

# The Emergence of a Dynamic Intervention Paradigm in Heart Failure

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Traditionally, the heart failure management model has focused on crisis intervention, which allows the disease syndrome to progress to a point that requires emergent care followed by a cycle of prolonged and repeated hospitalizations (such contacts between the patient and care providers occur at times when the heart failure syndrome has deteriorated dangerously, and are only concerned with resolving the immediate crisis). Over time this approach of emergent care results in a marked decline in the patient's quality of life and creates a "revolving door" effect with the combined use of emergency department and hospital inpatient resources. The alternative is to become proactive and optimize treatment before such emergencies arise. This model relies on effective continuous outpatient and home care to stabilize the chronic condition and avoid hospital admissions. These concepts have led to the development of a new model or paradigm of outpatient strategies that have resulted in the creation of specialized heart failure disease management centers. This article discusses the economic and epidemiological forces that are driving this shift in our treatment focus and evaluates strategies that strike an optimum balance between cost containment and quality.

## The Cost Burden of Heart Failure: How Have We Gone Astray?

The Health Care Financing Administration spends over 7 billion dollars a year for the care of the elderly with heart failure (1). Medicare expenditures for heart failure outstrip those for myocardial infarction and cancer by nearly 2 to 1 and 3 to 1, respectively. In fact, when one examines the proportional costs of heart failure as a function of the total health care budget, heart failure accounts for 5.4% of the entire allocation (2). When non-federal hospital expenditure is also factored into the equation, O'Connell and Bristow estimated that nearly 40 billion dollars a year are spent in heart failure therapy. The greatest portion of these health care dollars are spent in the inpatient environment since nearly 23 billion dollars a year are spent in hospitalization for patients with heart failure. Ambulatory care, which includes emergency department visits, costs nearly 14.7 billion dollars a year, and heart transplantation involves a relatively small expenditure of less than 30 million dollars annually (2). Thus the greatest impact on the cost of heart failure management would come from strategies that target inpatient heart failure expenditures and focus on reducing the frequency of hospitalization.

## Capitated Managed Care: Further Impetus for Disease Management

The overall goal of managed care is to control costs while maintaining the quality of care. The focus of managed care is to tackle total health costs for a defined patient population. The managed care market is highly competitive, but this competition is price-based and less emphasis is given to value-based competition. The problem with this is that price-based competition is a threat to rather than a stimulus for better performance. Hopefully, once prices have been pushed to a nadir, we will see the return to a value-based system of competition. It has been speculated that, ultimately, a harmony between price and quality will have to emerge in capitated managed care for it to succeed (3). Since heart failure is mainly a disease of the over-65 age group, the area of managed care most likely to have the greatest impact is in the capitation contracts between medical providers and the Health Care Financing Administration. It is predicted that by the year 2005, nearly 50% of all patients will be in a capitated form of managed care, that is, unsubsidized by the federal government. The growth of these so-called Medicare contracts has been logarithmic. Of 38 million Medicare beneficiaries in the United States, nearly 5.3 million of them

(14%) are now in a capitated managed care contract. This contrasts with 1992 in which only 6.4% of all Medicare beneficiaries were members of managed care contracts (1). With a shift of financial risk to the health care provider, the impetus is clearly present for the creation and implementation of cost-effective approaches to heart failure.

## Evolution of a Specialized Heart Failure Center

Any effort to establish a heart failure treatment center requires a methodical process that first seeks to examine the local operant conditions that influence therapeutic interventions. The key questions that must be prospectively tackled include the following: first, one must determine the process that works best. Secondly, we must define the patient population that will be treated at the center. This is important because as physician providers, we have only finite resources that require focused efforts to serve those that have the greatest need for help. The next step is to determine the most effective way to modify patient behavior because this is key to changing outcome in the heart failure patient. Finally, we must know the costs of these services that we plan to provide and whether those costs are justified. To define the economic feasibility of setting up a Heart Failure Treatment Center, we must know the cost of care for heart failure in our system as well as the average length of stay in the hospital setting. Furthermore, the 30- and 90-day readmission rates need to be calculated. Other important points to tackle relate to the current approach to these patients in the emergency department and, also, we must know the structure of payments and payer classes. In creating a comprehensive approach, one must also ask the question of whether we should make or buy the process? That is, should the process be bought from an outside vendor, or do the resources exist within our system to develop such a process? (1)

