

Otterbein University

## Digital Commons @ Otterbein

---

Nursing Student Class Projects (Formerly MSN)

Student Research & Creative Work

---

Summer 8-8-2021

### Heart Failure

Meredith Louden

meredith.louden@otterbein.edu

Follow this and additional works at: [https://digitalcommons.otterbein.edu/stu\\_msn](https://digitalcommons.otterbein.edu/stu_msn)



Part of the [Nursing Commons](#)

---

#### Recommended Citation

Louden, Meredith, "Heart Failure" (2021). *Nursing Student Class Projects (Formerly MSN)*. 469.  
[https://digitalcommons.otterbein.edu/stu\\_msn/469](https://digitalcommons.otterbein.edu/stu_msn/469)

This Project is brought to you for free and open access by the Student Research & Creative Work at Digital Commons @ Otterbein. It has been accepted for inclusion in Nursing Student Class Projects (Formerly MSN) by an authorized administrator of Digital Commons @ Otterbein. For more information, please contact [digitalcommons07@otterbein.edu](mailto:digitalcommons07@otterbein.edu).

# Heart Failure

Meredith G. Loudon

Otterbein University, Westerville, Ohio

## Topic

Heart Failure/ Congestive Heart Failure (CHF)  
 • Heart's inability to pump blood to maintain flow needed by the body (Ma et al., 2020)  
 • Classified by degree of ejection fraction (EF), whether reduced with EF <50% or preserved with EF >50% (Ma et al., 2020)

## Why CHF?

• CHF affects about 40 million people globally (Ma et al., 2020)  
 • More than 6.5 million people are diagnosed with CHF in the United States (Hsu et al., 2017)  
 • CHF creates a financial burden for a health system with limited resources, "resulting in one of the greatest health, organizational and economic issues facing medical services globally" (Verdu-Rotellar et al., 2020, p. 474)

## Signs & Symptoms

Clinical presentation varies dependent on cause: congestion or decreased cardiac output (CO)  
 • Congestion symptoms: orthopnea, dyspnea, paroxysmal nocturnal dyspnea, edema, JVD, hemoptysis, weight gain  
 • Low CO symptoms: fatigue, weakness, exercise intolerance, low urine output, low blood pressure (Aguanno & Samson, 2017)

## Pathophysiology

Pathophysiology of CHF is dependent upon the cause: diastolic or systolic, left sided, preserved EF (HFpEF) or reduced EF (HFrEF)  
 • "HFpEF involves left ventricular diastolic dysfunction, resulting from impaired left ventricular relaxation and increased stiffness, which contributes to elevated left atrial pressure" (Normand et al., 2019, p. 1046)  
 • Blood remains upstream of ventricles, which results in increased filling pressures (congestion) that impair organ function (Harjola et al., 2018)  
 • "Pulmonary congestion and pulmonary edema occur when blood remains upstream of the left ventricle due to elevated left atrial pressure; congestion of organs in abdominal cavity ensues when blood remains upstream of the right ventricle" (Harjola et al., 2018, p. 3)  
 • CHF causes inadequate perfusion due to low cardiac output, which results in tissue hypoxia, cell death, and organ dysfunction (Harjola et al., 2018)

Table below shows classifications of CHF based on EF% remaining (Aguanno & Samson, 2017)

Type	Classification	EF%	Description
I	Heart Failure with Reduced Ejection Fraction (HFrEF)	≤ 40%	Also referred to as systolic HF. Randomized controlled trials have mainly enrolled patients with HFrEF and it is only in these patients that effective therapies have been demonstrated to date.
II	Heart Failure with Preserved Ejection Fraction (HFpEF)	≥ 50%	Also referred to as diastolic HF. Several different criteria have been used to further define HFpEF. The diagnosis of HFpEF is largely one of excluding other potential non-cardiac causes of symptoms suggestive of HF. To date, effective therapy has not been identified.
IIa	HFpEF, Borderline	41 to 49%	These patients fall into a borderline or intermediate group. Their characteristics, treatment patterns, and outcomes appear similar to those patients with HFpEF.
IIb	HFpEF, Improved	>40%	It has been recognized that a subset of patients with HFpEF previously had HFrEF. 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.

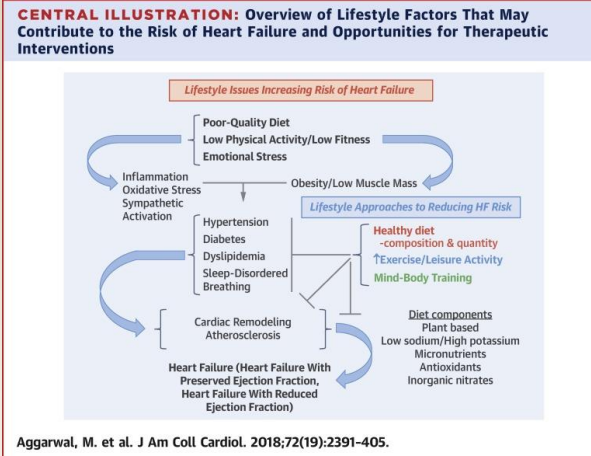
## Clinical Significance

• Patients 65 years or older account for 80% and 90% of heart failure-related hospitalizations and deaths (Son et al., 2020)  
 • "Despite advances in early diagnosis and treatment of heart failure, its debilitating characteristics result in substantial morbidity and a high burden of long-term management" (Son et al., 2020, p. 1)

