# Heart Failure

Chapter 26

Williams & Hopper

# Heart Failure

- Inability of ventricles to fill or pump enough blood to meet the body's oxygen and nutrient needs
- Results of HF
  - decreased tissue perfusion
  - fatigue
  - fluid volume overload
  - Reduced quality/length of life
- May develop acutely (cardiogenic shock/pulmonary edema) or chronic as a result of HTN or pulmonary dis.

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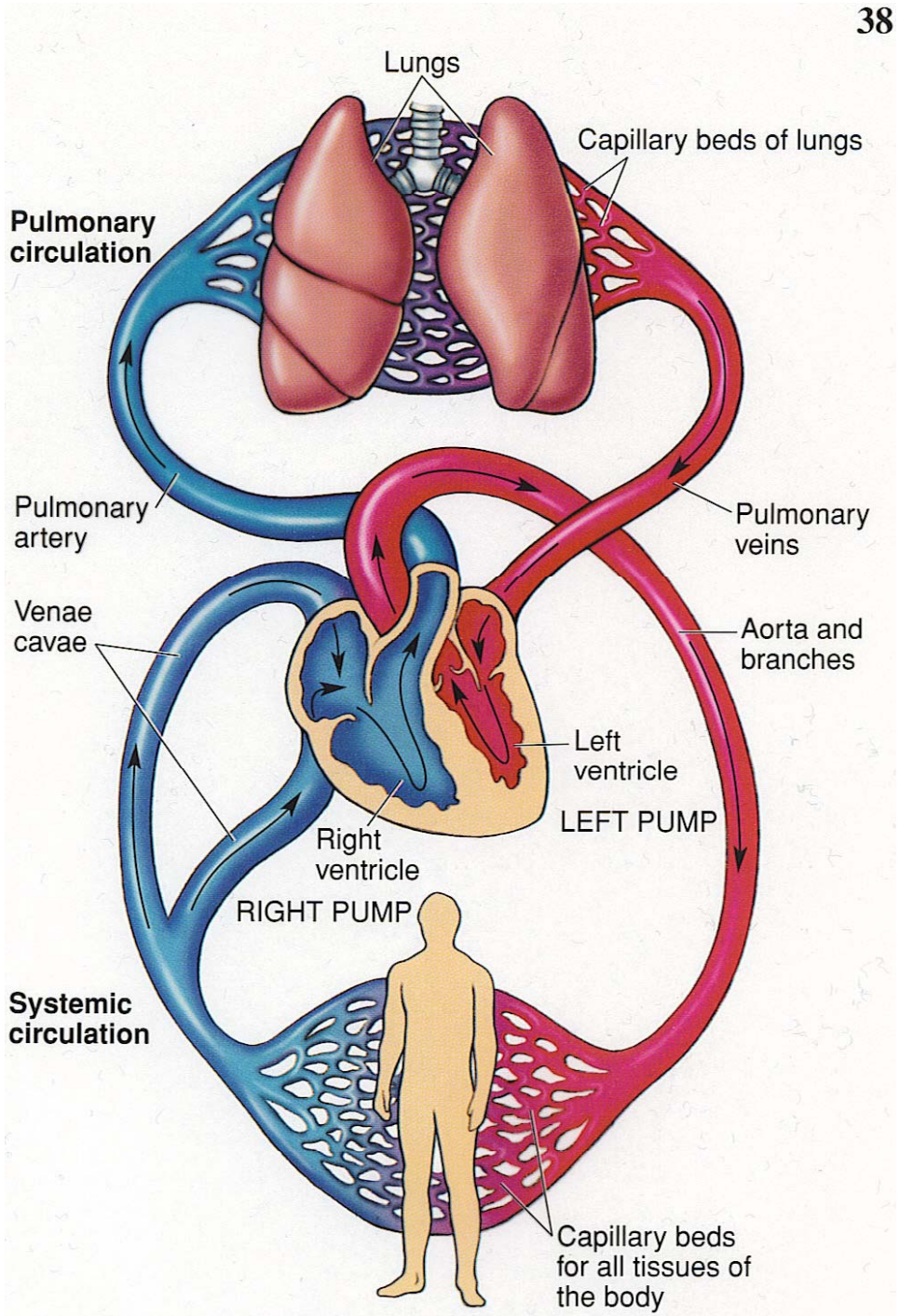
# Congestive Heart Failure

