



## 10.3 Circulation

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### The Liver: Chemical Factory of the Body

- Serves many different purposes

#### 1) A Living Filter

- Cleanses blood of used proteins, excess calcium, toxic substances
- Remove bacteria from blood vessels coming from intestines

#### 2) A Storage Organ

- Helps control blood glucose levels (via insulin)
- Stores vitamins and minerals
- Reserve Blood

#### 3) A Chemical Factory

- Blood proteins
- Lipoproteins(fat transport), bile salts(fat digestion)
- Can convert amino acids into glucose
- Can convert carbohydrates into fats (when fat is needed)
- Lymph fluid

#### How to kill a Liver:

- Viral hepatitis
- Alcohol abuse
  - o Cirrhosis – build up of fatty and fibrous tissue in liver
    - Leads to liver failure

#### One amazing thing about the liver:Regenera tion

- If  $\frac{3}{4}$  of liver is removed, it can grow back to normal size!

## Blood Pressure and Pulse

- Medulla oblongata (brain stem) controls blood pressure

### Why blood pressure is important:

- 1) Force blood through your blood vessels
- 2) Fill heart with blood during diastole

### Changes in blood pressure:

Highest bp: arteries coming from heart

Lowest: bp: Veins returning

Standing: Higher pressure in your feet than in your head (gravity)

Activities:      Sleeping: Lower BP      Lifting weights: Higher BP

Typical Blood Pressure: 120/80

Normal systolic range: 115-140 mm Hg

Normal diastolic range: 65-90 mm Hg

### Hypertension – high blood pressure

- Harmful because makes heart work harder than normal
- Possible danger of artery rupturing

## Care of the Cardiovascular System

- Cardiovascular disease is the leading cause of death among Americans
- 1.5 million Americans have a heart attack each year (500,000 die)
- Arteries can harden: arteriosclerosis
- Buildup of deposits can also cause another form of arteriosclerosis: atherosclerosis.

### Proper care:

- 1) Diet – Less fat and more fruits, veggies, and whole grains
  - Obesity puts large stress on heart
  - Fats deposit over years in coronary arteries
- 2) Exercise
  - Develops new blood vessels to heart muscle
  - Makes heart stronger and more efficient
    - o Allows for more resting time while beating
- 3) Bad habits
  - Smoking and heaving drinking elevate blood pressure and atherosclerosis
- 4) Spiritual/Mental Care
  - Stress
  - Bitterness
  - Guilt

### Treatment

- 1) Diet: low salt and low fat
- 2) Drugs:
  - a. Anticoagulants – prevent clots (heart attack)
  - b. Beta blockers – keep heart from speeding up
  - c. Nitroglycerin – causes blood vessels to expand
  - d. Digitalis – corrects irregular rhythms and stimulate the heart
- 3) Heart Surgery
  - a. Repairing birth defects
  - b. Open clogged coronary arteries
  - c. Coronary artery bypass
  - d. Valve-replacement surgery
  - e. Transplants or artificial hearts also could be implanted