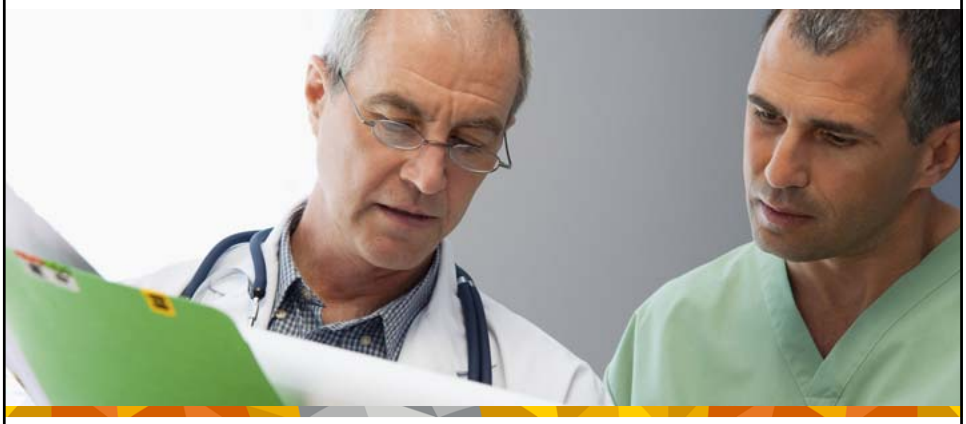
OPTUMHealth™
Education



Heart Failure: Current Treatments and Readmission Avoidance

James Steg, M.D., Mohammed Mirza, M.D., and Sandra Parks, R.Ph
February 2018

Disclosures

James Steg, M.D. has no relevant financial relationships to disclose.

Mohammed Mirza, M.D. has no relevant financial relationships to disclose.

Sandra Parks, R.Ph has no relevant financial relationships to disclose.

Objectives

At the end of this activity, participants should be able to:

- Explore clinical features, risk factors, co-morbidity, evaluation, treatment and admission avoidance for heart failure (HF).
- State the relationship between HF and depression and its impact on HF.
- Discuss the importance of a multidisciplinary approach when treating HF.
- Identify optimal clinical management strategies for HF through case study example.

Agenda

- Definition of Heart Failure
- Key Measure to Assess Heart Failure
- Heart Failure Classifications
- Heart Failure Stages and Functional Classes
- Clinical Case, Part 1
- Depression and Heart Failure
- Pharmacologic Treatment
- Worsening Symptoms of Heart Failure
- Clinical Case Part 2, Inbound Call
- Common Causes of Heart Failure Exacerbation
- Medications That Can Cause HFrEF Exacerbations
- Clinical Case, Part 3
- 2016 ACC/AHA/HFSA Focused Update
- Clinical Case, Part 4

Definition of Heart Failure

- "Heart Failure is a complex clinical syndrome that results from any structural or functional impairment of ventricular filling or ejection of blood."
- "The cardinal manifestations of HF are dyspnea and fatigue, which may limit exercise tolerance, and fluid retention, which may lead to pulmonary and/or splanchnic congestion and/or peripheral edema."
- "There is no single diagnostic test for HF because it is largely a clinical diagnosis based on a careful history and physical examination."
- "The clinical syndrome of HF may result from disorders of the pericardium, myocardium, endocardium, heart valves, or great vessels or from certain metabolic abnormalities, but most patients with HF have symptoms due to impaired left ventricular (LV) myocardial function."
- "HF may be associated with a wide spectrum of LV functional abnormalities, which may range from patients with normal LV size and preserved EF to those with severe dilatation and/or markedly reduced EF. In most patients, abnormalities of systolic and diastolic dysfunction coexist, irrespective of EF."

2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association. Text reprinted with permission of the American Heart Association.

Key Measures

Three key measures to assess with each HF patient:

1. **Ejection Fraction (EF)**
   - Left ventricular EF is important, as it determines our guideline directed medical therapy (GDMT) (aka EBM)
   - HF patients require different GDMT medications or interventions based on their EF

2. **New York Heart Association (NYHA) Functional Classification**
   - Assesses functional status and is key in understanding changes in your patients over time, especially after hospitalizations or health status changes