## Nursing Care

• "Nurse-led heart failure management programs reduced the heart failure specific readmission rate by 32%" (Son et al., 2020, p. 2)  
 • Evidence recommends patients with EF <35% and symptoms despite >3 months of regimented, medical treatment have a cardioverter defibrillator implanted to reduce sudden cardiac death and mortality (Brink, 2018)  
 • Joint Commission recommends inclusion of family caregivers in discharge education (Son et al., 2020, p. 11)

## Risk Factors



## Treatments

• Remove excess fluid in patients with volume overload with loop diuretics (Harjola et al., 2018)  
 • Pharmacological therapies include "angiotensin converting enzyme inhibitors (ACEs) and, when ACEs are contraindicated, angiotensin receptor blockers (ARBs) and loop diuretics" which have been shown to reduce mortality and hospitalizations (Aguanno & Samson, 2018, p. 8)  
 • "Unless contraindicated, all patients with a reduced EF should receive a beta-blocker and an ACE inhibitor or ARB" (Brink, 2018, p. 22)  
 • "Vasodilators improve ventricular function by reducing afterload and decrease symptoms by reducing cardiac filling pressure. Nitrates (nitroglycerin, nitroprusside) are direct-acting vasodilators" (Harjola et al., 2018, p. 13)  
 • Early recognition of symptoms/ worsening of symptoms with consecutive interventions helps minimize hospitalizations (Vuckovic et al., 2020)  
 • Digoxin can help to reduce exercise intolerance but has no effect on reducing mortality (Brink, 2018)  
 • Inotropic agents, such as Dobutamine and Milrinone, can be used in severe states of hypoperfusion (Harjola et al., 2018)  
 • Patients should be enrolled in cardiac rehabilitation programs/ participate in home exercise programs (Aggarwal et al., 2018)  
 • Left ventricular assist devices and cardiac transplants may be beneficial to patients with refractory symptoms (Brink, 2018)

## Complications

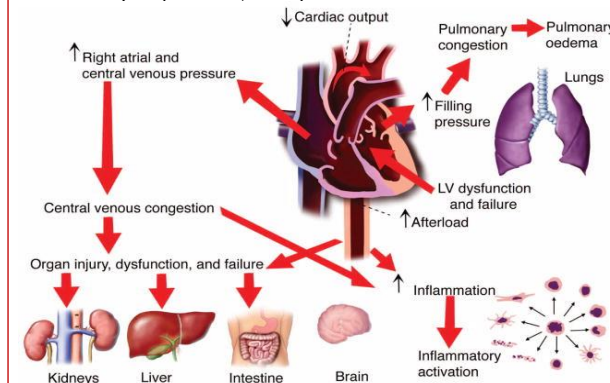
Heart failure decompensation can be precipitated by factors including:

- respiratory infections
- transgression in dietary restrictions
- non-compliance with pharmacological therapies
- hypertension
- cardiac arrhythmias (Verdu-Rotellar et al., 2020)

Other complications:

- Cardiorenal syndrome: results in kidney injury and worsening dysfunction due to "inflammatory mediators, iatrogenic damage (contrast media, nephrotoxic medication), low cardiac output and elevated intra-abdominal pressure" (Harjola et al., 2018, p. 6)
- Atrial fibrillation (Afib): up to 50% of patients with CHF will develop Afib or wide QRS complexes (Normand et al., 2019)
- Atrial fibrillation with rapid ventricular rate (Afib w/ RVR): patients with CHF are at an increased risk for Afib w/ RVR, which pathologically causes "loss of atrioventricular synchrony, and decrease in the contribution of atrial contraction to ventricular filling" (Verdu-Rotellar et al., 2020, p. 478)
- Pulmonary hypertension (pulm HTN): up to 80% of patients with CHF have pulm HTN due to increasing left atrial and pulmonary venous pressures caused by diastolic dysfunction (Ma et al., 2020)

The below picture illustrates the effects of congestion related to heart failure decompensation on end organs of the body. LV, left ventricle (Harjola et al., 2018)



## Conclusions

- "Health-related quality of life is known to be much worse in people with heart failure than those with other chronic conditions" (Son et al., 2020, p. 1)
- Evidence has shown that CHF can be prevented by the maintenance of lifestyle choices and modifications (Aggarwal et al., 2018)
- 66% of the causes of CHF decompensation are preventable (Verdu-Rotellar, 2020)
- "With the rapidly increasing number of older adults and the irreversible nature of heart failure, it poses an overwhelming burden requiring further efforts to reduce adverse health outcomes and improve quality of life" (Son et al., 2020, p. 2)

## References



SCAN ME



OTTERBEIN UNIVERSITY