1. Which one of the following statements accurately describes heart failure with reduced ejection fraction (HFrEF):

A. Patients have an estimated ejection fraction \( \leq 40\% \)
B. The left ventricle takes on a cubical shape, thus hindering inefficient contraction
C. It is also known as diastolic HF
D. Systemic blood circulation remains unaffected

Correct answer: A

One of the primary methods of diagnosing HF is obtaining a 2-dimensional echocardiogram. During this procedure, the physician is able to determine what the ejection fraction (EF) is. While individuals with heart failure with preserved ejection fraction (HFpEF) will maintain a normal or near-normal ejection fraction, those with HFrEF will have a value of \( \leq 40\% \). The geometry of the heart in HFrEF takes on a spherical shape; this results in inefficient contractions. Consequently, systemic blood circulation becomes affected.

2. HW was recently discharged from the hospital after being treated for a HF exacerbation, making it the third HF event this year. The team believes this may have been the result of his uncontrolled atrial fibrillation. They are considering a rhythm control strategy and would like to begin an antiarrhythmic agent. Which one of the following would be the most appropriate treatment selection for HW:

A. Flecainide
B. Sotalol
C. Amiodarone***
D. Propafenone

Correct answer: C

The majority of antiarrhythmics are contraindicated in patients with structural heart disease, including HF. However, if one is needed, then amiodarone and dofetilide would be safe options.
3. Which one of the following is a provision recognized by The Joint Commission (TJC) as a mandate for all patients admitted to the hospital for HF:
   A. Initiating of a diuretic so that patients can experience quick relief for edema.
   B. Removing all possible drugs that can exacerbate or induce HF
   C. Initiating stress ulcer prophylaxis
   D. Providing discharge education

   Correct answer: D

   TJC has several performance measure mandates in place for institutions to follow in an effort to prevent readmissions. Providing appropriate discharge education is one of the requirements that this agency has implemented.

4. Which of the following clinical trials demonstrated improvements in survival in New York Heart Association (NYHA) Class II patients with HFrEF who received eplerenone, in addition to standard guideline-directed medical therapy (GDMT), when compared with placebo:
   A. EMPHASIS-HF
   B. A-HeFT
   C. RALES
   D. ACCORD-Lipid

   Correct answer: A

   One of the recent differences between the 2009 and the 2013 guidelines involves the usage of aldosterone antagonists. While older guidelines recommended the addition of one of these agents in patients with NYHA Class III or IV disease, due to the positive results of the EMPHASIS-HF trial, recent guidelines suggest an earlier introduction of these agents for patients with NYHA Class II HFrEF. The A-HeFT study demonstrated improved survival when self-identified African-American patients with NYHA Class III or IV HFrEF were treated with hydralazine/ISDN along with a standard HF regimen in comparison with those randomized to placebo. The utility of aldosterone antagonists in reducing mortality for patients with HFrEF was illustrated in the RALES study; the trial enrolled patients with NYHA Class III or IV disease who were already taking an ACE inhibitor. The ACCORD-Lipid study was conducted to evaluate if combination lipid lowering therapy would reduce the risk of cardiovascular disease in comparison with statin monotherapy.
5. MR visits your HF clinic for follow-up. He has a history of HFrEF (EF = 35%), diabetes, and hypertension. His current medications include metoprolol succinate 100 mg daily, furosemide 20 mg twice a day (BID), metformin 1000 mg BID, and a multivitamin. Angiotensin-converting-enzyme inhibitors (ACEIs) make him cough a great deal. Vital signs include a heart rate (HR) of 60 beats per minute and a blood pressure of 155/85 mm Hg. Pertinent labs include SCr 0.8 mg/dL and a K 3.7 mEq/L. He states he is compliant with medications and diet, but still reporting some limitations in his daily activities from fatigue. What would be the most appropriate intervention to make to fully optimize MR’s medication regimen?

A. Add enalapril 10 mg BID
B. Increase metoprolol to 200 mg daily
C. Add amlodipine 5 mg daily
D. Add candesartan 4 mg daily

Correct answer: D

ACEIs and angiotensin receptor blockers (ARBs) represent GDMT and should be offered to all patients with HFrEF, barring any absolute contraindications or severe intolerances. Since MR is still experiencing HF symptoms with an appropriate diet and is adherent to other medications, recommending the addition of an ACEI or ARB would be the next step. Since he has experienced an intolerable ACEI-induced cough in the past, recommending an ARB would be the most appropriate. Increasing the metoprolol could result in bradycardia.

