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Research Paper

Strategies To Improve Flow Of Patient Care And Reduce Costs In Outpatient Heart Failure Clinic Utilizing Physician-Nursing Partnership Model

Medical Science

KEYWORDS : Nanostructured ZnO, Spray pyrolysis deposition, XRD, TEM, UV-Vis spectra

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ABSTRACT

Background: Heart failure is associated with increased morbidity and mortality.
Methods: We evaluated access to patients with heart failure before and after physician-nurse practitioner partnership. The compliance rate of adherence to guidelines was determined. We initiated ambulatory intravenous diuresis clinic for patients with heart failure exacerbation in an attempt to abort unnecessary hospitalization.
Results: The physician-nurse practitioner partnership facilitated an increased access to new patients, improved compliance rate, and the initiation of intravenous diuresis clinic aborted unnecessary hospitalizations without compromising quality care.
Conclusions: Nurse practitioners play a key role in the health care delivery in the aging heart failure population.

Introduction

Heart failure (HF) is a growing epidemic in the United States, owing to the aging of the population. It is estimated that 5.7 million patients in the United States carry the diagnosis of heart failure, with 550,000 new cases per year, representing the primary diagnosis for hospital discharges (1). Approximately 50% of patients diagnosedwith HF die within five years (2). HF mortality increases with age and risesprecipitously after age 65 (3). HF is the primary reason for 12 to 15 million office visits and 6.5million hospital days annually (4). Accordingto the Centers for Medicare and Medicaid Services statisticalreport, HF represents America's largest diagnosis-related group (DRG) coding. The overall health care impactof HF imposes a social and an economic burden.According to the American Heart Association (AHA) , it is estimated thatthe total direct and indirect costs for HF in the UnitedStates exceed $30 billion, which is approximately a $10billion increase from their estimates in 2001 (1).The HF outpatient clinic was structured to provide comprehensive evaluation of heart failure patients and long-term management using a multidisciplinary approach in consultation withother disciplines including electrophysiology, heart transplant department, diabetes education, pharmaceutical consultation, nutrition counseling, and cardiac rehabilitation. Nurse practitioners play a fundamental role in health care delivery and their partnership with heart failure specialists may provide avenues to meet the escalating demands of the HF population.

This project had 2 major aims.

We hypothesized that the physician-nurse practitioner partnership model increases capacity and access to new patients in the HF clinic without compromising quality care.

The physician-nurse practitioner partnership model helps in aborting unnecessary hospitalizations with the initiation of intravenous (IV) diuresis clinic without decompensation or adversely affecting 30 day survival.

METHODS

Patient population.

Patients were divided into 2 groups, before partnership (two year period 2010-2011) and after partnership (two year period 2012-2013). The number of new patients and followup visits was determined for each period.The protocol was approved by the institutional review board of our institution.

Compliance rate of adherence to the American College of Cardiology Foundation/American Heart Association (ACCF/AHA) guidelines was evaluated.

Documentation of use of angiotensin converting enzyme inhibitors (ACEI) / angiotensin receptor blockers (ARBs), beta-blockers.

Documentation for lack of use of any of the above medication in the presence of any contraindication.

Documentation of left ventricular ejection fraction (LVEF).

Documentation for need for electrical device therapy.

The number of aborted hospitalizations was determined and 30 day hospitalization rate was evaluated.

The role of nurse practitionerin the outpatient clinic includes:

Evaluates patients who have been referred to the HF clinic by the HF specialist and ensure long term care with monitoring on regular basis as deemed appropriate.

Initiate IV diuresisin the outpatient clinic as deemed appropriate.

Work in collaboration with other departments such as weight loss programs, pharmacy, and smoking cessation programs to ensure delivery of appropriate care.

Follow up on patients by phone calls and provide instructions to ensure compliance with medications and checking laboratory tests and making the appropriate adjustments.

Coordinate care for other non-cardiac comorbidities by consulting with the appropriate outpatient service.

Provide patient and family education.

IV Diuresis Clinic.

Patients with HF may experience intermittently symptoms of HF exacerbation related to several reasons including diet indiscretion, inappropriate medication dose, lack of compliance, and/or worsening of the disease process or concomitant comorbidities. The IV diuresis clinic was initiated with the primary goal to

abort unnecessary hospitalizations.

IV Diuresis Clinic Protocol
Patients with HF exacerbation who are considered low risk, are managed in the IV diuresis clinic. We define low risk as patients in the absence of:

1. Life threatening arrhythmias
2. Possible acute coronary syndrome (unstable angina, AMI)
3. Hypertensive emergency
4. Cardiogenic shock
5. Acute kidney injury
6. Multi-organ failure
7. Altered mental status (regardless of etiology)
8. Severe respiratory distress

9. Coexisting pulmonary embolism, pneumonia, or COPD exacerbation
10. Active bleeding (Regardless of etiology)
11. Sepsis

Patients who respond to IV diuresis, are discharged from the clinic to be followed up at the HF clinic within 7 days.

