collecting tubule** - The most proximal part of the renal collecting duct system.The CT's 2 main functions are *reabsorption of water in response to **vasopressin** and reabsorption of sodium in response to **aldosterone**.*

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