

d. Function: As the blood passes through the kidneys, the waste products are extracted in two ways:

- (1) Mechanical filtration
- (2) Selective action of cells

The urine thus excreted is gathered by series of tubules and emptied into the duct (ureter) of the kidney and is carried to the bladder.

e. Mechanism of excretion: The excreting unit of the kidney is made up of a microscopic collecting tubule connected with a tuft of capillaries.

f. Significant structural features

- (1) Arrangement of capillaries to secure higher capillary pressure than elsewhere in the body.
- (2) Exceptional thinness of membrane.
- (3) Cells capable of secretory function.

g. Significant function features

- (1) Mechanical filtration.
- (2) Re-absorption and secretion in tubules.

h. Amount of excretion: The amount of urine varies considerably under normal circumstances. Average amount 3 pints (1200 - 1500 cc or 40-50 ounces). Amounts less than 500 cc (1 pt.) or more than 3000 cc (3 qts.) if persistent should be considered as a departure from normal.

i. Composition: Color - yellowish or amber
Reaction - acid
Sp. Gravity - 1015 - 1025
Water - 96-97%
Solids - 4-3% -- Urea, creatinin, uric acid, inorganic salts.

2. Lungs are an important excretory organ, heat regulatory apparatus, and an organ of nutrition.

a. Area: Inner surface total area 90 sq. meters or 100 times as large as the total area of the skin surface. This inner surface of the lungs is in direct contact with the air in the spaces (alveoli) of the lungs. The membranous walls contain the blood vessels that bring blood from the heart. The entire blood supply is spread out in the pulmonary capillaries every few minutes.

b. Lung capacity

- | | | |
|----------------------|---------|-----------------------------------|
| (1) Residual air | 1000 cc | after extreme expiratory effects. |
| (2) Tidal air | 500 cc | ordinary quiet inspiration. |
| (3) Complemental air | 1600 cc | deep inspiration. |
| (4) Supplemental air | 1600 cc | deep expiration |
| Total capacity | 4700 cc | |

Vital capacity = Tidal plus complemental plus supplemental air.