- Older term
- Heart failure preferred since volume overload or “congestion” either in lungs or periphery is not present in everyone with heart failure at all times



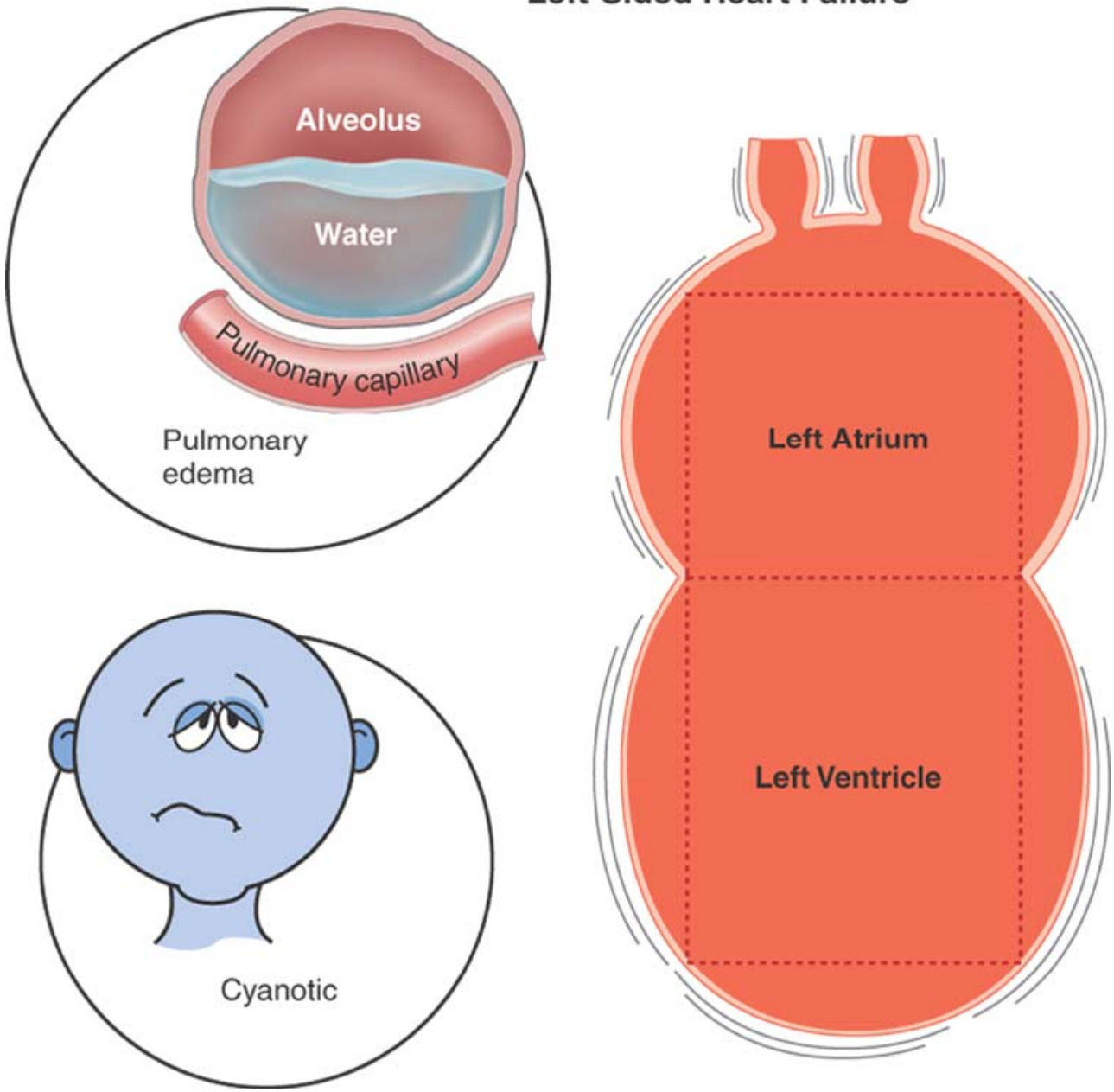
# Left Sided Heart Failure

- Impaired left ventricular functioning
- Terms:
  - Afterload – force that must be generated by the left ventricle to eject blood through the aortic valve
  - Peripheral vascular resistance (PVR) – pressure within the aorta and arteries