Criteria for Discharge from the IV diuresis Clinic:
1. Change in symptoms of congestion/improvement in dyspnea is documented.
2. Patient able to ambulate without significant exacerbation of symptoms or orthostasis.
3. Vital signs documented and no life threatening electrolyte imbalance exists.
4. Patient and family education addressed.
5. Outpatient pharmacology regimen established.
6. Follow-up in HF clinic within one week is arranged.

Patients who continue to have symptoms and are not stable to be discharged from the IV diuresis

clinicare hospitalized.

Statistical analysis.
Statistical analysis was performed using the *t*-test.

RESULTS
Partnership with nurse practitioners in the HF outpatient clinic model has improved access over time for new evaluations. Because of the aging and the increasing size of the HF population, our HF model has enabled us to increase access to new evaluations. Those patients requiring long-term care have been referred to the HF nurse practitioner without compromising quality. Table 1 illustrates a significant increase (x1.67 fold)in access to the new patient evaluationsover time before (two year period: 2010-2011) and after (two year period: 2012-2013) partnership with nurse practitioner. There was also significant increase (x2.76 fold) in patient followup visits (a patient may have multiple visits during the same year) before compared to after partnership (Table 1). Table 2 shows improvement in compliance rate with adherence to guidelines with post-partnership compared to pre-partnership.

A total of 48 hospitalizations were aborted with the utilization of ambulatory IV diuresis (Table 3). All patients were evaluated within week. There were no HF hospitalizations within 30 days and no deaths at 30 days. One patient received IV diuresis on 3x different occasions and because of the end-stage disease of HF, with metastatic gastric carcinoma, palliative care was consulted and patient expired 2 months later.

DISCUSSION
The escalating burden of HF has greatly impacted our health care system because of the growing and aging HF population with a constantly demanding cost-effectiveness, and quality improvement to alleviate the social and economic burden of this disease. Hence, novel avenues are vital to meet such demands and expectations. Tremendous efforts have been made to reduce the number of HF hospitalizations (5). The physician-nurse practitioner partnership plays a key role in the design of the outpatient HF clinic. Such collaboration holds promise for improving patient care and alleviating costs. We have shown that partnership significantly improves access to new evaluations. Such partnership also added a touch valueto the patient who is cared by the nurse practitioner longitudinally over patient's life time. This partnership has also been effective in aborting unnecessary HF hospitalizations which are known to contribute significantly to the healthcare costs. The average hospital cost stay for HF patients is US $10,500 (6) and hence, this translates into significant savings. Several programshave been initiated with the goal to reduce morbidity and mortality but met with limited success and/or different outcomes. The Medicare Coordinated Care Demonstration program used registerednurses, who provided patient education and monitoring via telephone but such a program did not impacthospitalization or mortality rates (7). Similarly, self-management counseling to HF patients in the Heart Failure Adherence and RetentionTrial,did not reduce death or HF hospitalizations either (8). However, other programs included intensive home surveillance programs and structured telemonitoring programs have shown favorable outcome on morbidity and mortality (9-12). Few clinical randomized trials utilizing multidisciplinary approaches with nurse practitioners have shown promising results with significant impact on hospitalizations and mortality (13-16). Recently, a large Veterans Affairsmulti-site study has shown that nurse practitioner intervention, compared with usual care, improve the health outcomes of Veteran patients with HF at 1 and 2 years, as reflected by decreasedresource utilization, including readmissions, and decreased mortality (17).A large subset of patients with HF are hospitalized without a clear need for time-sensitive therapies or procedures (18) and hence, a careful selection of patients would be desirable to effectively reduce hospitalizations. Observation units may be an attractive option but this is also costly. There has been a paucity of data in the literature about the use of IV diuresis in the outpatient setting, but the results were encouraging with demonstration of feasibility, and savings (19) and our study extends similar findings.Further, our study unmasks the key role of the nurse practitioner model in the design of the outpatient IV diuresis clinic with favorable outcome though we have some limitations. The data is retrospective in nature and the sample size of the IV diuresis outpatient is small. However, the results are promising and perhaps may be considered as a novel avenue to alleviate economic burden of the aging HF population.

Table 1. Patient access in relation to partnership.

	Before Partnership (2010-2011)	After Partnership (2012-2013)	P-value
New evaluation patients	N= 931	N= 1553	0.017
Followup visits	N= 2692	N= 7425	<0.0001

Table 2. Compliance rate adherence with the guidelines

	Before Partnership (n=100)	After Partnership (n=100)	P-value
Compliance rate	85%	95%	0.018

Table 3. Baseline characteristics of patients with aborted hospital admissions

N	48
Age (years)	74±9
Male	34 (70%)

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