3. **Stage of HF**
   - Based on EF and symptoms, will guide interventions

HF Classification Definitions

Classification	EF %	Description
Heart Failure with Reduced Ejection Fraction (HF*r*EF)	≤ 40%	Also referred to as systolic HF. Randomized clinical trials have mainly enrolled patients with HF*r*EF and it is only in these patients that efficacious therapies have been demonstrated to date.
Heart Failure with Preserved Ejection Fraction (HF*p*EF)	≥ 50%	Also referred to as diastolic HF. Several different criteria have been used to further define HF*p*EF. The diagnosis of HF*p*EF is challenging because it is largely one of excluding other potential noncardiac causes of symptoms suggestive of HF. To date, efficacious therapies have not been identified.
HF*p*EF, Borderline	41% to 49%	These patients fall into a borderline or intermediate group. Their characteristics, treatment patterns, and outcomes appear similar to those of patient with HF*p*EF.
HF*p*EF, Improved	> 40%	It has been recognized that a subset of patients with HF*p*EF previously had HF*r*EF. These patients with improvement or recovery in EF may be clinically distinct from those with persistently preserved or reduced EF. Further research is needed to better characterize these patients.

2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association. Table reprinted with permission of the American Heart Association.

OPTUMHealth Education

 7

HF Stages and Functional Classes

Heart Failure Stages		NYHA Functional Classifications***	
Stage	**Description**	**Class**	**Description**
A	**Asymptomatic but at risk for HF** • Risk for developing HF: CAD, diabetes, hypertension, familial cardiomyopathy, chemotherapy, etc. • In this stage, there is no structural heart disease	**None**	Asymptomatic
B	**Asymptomatic HF, identified structural heart damage** • For HF*r*EF (EF ≤ 40%) only; Guideline directed medical therapy (GDMT) from ACCF/AHA 2013 apply • All other patients may benefit from these meds, but they are not GDMT supported for HF*p*EF or HF-borderline EF	**I**	No symptoms with ordinary physical activity • No physical activity limitations

***It is important to assess symptoms to determine NYHA Classification at engagement, and at least yearly, with the patient.

2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association

OPTUMHealth Education

 8

HF Stages and Functional Classes

Heart Failure Stages		NYHA Functional Classifications	
Stage	**Description**	**Class**	**Description**
C	**Symptomatic HF** • Guideline directed medical therapy (GDMT) from ACCF/AHA 2013 and 2016 Update Guideline for the Management of HF apply • GDMT will reduce mortality and unplanned admits in HF*r*EF	I	No symptoms with ordinary physical activity • No physical activity limitations
		II	Comfortable at rest; ordinary physical activity results in fatigue, palpitations, dyspnea or anginal pain • Some physical activity limitations
		III	Comfortable at rest; less than ordinary physical activity results in fatigue, palpitations, dyspnea or anginal pain • Notable physical activity limitations
		IV	Symptoms at rest; discomfort increases with any physical activity • Unable to perform physical activity without symptoms

2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association

OPTUMHealth Education

 9

HF Stages and Functional Classes

Heart Failure Stages		NYHA Functional Classifications	
Stage	**Description**	**Class**	**Description**
D	**Symptomatic HF limits basic activities of daily living** • Advanced end stage HF, cardiac output is markedly reduced EF <30%, and patients may receive specialized therapies such as IV inotropes, LVAD, or Transplant • In patients not eligible for these treatments, they can benefit from palliative care or hospice	IV	Symptoms at rest; discomfort increases with any physical activity • Unable to perform physical activity without symptoms

2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association

OPTUMHealth Education

 10

Clinical Case, Part 1
Initial Assessment: Outbound Call to Mrs. Smith

HF Assessment:

- No symptoms with ordinary physical activity (***Think what NYHA class***)
- Cardiologist onboard
- EF: 40%
- 1 recent ED visit and 1 hospital admission 3 months ago
- Advised to weigh daily by provider – weighs about 3-4 x / week
- Reported BP: 136/76
- Attempts to adhere to low sodium diet
- Takes Cozaar® (losartan) 100 mg QD, Lopressor® (metoprolol succinate) 100 mg QD, Demadex® (torsemide) 40 mg QD, Lipitor® (atorvastatin) 40 mg QD, Aspirin™ (ASA) 81 mg QD, and Lexapro® (escitalopram) 10 mg QD
- HF, CAD, HBP, Osteoarthritis knees and Depression/Anxiety

