IN THE NAME OF GOD

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CHF Defined

* An imbalance in pump function in which the heart fails to maintain the circulation of blood adequately.

Background

* Effects an estimated 20 million
* 2% of adults
* 6-10% adults over 65
* Increase privalance with aging
* 50% with NLEF

Heart Failure

* Results from any structural or functional abnormality that impairs the ability of the ventricle to eject blood (**Systolic Heart Failure**) or to fill with blood (**Diastolic Heart Failure**).

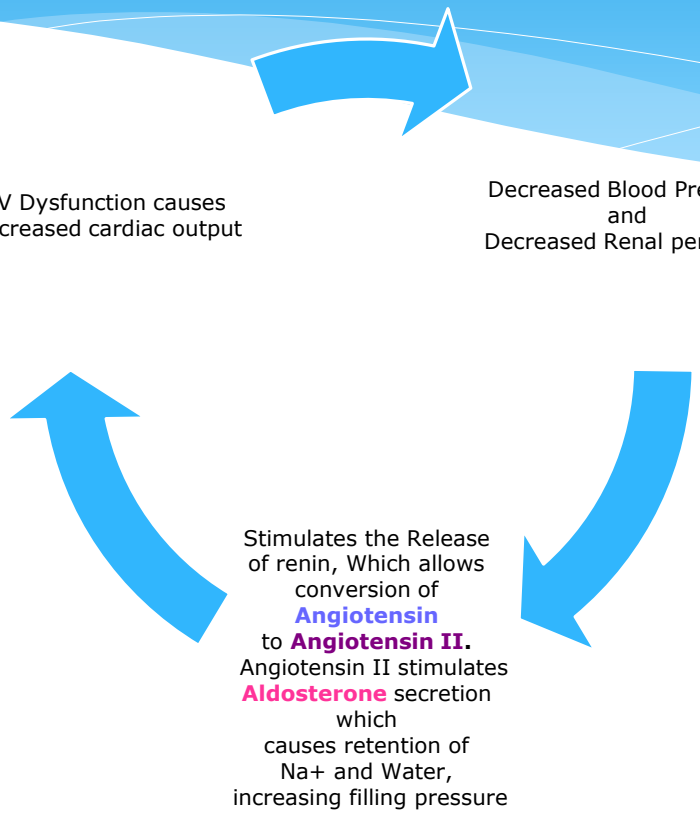
Etiologies

* Coronary artery disease 60-75%
* HTN 75%
* Valvular heart disease (especially aorta and mitral disease)--chronic
* Infections--acute
* Dysrhythmias--acute
* Alcohol--chronic
* MI--acute
* Diabetes—chronic
* Dilated CMP 20-30%

Types of Heart Failure

- **Low-Output Heart Failure**
  - Systolic Heart Failure:
    - decreased cardiac output
    - Decreased Left ventricular ejection fraction
  - Diastolic Heart Failure:
    - Elevated Left and Right ventricular end-diastolic pressures
    - May have normal LVEF
- **High-Output Heart Failure**
    - Seen with peripheral shunting, low-systemic vascular resistance, hyperthryoidism, beri-beri, carcinoid, anemia
    - Often have normal cardiac output
- **Right-Ventricular Failure**
    - Seen with pulmonary hypertension, large RV infarctions.

