

## Chapter 15

# Cardiovascular, Respiratory, and Digestive Systems

1. The Cardiovascular and Lymphatic Systems
2. The Respiratory System
3. The Digestive System
4. The Excretory System

#OnedayIwokeup #Doppitup

## Lesson 1 — The Cardiovascular and Lymphatic Systems

Your heart is a fist-sized muscle with four chambers pumping blood through a network that, if laid end to end, would circle the Earth nearly two and a half times. Blood has four main components:

■ <b>Plasma</b>	~55% of blood volume; pale yellow liquid carrying nutrients, proteins, hormones, and salts
■ <b>Red blood cells</b>	~40% of blood; contain hemoglobin that carries oxygen and carbon dioxide
■ <b>White blood cells</b>	Immune defenders — engulf pathogens, produce antibodies, fight allergic reactions
■ <b>Platelets</b>	Tiny cell fragments that trigger blood clotting when a vessel is damaged

### Blood Pressure — Updated Guidelines

■ <b>Normal</b>	Below 120/80
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■ ■ Elevated	120–129/less than 80
■ Stage 1 Hypertension	130–139/80–89 (new lower threshold from 2017 AHA guidelines — was 140/90)
■ Stage 2 Hypertension	140/90 or higher

## Lesson 2 — The Respiratory System

Your respiratory system performs a vital two-way gas exchange — delivering oxygen to the blood and removing carbon dioxide. Air travels: Nose/mouth → Pharynx → Larynx → Trachea → Bronchi → Bronchioles → **Alveoli** (tiny air sacs where gas exchange happens).

Asthma affects about 1 in 13 Americans — approximately **28 million** (nearly double older estimates). COVID-19 vaccines represent a major new respiratory disease prevention tool since this textbook was written.

## Lesson 3 — The Digestive System

Food travels: Mouth (mastication + enzymes) → Esophagus (peristalsis) → Stomach (gastric juices + pepsin) → Small intestine (90% of absorption via villi) → Large intestine (water absorption) → Elimination.

Colorectal cancer is now the **#2 cause of cancer death** in the U.S. and has become the **leading cause in men under 50**. The American Cancer Society now recommends starting colorectal cancer screening at **age 45** (lowered from 50 in 2021).

## Lesson 4 — The Excretory System

Excretion removes metabolic wastes that would become toxic if allowed to build up. The kidneys contain over a million **nephrons** — microscopic filtering units. The liver is also a powerful detoxifier, processing drugs and alcohol. Drink at least 8 cups of water daily to keep kidneys flushing properly.

## Chapter Vocabulary

### Lesson 1

<b>Plasma</b>	The liquid portion of blood (~55%), carrying nutrients, proteins, hormones, and salts
<b>Hemoglobin</b>	The oxygen-carrying protein in red blood cells, containing iron
<b>Platelets</b>	Blood cell fragments that initiate clotting when a vessel is damaged
<b>Capillaries</b>	The smallest blood vessels; the site of gas and nutrient exchange between blood and cells
<b>Blood pressure</b>	The force blood exerts against artery walls as the heart pumps

### Lesson 2

<b>Diaphragm</b>	The dome-shaped muscle below the lungs that drives breathing
<b>Trachea</b>	The windpipe; carries air from the throat to the bronchi
<b>Asthma</b>	A chronic inflammatory condition in which airways narrow, causing difficulty breathing
<b>Emphysema</b>	A progressive, irreversible disease that destroys alveolar walls; almost always caused by smoking

### Lesson 3

<b>Mastication</b>	The mechanical process of chewing
<b>Peristalsis</b>	Rhythmic, involuntary muscle contractions that move food through the digestive tract
<b>Gastric juices</b>	Stomach secretions containing hydrochloric acid and pepsin that chemically digest food
<b>Appendicitis</b>	Inflammation of the appendix; requires emergency surgery

### Lesson 4

<b>Nephrons</b>	The microscopic filtering units of the kidney; each kidney has over a million
<b>Ureters</b>	Tubes connecting the kidneys to the bladder

<b>Cystitis</b>	Inflammation of the bladder, usually from bacterial infection
<b>Hemodialysis</b>	A medical procedure using a machine to filter waste from the blood when the kidneys fail