Objectives
To begin unit on excretory system.
I.D. elements of the gross anatomy.
- Kidney
- Bladder
- Sphincters
Introduce the nephron and its general function.
Learn some interesting facts about the excretory system.

Functions of the Excretory System
- The kidneys excrete nitrogenous wastes, such as urea, uric acid, creatinine and ammonium.
- The kidneys maintain blood volume by regulating water excretion.
- Monitor blood composition and blood pH by regulating electrolyte excretion.
- Kidneys secrete the enzyme renin, which helps maintain blood pressure.
- The kidneys secrete erythropoietin, which stimulates RBC production.
- Gluconeogenesis during prolonged fasting.

Amazing Facts
About 1100-1200 liters of blood pass through the capillaries in our kidneys every day.
The kidneys filter nearly 200 liters of fluid from the bloodstream every day!
Our kidneys extract about 180 L (45 gallons) of fluid/filtrate.
The kidneys refine the filtrate, and in a typical day we excrete only about 1.5 L of urine.
Blood and Nerve Supply
- Renal arteries deliver ~ \( \frac{1}{4} \) (1200 ml) of cardiac output to the kidneys each minute.
- Most of the blood directed towards cortex, where urine production occurs.
- Nerve supply is via sympathetic fibers from the renal plexus.

Function of the Nephron
The functional unit of the kidney.
Primary role is to filter the blood.
Produces concentrated urine.

More than 1 million nephrons are packed into each kidney!

Location of the Nephron
- Found in the renal cortex.
- Cortical nephrons account for 85% in human kidney.
- Portions of the nephron extend into the renal medulla.

Primary parts of Nephron
1. Glomerulus: a tuft of capillaries
2. Renal tubule: begins as cup-shaped glomerular (Bowman’s) capsule surrounding the glomerulus

Urinary Bladder
- Muscular sac for temporary storage of urine
- Retroperitoneal, on pelvic floor posterior to pubic symphysis
  - Males—prostate gland surrounds the neck inferiorly
  - Females—anterior to the vagina and uterus
Females—anterior to the vagina and uterus
Males—prostate gland surrounds the neck
Retroperitoneal, on pelvic floor posterior

Sphincters

I. Internal urethral sphincter
   - Involuntary (smooth muscle) at bladder-urethra junction
   - Contracts to open

II. External urethral sphincter
   - Voluntary (skeletal) muscle surrounding the urethra as it passes through the pelvic floor