

**AN OVERVIEW ON ACUTE
HEART FAILURE
EXACERBATION**

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Objectives

- Identify the process for diagnosing and treating acute exacerbation of systolic and diastolic heart failure.
- Identify clinical indication and positive effects in the use of pharmacologic agents in treatment of acute exacerbation of CHF.
- Identify strategies to improve patient outcomes and prevent hospital readmission.

Process to meet objectives

- Presentation will discuss :
 1. Pathophysiology
 2. Diagnostic studies
 3. Interpretation of studies
 4. Presentation of case studies



Congestive Heart Failure

- Heart is unable to generate adequate cardiac output
- Causing inadequate perfusion of tissues
- Increasing diastolic filling pressure in one of both ventricles

(McCance, Huether, Brashers & Rote, 2010)

Morbidity and Mortality

- 5.1 million people in the US with heart failure
- One in 9 deaths in 2009 included heart failure as a contributing cause
- Half of diagnosed cases die within 5 yrs of diagnosis
- Cost is \$32 billion each year
- One million hospital admissions in 2010
- Most admissions were for ages 65 and older

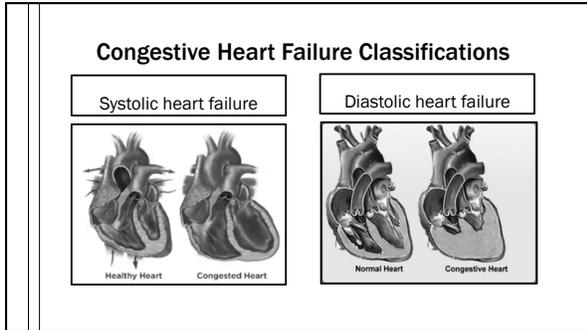
(Hall, Levant, & DeFrances, 2012)

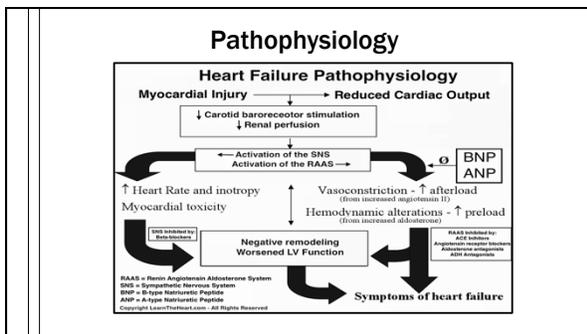
Risk Factors

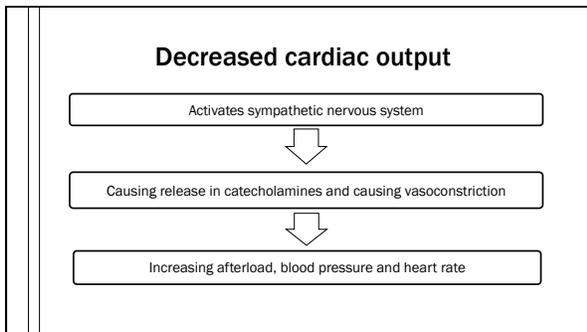
- Increasing age
- Hypertension
- Ischemic heart disease
- Obesity
- Diabetes
- Renal failure

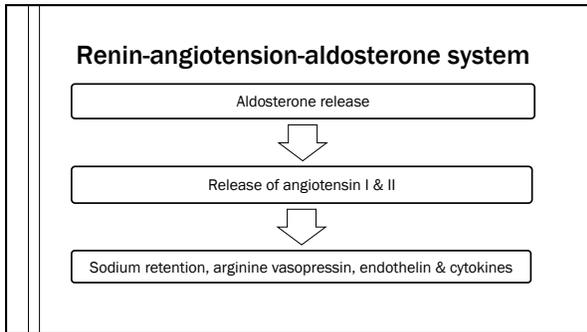


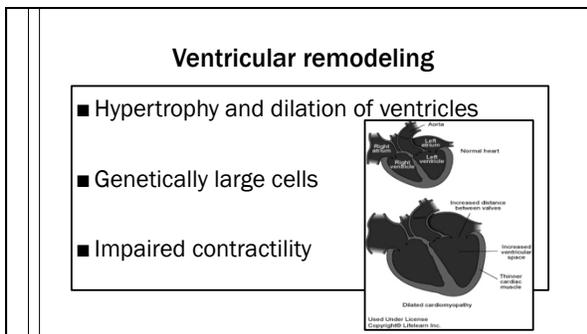
(McCance, Huether, Brashers & Rote, 2010)

