The Relationship Between Home Health Care and Hospital Readmission Rates for Congestive Heart Failure: A Review of Literature

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Abstract
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This review of literature analyzes six research studies, which investigated the relationship between home health care and hospital readmission rates for patients with congestive heart failure (CHF). Four of the research studies found that the use of home health care could reduce hospital admissions and save money. One study found that it was more costly to utilize home health care and another study showed that there was no significant difference. This information was utilized to develop a proposed program specifically targeted to patients with CHF. This program empowers nurses and advanced practice nurses to provide preventative care that improves the quality of the patient’s life and is fiscally responsible to the healthcare industry.
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The Relationship Between Home Health Care and Hospital Readmission Rates for Congestive Heart Failure: A Review of Literature

Introduction

Heart Failure is defined as a condition when the heart cannot pump adequate blood to meet the demands of the body’s other organs. In addition, congestive heart failure (CHF), as defined in The Merck Manual, is when plasma volume increases and fluid accumulates in the lungs, abdominal organs and peripheral tissues (Beers & Berkow, 1999). Coronary artery disease, previous myocardial infarction, high blood pressure, infection of the heart, or birth defects can cause CHF. The number of hospital discharges of patients with CHF has nearly tripled since 1979 and is becoming an increasingly large burden for the United States health care system. The cost of managing CHF in the USA is estimated to be over $20 billion per year. In addition, there are over 4.7 million Americans, as of May 2001, with CHF and about 550,000 new diagnoses are made every year (http://www.americanheart.org).

This large number of CHF patients severely impacts the health care system because up to fifty percent of the patients who are hospitalized are readmitted in three to six months (Tierney, Jr., McPhee, & Papadakis, 2000). With such financial strains being put on health care providers and organizations, a reduction in the readmission rate would lead to substantial savings, relieving economic stress and personal suffering while utilizing less acute care resources.
Home health care, including home based management programs may be a cost-effective way to reduce hospital readmission rates.

This paper reviews selected current research studies that have examined the relationship between home health care and hospital readmission rates for CHF patients. An epidemiological framework is utilized to format this review. The utility of screening patients who are at high risk for readmission coupled with the utilization of a home based management program is discussed and a plan for easing the financial burden on both health care organizations and CHF patients is presented.

**Review of Selected Research Studies**

Stewart, Marley, & Horowitz (1999) prospectively tested the null hypothesis that there would be no significant difference in the frequency of unplanned readmissions and death, during a minimum six months follow-up of patients with CHF, discharged home after a CHF specific, home-based intervention in addition to the usual care provided.

Convenience sampling was done by screening inpatients and limiting the eligibility to those with CHF, 55 years or older, who were going to be discharged home and had at least one previous admission for acute heart failure. The exclusion criteria were very specific and thus limited the sample to 285 from the 4055 who were screened. The screened sample was then randomly assigned into a group that got usual care and a group that got usual care in addition to a specific home-based intervention that included a visit from a cardiac rehab nurse to assess the home situation and educate the patient and family. The nurse also
collaborated with the physician to develop a flexible diuretic regimen that could be adjusted according to daily weights (Stewart et al. 1999).

The authors found that an inexpensive, home based intervention improved the efficacy of pharmacotherapy in limiting readmissions to the hospital and death in subjects with severe CHF for at least 6 months. There was a 40% (77 intervention vs. 129 control) reduction in unplanned readmissions and out-of-hospital deaths in the intervention group after 6 months of treatment. (Stewart et al. 1999).

The authors stated that their findings differed somewhat from previous studies, which incorporated extensive clinic based follow-up, hence there is still a need for replication. Some of the patients getting the intervention may have gotten more extensive health care from their primary care provider because they were enrolled in a study. This was difficult to control as the same nurses were taking care of both groups (Stewart, et al, 1999).

Martens and Dempsey-Mellor (1997) found that there was a statistically significant relationship between the use of home health care services and readmission rates at 90 days after discharge. Retrospectively, medical records of all patients (n=924) discharged home with a primary diagnosis of CHF were evaluated. The researchers compared data on patients who did or did not receive home health care. Results demonstrated that at 90 days, patients who received home health care were significantly less likely to be readmitted to the hospital than those who did not. The data approached significance at 35 days
yet there was no significant difference at 14 days. The authors considered this to be a pilot study that needs further exploration.

Cline, Isrealsson, Willenheimer, Broms, & Erhardt, (1998) hypothesized that a CHF management program could reduce hospital readmissions and health care costs without sacrificing patients' quality of life. The investigators utilized a randomized, prospective design. The intervention group was given information about the disease and a guide for the self-management of the disease with diuretics. The subjects were to keep a diary of their daily weight, ankle circumference, and any other CHF symptoms experienced. A nurse was available by telephone to answer questions and the patients could see the nurse on short notice in a nurse directed outpatient clinic. The nurse also provided a one-hour visit for the patient and family at the patient's home after being discharged from the hospital. The control group was followed up by their cardiologist or primary care provider and treated as the physician felt appropriate.

