

Heart Failure & Cardiomyopathies

Heart Failure

- Failure of the heart to meet metabolic demands of the body
 - Supply O₂
 - Supply nutrients
 - Transport waste to liver and kidneys
- Acute or Chronic

Cardiomyopathies

- Most heart failure is caused by cardiomyopathy
- A group of diseases that result in damage and dysfunction of the heart muscle
- May be left or right sided failure
 - Congestive (left)
 - Cor Pulmonale (right)
- Two basic forms
 - Systolic dysfunction
 - Diastolic dysfunction

Systolic Dysfunction

- Failure of the heart to pump efficiently
 - $CO = SV * HR$
 - $SV = EDV * EF$
 - EF depends on
 - Efficiency of valves
 - Blood pressure
 - Aortic distensibility
 - Ventricular muscle
 - Ventricular compliance

Systolic Failure

- As EF falls
 - SV falls
 - CO falls
 - Tissues become hypoxic
 - Epinephrine release
 - RAAS activation
 - ↑BP, ↑HR
 - EDV grows
 - Heart becomes stretched
 - Frank-Starling's law of the Heart

Systolic Failure

- Ventricular Remodeling
 - As BP ↑, resistance ↑ (afterload)
 - Heart muscle responds like any muscle
 - Vascular remodeling
 - Collagen deposits
 - Increased myocardial demand
 - Increased risk for

Systolic Failure

- Hormonal action
 - Catecholamines
 - Angiotensin II
 - Aldosterone
 - Arginine vasopressin (ADH)
 - Natriuretic peptides
 - Endothelial hormones
 - Endotoxin
 - TNF- α

Dilated Cardiomyopathy

- May result in dilated cardiomyopathy
- Causes
 - Idiopathic
 - Family link
 - Alcoholics
 - Ischemia
 - Drug Toxicity
 - Valve Disease