## The Heart Failure Continuum of Care Triad

An effective model for developing a disease management program in heart failure must be an integrated effort between the outpatient clinics and inpatient and emergency department areas (Table 1). This effort requires the creation of a continuum of care in each of these three areas. Streamlined inpatient programs that focus on reducing length of stay and preventing repeat hospitalizations as well as *emergency department programs* that define risk groups for triage to rapid hospitalization or aggressive observational treatment need to be effectively developed. In the *outpatient setting*, an emphasis on patient education and need for compliance is required. One must devise effective follow-up and contact strategies with the

**Table 1. Crisis versus Preventive Care: Focus Changes**

- **Crisis Care**  
*Major focus:* emergency care and hospital
- **Preventive Care**  
*Major focus:* Outpatient and home care

**Table 2. The Triad of Optimal Care Goals**

- 1. Outpatient Program**  
Compliance, education, telemanagement, intravenous drugs
- 2. Emergency Care Program**  
Observation and admission guidelines
- 3. Inpatient Program**  
Intensive education, discharge planning, reduction in length of stay

heart failure patient. The outpatient setting must be structured so as to enable the administration of intravenous infusions of either diuretics or inotropic support when appropriate (Table 2). It is also important to understand where the important financial responsibilities and opportunities lie in the overall process of heart failure management. Clearly the establishment of more effective outpatient services is associated with an increase in costs due to the additional resources needed for increased telephone management, educational programs, and the increased use of pharmaceuticals. On the other hand, major cost savings emanate from reduced hospital and emergency department expenditures. Thus, for the model to be effective, there must be a balance between payments for such innovative programs and implementation of the increased costs of setting up outpatient care processes. One possible source of such payments is the hospital that benefits from this strategy. Only an appropriate financial alignment will ensure the longevity of a heart failure disease management program.

## Strength of the Scientific Evidence for Comprehensive Heart Failure Care

Congestive heart failure is the most common reason for hospitalization of the elderly. Breaks in patient compliance with medication regimens frequently exacerbate the disease and lead to more hospital visits. A major principle of the comprehensive approach outlined above is to prevent these occurrences through patient education and frequent monitoring. Nurses, social workers, dietitians, and members of other pro-

fessions are often involved in these activities, although the 3 elements critical to the success of outpatient programs center on the physician, physician extender, and home health care provider (Table 3).

The program should include intensive teaching, distribution of informational materials on congestive heart disease, recommendations about diet, an emphasis on simplifying the medical regimen, implementation of home care services, and regular telephone contacts. In a randomized trial of high-risk patients aged 70 or older, readmissions were reduced by 56% in those who received these services after being hospitalized for congestive heart failure when compared with the control group. This resulted in a saving of \$460 per patient over a 90-day period (4). Quality of life scores also improved for patients in the treated group. A separate analysis of a subset of the patients in the same trial found that the comprehensive strategy significantly improved compliance with the medication regimen. This may be the reason patients in these programs have better health outcomes (5). In another study, candidates for heart transplantation were referred to a program that focused on increased use of angiotensin converting enzyme (ACE) inhibitors, a flexible diuretic regimen, diet, and exercise counseling. Hospital admissions were reduced 85% in the 6 months after referral, compared with the prior 6 months. The patients' functional status improved as well. The estimated saving from hospital costs during the post-referral period, after subtracting the initial costs for evaluation, was \$ 9,800 per patient (6). These 2 studies are similar with regard to the comprehensive and concerted nature of the outpatient and home care provided, but differ in the populations studied. The first investigation by Rich et al (4) examined elderly subjects with a mix of diastolic and systolic heart failure. The second study by Fonarow and colleagues (6) primarily investigated a younger population of patients with systolic dysfunction and little major comorbidity. Yet the results of a focused approach revealed the same findings. Optimal and continued outpatient care decreased hospitalizations, reduced inpatient stay, and improved quality of life, while decreasing overall care costs. Unfortunately, these studies can be criticized because they occurred in specialized centers with a broad-based referral network and do not primarily involve heart failure patients that are recycled from within a defined population.

### **The Ochsner Clinic Heart Failure Program: A Focus on Populations at Risk**

Patients with severe congestive heart failure benefit more from a comprehensive program than those who have mild illness. Providing patients with a comprehensive strategy reduces hospitalization for heart failure among all patients, but the reduction in hospitalization is greatest for those with advanced or

**Table 3. Critical Staff in the Heart Failure Care Program**

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| <p><b>1. Principal Care Provider</b><br/>Heart Failure specialist</p> <p><b>2. Principal Care Coordinator</b><br/>Physician assistants, nurse practitioner, or nurse clinician</p> <p><b>3. Home Health Care Coordinator</b><br/>Home health cardiac nurse</p> |
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unstable disease. Given that resources are limited, the highest level of benefit can be achieved by concentrating on patients who fall into the latter category.