# Signs and symptoms

- Shortness of breath
- Cyanosis
- Pulmonary edema or fluid in lungs

# Left-Sided Heart Failure



# Right Sided Failure

- Impaired right ventricular functioning
- Major cause is left sided heart failure
  - Fluid in lungs and increased pulm pressure
  - Continued resistance the right ventricle pumps against
    - Right sided heart failure

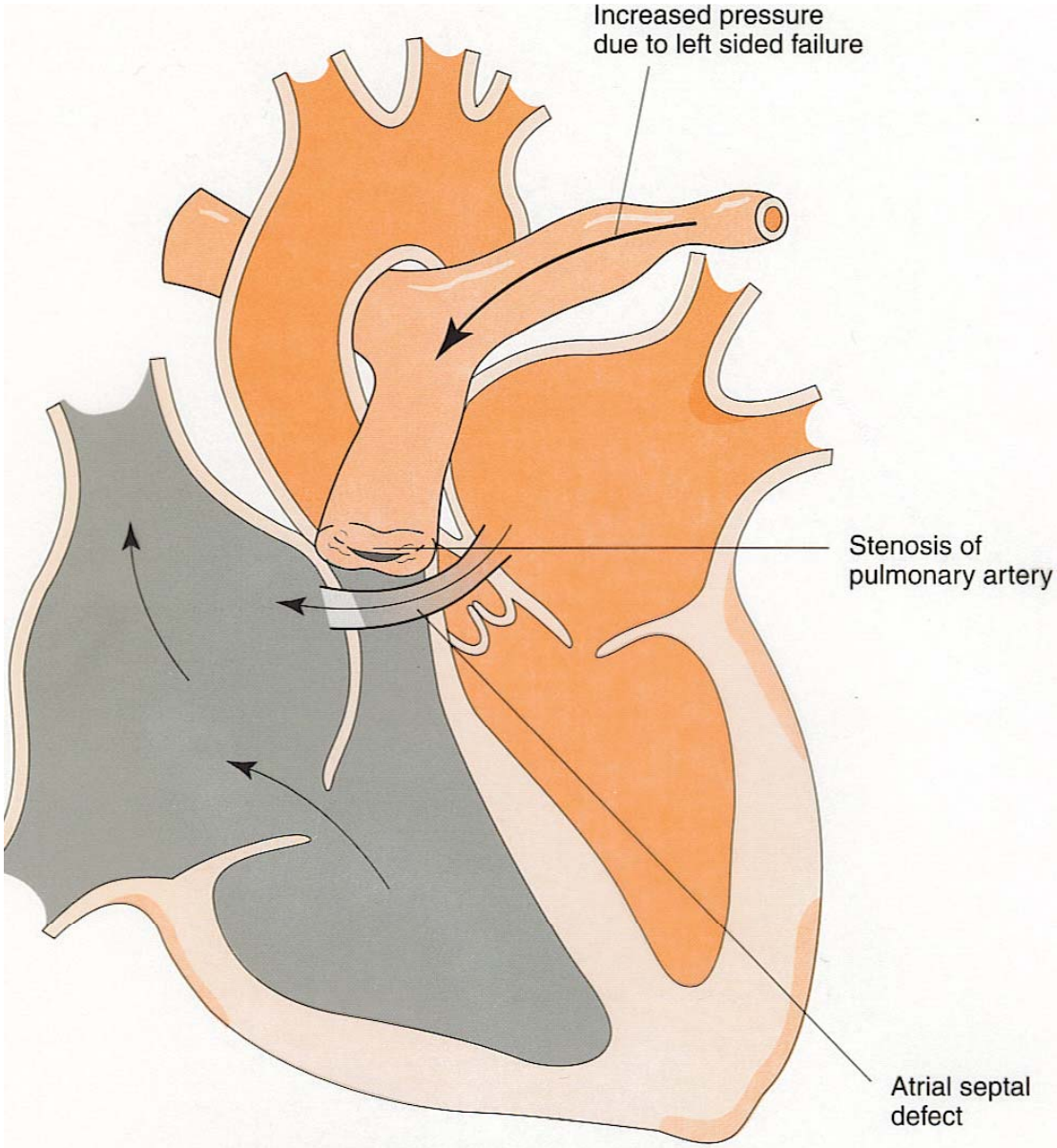
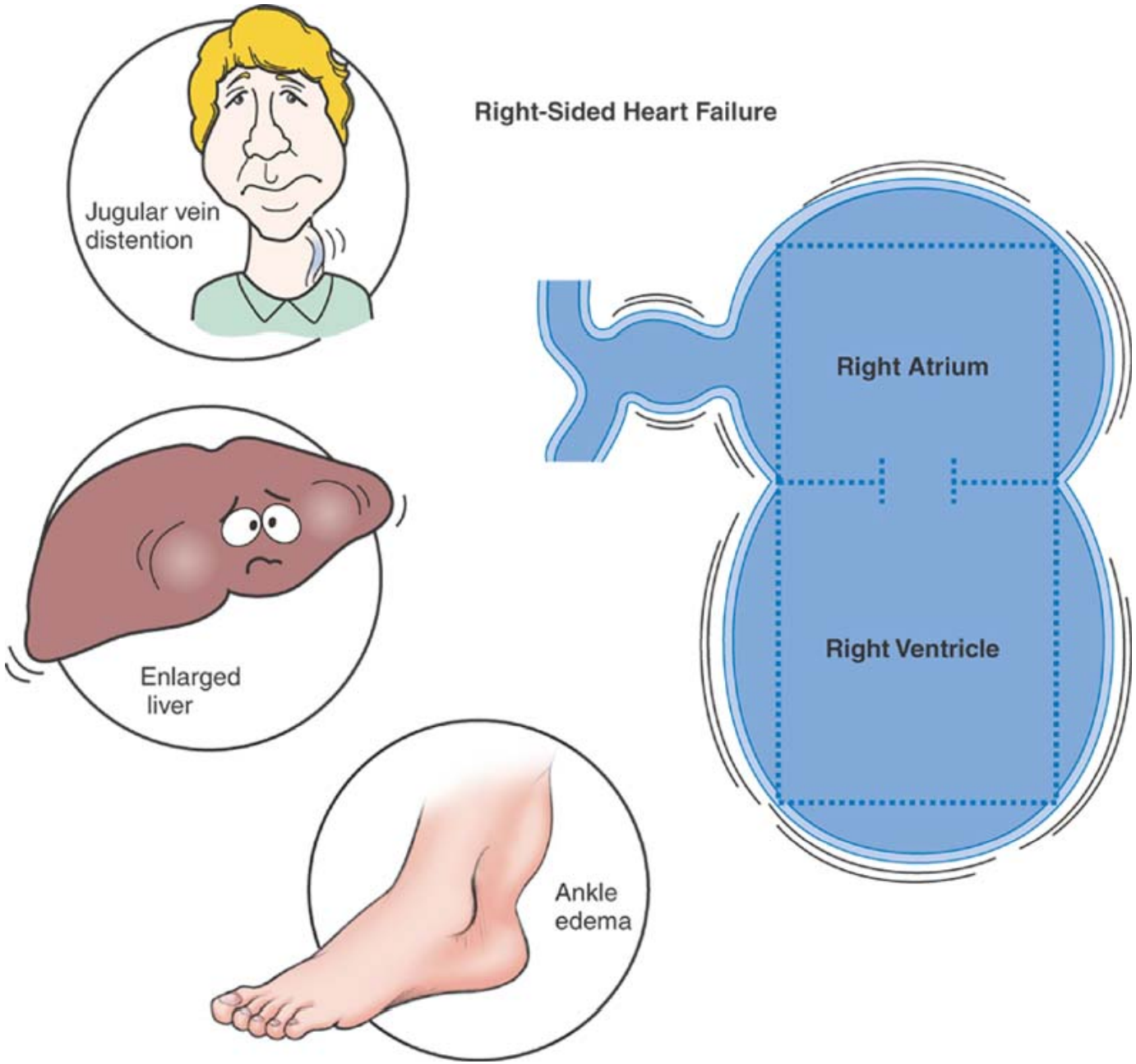
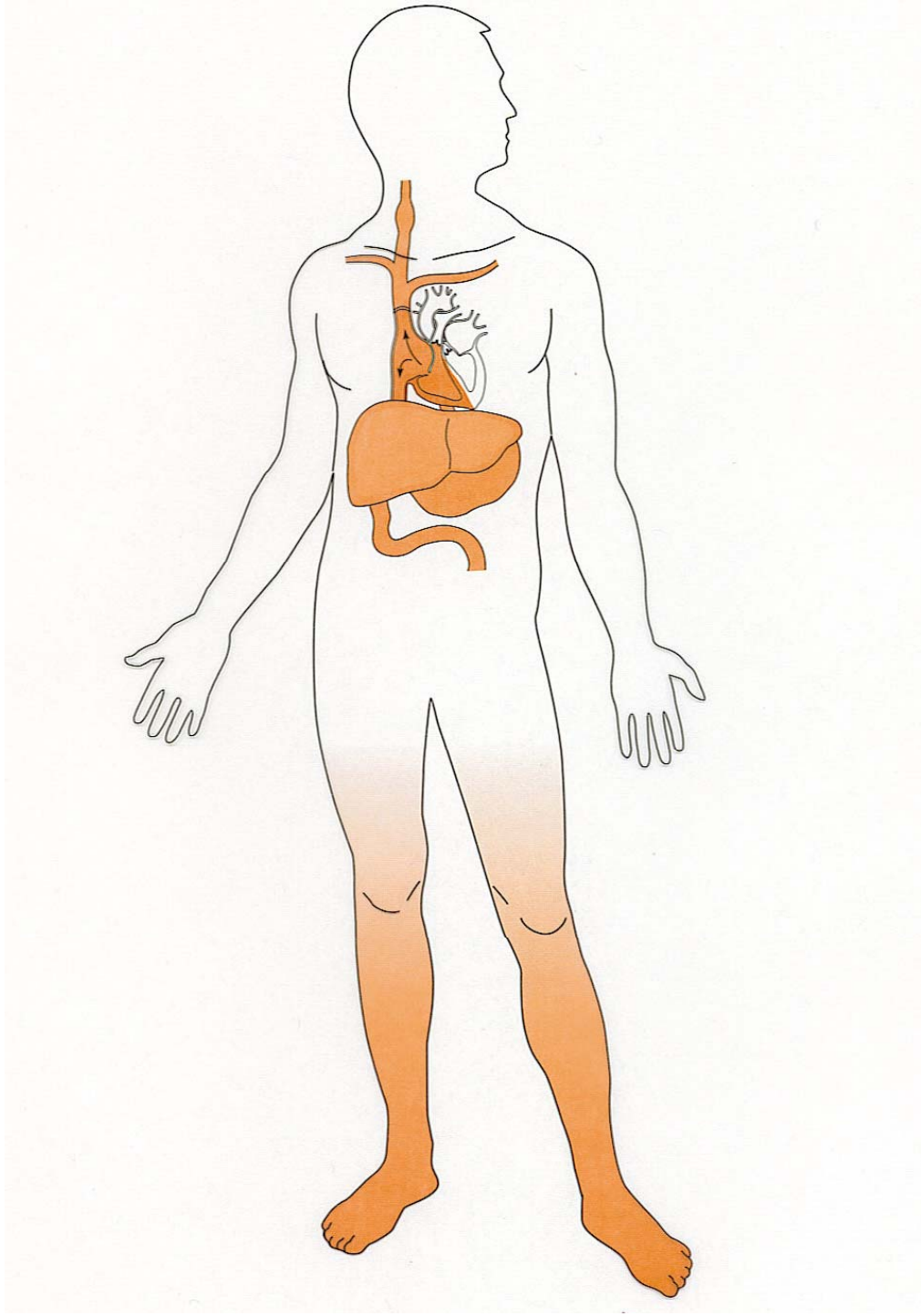