There was a statistically significant increase in the number of days until readmission (p<0.05) and, although not statistically significant (p=0.08), a trend towards a reduction in the number of hospitalizations per patient for the intervention group. These results indicated that implementation of a management program where easy access to a nurse, focused patient education, and self management are present, health care costs can be reduced ($1300 per patient including the cost of the implemented program) without decreasing quality of care or quality of life (Cline, et al, 1998).
Landi, Gambassi, Pola, Tabaccanti, Cavinato, Carbonin, & Bernabei (1999) examined what effect a home care program based on case management and a comprehensive assessment would have on hospital usage and costs in CHF patients. The authors utilized a quasi-experimental design, which included a 6-month follow-up. One hundred fifteen out of 137 participants met their eligibility criteria that were vague and not specific to the extent of the subject's disease. A comprehensive geriatric assessment was performed by case managers immediately after home care was requested and at least two or more times throughout the six-month follow-up. The researchers used the individual patient history as a control to compare hospital admission rates and number of days admitted 6-months before and 6-months after the home care program was implemented.

Results showed a statistically significant ($p<0.001$) reduction in hospitalizations after the home care program was implemented. A reduction in the number of days in the hospital resulted in 29% savings, which saved approximately $1260 per patient. This figure was calculated after accounting for the cost of the program which was about $670 per patient. This study had weak eligibility requirements and was not specific to patients with CHF but the outcome supports the findings of the three previous studies on how a home health management program can result in cost savings (Landi, et al, 1999).

Wilson, Smith, Dahle, & Ingersoll (1999) conducted a study that found contrary results. Investigators compared patients with CHF that had an ejection fraction of 10 to 30%, three months prior to receiving home health and patients
who had been receiving home health after three months. This was a very high risk CHF group for hospital admissions. Results, however, showed the readmission rate for patients after receiving home health was actually a little higher and the average cost of health care was $3,848 per patient.

The authors did address some of the possible reasons for their results. One possible explanation was that the severity of their illness in this sample was much higher than in previous studies. Also, three months is a very long time for a patient with end stage CHF and comparing the patients three months apart could be a threat to internal validity. Another reason was that the consistency and quality of home care was not as controlled as in previous studies. Other studies implemented a home care program with specific guidelines while this study looked at the basic home health visit. Investigators did make the statement that their methods are a greater reflection of actual clinical practice, which this author agrees with. The basic home health visit may need to be modified to meet the needs of these patients in a more effective manner (Wilson, et al, 1999).

Knox and Mischke (1999) discussed how one health care agency reduced costs, and the number of hospital readmissions by implementing a CHF disease management program. This program was implemented because the federal reimbursement for health care has changed to a retrospective payment, diagnosis related groups (DRG’s) system. The pressure from this change forced providers to provide quality care yet get patients discharged within the pre-determined length of stay. Home health was a key player in this scenario. When
patients are discharged home they can still be monitored and assessed by nursing. This home assessment may fill in missing pieces to a comprehensive patient picture that can keep the patient from future hospitalizations.

Patient education was provided in written and verbal form. Nurses made home visits for assessment, made themselves available through an outpatient clinic, and used standardized tools and frequent telephone calls to assess and encourage compliance to the program. This comprehensive plan decreased the hospital length of stay by 33% from the national average, decreased the prevalence of 30-day readmission from the national average of 23% down to 2.3%, improved overall patient compliance, and ultimately reduced costs. Through this study the agency also found that there was a lack of physician involvement because these standard protocols were considered to be an oversimplification or called, "...cookbook medicine..." (Knox and Mischke, 1999, p. 71).

Assessing for patient needs

Anderson, Pena, & Helms (1998) retrospectively reviewed patient records to study subject characteristics and utilization of resources. Participants were screened according to the following inclusion criteria: needed to have CHF as their primary diagnosis, received two or more home visits from a nurse, payment by Medicare, and age 65 years or older. Eighty records met the inclusion criteria and 40 were randomly selected and then reviewed for resource usage.

Men required a higher number of home health aide visits (men 7.75 vs. women 3.04) due to more functional limitations and deficits in their ability to carry
out activities of daily living (ADL’s). Women, on the other hand, needed a greater number of skilled nursing visits (men 17.4 vs. women 52.2 days) for unknown reasons. Their findings did corroborate previous findings but further research is still needed (Anderson, et al, 1998).

Predictors of hospital readmission

Hoskins, Walton-Moss, Clark, Schroeder, & Theil (1999) compared two groups of patients looking for accurate predictors of hospital readmission among CHF patients. Researchers retrospectively reviewed the charts of 117 clients with CHF. The sample was then divided into two groups, 32 patients who had been rehospitalized and 85 patients who were discharged from home health. There were three factors that reached statistical significance for the differences between the groups. The patient who utilized a home health aide was more likely to be rehospitalized (expected because these patients would tend to be sicker). The number of previous hospitalizations was a good indicator of future needs for hospital readmission. The chance of readmission decreased as the number of home health visits increased.

