Lecture Note Objectives: Urinary System

Textbook: Chapter 15 Urinary System

Suggested: Read the textbook to help clarify (clear up) definitions and concepts (ideas) that are used in the Introduction Lecture Notes.

For ALL topics: Use and define all terminology.

1) Topic: Introduction
   - Distinguish between excretion and secretion.
   - List the different excretory organs and identify the types of substances each excretes.
   - List the general functions of the urinary system.
   - Explain endocrine function of the kidney.
   - List the different nitrogenous waste products excreted by the urinary system.
   - Explain where each of the different nitrogenous waste products are produced in the body.

2) Topic: Organs of the Urinary System
   - Describe the structure of each organ of the urinary system.
   - Explain how urine is moved through the ureter.
   - List, in order, the structures involved in urine production through the excretion of urine out of the body.

3) Topic: Urine Formation
   - Describe the structure of a nephron.
   - List the processes of urine formation, in order.
   - List, in order, the blood vessels that bring blood to the kidney and return the blood back to the inferior vena cava.
   - Explain the process/location of glomerular filtration.
   - Describe the composition of the filtrate.
   - Identify the substances which are not (normally) filtered out of the blood during glomerular filtration.
   - Explain the process/location of tubular reabsorption.
   - Identify the composition of the filtrate following tubular reabsorption.
   - Explain the process/location of tubular secretion.
   - Identify substances which are commonly transported during tubular secretion.
   - Explain the effect of caffeine and alcohol on urine formation.

4) Topic: Water-Salt Balance
   - Explain the effect of changing blood volume on blood pressure.
   - Identify the structures involved in water-salt balance.
   - Identify/explain the permeability of different nephron parts to water and/or salts.
   - Identify the organ that produces ADH.
   - Explain the effect of ADH on water-salt balance, specifically what molecule is affected and where it is moved to.
   - Identify the organ that produces aldosterone.
   - Explain the effect of aldosterone on water-salt balance, specifically what molecule is affected and where it is moved to.
   - Identify the source of Renin.
   - Explain why Renin is produced.
   - Explain the effect of renin on the adrenal cortex and how this affects water-salt balance.
   - Identify the organ that produces ANH.
Explain the effect of ANH on aldosterone and how this affects water-salt balance.
Identify the hormones that increase AND decrease blood volume.

5) Topic: **Acid-Base Balance**
- Explain how increasing carbon dioxide concentration in the blood affects the pH of the blood.
- As the lungs excrete CO₂, explain the effect on blood pH.
- Explain how the kidneys work to maintain blood pH. Identify specific substances that the kidneys will excrete in order to raise/lower blood pH.

6) Topic: **Kidney Stones**
- Describe the substances that form kidney stones.
- Explain how most kidney stones are removed from the body.