

CHAPTER 6. HEART FAILURE, SELF-ASSESSMENT QUESTIONS

1. Which of the following finding, when reduced, indicates impaired systolic function in a patient with heart failure?
 - A. BNP
 - B. SCr
 - C. LVEF
 - D. LVH
 - E. Troponin
2. What is the **most common** etiology of heart failure?
 - A. Ischemic
 - B. Idiopathic, unknown cause
 - C. Viral cardiomyopathy
 - D. Drug-induced
 - E. Hypertension

Use the following to answer questions 3–5:

A 58-year-old man presents to the clinic today with complaints of increasing shortness of breath while dressing and carrying groceries and a 10 lb (4.5 kg) weight gain. A few months prior, he noticed episodes of waking in the middle of the night with shortness of breath, difficulty breathing after walking two flights of stairs, as well as ankle edema. The patient has a history of osteoarthritis × 10 years, hypertension × 4 years, diabetes mellitus × 5 years, dyslipidemia, and is status post myocardial infarction 2 years ago.

Physical exam reveals the following: BP 148/96 mmHg, pulse 98 beats/min, Ht: 5'11" (180 cm), Wt: 189 lb (86 kg; usual = 178 lb [81 kg]), BMI: 26.4 kg/m²

(+) JVD, (-) HJR or hepatomegaly

(+) S₃, (+) S₄

ECG: regular rate/rhythm, evidence of old infarct

ECHO: EF 33% (0.33)

CXR: Crackles bilaterally and cardiomegaly (enlarged heart)

Labs:

Sodium: 142 mEq/L (142 mmol/L)

Potassium: 3.7 mEq/L (3.7 mmol/L)

Magnesium: 1.8 mEq/L (0.90 mmol/L)

BUN: 22 mg/dL (7.9 mmol/L)

SCr: 1.3 mg/dL (115 µmol/L)

BNP: 322 pg/mL (322 ng/L; 93 pmol/L)

Current medications:

Aspirin 81 mg daily

Diltiazem 180 mg daily

Glipizide 10 mg twice daily for diabetes

Simvastatin 20 mg nightly at bedtime

Acetaminophen 500 mg twice daily

3. Which of the patient's medications can exacerbate systolic dysfunction heart failure?

- A. Glipizide
- B. Diltiazem
- C. Acetaminophen

- D. b and c
 - E. All of the above
4. Which of the following is TRUE regarding the patient's current NYHA functional class and stage of heart failure?
- A. Class III, Stage B
 - B. Class III, Stage C
 - C. Class II, Stage B
 - D. Class II, Stage C
 - E. Class IV, Stage C
5. Which of the following is the MOST appropriate ACUTE treatment plan for the patient's heart failure?
- A. Add HCTZ 12.5 mg Qday, since creatinine clearance is above 30 mL/min (0.5 mL/s)
 - B. Add HCTZ 25 mg Qday, increase dose of diltiazem to 240 mg Qday
 - C. Add furosemide 20 mg BID and nesiritide infusion since BNP is elevated
 - D. Add furosemide 20 mg BID and lisinopril 10 mg Qday, discontinue diltiazem
 - E. Add furosemide 20 mg BID, and carvedilol 3.125 mg twice daily, discontinue diltiazem
6. What is the medical term for the symptom of "feels short of breath when she lies down at night"?
- A. Orthopnea
 - B. Hepatojugular reflux
 - C. Paroxysmal nocturnal dyspnea

