**THE URINARY SYSTEM**

* is responsible for the removal of the waste from metabolism and toxins

 The urinary system consists of:

* *the kidneys (renes)*
* *ureters (ureter)*
* *the urinary bladder (vesica urenaria)*
* *the urethra (urethra)*



*https://image.shutterstock.com/image-vector/anatomy-human-urinary-system-main-600w-1102532042.jpg*

# *Structure of the urinary system*

**1. kidneys**

* the main organ of the system, located by the spine in its lumbar area
* paired bean-shaped organs, approx. 12x6x3 cm large
* protected by a layer of fat
* consist of **renal cortex** with **nephrons** and **renal medulla**

 **nephron structure: renal corpuscle** (glomerulus and Bowman’s capsule)

 **system of tubules** (proximal convoluted tubule, loop of Henle, distal convoluted tubule)

 **renal medulla:** consists of renal pyramids**,** whose apexes are surrounded by renal calyces collecting urine, which is then conveyed to the ureters and finally to the bladder

**2. ureters -** paired organs, approx. 30 cm long, leading to the bladder. Urine is conveyed by peristalsis (1 – 5 movements/min)

**3. urinary bladder –** a hollow muscular organ which stores urine and can hold about 500 ml

**4. urethra** – leads the urine from the bladder when pressure is increased in urination/**micturition.** It is shorter in females and has an independent opening, while in males it is longer and shares the opening with the reproductive system

***The Process of Urine Formation***

1. glomerular filtration – ultrafiltration of blood plasma, results in primary urine (150-170 l/24 hrs), whose composition is like blood plasma but without proteins

 2. tubular reabsorption – reabsorption of water and some other substances, resulting in producing urine (1,5-1,7 l/24 hrs)

3. tubular secretion – removal of metabolic waste and excess substances

# *Urologic Diseases*

**Uremia** - kidney failure and disruption of the internal environment.

**Dialysis** – in a dialysis machine - wasted is filtered from the blood, which then returns to the body

**‘Floating kidney’** – a kidney changes position which can lead to renal tract obstruction