Question 3

OPTUMHealth Education

 11

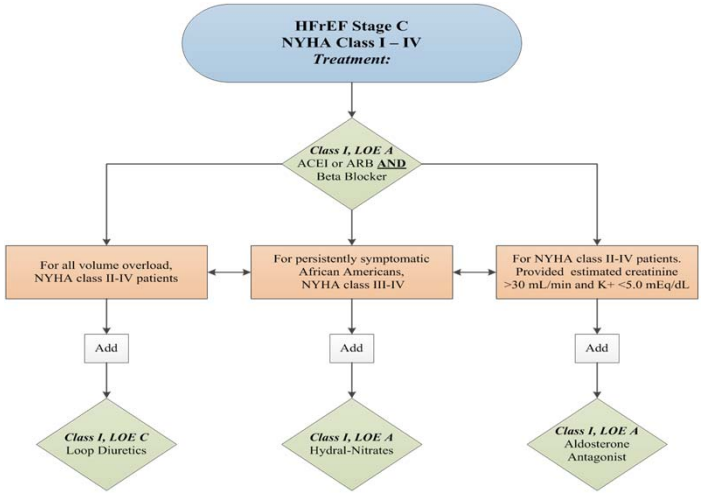
Depression and Heart Failure

- Depression is an important comorbidity of HF per 2013 ACCF/AHA Guideline for the management of HF
- Depression is common in patients with HF
  - 20-40% of HF patients have major depressive disorder (MDD)
  - 4-5% higher prevalence in the general population
- Those with depressive symptoms have lower quality of life, poorer self-care, and increased hospitalizations
  - Results from meta-analysis suggest a twofold increase in mortality in HF patients as compared to those without depression
- HF and depression mechanisms still remain unclear
- The proposed potential pathophysiologic mechanisms to explain the high prevalence of depression include:
  - Autonomic nervous system dysfunction
  - Inflammation
  - Cardiac arrhythmias
  - Altered platelet function
- The most effective depression intervention strategy is not known with knowing remission from depression may improve cardiovascular outcomes
- To date, pharmacological management of depression in HF has not been shown to improve major HF outcomes

OPTUMHealth Education

 12

HF Pharmacologic Treatment for Stage C HF*r*EF



2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association. Figure reprinted with permission of the American Heart Association.

OPTUMHealth Education

 13

Clinical Case, Part 1
Initial Assessment: Outbound Call to Mrs. Smith

HF Assessment:

- No symptoms with ordinary physical activity ***(Think NYHA class)***
- Cardiologist onboard
- EF: 40%
- 1 recent ED visit and 1 Admission 3 months ago
- Advised to weigh daily by provider – weighs about 3-4 x / week
- Reported BP 136/76
- Attempts to adhere to low sodium diet
- Takes Cozaar® (losartan) 100 mg QD, Lopressor® (metoprolol succinate) 100 mg QD, Demadex® (torsemide) 40 mg QD, Lipitor® (atorvastatin) 40 mg QD, Aspirin™ (ASA) 81 mg QD, and Lexapro® (escitalopram) 10 mg QD
- HF, CAD, HBP, Osteoarthritis knees, and Depression/Anxiety

Question 4

OPTUMHealth Education

 14

"What Worse Looks Like"

Worsening Symptoms of HF

- New or worsening SOB with activity or when laying down
- New or worsening swelling in feet, ankles, legs, or abdomen
  - Clothes tighter than usual
  - Can't fit into shoes
- New or worsening fatigue or weakness in arms/legs making normal tasks harder (walking to mailbox, stairs, standing to make a meal)
- New or worsening weight gain (3 lbs in one day)
- New or worsening cough / wheeze
- Nausea / lack of appetite
- New or worsening confusion or memory loss

Inbound Patient Call, Clinical Case Part 2

(Inbound Call Part 1)

Patient: "I just wanted to call and let you know that I've been feeling a little off the past few days."

RN CM: "Oh, sorry to hear that. Can you tell me more about that?"

Patient: "Well, I've been more tired than usual and yesterday I noticed my ankles were swelling up. My knees are more sore than usual."

RN CM: "Hmmm…anything else going on?"

Patient: "Well, I didn't sleep so well last night either. Seems like each time I started to fall asleep, I woke up again. I ended up adding a couple of pillows under my head and that seemed to help."

RN CM: "I can see why you are concerned. I'm glad you called this morning. Is your doctor aware of how you are feeling today?"

Patient: "No, I thought I would just give you a call. I hate to bother my doctor if it's nothing."

Question 5

Inbound Patient Call
(Part 2)

- RN CM: "Have you ever had symptoms like this before?"
- Patient: "Yes, once. I had to see the doctor for some blood drawn and a prescription."
- RN CM: "So, tell me this: I know you are taking medications for your heart…Metoprolol and Losartan. Have you recently missed any doses?"
- Patient: "Oh, no! I take my heart pills just like the doctor tells me to!"
- RN CM: "Good to hear! So what about your water pill, the Torsemide? Have you missed any doses of that one lately?"
- Patient: "Well, I didn't take that one over the weekend because my grandkids came to visit. I can't be running to the bathroom all the time when I have company over!"
- RN CM: "Grandkids! Oh, I bet you had a fun weekend. Have you noticed your clothes feeling tighter? Or any weight gain?"
- Patient: "Yes, my pants are tight this morning and the scale shows I've put on five pounds since the weekend!"
- RN CM: "How did you manage company and sticking to your low salt diet?"
- Patient: "Well, we did go thru the drive thru for a burger and fries. And then I made my famous fried chicken with mac & cheese that those kids love so much. I guess that explains why I am so tired. Those kids wore me out."

