What is Kidney Anatomy?

Worksheet

Grossly, the kidney has an outer cortex, an inner medulla (renal pyramids), and a collecting system (calyces, renal pelvis) draining into the ureter. Microscopically, each kidney contains about a million nephrons - the functional units that filter blood through the glomerulus and process filtrate through a series of tubules.

Questions

1. What is the functional unit of the kidney?

A) The renal pelvis
B) The nephron
C) The renal capsule
D) The ureter

2. Where does blood filtration occur?

A) Renal vein
B) Loop of Henle
C) Glomerulus
D) Collecting duct

3. Which vessel carries blood into the glomerulus?

A) Efferent arteriole
B) Afferent arteriole
C) Renal vein
D) Interlobular vein

4. What is the correct order of urine drainage after the collecting duct?

A) Renal pelvis calyx ureter
B) Minor calyx major calyx renal pelvis ureter
C) Ureter calyx renal pelvis
D) Major calyx minor calyx ureter

5. A patient's kidney biopsy shows damage to the capillary tuft responsible for blood filtration. Which structure is affected, and what enters it first?

6. Explain why the renal medulla appears striped or pyramidal on cross-section, unlike the cortex.

7. Trace urine's path from the nephron to the ureter.

8. Define: What is the functional unit of the kidney?

9. Define: What are the two main gross regions of the kidney?

10. Define: Where does blood filtration occur?

Answer Key

1. B) The nephron - The nephron is the kidney's basic functional filtering unit.

2. C) Glomerulus - The glomerulus is the capillary tuft where plasma is filtered.

3. B) Afferent arteriole - The afferent arteriole delivers blood into the glomerulus.

4. B) Minor calyx major calyx renal pelvis ureter - Urine flows from minor to major calyces, then the renal pelvis, then the ureter.

5. The capillary tuft responsible for filtration is the glomerulus. Blood enters the glomerulus via the afferent arteriole before filtration occurs.

6. The medulla contains renal pyramids made of parallel loops of Henle and collecting ducts running toward the papilla. This parallel tubular arrangement creates the striped appearance, unlike the more uniform, granular cortex, which contains the glomeruli and convoluted tubules.

7. Filtrate leaves the nephron via the collecting duct. It drains into a minor calyx, then a major calyx, then the renal pelvis, and finally into the ureter.

8. The nephron - about 1 million per kidney.

9. The outer cortex and the inner medulla (renal pyramids).

10. In the glomerulus, within Bowman's capsule.