

Discussion Questions: Heart Failure

Application of Course Knowledge

- **Differentiate between systolic and diastolic heart failure.**
- **State whether the patient is in systolic or diastolic heart failure.**
- **Explain the pathophysiology associated with each of the following symptoms: dyspnea on exertion, pitting edema, jugular vein distention, and orthopnea.**
- **Explain the significance of the presence of a 3rd heart sound and ejection fraction of 25%.**

Systolic heart failure is when the left ventricles of the heart cannot contract completely. The heart is unable to generate adequate cardiac output for perfusion. According to McCance, K. L., & Huether, S. E., systolic heart failure is heart failure with reduced ejection fraction (HFrEF) with an ejection fraction of less than 40% along with the inability of the heart to adequately produce cardiac output to perfuse vital tissues, (2019). The heart cannot pump forcefully enough to move blood throughout the body.

In diastolic heart failure, the left ventricles can no longer relax between heartbeats because the tissues have become stiff. Diastolic heart failure is defined as pulmonary congestion even though a patient may have a normal stroke volume and cardiac output, (McCance, K. L., & Huether, S. E., 2019). Diastolic heart failure is heart failure with preserved ejection fraction (HFpEF). When the heart cannot fully relax, the heart will not be able to fill up properly with blood before the next contraction.

In this case study, the patient is in systolic heart failure. In heart failure, a person's heart is unable to generate adequate cardiac output by not being able to fill properly, or pump effectively. In this case study, we see that the patient's ejection fraction is 25% which means the patient's heart has the inability to provide adequate cardiac output to perfuse vital tissues, (McCance, K. L., & Huether, S. E., 2019). Myocardial infarction is the most common cause of decreased contractility. This patient had a silent MI that caused his heart tissues to stiffen resulting in the heart to not fill properly.

Dyspnea is having difficulty breathing, and dyspnea on exertion is caused by failure of the left ventricular output to rise during exercise resulting in an increase of pulmonary venous pressure. This means the blood is back flowing into the lungs causing interstitial pulmonary edema, (McCance, K. L., & Huether, S. E., 2019). Since the heart cannot pump out enough blood from the lungs, pressure in the heart builds up and pushes the extra fluid into the lungs' alveoli making it difficult for the patient to breathe on exertion. This symptom also goes hand-in-hand with orthopnea. When the patient is laying down, this causes blood from the patient's legs to flow back to the heart and lungs. The heart is now working against gravity which increases pressure in the blood vessels of his lungs. The extra fluid in the lungs makes it difficult to breathe and usually patients will feel better when sitting propped up on a few pillows.

Jugular vein distention is a manifestation of abnormal right heart mechanics, most likely caused by elevated pulmonary pressure from left heart failure. This distention usually implies fluid overload. Just like how the blood cannot be moved out of the lungs adequately, this also affects the right side of the heart including the superior