Question 6

 17

Inbound Patient Call
(Part 3)

- RN CM: "Hmmm…. Sounds like it might be more than just being worn out from the grandkid's visit. It's very important you take your medications (including torsemide) just like your doctor ordered. Missing your medications may cause you to retain fluids and cause some difficulty breathing. That extra fluid can back up around your heart and be really noticeable when you try to lay down to sleep. That may be why the extra pillows helped last night. Are you coughing at all?"
- Patient: "Yes, I've been coughing since the middle of the night. I thought maybe those kids got me sick."
- RN CM: "Well, maybe, but that cough can also be a sign that you have some extra fluid backing up around your heart. Have you taken your pills including torsemide today?"
- Patient: "Not yet, I'm just not feeling good…I don't even have the energy to make my breakfast today."
- RN CM: "Is there anything else you are feeling? Any chest discomfort, weakness or difficulty breathing?"
- Patient: "No, just very tired. I just want to curl up and sleep in my recliner."

Question 7

 18

Common Causes of HF Exacerbation

Coronary Artery Disease
New coronary ischemia (silent or with chest pain)

Hypertension
Poorly controlled BP is a cardiac strain

Valvular Heart Disease
Valves failing can lead to HF symptoms

Environmental Factors
Alcohol, stress, tobacco use, sodium intake, and medications

Arrhythmias
Patients with HF may develop a new rhythm disturbance (bradycardia, tachycardia, atrial fibrillation, etc.)

Respiratory Compromise/Hypoxemia
Due to COPD, pneumonia, sleep apnea, or pulmonary hypertension from a number of causes

Non-Adherences
Not adherent to medications for HF and/or comorbidities which increase risk of HF

Medications That Can Cause HF*r*EF Exacerbations

"Drugs known to adversely affect the clinical status of patients with current or prior symptoms of HF*r*EF are potentially harmful and should be avoided or withdrawn whenever possible." *Text reprinted with permission of the American Heart Association*

- Advil® (Ibuprofen) (any other Nonsteroidal anti-inflammatory drugs {NSAID}):
  - Increase fluid retention leading to worsening of HF by reducing flow through the kidney
  - Many patients do not report over the counter NSAID use to their provider. ***This is an opportunity for patient education and to notify NSAID use to the provider's attention.***
- Most antiarrhythmic drugs (such as Cordarone® {amiodarone}, Tambocor ® {flecainide})
- Most calcium channel–blocking drugs (except Norvasc® {amlodipine})
- Actos® (pioglitazone)

2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association

Clinical Case (Part 3)
Mrs. Smith Goes to Dr. Jones

- After warm conference call talking with Dr. Jones' nurse, appointment made for that afternoon, 3 p.m.
- Mrs. Smith states to Dr. Jones' nurse that she has been taking Ibuprofen 200 mg, 3 tabs (total 600 mg), 2-3 times/day for the last week, wanting to minimize her knee pain during her grandchildren's visit
- Physical Examination
  - Vital signs (VS) revealed T 99.1, BP 152/92, P 104 regular, RR 24, and weight 172 (increased 9 lbs since visit 6 weeks ago)
  - Lungs: Fair air movement bilaterally with bibasilar rales and scattered wheezes
  - Cardiac: Regular rhythm, no significant murmurs
  - Lower ext: 2+ pitting edema to mid shins bilaterally
- EKG reveals sinus tach with no acute ST, T wave changes
- CXR reveals changes consistent with mild HF

Question 8

2016 ACC / AHA / HFSA Focused Update
Pharmacological Treatment for Stage C HF*r*EF: Recommendations

Recommendations for Renin-Angiotensin System inhibition with ACE Inhibitor or ARB or ARNI (angiotensin receptor blocker Neprolysin Inhibitor, only current one is Entresto® (valsartan/sacubitril)

COR*	LOE**	Recommendations
I	ARNI: B-R	**In patients with chronic symptomatic HF*r*EF NYHA class II or III who tolerate an ACE inhibitor or ARB, replacement by an ARNI is recommended to further reduce morbidity and mortality.**

*Class of Recommendation
**Level of Evidence

2016 ACC/AHA/HFSA Focused Update on New Pharmacological Therapy for Heart Failure.
Table reprinted with permission of the American College of Cardiology.

