HEART FAILURE Heart can't pump enough blood to meet metabolic demands for O2 and nutrients

PATHOPHYS

- Right-sided HF: inability of the right ventricle to pump effectively, leading to backup of blood in the systemic circulation. Often referred to as Corpulmonal
- Left-Sided HF: inability of the left ventricle to pump effectively, leading to backup of blood in the pulmonary circulation and decreased oxygenation.
- Systolic failure is the inability of the heart to pump effectively due to impaired ventricular contraction.
- Diastolic failure is the inability of the heart to pump effectively due to impaired ventricular relaxation and filling.

SUMMARY

Left sided (usually first side to fail) (this is CHF) (Commonly leads to Right sided HF)

- Left ventricle can't propel blood volume forward
  (↓CO) and (left atrium and pulmonary veins back up)
- Pulmonary circ becomes engorged, ↑capillary pressure pushes Na+ and H2O into interstial space
  (impaired gas exchange –cyanosis and S/S of hypoxia)
  (Pulmonary edema – orthopnea, cough w/ frothy sputum, nocturnal dyspnea)

Right sided

- Right ventricle has hard time propelling blood into pulmonary circ
  (because of left sided engorgement of pulm circ)
- Blood backs up and causes pressure and congestion in vena cava & systemic circ
- ↑ cap pressure forces excess fluid into interstitial space causes edema & ascities
- Liver congestion (S&S r/t impaired liver fxn)
- GI tract congestion (anorexia, GI distress, wt loss – but edema so wt gain)
- Ultimately cerebral edema and death

CAUSES

Myocardial dysfunction is most often caused by:

- CAD
- Cardiomyopathy
- Hypertension
- Valvular heart disease – blood regurgitates or ventricles don't fill all the way or atria don't empty all the way (no atrial Kick)

Other RISK FACTORS

- atherosclerotic risks
- atherosclerotic related diseases
- anemia
- cardiac dysrhythmias
- valvular disorders
- inflammatory heart diseases
- thyroid disorders
- IV fluid overload
- radiation treatment to the chest area (changes vent) also COPD
- chemotherapy medications
- excessive alcohol or illicit drug use

Compensatory Mechanisms

- Activation of the sympathetic nervous system (SNS) – to support heart
- Activation of the Renin-Angiotensin-Aldosterone mechanism
- Myocardial hypertrophy
- Release of Atrial Natriuretic Peptide (ANP) and B-type Natriuretic Peptide (BNP) by the atria and ventricles

S&S

Cardiovascular –tachy cardia, S3, JVD, dysrhythmias, palpitations, murmur, weak pulse

Pulmonary - cough and frothy white bubbles (flash pulmonary edema) low pulseox, orthopnea, dyspnea, ↓ breath sounds

Gastrointestinal - enlarged spleen, pancrease

Renal - ↓ urine or nocturia, wt increase, central venous pressure monitors FVE

Integumentary- cool, pale, cyanotic, edema

Neurologic – down LOC, confusion, apprehension, anxiety, restlessness

right-sided failure blood backing up from the heart into the body

Dependent edema, ascites

Hepatomegaly – lg spleen and liver

JVD

Wt gain

Fatigue

Anorexia and nausea

left side : can't pump enough blood into the body to O2 the tissues, backing up into the lungs

crackles

dyspnea

oliguria

pale, cool, clammy skin

Review the New York Heart Association (NYHA) Classification of Heart Failure, American College of Cardiology and American Heart Association (ACC/AHA) Classification of Heart Failure. (just know classes and that they impact daily living)

Lab & Diagnostics

- echocardiogram (transthoracic and/or TEE) size and structure of heart & valves, EF
- a MUGA or ERNA nuclear scan
- chest xray – size and shape (shows hypertrophy)
- 12-lead EKG – conduction system
- stress test and/or cardiac cath – blockage, ischemia
- BNP levels – should be < 100
- electrolytes
- BUN and creatinine
- Hbg/Hct
- Fasting Blood Sugar
- thyroid function

ASSESS

- Look for S&S of pulmonic and systemic fluid overload
- Assess to see if compensatory mechanisms are activated
- evidence that tissues are not being adequately perfused

INTERVENTIONS

- impaired gas exchange
- decreased cardiac output
- activity intolerance
- excess fluid volume

Drugs

- drugs that Affect the Renin-Angiotension-Aldosterone System
- Beta Adrenergic Receptor Blockers - MAKES HEART EFFICIENT **
- Diuretics
- Vasodilators + give diuretics, moves fluid
- Positive inotropes

Evaluating/Teaching.

patient should have the knowledge to be able to manage the following issues:

- What to do if chest pain occurs
- Maintaining/improving physical strength & mobility
- Monitoring Weight
- Dietary Therapy
- Prescribed Medications
- Follow-up Appointments

Heart failure is a chronic condition and management focuses on lifestyle changes and medications to prevent acute exacerbations

Potential Major complications

- pulmonary edema
  cardiogenic shock – critical, ↓BP and heart fxn
- dysrhythmias
- thromboembolism
- pericardial effusion – inflammation "friction rub"

AND JUST IN GENERAL

CAD A condition that affects the arteries of the heart which reduces the flow of O2 and nutrients to the myocardium. The most common form is Coronary Atherosclerosis, an accumulation of lipids and fibrous tissue in the blood vessel walls that block blood flow, leading to ischemia. S&S are chest pain, SOB, weakness, nausea, but many people are asymptomatic.

DJD can cause hypercalcemia which can cause alterations in cardiac muscle function.

HTN can cause aneurysms and/or thrombus, possibly leading to a transient ischemic attack or DVT's.

HTN can lead to atherosclerosis, heart failure (increased left side heart workload) and CAD (esp when combined w/ hypercholestremia).

HTN contributes to accumulation of plaques in arterial walls and possible CAD.

HTN could be a contributing factor to CAD and vice versa.

Hyperlipidemia and hypothyroidism could be a contributing factor to PVD and CAD.

PVD Peripheral Vascular Disease Any abnormal condition that affects the blood vessels and lymphatic vessels (except ones that supply the heart). PVD in association w/ endocarditis can lead to gangrene. Types of PV include atherosclerosis and arteriosclerosis, S&S: numbness, pain, pallor, impaired arterial pulsations, elevated BP.

Sinus Bradycardia: a sinus node generated heart rate of < 60 bpm.

Sinus Tachycardia: a sinus node generated heart rate of 100-180 bpm. It is a normal response to conditions such as exertion, CHF, cardiogenic shock, acute pulmonary embolism, acute MI, or infarction extension.

Smoking is directly related to lung cancer and CAD, and increases the risk of cardiac disease for people with HTN.