

الصيدلة	الكلية
العلوم المختبرية السريرية	القسم
Histology	المادة باللغة الانجليزية
علم الانسجة	المادة باللغة العربية
الاولى	المرحلة الدراسية
م.م علاء عماد عبدالرزاق	اسم التدريسي
Urinary System	عنوان المحاضرة باللغة الانجليزية
الجهاز البولي	عنوان المحاضرة باللغة العربية
العاشرة	رقم المحاضرة
Junqueira's Basic Histology: Text and Atlas	المصادر والمراجع

محتوى المحاضرة

URINARY SYSTEM

- ❖ The body takes nutrients from food and converts them to energy. After the body has taken the food components that it needs, waste products are left behind in the bowel and in the blood.
- ❖ The kidney and urinary systems help the body to eliminate liquid waste called urea, and to keep chemicals, such as potassium and sodium, and water in balance.
- ❖ Urea is produced when foods containing protein, such as meat, poultry, and certain vegetables, are broken down in the body. Urea is carried in the bloodstream to the kidneys, where it is removed along with water and other wastes in the form of urine.

- ❖ Other important functions of the kidneys include blood pressure regulation and the production of erythropoietin, which controls red blood cell production in the bone marrow.
- ❖ The kidneys, ureters, urinary bladder and urethra are the main components of the urinary system.
- ❖ A function of the urinary system that immediately comes to mind is the excretion of waste products from the body. This is only one of many functions of the system.

Others function are:

- elimination of foreign substances
- regulation of the amount of water in the body
- control of the concentration of most compounds in the extracellular fluid

Most of these tasks are performed in the kidneys. Functionally the processes can be divided into two steps, each of which have their anatomical correlate:

- filtration - glomeruli of the kidney
- selective resorption and excretion - tubular system of the kidney
- **Kidney**
- The kidney is composed of an **outer cortex** and **inner medulla**. Portions of the medulla extend into the cortex as the medullary rays, collections of straight renal tubules.
- The medulla contains multiple cone-shaped lobes, known as medullary pyramids. These urinary lobes are fused in the cortex

Nephron

The nephron is the structural and functional unit of the kidney. There are about two million nephrons in each kidney. Nephrons begin in the cortex; the

tubules dip down to the medulla, then return to the cortex before draining into the collecting duct.

The components of a single nephron include:

- renal corpuscle
- proximal convoluted tubule
- loop of Henle
- distal convoluted tubule

Different sections of nephrons are located in different parts of the kidney:

- The cortex contains the renal corpuscle, proximal, and distal convoluted tubules.
- The medulla and medullary rays contain the loops of Henle and collecting ducts.

Glomerulus •

The glomerulus is a capillary tuft that receives the blood supply from an afferent arteriole of the renal circulation. •

Promixal Convoluted Tubule

The proximal convoluted tubule is the first segment of renal tubule. It begins at the urinary pole of the glomerulus. This is where the majority (65%) of the glomerular filtrate is reabsorbed. The convoluted portion of the tubule leads into a straight segment that descends into the medulla within a medullary ray and becomes the loop of Henle.

Loop of Henle

The loop of Henle forms a hair-pin structure that dips down into the medulla. It contains four segments: the pars recta (the straight descending limb of proximal tubule), the thin descending limb, the thin ascending limb, and the thick ascending limb. The turn of the loop of Henle usually occurs in the thin segment within the medulla, and the tubule then ascends toward the cortex parallel to the descending limb. The end of the loop of Henle becomes the distal convoluted tubule near its original glomerulus.

Urinary Bladder

The ureter empties the urine into the bladder. The transitional epithelium continues over the surface of this organ. The thickened muscular layers become interwoven and cannot be clearly identified at this point.

Urethra

The urethra carries the urine away from the bladder to the outside of the body. In the male, it is joined by the genital system. The epithelium changes from transitional to stratified or pseudostratified columnar in the urethra, and to stratified squamous in the distal end of the urethra.

