

EXCRETORY PRODUCTS AND THEIR ELIMINATION

Ammonia is the most toxic and uric acid is the least toxic. The process of removing ammonia is called ammonotelism and organisms that excrete ammonia are called ammonotelic (hiny fishes, aquatic amphibians and insects),

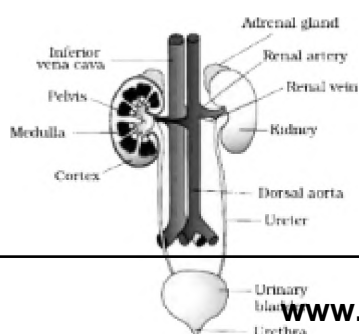
• The organism that release urea as nitrogenous wastes are called ureotelic (terrestrial amphibians). The organism that excretes uric acids are called ureotelic (reptiles, birds and land snails),

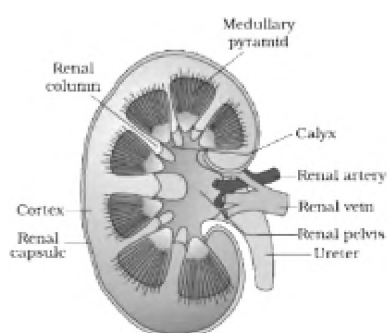
Animals	Excretory organs
Flat worms, some annelids and cephalopods	Protonephridia or flame Cells
Earthworms and annelids	Nephridia
Insects including cockroaches	Malpighian tubules
Mammals	Kidney

Human. Excretory system

The human excretory system consists

- i. A pair of kidneys
- ii. A pair of ureters
- iii. A urinary bladder
- iv. A urethra





- The functional unit of kidney is nephron. Each kidney contains about one million nephrons.
- Each nephron has two parts: the glomerulus and renal tubules.
- > The malpighian tubules, PCT and DCT of nephron are situated in cortical region where 35% of H₂O enters into medulla.

Urine formation

1st step	- Glomerular filtration. * Filtration of blood by glomerules.
2nd step	• Reabsorption by renal tubules.
	• Secretion * Tubular cells secrete H ₂ O, NH ₄ ⁺ into filtrate.

- * The amount of filtrate formed by kidneys per minute is called glomerular filtration rate (GFR) which is 125 ml/minute.
- * GFR is controlled by carried out by Juxtaglomerular apparatus.
- 99% of filtrate has been reabsorbed by renal tubules called reabsorption.

Function of Tubules

- Proximal Convoluted Tubules (PCT)** - all the important nutrients 70-80% electrolytes and water are reabsorbed.
 - Henle's Loop** - maintains high osmolarity of medulla in a U-shaped loop.
 - Distal Convoluted Tubules (DCT)** - conditional reabsorption of Na⁺ and water. Maintain pH and sodium-potassium balance.
 - Collecting Duct** - large amount of water is reabsorbed to produce concentrated urine.
- > The transport of substance facilitated by special arrangement of Henle's loop and vasa recta is called counter current mechanism.

Disorders of Excretory System

- **Uremia** - there is high concentration of non-protein nitrogen (urea, uric acid, creatinine). Urea can be removed by hemodialysis.
- **Renal failure** - also known as kidney failure which glomerular filtration is ceased and both kidney stops working.
- **Kidney transplant** is the ultimate method in correction of acute kidney failure.
- **Renal Calculi** - formation of stone insoluble mass of crystallized salts deposited within the kidney.
- **Glomerulonephritis** - inflammation of glomeruli of kidney due to entry of protein or red blood cells into filtrate due to injury.