

You are working in the internal medicine clinic at Beebe. Today your first patient is 70-year-old J.M., a man who has been coming to the clinic for several years for management of coronary artery disease (CAD) and hypertension (HTN). A cardiac catheterization done a year ago showed 50% stenosis of the circumflex coronary artery. He has had episodes of dizziness for the past 6 months and orthostatic hypotension, shoulder discomfort, and decreased exercise tolerance for the past 2 months. On his last clinic visit 3 weeks ago, a chest x-ray (CXR) examination revealed cardiomegaly and a 12-lead electrocardiogram (ECG) showed sinus tachycardia with left bundle branch block. You review J.M.'s morning blood work and initial assessment.

Laboratory Results

Chemistry

Sodium	142 mEq/L (142 mmol/L)
Chloride	95 mEq/L (95 mmol/L)
Potassium	3.9 mEq/L (3.9 mmol/L)
Creatinine	0.8 mg/dL (70.7 mcmol/L)
Glucose	82 mg/dL (4.6 mmol/L)
BUN	19 mg/dL (6.8 mmol/L)

Complete Blood Count

WBC	5400/mm ³ (5.4 x 10 ⁹ /L)
Hgb	11.5 g/dL (115 g/L)
Hct	37%
Platelets	229,000/mm ³ (229 x 10 ⁹ /L)

Initial Assessment

J.M. reports increased fatigue and shortness of breath, especially with activity, and "waking up gasping for breath" at night, for the past 2 days.

Vital Signs

Temperature	97.9 ° F (36.1 ° C)
Blood pressure	142/83
Heart rate	105 beats/min
Respiratory rate	18 breaths/min

1. Highlight the lab results that cause you concern and explain why.

H&H are slightly low which could indicate anemia and may effect his dizziness, orthostatic hypotension, and decreased activity tolerance.

2. Knowing his history and seeing his condition this morning, what further questions are you going to ask J.M. and his daughter?

What medication are you currently taking, and are you taking them as prescribed?

How are you currently managing your CAD and HTN?

Are you having any heart palpitations, chest pain, or other cardiovascular or respiratory symptoms?

What is your current daily routine and diet?

Do you drink alcohol (if yes how much & how often), do you smoke, use illicit drugs?

CASE STUDY PROGRESS

J.M. tells you he becomes exhausted and has shortness of breath climbing the stairs to his bedroom and must lie down and rest (“put my feet up”) at least an hour twice a day. He has been sleeping on 2 pillows for the past 2 weeks. He has not salted his food since the provider told him not to because of his high blood pressure, but he admits having had ham and a small bag of salted peanuts 3 days ago. He states that he stopped smoking 10 years ago. He denies having palpitations but has had a constant, irritating, nonproductive cough lately.

3. You think it’s likely that J.M. has heart failure (HF). From his history, what do you identify as probable causes for his HF?

History of CAD, HTN (primary risk factors), smoking, increased sodium intake.

4. For each potential assessment finding listed, specify whether it is associated with left-sided HF or right-sided HF.

Potential Assessment Finding	Left-Sided HF	Right-Sided HF
a. Weakness	X	
b. Jugular (neck) vein distention		X
c. Dependent edema (legs and sacrum)		X
d. Hacking cough, worse at night	X	
e. Enlarged liver and spleen		X
f. Exertional dyspnea	X	
g. Distended abdomen		X
h. Weight gain		X
i. S ₃ /S ₄ gallop	X	
j. Crackles and wheezes in lungs	X	

CASE STUDY PROGRESS

The provider confirms your suspicions and indicates that J.M. is experiencing symptoms of early left-sided heart failure. A two-dimensional (2D) echocardiogram is ordered. Medication orders are written.

Medication Orders

Enalapril 10 mg PO twice a day

Furosemide 20 mg PO every morning

Carvedilol 6.25 mg PO twice a day

Digoxin 0.5 mg PO now, then 0.125 mg PO daily

Potassium chloride 10-mEq tablet PO once a day

5. For each medication listed, identify its class and describe its purpose in treating HF.

Enalapril: ace inhibitor, lower BP, reduce symptoms of HF, decrease development of HF

Furosemide: loop diuretic, use to treat edema associated with HF

Carvedilol: antihypertensive, improve CO, slow progression on HF, decrease HR and BP

Digoxin: cardiac glycoside, increase CO & slow heart rate

Potassium chloride: mineral & electrolyte replacement, replace and prevention of deficiency

6. When you go to remove the medications from the RX Station, you see that carvedilol (Coreg ER) is stocked. Will you give it to J.M.? Explain. I would not give it if it's the ER version because that's not what he is ordered.

7. As you remove the digoxin tablet from the automated medication dispensing machine, you note that the dose on the tablet label is 250 mcg. How many tablets would you give? I would give 2.

8. Based on the new medication orders, which blood test or tests will be monitored carefully? Explain your answer. Serum electrolyte levels (potassium), digoxin levels, apical pulse, blood pressure.

9. When you give J.M. his medications, he looks at the potassium tablet, wrinkles his nose, and tells you he “hates those horse pills.” He tells you a friend of his said he could eat bananas instead. He says he would rather eat a banana every day than take one of those pills. How will you respond?

I would explain to him that bananas do have potassium but he needs a specific dose that is based off his serum potassium level and what his body needs. Eating a banana everyday would not give him the enough amount of potassium.

10. The echocardiogram shows that J.M.’s left ventricular ejection fraction (EF) is 49%. Explain what this test result means with regard to J.M.’s heart function.

A normal EF is 55-65%, so JM EF is lower so it’s showing that his having a harder time to pump out blood.

CASE STUDY PROGRESS

This is J.M.’s first episode of significant HF. Before he leaves the clinic, you want to teach him about lifestyle modifications he can make and monitoring techniques he can use to prevent or minimize future problems.

11. List 5 suggestions you might make and the rationale for each.

1. take daily weight to monitor for fluid build up/overload
2. Eat a low sodium diet and follow a fluid restriction per orders to help with fluid build up
3. Try to exercise as tolerated to help with circulation
4. Take daily hr and BP to monitor for any changes and trends
5. Reduce stress to keep hr and BP lower

12. You tell J.M. that the combination of high-sodium foods he had during the past several days might have contributed to his present episode of HF. He looks surprised. J.M. says, “But I didn’t add any salt to them!” To what health care professional could J.M. be referred to help him understand how to prevent future crises? State your rationale.

A dietitian/nutritionist because they can help create a food plan for J.M. to follow and give guidance on what foods would be best to eat.

13. After visiting with the cardiac dietitian, you review potential food choices with J.M. Which foods are high in sodium and must be avoided? *Select all that apply.*

- a. Fresh fruits
- b. Canned soups
- c. Cheddar cheese
- d. Processed meats
- e. Whole wheat bread
- f. Fat-free fruit yogurt
- g. Canned vegetables

14. You also include teaching about digoxin toxicity. When teaching J.M. about the signs and symptoms of digoxin toxicity, which will be included? *Select all that apply.*

- a. Diarrhea
- b. Visual changes
- c. Increased urine output
- d. Loss of appetite or nausea
- e. Dizziness when standing up

END