Diploma in Pharmacy 1st Year
Human Anatomy & Physiology Practical

To study the given model of human urinary system.

Aim:

To study the given model of human urinary system.

Reference :

Dr. Gupta G.D , Dr. Sharma Shailesh , Dr. Sharma Rahul Kumar , "Practical Manual of Human Anatomy and Physiology" Published by Nirali Prakashan , Pg.No 139 - 142

Theory :

The main excretory system is the urinary system. It consists of:

1) 2 kidneys which secrete urine.
2) 2 ureters, which convey the urine from the kidney to bladder
3) The urinary bladder, which collects urine and stores it temporarily.
4) The urethra is the tube that connects the urinary bladder to outside.

Functions of the Kidney

1. Water and waste products of protein metabolism are excreted.
2. Urine production and secretion, which controls the total body water, electrolyte, and acid-base balance.
3. The hormone erythropoietin, which stimulates the development of red blood cells, is produced and secreted.
4. It produces and secretes renin, ie, an important enzyme in the control of 4 blood pressure.

Position of the Kidney

The kidneys are located below the peritoneum and below the diaphragm on the posterior abdominal wall, one on each side of the vertebral column.

They extend at the 12th thoracic vertebra and ends at the 3rd lumbar vertebra The right kidney is a bean-shaped organ that is 11cm long, 6cm wide, 3cm thick. and weighs 150gm. It is normally slightly lower than the left kidney.

Structure of Kidney

An outer fibrous capsule surrounds the kidney:

1) An outer cortex which is reddish- brown in colour
2) Inner medulla which contains pyramids of the kidney
3) An upper extended end of ureter caller pelvis.

The kidneys are made up of nephrons, which are structural and functional units.

1) Malpighian bodies made of Bowman's capsule and glomerulus.
2) Renal tubules.

Blood Supply of Kidney

Renal arteries, which are branches of the abdominal aorta, supply blood to the kidneys. Renal veins that flow into the inferior vena cava drain the Venus blood of the kidney.

Formation of Urine

1) **Glomerular Filtration:** In the glomeruli, water, salt, and other chemicals are filtered. The fluid generated following filtration is known as glomerular filtrate.
2) **Tubular Secretion:** It is an active process that takes place in convoluted tubules. This technique removes abnormal chemicals or normal substances that are present in excess in the blood.
3) **Tubular Reabsorption:** It is about 100ml per min. In one hour, around 6 litres of glomerular filtrate can be produced. However, because about 99 per cent of the glomerular filtrate is reabsorbed, the amount of urine discharged every day is only about 15 litres. Water is reabsorbed in the convoluted tubules and collecting tubules.
4) Ureter: It is a tube that transports urine from the kidney to the bladder. It's a tube-like construction with a length of roughly 26cm. It all starts with the kidney pelvis. It goes through the abdominal cavity and opens at the urine bladder's posterior sides.
5) **Urinary Bladder:** It acts as a urine reserve It is located behind the symphysis pubis in the pelvic cavity. There are three openings in the bladder: two for the ureter and one for the urethra
6) **Urethra:** It is a tube that connects the bladder to the outside
7) **Micturition:** It is the act of passing urine. When urine builds up in the bladder, the bladder's wall stretches. The pressure inside the bladder rises as a result of this This, in turn, stimulates the bladder's afferent nerve. Higher centres that control micturition receive the impulses.
8) **Composition of Urine:** Urine is pale amber in colour has an aromatic odour , and has a slightly acidic reaction (pH = 6) Specific gravity ranges between 1010 and 1025

   Urine consist of:
   Water-96%, Urea-2%, Uric acid and Salt-2%

Result: The given model of human urinary system was studied,