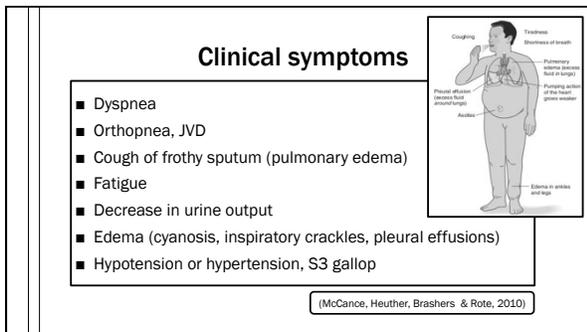












Clinical work up

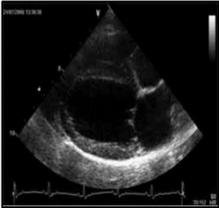
- Medical history and physical exam
- Echocardiography
- X-Ray
- EKG
- Labs: CMP, CBC, HFT, BNP, TSH, cardiac markers

Diagnostics/Radiology



- Bilateral pulmonary congestion
- Cardiomegaly
- Pulmonary venous hypertension
- Pleural effusions

Echocardiogram



- Dilated right ventricular chamber size
- Segmental wall motion abnormalities
- Paradoxical motion of the interventricular septum
- Measurement of ejection fraction (EF)

Laboratory findings



- Elevated BNP
- Elevated cardiac markers
- Elevated LFT
- Hyponatremia
- Elevated BUN and Creatinine

Treatment goals

- Aimed at interrupting the worsening cycle of decreasing contractility
- Increasing preload
- Increasing afterload
- Blocking the neurohormonal mediators of myocardial toxicity
- Symptom relief

Airway protection

TREATING CONGESTIVE HEART FAILURE



(UNLOAD FAST!)
 ■ Furosemide (Lasix)
 ■ Nitroglycerin (Nitro)
 ■ Morphine
 ■ Oxygen
 ■ NCP/BIPAP
 ■ Endotracheal Intubation
 ■ Mechanical Ventilation
 ■ ACE Inhibitors (Lisin, Lisin, Lisin)
 ■ Beta Blockers (Carvedilol, Carvedilol)
 ■ Diuretics (Furosemide, Furosemide)
 ■ Oxygen Restriction
 ■ ECG (Rhythm, Atrial, P-R-T Level)

- Supplemental Oxygen
- Non- invasive positive pressure ventilation
- Mechanical ventilation

Medication therapy

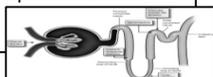
- Diuretics – Loop diuretics specifically
- Inotropic drugs (dobutamine, dopamine)
- ACE inhibitors
- Nitrates and recombinant BNP (improves preload and contractility)
- Beta blockers



Pharmacology

Diuretics

- Furosemide
- Bumex
- Spironolactone



Inotropes

- Dobutamine
- Dopamine
- Milrinone
- Digoxin

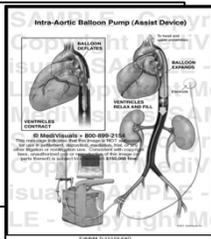
Vasodilators/Beta-blockers

- Nitrates
- Nitroprusside
- Natreacor

- Metoprolol
- Carvedilol
- Labetalol

Invasive treatments

- Hemodynamic monitoring
- Intra-aortic balloon pump conterpulsation
- Ventricular assist device



Performance improvement

- Identify patients admitted with congestive heart failure
- Start discharge planning on admission
- Follow guidelines
- Make sure all core- medications are in place on discharge
- Patient education

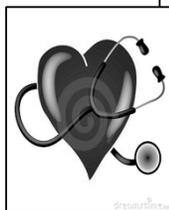


Case Study

■ 70 year old white female measuring 5 feet 4 inches tall who was a former heavy smoker. Presented to the ER with c/o progressively worsening breathlessness over 7 days. Now present at rest, with the onset of orthopnea, mildly productive cough, and wheezing for the past 2 days. She has a history of hypertension, chronic heart failure, and chronic obstructive pulmonary disease.

Differential diagnosis

- Pneumonia
- COPD exacerbation
- Acute coronary syndrome
- Pulmonary embolism
- Asthma



Clinical & Diagnostic Findings

- Last EF 47% 3 months ago
- VS: T 38.0, BP 160/100mm Hg, HR 95/min,
- Body weight was 165 pounds and had increased by 6 pounds since it was last measured 3 months ago.
- Labs: Elevated troponin I, BUN 57, WBC 12500, mildly elevated liver enzymes,
- CXR- Mild pulmonary vascular congestion with no infiltrates.
- EKG showed mild ventricular hypertrophy

Diagnosis and Treatment

- BNP level came back elevated at 650 pg/mL supporting diagnosis of acute CHF exacerbation
- She was placed on supplemental O2
- Started on NTG drip
- Started on intravenous Lasix
- Continued her home enalapril, bisoprolol, and triamterene

Outcome & discharge

- 5 days later patient was discharged and education was provided on:
 1. Rationale for pharmacologic therapy
 2. Importance of limiting sodium intake
 3. Importance of limiting her fluid intake
 4. Daily weight record keeping

Conclusion

- Although the management of acute congestive heart failure remains a big challenge, possessing the skills to rapidly recognize and treat acute congestive heart failure exacerbation has shown to decrease mortality and improve patient outcomes.



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