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Heart Failure

M1 – Cardiovascular/Respiratory Sequence
Gerald Abrams, MD
Jennifer Matthews, MD
Jonathan Haft, MD

Fall 2008
**HEART FAILURE**

Inability of the heart to eject sufficient blood to meet metabolic demands of the body

- increased demand
- systolic failure
- diastolic failure
CAUSES OF HEART FAILURE

• Resistance to flow
• Regurgitant flow
• Myocardial disease
• Conduction abnormality
Hypertensive heart
Aortic Stenosis
Aortic Stenosis
Mitral Stenosis
Mitral Regurgitation
Myocardial Ischemic Disease
Myocardial Ischemic Disease
Myocardial Ischemic Disease
Myocarditis
Hemochromatosis
Hemochromatosis
Iron Stain
Amyloidosis
Hypertrophic Cardiomyopathy
Hypertrophic Cardiomyopathy

G.D. Abrams, University of Michigan Medical School
Compensatory Mechanisms

• Frank-Starling mechanism
• Myocardial Hypertrophy
• Activation of neurohumoral systems
Myocardial Hypertrophy

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Concentric Hypertrophy
Eccentric Hypertrophy
Neurohumoral Mechanisms

- Norepinephrine
- Vasopressin
- Renin-Angiotensin-Aldosterone system
- Natriuretic peptides
- Cytokines
Problems with Hypertrophy

- Adequate perfusion
- Mitochondrial deficiency
- Altered gene expression
- Apoptosis
- Remodeling
  - unfavorable geometry
  - fibrosis
Myocardial fibrosis
Problems with Neurohumoral Activation

- Vasoconstriction……..altered afterload
- Chronic cardiotoxic effects
- Sodium retention – water retention
Consequences of Heart Failure

• “Forward failure”
• “Backward failure”

• Left heart failure
• Right heart failure
H.F. Effects in Liver
H.F. Effects in Liver
Ischemic Colitis
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