6. The position of the Centers for Medicare & Medicaid Services (CMS) on HF management is to do which one of the following:

A. Provide additional funding for institutions in need
B. Halt reimbursements for hospitals with frequent readmissions
C. Revoke accreditation from institutions who fail to comply with HF core measures
D. Assist hospital administrators in recruiting staff trained to manage patients with HF

Correct answer: B

In an effort to encourage institutions to be actively involved in reducing readmission rates for HF, agencies, such as the CMS, have cautioned that they will no longer reimburse or reduce payment for these patients with frequent readmissions for HF. CMS does not provide any funding or assistance with staff recruitment. Accrediting agencies, such as The Joint Commission (TJC) or the Healthcare Facilities Accreditation Program (HFAP), could potentially revoke accreditation from institutions if specific standards of care are not met.
7. According to the ACC/AHA staging system, which one of the following patients would likely fall under stage C:

A. MR, a woman 58 years of age, with a history of poorly controlled hypertension and chronic obstructive pulmonary disease (COPD)

B. GT, a man 45 years of age, with an EF 10%, awaiting LVAD placement

C. WD, a woman 55 years of age, with a history of diabetes, diagnosed with HFpEF about 3 years ago***

D. BW, a chronic smoker 60 years of age who was recently diagnosed with asymptomatic mitral regurgitation

Correct answer: C

ACC/AHA staging system for HF provides a more accurate depiction of the evolution of the syndrome in comparison with the NYHA classification system. WD would fall under stage C because she has prior symptoms of HF. MR represents a stage A patient because she has HF risk factors present (hypertension), but has not had any symptoms. GT would be categorized as stage D: individuals in the stage have refractory symptoms and require advanced interventions, such as having a mechanical circulatory support device implanted or a heart transplantation. BW would be classified as a stage B patient: these individuals have structural heart disease present (such as asymptomatic valvular heart disease, myocardial infarction, or left ventricular hypertrophy), but have not had any HF symptoms.

8. Mortality benefits have been demonstrated after treatment with which one of the following drugs/drug classes for the management of HFrEF:

A. Digoxin
B. Amlodipine
C. Enalapril***
D. Omega-3 fatty acids

Correct answer: C

Not only should clinicians provide therapies that will help to reduce symptoms for patients with HFrEF, but appropriate mortality-improving agents should definitely be considered. Of the options listed, enalapril (an ACE inhibitor) has demonstrated improved survival for patients with HFrEF. The same outcome has been observed with other ACE inhibitors in other studies. Digoxin has only shown a reduction in hospitalizations, not a reduction in mortality. Amlodipine
has illustrated neutral effects on both morbidity and mortality. Omega-3 fatty acids have not shown any mortality benefits.

9. **HT has been in the hospital because of pulmonary congestion caused by new-onset HF.**
   The pharmacist would likely be involved with all of the following activities except:
   A. Communicate with the pharmacist at the ambulatory clinic associated with your institution about HT’s hospital visit in order to ensure a smooth transition
   B. Provide a 5 minute overview of what HF entails once HT is ready for discharge***
   C. Review HT’s home medication list to detect for potential drugs that could induce or exacerbate HF
   D. If required, make recommendations to the medical team to order evidence-based driven therapies

**Correct answer: B**

As an effort to ensure that TJC core HF standards are met, an interdisciplinary approach is recommended. Pharmacists have key functions as a member of the team, such as communicating with other health care providers who will be involved in managing the patient, reviewing the appropriateness of medication profiles, and making evidence-based recommendations. While pharmacists are also involved with providing discharge education, patients with newly diagnosed HF will need more than 5 minutes to fully understand the condition. Comprehensive sessions can range from 30 to 45 minutes, depending on the patient.

10. **Which one of the following statements is TRUE regarding statin therapy in the management of HF:**
    A. They should be used as apart of GDMT for all patients with HFrEF
    B. They have been associated with a mortality reduction in patients with HFpEF.
    C. They should only be recommended in those patients with concomitant conditions, such as atherosclerotic cardiovascular disease (ASCVD)***
    D. They are useful adjunctive agents for improving morbidity, but not mortality.

**Correct answer: C**

Although the use of statins was not specifically addressed in the 2009 recommendations, recent literature prompted the authors of the 2013 guidelines to only advocate for statin usage in patients with HF only if the individual has a true indication for it. Using a statin adjunctively in a patient with HF and without ASCVD has not demonstrated benefit, thus, should not be recommended as an adjunct to GMDT.