**Figure 21–3.** Causes of right-sided heart failure.

# Signs & Symptoms

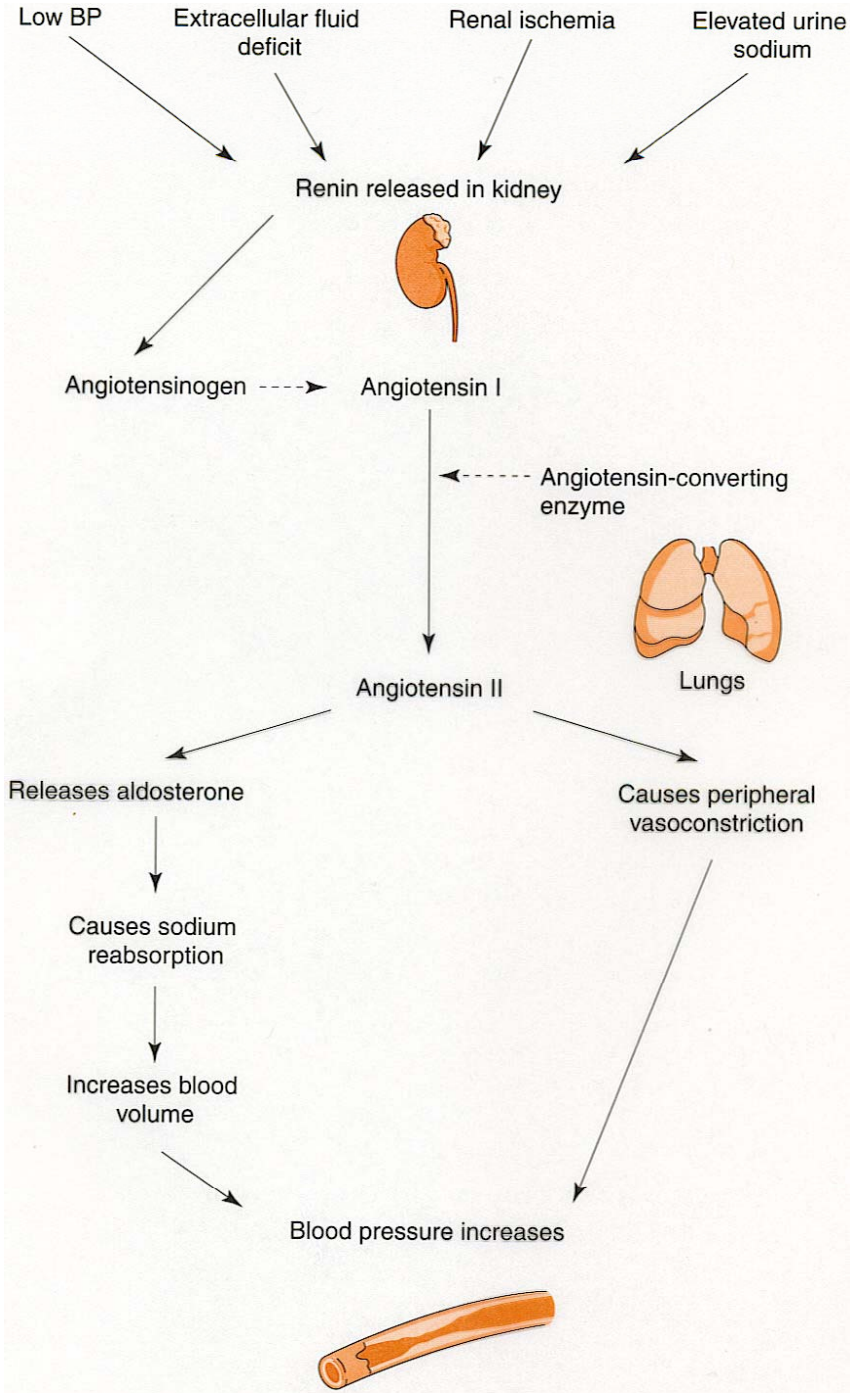
- Distended jugular veins
- Peripheral edema
- Anorexia, nausea and abd pain
  - Congestion in GI tract
- Hepatomegaly/splenomegaly