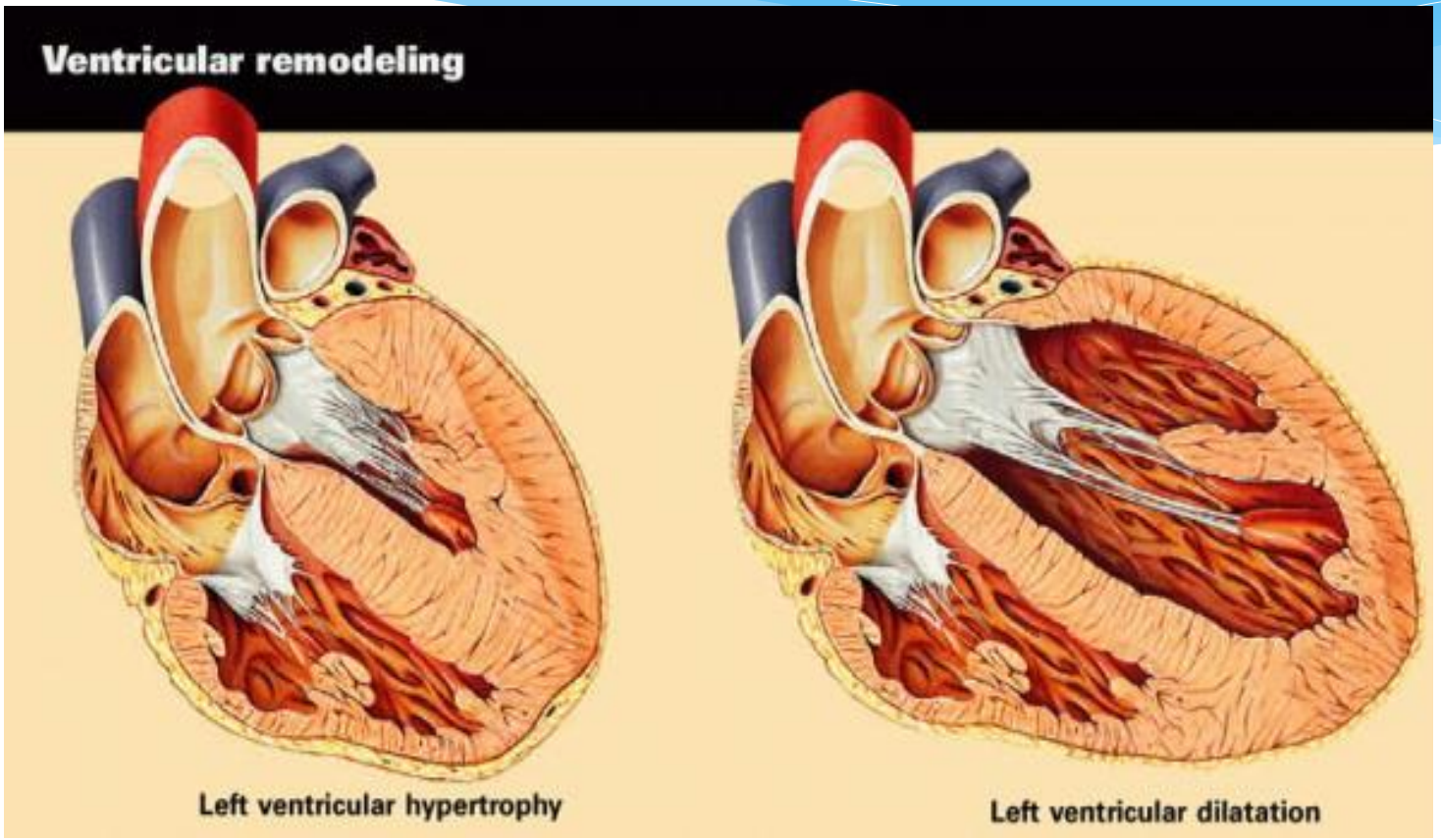
The Vicious Cycle of Congestive Heart Failure



Pathophysiology- ***Structural Changes with HF***

* Dec. contractility
* Inc. preload (volume)
* Inc. afterload (resistance)
* **Ventricular remodeling (ACE inhibitors can prevent this)
  * Ventricular hypertrophy
  * Ventricular dilation

Ventricular remodeling



Clinical Presentation of Heart Failure

* Due to excess fluid accumulation:
  * **Dyspnea** (most sensitive symptom)
    * DOE less strenuous activity at rest

      Most important mechanism is **pulmonary congestion**
  * **Orthopnea**:redisteriurbution of fluid from splanchnic circulation & lower ext. to central circulation increase pulmonary capillary pressure
  * **Nocturnal cough**

Clinical Presentation of Heart Failure

* **Paroxysmal Nocturnal Dyspnea (PND)**

- 1-3 h
- Coughing & wheezing
- Increase pressure of bronchial arteries leading to air way compression
- Interstitial pulmonary edema increase air way resistance.