2016 ACC / AHA / HFSA Focused Update

Pharmacological Treatment for Stage C HF*r*EF: Recommendations

COR*	LOE**	Recommendations
IIa	B-R	**Ivabradine can be beneficial to reduce HF hospitalization for patients with symptomatic (NYHA class II-III) stable chronic HF*r*EF (LVEF ≤35%) who are receiving GDMT (aka EBM) including a beta blocker at maximum tolerated dose, and who are in sinus rhythm with a heart rate of 70 bpm or greater at rest.**

*Class of Recommendation
**Level of Evidence

- One RCT demonstrated the efficacy of Colanor® (ivabradine) in reducing the composite endpoint of cardiovascular death or HF hospitalization – this benefit was driven by a reduction in HF hospitalization

2016 ACC/AHA/HFSA Focused Update on New Pharmacological Therapy for Heart Failure.
Table reprinted with permission of the American College of Cardiology.

OPTUMHealth Education

 23

Clinical Case (Part 4)

Mrs. Smith Follows Up 4 Weeks Later with Dr. Jones

- Mrs. Smith has been taking her prescribed medications regularly and stopped Advil® (ibuprofen) as instructed. She has been taking Tylenol® (acetaminophen) 500 mg TID (3 times a day) as needed for knee pain with good result.
- Patient notes that she does get short of breath walking 100 feet from her front porch to the mailbox (***Think NYHA class***).
- Physical Examination
  - VS revealed T 98.2, BP 130/82, P 68 regular, RR 18, and weight 164 lbs. (decreased 8 lbs. since visit 4 weeks ago)
  - Lungs: Fair air movement bilaterally without wheezes, rales
  - Cardiac: Regular rhythm, no significant murmurs
  - Lower ext: Trace pedal edema bilaterally

OPTUMHealth Education

Question 9

 24

Lago Atitlan, Guatemala: Hands of Healing Missions October 2014, 2015, 2016, and Planned April 2018

Questions ?

OPTUMHealth Education

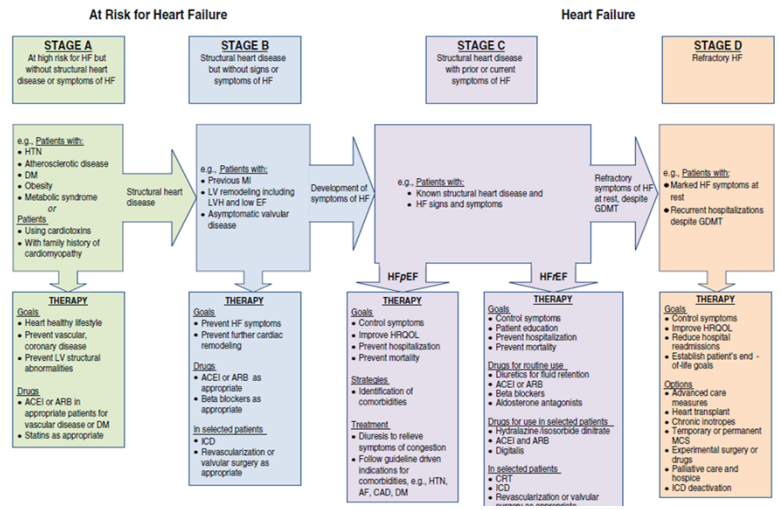
 25

OPTUMHealth Education

Thank You

Appendix: Managing Co-morbidities in HF

Required throughout the progression of illness



2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association. Table reprinted with permission of the American Heart Association.

References

- 2013 ACCF/AHA Guideline for the Management of Heart Failure: American College of Cardiology/American Heart Association. , Update Jan 2013, Accessed on Dec 13, 2017).
- 2016 ACC/AHA/HFSA Focused Update on New Pharmacological Therapy for Heart Failure: An Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure. Updated Jan 2016, Accessed on Dec 13, 2017).
- Mbakwem A. et.al. Expert Opinion-Depression in Patients with Heart Failure: Is Enough Being Done? Card Fail Rev. 2016 Nov; 2(2): 110-112, bakwem, Updated Nov 2016, Accessed Jan 3, 2017.
- Yancy CW, et.al. , 2016 ACC/AHA/HFSA Focused Update on New Pharmacological Therapy for Heart Failure: An Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure, Journal of the American College of Cardiology (2016), doi: 10.1016/ j.jacc.2016.05.011, Updated Sep 2016, Accessed Jan 4, 2017.