Right-Sided Heart Failure
Jugular vein distention
Enlarged liver
Ankle edema
Right Atrium
Right Ventricle



# Compensatory Mechanisms

- Increased heart rate
- Activation of the renin-angiotensin-aldosterone system
  - ↓ urine output
- Dilatation and hypertrophy of cardiac muscle
  - Dilation-heart muscles stretch to increase force of contractions
  - Hypertrophy- muscle mass of heart increases creating more contractile force


Low BP
Extracellular fluid deficit
Renal ischemia
Elevated urine sodium
Renin released in kidney
Angiotensinogen
Angiotensin I
Angiotensin-converting enzyme
Lungs
Angiotensin II
Releases aldosterone
Causes peripheral vasoconstriction
Causes sodium reabsorption
Increases blood volume
Blood pressure increases

# Acute Heart Failure (Pulmonary Edema)

- Severe congestion of alveoli
- Life threatening condition
- Compensatory mechanisms fail

# Signs & Symptoms

- Anxiety, restlessness
- Pale skin/mucous membranes
- Clammy and cold skin
- Sever dyspnea – **orthopnea**
- Coughing, pink frothy sputum(classic pulm edema sign)
- Crackles and wheezes

# Treatment

- Medical emergency
  - Pt will drown in own secretions
- Intensive care unit
- Treat underlying cause

# Treatment (cont.)

- Semi or high-Fowlers position
- Oxygen – ET intubation if severe
- Medications
  - MSO4 IV
  - Diuretics
  - Inotropic agents
- Frequent VS, daily wts, urinary output, pulmonary pressure

# Chronic Heart Failure

- Progressive disorder
- s/s worsen over time
- Can be right sided or left sided
  - Williams & Hopper (Table 26-4 pg. 484)

# Signs & Symptoms

- Fatigue and weakness
- Dyspnea – orthopnea
- Cough
- Crackles and wheezes
- Tachycardia
- Chest pain

# Signs & Symptoms (cont.)

- Cheyne-Stokes Respiration
- Edema
- Anemia
- Nocturia
- Cyanosis
- Altered mental status
- Malnutrition

# Complications

- Hepatomegaly
- Splenomegaly
- Pleural effusion
- Left ventricular thrombus and emboli
- Cardiogenic shock

# Diagnostic Tests

- CXR
- EKG
- Stress testing/nuclear imaging
- Echocardiography
- Cardiac catheterization
- Hemodynamic monitoring
- Laboratory testing

# Treatment

- Oxygen
- Activity
  - Regular exercise if patient stable
- Sodium restricted diet
- Heart failure treatment guidelines
  - Multidisciplinary approach

# Treatment (cont.)

- Drug therapy -See Table 26.5
  - ACEIs/ARBs
  - Diuretics
  - Beta Blockers
  - Digoxin
- Mechanical Assistive Devices
  - Intra-Aortic Balloon Pump
  - Ventricular assist devices
- Surgical Management
    - Left ventricular reconstruction, aneurysm repair,
    - Other types being studied (cardiac support device, cardiomyoplasty)

# Treatment (cont.)

- Cardiac Resynchronization Therapy
  - Ventricles do not always beat together in HF
  - Resets heart beat
  - Biventricular cardiac pacing system
  - An atrial lead senses and paces them
  - Right and left ventricle lead synchronizes in response to atria
- Mechanical Assistive Devices
  - Increase CO
  - Intra-aortic balloon pump
  - Ventricular assistive devices
- Autologous adult stem cell Therapy
  - Not available in US, cells stimulate growth of new blood vessels and cardiac muscle

# Nursing Process

- Assessment
- Nursing diagnosis
- Planning
- Nursing interventions
  - Oxygen, rest, positioning, fluid retention (>2/day or 5/wk), med compliance, low sodium diet, weight control, education, coping
- Evaluation

# Cardiac Transplantation

- End-staged cardiac dx
- Strict criteria (Williams & Hopper, Table 26.3, pg 497)
- Immunosuppressive therapy – begins pre-operatively
  - Risk for rejection is highest immediately after sx