

**Understanding Heart Failure: Signs, Risk Factors, and Treatments**

Marisol Isabelle Azar

Margaret H Rollins School of Nursing

Nursing 102: Nursing Care of Adults

Dr. K. Zahner

March 17, 2024

## **Understanding Heart Failure: Signs, Risk Factors, and Treatments**

Heart failure is a cardiovascular issue that is highly significant in the United States. Heart disease is the leading cause of death in the country with an estimated one-year fatality rate of 24% among adults (Emmons et al., 2022). Heart failure is when the heart is unable to pump effectively, leading to a decreased cardiac output and inefficient perfusion of tissue. Heart failure manifests through a wide variety of symptoms, with the most common including fatigue, shortness of breath, and edema. This essay will provide a comprehensive overview of heart failure, evidence-based practice for prevention and screening, treatments with lifestyle and risk modifications and the nurses role in the prevention and treatment of this condition. Nurses play a vital role in educating the community about heart failure, which is essential in minimizing its detrimental impact on public health.

### **Statement of the Problem**

#### **Significance and Pathophysiology Overview**

At least six million people in the United States are living with heart failure, making it a significant health concern in the country (Chen & Aronowitz, 2022). The heart's inability to pump sufficient blood to meet the body's needs characterizes the pathophysiology of heart failure. The symptoms associated with distinct types of heart failure vary, yet a handful of symptoms will overlap such as fatigue and generalized weakness. Identifying the pathophysiology of the cardiovascular system provides the first steps to understanding this condition.

Unxygenated blood first enters the inferior vena cava or superior vena cava into the right atrium of the heart. It then travels into the right ventricle which pumps the blood through the pulmonary artery to be oxygenated by the lungs. After, it is returned through the pulmonary

vein to the left atrium to the left ventricle where it is pumped out into the body through a big, large-lumened artery known as the aorta which supplies oxygenated blood to the entire body.

Left-sided heart failure occurs when the left ventricle cannot pump efficiently. The blood is consequently pooled back into the left atrium and the pulmonary vein and ends up congested in the lungs, causing pulmonary edema. Hence why left-sided heart failure is associated with lung symptoms such as coughing and shortness of breath. Along with these debilitating symptoms, left-sided heart failure may cause right-sided heart failure.

The right ventricle must compensate and pump harder to pass the blood into the congested lungs. Eventually the right ventricle weakens and blood backs up into the IVC and SVC. As deoxygenated blood cannot effectively transport back to the heart via these veins, the blood backs up into the rest of the body. This explains why right-sided heart failure is associated with peripheral edema. As blood is pooled into the IVC the internal jugular veins (directly above) may appear distended as they are swollen with blood. The location of heart failure (right vs left) is crucial to identify, however further categorization of heart failure (systolic vs diastolic) is important too. Systolic heart failure is when the ventricles cannot contract strong enough to pass blood along. Diastolic heart failure is when the ventricles cannot relax to fill up with the proper amount of blood. These both lead to decreased cardiac output and ineffective tissue perfusion in the body.

### **Effects on Nursing Practice**

Nurses play a critical role in assessments and implementation of interventions that aid in deciphering the symptoms of heart failure. It is imperative that they are knowledgeable and educate the public community on causations of this condition. Identifying early signs such as crackles in the lungs or abnormal heart sounds are also imperative. In preexisting cases, nurses

must address the decrease in cardiac output, support respiratory function, and manage fluid and electrolyte balance. Nurses' responsibility revolves around knowing and executing correct treatments and modifying risk factors that may decelerate the occurrence of this disease. Nurses play a vital role in preventing heart failure and improving quality of life for patients already battling this condition.

### **Risk Reduction/Treatment of the Problem**

#### **Evidence-Based Prevention and Screening**

The prevention of heart failure is to change modifiable risk factors. If these risk factors are found and controlled, the incidence of heart failure may be minimized. Significant risk factors associated with the development of heart failure include atherosclerosis, tobacco use, and diet. As these risk factors become more prevalent in the general population, heart failure has also become more ubiquitous.

#### **Treatment Options**

In addition, there are medicational management treatment options for patients with heart failure that cannot be sufficiently controlled with lifestyle modifications. The most common types are ACE inhibitors such as lisinopril and diuretics such as furosemide. These medicines correct the excess fluid volume that occurs with heart failure.

Inadequate perfusion from the heart to the kidneys imitates hypovolemia, the lack of adequate fluid volume in the body. The kidneys then turn on a compensatory mechanism known as the RAAS system, one of the main controllers of blood pressure in the body. When perfused inadequately, the kidneys presume it is due to low blood pressure caused by hypovolemia. The hormone renin is then released, starting a cascade which produces angiotensin II. Angiotensin II causes vasoconstriction and causes the adrenal cortex to release aldosterone, causing sodium and

water reabsorption. The kidneys believe they are doing a beneficial action, but they are instead causing an increase in blood volume and blood pressure that increases the afterload and work of an already weakened heart.

