Managing Multiple Medications in Heart Failure-Article

EDUCATIONAL OBJECTIVES:

Upon completion of this program, participants should be better able to:

1. Identify guideline-recommend therapy for heart failure (HF) according to HF stage and left ventricular function.
2. List starting and target doses for guideline-recommended HF therapies.
3. Explain pharmacodynamics and bioavailability of loop diuretics used in HF.
4. Outline recommended evaluation and monitoring parameters for HF therapies.

Post-Test/Rationale:

1. For a patient with Stage C HF, reduced ejection fraction, and no renal impairment, which of the following classes of medication should initially be considered?

   A. Diuretic, ACE inhibitor/ARB/ARNI, beta-blocker, aldosterone antagonist***
   B. Diuretic, ACE inhibitor/ARB/ARNI, beta-blocker, and hydralazine/isosorbide dinitrate
   C. Diuretic, ACE inhibitor/ARB/ARNI, aldosterone antagonist, fish oil
   D. Diuretic, ACE inhibitor/ARB/ARNI, beta-blocker, ivabradine

Correct Answer: A

The ACCF/AHA guideline update for heart failure management in patients with reduced EF call for the 4 classes of medications shown in response A. Isosorbide dinitrate is further recommended in African Americans. Fish oil

A 62-year-old white male comes to your outpatient clinic with a complaint of worsening symptoms of heart failure (increased shortness of breath, edema, weight gain, orthopnea, and tiredness). The patient is currently on enalapril 5 mg bid, metoprolol succinate 25mg bid, and furosemide 80mg qd. There is no history of renal impairment. Blood pressure is 120/80 mmHg, and heart rate is 69 bpm.

2. Which of the following is the most important next consideration in the management of this patient’s heart failure?

   A. Increase beta-blocker dose to 50 mg bid to achieve target dose
   B. Ask the patient about his diuretic response and adjust diuretic by increasing either the dose or the frequency***
   C. Discontinue enalapril and initiate sacubitril/valsartan therapy
   D. Both A and C could be considerations

Correct Answer: B
The patient is fluid overloaded and symptomatic; this needs to be addressed first to rapidly improve symptoms and help to prevent a hospitalization. The beta-blocker dose should not be increased when the patient is symptomatic, so A is incorrect.

The same patient returns to the clinic 6 months later and is feeling great. He is currently on enalapril 5 mg bid, metoprolol succinate 25 mg bid, furosemide 80 mg qd (no history of renal impairment). His blood pressure is 120/80 mmH and heart rate is 69 bpm.

3. What is the next consideration for this patient?
   
   A. Change metoprolol succinate to metoprolol tartrate, since tartrate formulation has been shown in large controlled trials to be of benefit
   B. Increase metoprolol succinate 25 mg bid to 50 mg bid
   C. Discontinue enalapril and initiate sacubitril/valsartan therapy
   D. Both B and C should be considered next in this patient***

Correct Answer: D
The patient is stable and should titrate up beta-blocker dose and consider changing from enalapril to sacubitril/valsartan for improved outcomes.

A patient with symptomatic heart failure (ejection fraction 30%) is started on lisinopril 5 mg qd, carvedilol 3.125 mg bid, and furosemide 40 mg qd. After starting therapy patient complains of mild swelling of the lips and some minor red welts consistent with apparent angioedema. The patient’s lisinopril is discontinued and symptoms resolve.

4. What should be the next step for this patient?

   A. Initiate hydralazine and isosorbide dinitrate therapy
   B. Initiate sacubitril/valsartan therapy
   C. Initiate angiotensin receptor blocker (ARB) therapy***
   D. Either B or C

Correct Answer: C
Patients with history of angioedema should receive a trial of ARB therapy and be carefully monitored, per guidelines. Patients are unlikely to experience angioedema with ARB. Sacubitril is likely to cause angioedema in this patient and is contraindicated.

5. Before initiating spironolactone therapy, the most important consideration is:

   A. Renal function and potassium level***
   B. Diuretic dose and frequency
   C. Liver function tests
   D. All the above

Correct Answer: A
Per guidelines, both serum creatinine and potassium should be evaluated to determine patient eligibility for aldosterone inhibitor (spironolactone) therapy.

6. In which patients is the combination of hydralazine and isosorbide dinitrate recommended per current heart failure guidelines?

   A. Self-identified African Americans, as initial therapy for heart failure
   B. Self-identified African-American patients with HFrEF who remain symptomatic on optimized beta-blocker/ACE inhibitor/ARB therapy***
   C. Patients with heart rate > 70 beats/minute
   D. A and B above

Correct Answer: B
Self-identified African Americans should be considered for hydralazine and isosorbide dinitrate therapy if symptomatic after receiving optimal therapy with ACE inhibitors and beta-blockers, unless contraindicated. In addition, there is a Class IIB recommendation for this combination in non-black patients who are intolerant to ACE inhibitor or angiotensin receptor blocker (ARB) therapy.

7. Upon initiating beta-blocker therapy in patients with heart failure the following may be expected:

   A. Increase in ejection fraction
   B. Increase in cardiac output
   C. Increase in fatigue***
   D. All the above

Correct Answer: C
When starting beta-blocker therapy or increasing the dose some patients experience worsening symptoms, which may include fluid retention and increase in fatigue. It may take weeks to months for patients to feel better. This setback is due to inhibiting the sympathetic drive to the heart resulting in decreased cardiac output. Over time (weeks to months) as the heart adapts to less sympathetic drive (norepinephrine) the heart will remodel and become more efficient, so patients may actually see an improvement in cardiac output and ejection fraction.

8. Which of the following is the most important consideration for digoxin therapy in patients with heart failure?

   A. Decrease mortality
   B. Reduce hospitalizations***
   C. Increase diuresis
   D. All the above

Correct answer: B
Digoxin does not affect mortality or diuresis, so A, C, and D are incorrect. In a secondary analysis of the Dig Trial, digoxin concentrations in the range of 0.5 to 0.9 ng/mL was shown to have the greatest benefit in reducing hospitalizations.

9. To reduce mortality and cardiovascular hospitalizations, the recommended dose for omega-3 polyunsaturated fatty acid (PUFA) as adjunct therapy in patients with NYHA class II-IV symptoms and HFrEF or HFpEF is ____

   A. 1 g once daily***
   B. 1 g twice daily
   C. 4 g once daily
   D. 100 mg twice daily

Correct Answer: A
The AHA guidelines recommend omega 3 PUFA (1 g daily) to reduce mortality rates.

10. Which of the following should be considered in patients with heart failure and preserved ejection fraction (HFpEF)?

   A. Initiate sacubitril/valsartan 24/26 mg twice daily
   B. Initiate ACE inhibitor and beta-blocker therapy
   C. Manage fluid balance and treat risk factors such as hypertension and lipids***
   D. Initiate hydralazine and isosorbide dinitrate in self-identified African-American patients

Correct Answer: C
In contrast to HFrEF, there are no guideline-directed medical therapies shown in randomized controlled trials to improve mortality or reduce hospitalizations in patients with HFpEF. At this time the cornerstone of management for HFpEF is to treat cardiovascular risk factors such as hypertension and dyslipidemia according to current clinical guidelines.