The authors found that they were limited by the information that was in the chart and the reliability and validity of the data was dependent on the charting done by the home health nurse. Suggestions by the researchers to the home health nurses in the clinical area were noted. These suggestions included occasional telephone monitoring, extra support for the first two weeks after hospital discharge, and using a critical pathway to maintain continuity of care and cut costs (Hoskins, et al, 1999).
Graff, Orledge, Redford, Wang, Petrillo, & Maag (1999) compared admission guidelines as described in the Agency for Health Care Policy and Research (AHCPR) with patient mortality. This was a retrospective observational cohort study where trained extractors looked for 386 items including the AHCPR admissions criteria. The criteria included pulmonary edema by x-ray or severe respiratory distress, hypoxia, significant edema or anasarca, symptomatic hypotension or syncope, new onset CHF, and evidence of myocardial infarction (MI). Investigators evaluated the association of these items with mortality at one month, six months and one year. Patients who were sent home from the emergency department without being admitted had a lower mortality rate than those admitted to the hospital. This finding would be expected because their condition would not be as fragile if they were able to go home and manage their disease.

Two of the criteria used for admission, new onset CHF and MI, did not correlate with the probability of being admitted to the hospital. The other four admission criteria (pulmonary edema, respiratory distress, significant peripheral edema, and severe hypotension or syncope) did correlate with the probability of being admitted (P<.001), length of stay (P<.014), and mortality rate at 30 days (P<.0001). If zero or one of the above four criteria are met, this should be combined with the physician’s clinical judgment to assess a patient’s risk of dying. Low risk patients may benefit from being taken care of in an outpatient setting rather than being admitted to the hospital. If two or more of the criteria were met, the clinician’s judgment could not distinguish patients less likely to die.
The previous studies are useful in developing a plan of care that would benefit the healthcare system fiscally and also benefit the patients by keeping their CHF better controlled in the setting of their home or provider's office. Most of the evidence suggests that a home treatment plan can help reduce hospitalizations, length of stay in the hospital, and/or cut health care costs.

**Proposed CHF Program**

The goal of a proposed CHF Program is to reduce hospital readmissions for patients with CHF by at least 50% within six months of discharge. With computer technology and billing systems available, the statistical information can easily and accurately obtained. The ICD/9 code #428.0 is specific for and is used nationwide for diagnosis of CHF.

Research has shown that implementing an educational program that begins while the patient is still in the hospital and includes following up with phone calls or home health visits (depending on the severity of the CHF) has been beneficial in reducing readmissions to the hospital. Nurse Practitioners have the opportunity to develop a standardized care plan that includes education, assessment tools, and follow up based on those assessments. Education should begin soon after admission by the hospital staff nurses and be continued until discharge. This education needs to be repeated several times throughout the stay so that the patient will have ample opportunity to not just hear the words but learn the information. This will include low salt dietary modifications, daily weights, information regarding their medications, and when to call their primary
care provider or nurse. Knox and Mischke (1999) have excellent examples of standardized care plans.

Every patient who has been admitted to the hospital with the diagnosis of CHF will be given a multiple-choice questionnaire about the basics of congestive heart failure and their knowledge of the medications that the patients are taking to determine their level of need. If they score less than 75%, they will be given the opportunity for a cardiac rehab nurse to come to their home within one week of discharge and make an assessment of their needs and accordingly provide subsequent instruction. If needed, home health care of another discipline may be integrated into the patient's care at this time. The cardiac rehab nurse may contact the patient's primary care provider to discuss the possibility of a flexible diuretic schedule based on daily weights and patient condition. There will be a phone call follow-up within two weeks of the visit to clarify information or discuss how the patient is doing with their illness.

If the patient scored greater than 75% on the multiple-choice questionnaire, a phone call will be made to the patient within two weeks of discharge to assess his condition subjectively. Future phone calls may need to be scheduled at this time to keep in contact with the patient at minimal cost. The cardiac rehab nurse will take the patient's ejection fraction and potential for readmission into account and determine if home health care is needed and appropriate. Follow-up is a key piece to keeping people out of the hospital and will be tailored to fit the needs of the patient based on the nurse's assessment.
and including input from the patient and family. The cardiac rehab nurse will also provide a phone number for the patient to call if they have questions or concerns.

Re-evaluation can be performed at six-month intervals to assess the usefulness of the multiple-choice questionnaire and to identify if the program is saving money and resources. The questions may have to be altered to account for the knowledge level and literacy level of the patients. The ICD/9 code can be used to measure how many CHF admits occur prior to and after implementing the program and calculating the cost of an average hospital stay of a patient with CHF vs. the cost of the program will be an integral part of this evaluation.

Conclusion

In conclusion, the use of standardized care plans, utilization of home health when appropriate, and ongoing research can lead to higher quality of care while keeping costs under control for this rapidly growing population of CHF patients. Ni and Hershberger (1999) assessed the trend in hospital mortality of heart failure patients and concluded that mortality is decreasing, as is length of stay. This may be due to the use of standardized care plans, or better pharmaceutical medications, but healthcare providers are always trying to improve care in a cost-effective manner. With the advancements in technology and the costs for new and improved diagnostic tests going up, cost containment will always be a struggle with which nurse practitioners will have to grapple. The focus of nurse practitioners, must always be to provide the best care to patients and yet maintain a balance between what is medically necessary and fiscally prudent.
References