ACE inhibitors block the conversion of angiotensin I into angiotensin II, widening blood vessels and increasing proper perfusion to the tissues of the body while reducing the workload of the heart.

Diuretics manage excess fluid volume by increasing the excretion of sodium and water, further reducing the afterload and vascular resistance on the heart (Mullens et al., 2019). As well as relieving symptoms caused by excess fluid volume such as peripheral swelling and SOB from pulmonary edema.

### **Positive Lifestyle Choices**

Lifestyle changes are crucial in the prevention of heart failure. By implementing smoking cessation and eating a proper healthy diet, lifestyle modifications can be remarkably efficacious, preventing the internal battle of heart failure. Both tobacco cessation and a healthy diet reduce the risk of developing atherosclerosis, the buildup of plaque in arteries. Atherosclerosis is one of the dominant causes of cardiovascular disease such as heart failure (Heart Research Institute, 2023). Modifying these changeable risk factors are the first stage of treatment for heart failure.

Tobacco smoking is a major risk factor for atherosclerosis, causing harmful effects on vascular endothelial cells and increasing platelet adherence (Lawson 2023). As stated above, atherosclerosis is a major contributor to heart failure. Another study cites “Smoking is considered a major modifiable risk factor for HF, accounting for 14% of excess risk of incident HF” (Ding et al., 2022, p. 2).

“Poor dietary quality has surpassed all other mortality risk factors, accounting for 11

million deaths and half of CVD deaths globally” (Sikand & Severson 2020). Poor diet leads to an increase in the development of atherosclerosis. A diet with adequate fruits and vegetables along with lower sodium, trans fat, and cholesterol may help prevent this. Cholesterol should be limited to less than 200 mg a day while protein should be consumed from plant-based sources (Sikand & Severson 2020).

### **Planning of Teaching Content**

Implementing teaching strategies such as interactive sessions on risk factor modifications including diet and smoking cessation along with education on recognizing the signs and symptoms of heart failure are vital. The learner will be able to state the common signs and symptoms of heart failure such as SOB, peripheral and pulmonary edema, and weakness/fatigue. The learner will also be able to identify the proper diet to prevent heart failure (high in fruits and vegetables, low in cholesterol, sodium, and trans-fat). Physical teaching tools will include brochures with the common signs and symptoms of heart failure, proper diet, along with a model illustrating normal heart anatomy.

### **Conclusion**

Heart failure needs to be more widely recognized as well as educated on by healthcare professionals. Nurses are vital in the role of educating the community about heart failure, as this information can help lessen the negative impact of this disease in the public population. The role of implementing evidence-based practices to prevent and treat heart failure can empower individuals to improve their health. By spreading this knowledge, nurses can better serve the community.

## References

- Chen J, Aronowitz P. (2022). Congestive Heart Failure. *Med Clin North Am.* 106(3):447-458.  
<https://doi.org/10.1016/j.mcna.2021.12.002>.
- Ding, N., Shah, A. M., Blaha, M. J., Chang, P. P., Rosamond, W. D., & Matsushita, K. (2022). Cigarette smoking, cessation, and risk of heart failure with preserved and reduced ejection fraction. *Journal of the American College of Cardiology*, 79(23), 2298–2305.  
<https://doi.org/10.1016/j.jacc.2022.03.377>
- Emmons-Bell, S., Johnson, C., & Roth, G. (2022). Prevalence, incidence, and survival of heart failure: a systematic review. *Heart (British Cardiac Society)*, 108(17), 1351–1360.  
<https://doi.org/10.1136/heartjnl-2021->
- Heart Research Institution. (2023) *Atherosclerosis: Causes and Risk Factors*  
<https://www.hri.org.au/health/learn/cardiovascular-disease/atherosclerosis-causes-and-riskfactors>
- Mullens, W., Damman, K., Harjola, V. P., Mebazaa, A., Brunner-La Rocca, H. P., Martens, P., Testani, J. M., Tang, W. H. W., Orso, F., Rossignol, P., Metra, M., Filippatos, G., Seferovic, P. M., Ruschitzka, F., & Coats, A. J. (2019). The use of diuretics in heart failure with congestion - a position statement from the Heart Failure Association of the European Society of Cardiology. *European Journal of Heart Failure*, 21(2), 137–155.  
<https://doi.org/10.1002/ejhf.1369>

Lawson J. S. (2023). The rise and fall of tobacco smoking and associated rise and fall of coronary atherosclerosis the lethal role of tobacco. *Frontiers in cardiovascular medicine*, 10, 1267205. <https://doi.org/10.3389/fcvm.2023.1267205>

Sikand, G., & Severson, T. (2020). Top 10 dietary strategies for atherosclerotic cardiovascular risk reduction. *American Journal of Preventive Cardiology*, 4, 100106. <https://doi.org/10.1016/j.ajpc.2020.100106>