At the Ochsner Clinic, we identified the small number of heart failure patients who utilize the most resources, according to standardized criteria. Patients were considered if they had 2 or more hospitalizations for heart failure during the baseline year, or 1 hospitalization of unusual length or high cost (more than 2 standard deviations from the median). It was assumed that a comprehensive program that targets this group would not only allocate resources so as to get the most impact for the dollar, but would also help those who are in greater need of such intervention.

The multidisciplinary program we implemented for Medicare beneficiaries enrolled in a capitated plan at the Ochsner Clinic illustrates the shift in focus to outpatient management (7). We evaluated 19,401 Medicare enrollees in a capitated risk management plan between June 1995 and May 1997. Of this total, 11% suffered from heart failure and 1.1% met our criteria for high resource utilizing heart failure patients. This latter group of 210 patients was enrolled during 12 months, from 1996 to 1997, in a comprehensive outpatient service program. The tools used in the program are summarized in Table 4 and were similar to those used in the studies cited above. The education, provided by a nurse clinician specialized in heart failure, included instructions for fluid and dietary management, early symptom detection, and compliance with drug and exercise regimens. The patient's weight, symptoms, and adherence to medical and activity prescriptions are checked by the nurse on a regular basis via personalized phone conversations designed at appropriate time intervals (7). If there are signs of worsening heart failure, additional treatment is initiated, usually in the form of diuretics administered intravenously at home. Patients who still require frequent hospitalization despite the comprehensive care have occasionally been given weekly intravenous inotropic pulse therapy.

**Table 4. Tools for the Ochsner Clinic Heart Failure Care Program**

- Intensive education
- Compliance assessment
- Clinical evaluation of medical regimens (appropriate and inappropriate)
- Telemanagement
- Standardized home health care
- Streamlined emergency department intervention
- Outpatient inotropic therapy for selected patients

## Population-Wide Impact of the Program in a Managed Care Environment

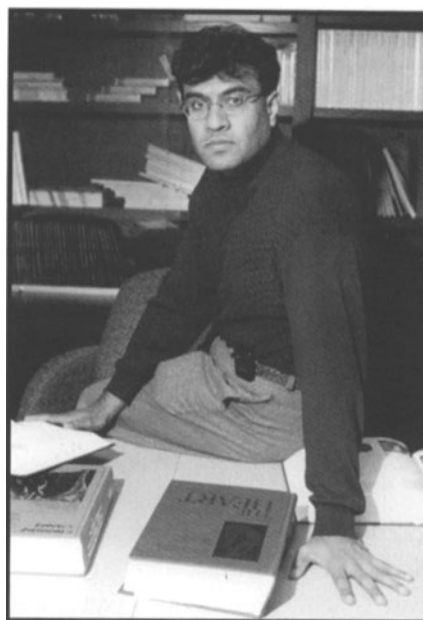
While the interventions targeted only high-risk patients from within an at risk population, the effect on resource utilization for the entire enrollee population was assessed by comparing the program year (1996-97) with the previous year (1995-96). During the implementation period, hospital admissions for heart failure, per 1,000 plan members, were reduced by 11% and emergency department visits for this disease declined by 21% ( $p < 0.01$ ). These findings were achieved despite a 31% decrease in home health visits for the entire population, emphasizing the importance of the core clinic telemanagement and close follow-up approach in achieving the reductions in resource utilization parameters. Of note, there were no noticeable changes in inpatient mortality during this time. The direct total savings were \$145,736. These results, consistent with other findings, suggest that a comprehensive program of this kind can be used to reduce costs in a managed care setting. Offering it only to patients with severe congestive heart failure keeps the program costs down while achieving large savings from reduced hospital admissions (7).

## Conclusions

The impetus for the development of a dynamic intervention approach to heart failure has largely been financial thus far, but the recognition of the clinical cost effectiveness of this strategy is now becoming clear. For any heart failure disease management strategy to be successful, a 3-staged effort must be utilized. This includes the availability and development of resources (personnel and facilities), the breakdown of barriers to their implementation (health care provider education), and the judicious application of evidence-based heart failure care (cost-effective medicine). The greatest impact is likely to accrue from population-based approaches that evaluate and allocate available resources in an effective manner. The success of the Ochsner Heart Failure Program is attributable to proactive dynamic intervention.

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