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CardioMEMS Heart Failure System: Keeping Patients out of the Hospital

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CardiMEMS Heart Failure System: Keeping patients out of the hospital
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Introduction

Pathophysiology

When the heart, or myocardium, cannot pump enough blood to meet the body’s demands, heart failure occurs. The body responds to this stress by increasing blood pressure, breathing more rapidly, and moving liquid from the body into the lungs. If the heart is unable to pump enough blood, the body may become unable to function. The body’s tissues cannot receive enough oxygen and nutrients to work properly. Without these supplies, the body’s cells cannot function. As a result, the body’s organs may fail. The most common causes of heart failure are coronary artery disease (CAD), a very common cause of CHF, results in coronary vessels becoming blocked or restricted.

When blood is not adequately pumped out of the heart, the body cannot deliver oxygen and nutrients to the body’s tissues. The body’s tissues may become starved for oxygen and nutrients. The body’s tissues may not be able to work properly. This can lead to fatigue, shortness of breath, and other symptoms. The body’s tissues may become damaged.

CardiMEMS HF System

The CardioMEMS HF System consists of a small, battery-free sensor, an antenna, and a wireless electronics unit. The sensor is permanently placed in the body by a physician under fluoroscopy into the PA via the femoral vein (St. Jude Medical, 2014). The CardioMEMS sensor continuously monitors the patient’s PAPs and sends the data to a wireless electronics unit. The sensor is permanently placed in the body by a physician and wirelessly transmits data to a wireless electronics unit. The wireless electronics unit then sends the data to a central server so that the clinician can monitor the patient’s PAPs and adjust patients’ medications before the patient is discharged from the clinic. The CardioMEMS HF System is a non-invasive procedure, there are rare complications that can occur (St. Jude Medical, 2014).

References


Conclusion

If the baby boomer generation to come, there will undoubtedly be an increase in the number of cardiac and pulmonary failure patients. While focus should remain on preventative care, education, and reducing risk factors for developing HF, the goal of care will continue to be improving quality of life while minimizing dependency and evidence-based care. (2013). Patient Care, 47, 247-250. doi:10.1097/01.NPC.0000441339.27814.d3

Nursing Implications

It is inevitable that nurses will care for patients with some degree of CHF. It is important for nurses to understand the pathophysiology of HF. In doing so, nurses can use their knowledge of pathophysiology to ensure the best care for patients with HF. In order to meet the needs of patients with HF, nurses may need to expand their scope of practice.

When pathologic changes of CHF may be reversible, such as infection and physical inactivity, many causes are not, such as hypertension and ischemic heart disease. Chronic obstructive pulmonary disease (COPD), coronary artery disease (CAD), a very common cause of CHF, results in coronary vessels becoming blocked or restricted.

Figure 2. Antennas and wireless electronic units. Adapted from St. Jude Medical, Inc., 2014. doi:10.1177/1081073413505033

Figure 3. Adapted from St. Jude Medical, Inc., 2014. doi:10.1177/1081073413505033

Figure 4. PA Sensor and Delivery System

References


Additional Sources

www.heartfailureanswers.com
www.sjcmed.com

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