- D. Pulmonary congestion
 - E. Peripheral edema
7. Which of the following is TRUE regarding ACE inhibitors in heart failure?
- A. Should be used mainly in severe heart failure, NYHA functional class IV
 - B. Efficacy of ACE inhibitors is a class effect
 - C. May be used in place of hydralazine and isosorbide dinitrate in cases of renal dysfunction
 - D. Can be replaced by angiotensin receptor blockers if the patient has hyperkalemia
 - E. Should be discontinued if creatinine clearance decreases by more than 10%
8. Which of the following is TRUE regarding β -blockers in heart failure?
- A. Ideally should be started in setting of congestion to aid in diuresis
 - B. FDA-approved agents include carvedilol and metoprolol succinate
 - C. Metoprolol tartrate is more efficacious than carvedilol for heart failure
 - D. Chronic β -blockade increases ventricular mass
 - E. Metoprolol has more potent blood pressure lowering effects compared to carvedilol
9. A 74-year-old woman presents to clinic for heart failure follow-up. She is classified as NYHA FC II. Her blood pressure is 144/82 mm Hg, and most recent EF is 26% (0.26). Her current medication regimen includes lisinopril 20 mg Qday, carvedilol 25 mg BID, digoxin 0.125 mg Qday, and furosemide 20 mg BID. Which of the following would be the BEST choice to add at this time?
- A. Metolazone
 - B. Hydralazine and isosorbide

- C. Spironolactone
 - D. Hydrochlorothiazide
 - E. Valsartan
10. Mineralocorticoid receptor antagonists (or aldosterone receptor antagonists) have been shown to reduce mortality in patients with heart failure. Which of the following is TRUE about MRAs?
- A. Spironolactone leads more frequently to gynecomastia compared to eplerenone
 - B. Associated with hypokalemia
 - C. Can only be used in NYHA functional class IV
 - D. Used after maximizing ACE inhibitors, β -blockers, and digoxin
 - E. Added to loop diuretic when a patient is resistant to its effects to enhance removal of fluid
11. A 76-year-old man is admitted to the hospital presenting with peripheral and pulmonary edema, decreased urinary output, hypotension, and altered mental status. Pertinent values: PCWP = 32 mm Hg (4.3 kPa), Cardiac index (CI) = 1.8 L/min/m². Based on his presentation, what hemodynamic subset is he in?
- A. I
 - B. II
 - C. III
 - D. IV
 - E. II and IV
12. Which of the following diuretic combinations is used for the purpose of reducing congestion in the setting of diuretic resistance?

- A. Hydrochlorothiazide and spironolactone
 - B. Spironolactone and torsemide
 - C. Furosemide and spironolactone
 - D. Furosemide and metolazone
 - E. Nesiritide and spironolactone
13. A 68-year-old African American woman is admitted to the hospital for new onset acute decompensated heart failure. Her current medications include felodipine 2.5 mg Qday and atorvastatin 20 mg Qday. Hemodynamic readings include a PCWP of 16 (2.1 kPa) and a CI of 1.8 L/min/m². Which of the following is the MOST appropriate treatment plan?
- A. Fluids, inotropes
 - B. Diuretics, vasodilators
 - C. Fluids, inotropes, vasodilators
 - D. Diuretics, fluids, inotropes
 - E. Diuretics, inotropes, vasodilators
14. Which of the following statements is **most** appropriate for patient counseling on nonpharmacologic management of heart failure?
- A. Supervised exercise is recommended including aerobic activity and weight lifting
 - B. Contact health care provider if weight increases by more than 3 lb (1.4 kg) in a day or 5 lb (2.3 kg) in a week
 - C. Lower dietary sodium intake to no more than 2 grams per day
 - D. Maintain alcohol intake to no more than 2 drinks per day if diagnosed with alcohol-induced cardiomyopathy

- E. Weight should be kept at 15% above ideal body weight to maintain adequate nutrition absorption
15. A 68-year-old woman is admitted for decompensated heart failure, hemodynamic subset IV. Her current medication regimen includes enalapril 10 mg BID, digoxin 0.125 mg Qday, carvedilol 12.5 mg BID, furosemide 80 mg BID, and potassium chloride (K-Dur) 40 mEq (40 mmol) BID. Which of the following is TRUE regarding using milrinone therapy in this patient?
- A. Milrinone can interact with her β -blocker therapy due to its β -agonist mechanism
 - B. Effects begin to wear off after 72 hours due to tolerance
 - C. Dose needs to be adjusted in renal dysfunction
 - D. Milrinone is not appropriate to use in subset IV
 - E. a and c

ANSWERS

- 1. C
- 2. A
- 3. B
- 4. B
- 5. D
- 6. A
- 7. B
- 8. B
- 9. C

10. A

11. D

12. D

13. A

14. B

15. C