

Internal Medicine Clerkship
Case Discussions

Congestive Heart Failure
Student Guide

Objectives:

1. Identify characteristics and relevant review of systems that determine the presence of decompensation and precipitants of congestive heart failure including dyspnea, orthopnea, and paroxysmal nocturnal dyspnea.
2. Assess for risk factors and predisposing conditions including coronary artery disease, pulmonary hypertension, and medication nonadherence.
3. Assess for social risk factors and causes for decompensation including tobacco use and dietary or fluid indiscretion.
4. Identify key physical exam findings that help determine the presence of decompensation and differentiate right from left sided heart failure (including rales/crackles, presence of S3, and peripheral edema).
5. Identify and interpret key laboratory and imaging tests and list indications, benefits, test characteristics, risks, and costs of testing that determine severity (including N-terminal pro-B-type natriuretic peptide) and determine underlying etiology (including electrocardiogram and echocardiography).
6. Describe a rational and evidence-based approach to treating a patient with congestive heart failure:
 - a. Describe initial treatment modalities including diuretics, ACE inhibitors/Angiotensin receptor blockers, and beta-blockers.
 - b. Describe indications for hospitalization based on history or exam.
7. Describe possible complications of congestive heart failure including sudden cardiac death.
8. Describe factors that affect prognosis including demographics, hospitalization, and heart failure etiology.

Clinical Case 1:

A 72-year-old retired CTA bus driver has been under your care for hypertension and diabetes for the past 12 years. She presents to your office for a routine visit and complains of leg swelling, mild exertional dyspnea, and a 10-pound weight gain over the past month. She denies chest pain, orthopnea, and PND although she sleeps propped up in bed. She does not smoke or use alcohol. Her current medications include metformin 1000mg BID, metoprolol succinate 100mg/day, HCTZ 25 mg/day, ibuprofen 600 mg TID prn, and lisinopril 20 mg/day. She can walk 2 blocks before she starts to develop shortness of breath.

BP 170/100, RR 20, HR 66, T 98f

Gen: Overweight female in no apparent respiratory distress

Neck: JVP to angle of jaw, positive hepatojugular reflux

Lungs: Dull at bases but otherwise clear to auscultation

CV: S4 audible, PMI Diffuse in MCL, 2/6 holosystolic murmur at apex

Abd: obese, without hepatomegaly

Ext: 1+ Bilateral ankle edema present

Updated 3/13/26 MRE

Questions:

1. What are the common etiologies of heart failure, and which does this patient most likely have? Differentiate the causes based on heart failure with reduced ejection fraction and heart failure with preserved ejection fraction.
2. What are the likely pathophysiologic mechanisms at work in this patient's heart failure?
3. What are the common symptoms of heart failure?
4. What physical exam signs should you be careful to assess for on exam?
5. What are the NYHA classes of heart failure and what are the ACC/AHA stages of heart failure? What class and stage does she have?
6. What is the significance of the patient's blood pressure, and how will it affect your management?
7. What tests are indicated to make the diagnosis?

The patient undergoes additional evaluation. Her cbc is normal, chemistry is notable for a creatinine of 1.3, liver function tests are normal, and hga1c is 7.6. Her echo reveals LVH, a mildly dilated left atrium, and an EF 55%.

8. What changes would you make in the patient's diabetic drug therapy?
9. What are the different phenotypes of heart failure? What type of heart failure does she have? and
10. How would you treat her?

11. What is her prognosis? Does the NYHA class help you with the prognosis?

Clinical Case 2:

A 74-year-old retired elementary school principal is referred to you for general care after a change in his HMO provider. He has a history of CAD and suffered a large anterior wall infarction eight months ago complicated by acute pulmonary edema requiring mechanical ventilation. He subsequently underwent a PTCA and stenting of the LAD and has had no ischemic symptoms since. The LV ejection fraction was last measured at 25% by echocardiogram done three months ago. There was mild mitral regurgitation noted.

For the past two months he has noted increasing dyspnea on exertion and an eight-pound weight gain. He never complains of chest discomfort but is only able to walk up one flight of stairs before having to rest. He uses 3 pillows to prop his head up at night and will occasionally wake up in the middle of the night with a dry cough.

His medications include lisinopril 20mg/day, aspirin 325 mg/day, clopidogrel 75 mg/day, and furosemide 20 mg/day. He has no drug allergies.

BP 110/70 HR 110 RR 20 T 97F

Gen: Appears older than stated age, able to complete sentences, comfortable while sitting

Neck: JVD 10 cm at 45 degrees

Lungs: Few crackles at lung bases b/l but otherwise clear to auscultation

CV: PMI laterally displaced, S1 S2 regular, soft S3 and 3/6 HSM at apex radiating to axilla, no rub

Abd: Non-distended, non-tender, normal bowel sounds

Ext: 1+ Bilateral pitting ankle edema to mid shin

Questions:

1. What factors may be contributing to this patient's apparent exacerbation of heart failure?
2. What further diagnostic testing is indicated currently?
3. Is there an indication to admit this patient to the hospital for treatment currently?
4. How would you treat this patient's symptoms? Is there a need for an adjustment in his present medication regimen? What medications would you add or remove and why?

5. List the medications that improve mortality in patients with LV dysfunction and HFrEF. If you were forced to pick one medication to treat chronic heart failure based on evidence, which one would provide the greatest survival advantage?

6. Comment on the utility of digoxin, diuretics, and calcium channel antagonists in patients with heart failure with reduced ejection fraction.

7. What are the contraindications to starting beta-blocker therapy in patients with decompensated heart failure?

References:

Harrison's Principles of Internal Medicine, 22e. Chapter 264: Heart Failure: Pathophysiology and Diagnosis

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