Clinical Presentation of Heart Failure

* **Cheyne Stokes**

- Periodic respiration

- 40% advanced HF with low CO

- Increase sensitivity of respiratory center to Pco2 arterial

- Apneic phase: decrease Po2 & increase Pco2

then stimulate therespiratory center and cause heperventilation and hypocapnea

Clinical Presentation of Heart Failure

* Hepatic congestion
* Inappetence
* nocturia

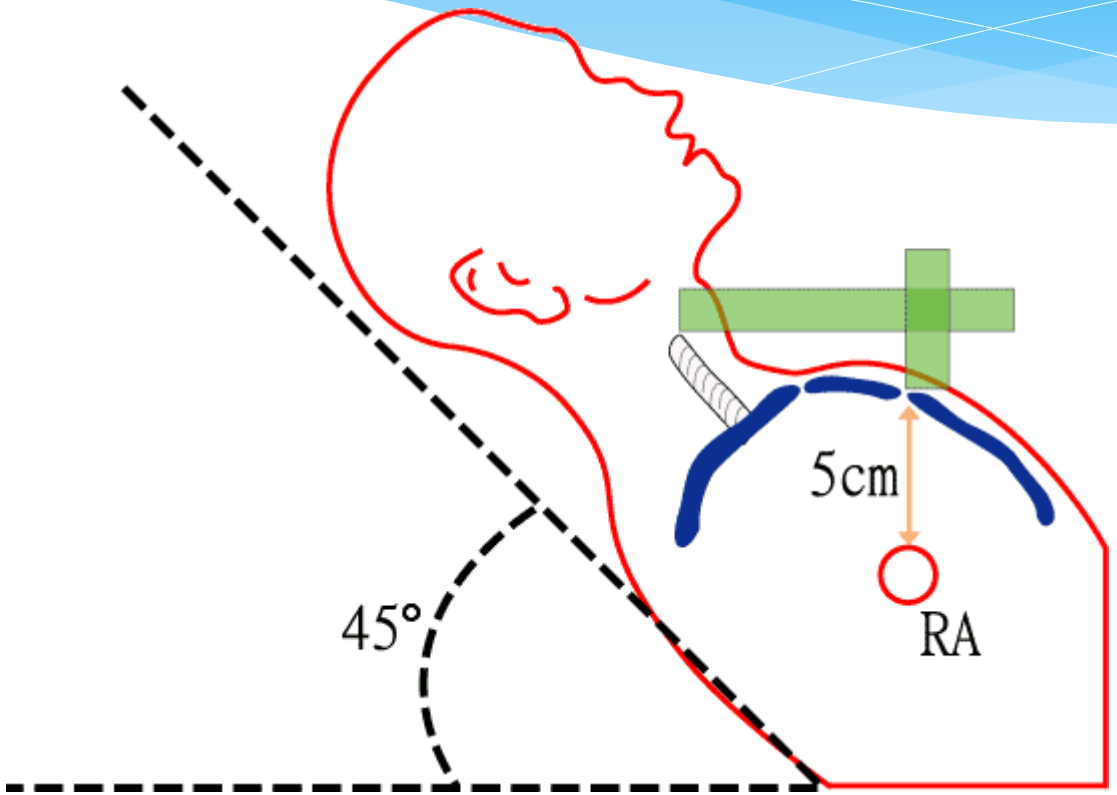
* **Due to reduction in cardiac ouput:**
* **Fatigue** (especially with exertion)
* Skeletal muscle abnormality anemia
* Weakness

Physical Examination in Heart Failure

* S3 gallop
  * Low sensitivity, but highly specific

* Cool, pale, cyanotic extremities
  * Have sinus tachycardia, diaphoresis and peripheral vasoconstriction
* Crackles or decreased breath sounds at bases (effusions) on lung exam
* Elevated jugular venous pressure
* Abdominojugular reflex
* Lower extremity edema
* Ascites
* cachexia
* Hepatomegaly
* Splenomegaly

Measuring Jugular Venous Pressure



Pulmonary Edema

Definition:

* Pulmonary edema is a condition characterized by fluid accumulation in the lungs caused by back pressure in the lung veins. This results from malfunctioning of the heart.

Causes:

* Pulmonary edema is a complication of a myocardial infarction (heart attack), mitral or aortic valve disease, cardiomyopathy, or other disorders characterized by cardiac dysfunction.

Symptoms:

* Extreme shortness of breath, severe difficult breathing
* Feeling of "air hunger" or "drowning"
* "Grunting" sounds with breathing
* Inability to lie down
* Rales
* Wheezing
* Anxiety

Symptoms:

* Restlessness
* Cough
* Excessive sweating
* Pale skin
* Nasal flaring
* Coughing up blood
* Breathing, absent temporarily

Treatment:

* This is a medical emergency! Do not delay treatment. Hospitalization and immediate treatment are required.
* Oxygen is given, by a mask or through endotracheal tube using mechanical ventilation.

Treatment:

Medications include

* diuretics such as furosemide to remove fluid,
* vasodilators(nitrat) to help the heart pump better,
* drugs to treat anxiety(morphin),
* and other medications to treat the underlying cardiac disorder.

THANK YOU