White Paper: Congestive Heart Failure (CHF)

Congestive Heart Failure (CHF)

Growing Problem - There are approximately 5.3 million people suffering from congestive heart failure (CHF) in the United States. The lifetime risk of developing heart failure at the age of 40 is 20%, and approximately 380,000 people above the age of 65 will be diagnosed with CHF annually. While the incidence of heart failure has remained stable over the past 20 years, an increase in the over 65 year old demographic (attributed to the aging baby boomer generation) coupled with longer survival rates will give rise to a far greater number of heart failure patients in the coming years[1].

Incidence of Hospitalization – A great cause for concern has been the increasing number of patients being hospitalized with CHF. The number of patients with CHF discharged from the hospital rose from 400,000 in 1979 to over 1 million in 2005[2]. Furthermore, within 4-6 months after discharge 47% of the patients are likely to be readmitted[3]. In 2004, CHF was listed as the underlying cause in 57,120 deaths and it rose to 284,365 when the total mention of diseases was included[4]. The five year mortality rate for patients with CHF was 48% from 1996-2000[5].

Cost – The estimated total of direct and indirect cost of heart failure in the United States for 2008 is $34.8 billion with the greatest share being hospitalizations[6]. In the commercially insured, Medicare and Medicaid populations, the single largest health expenditure is inpatient utilization (nearly 33% in 2005) with 13.3% of all emergency department visits associated with a hospital admission. The average cost associated with a CHF hospitalization is $10,000. While approximately 14% of Medicare beneficiaries have heart failure, they account for 43% of Medicare spending[7].

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[1] American Heart Association. Heart Disease and Stroke Statistics — 2008 Update. Dallas, Texas: American Heart Association; 2008. ©2008, American Heart Association

[2] American Heart Association. Heart Disease and Stroke Statistics — 2008 Update. Dallas, Texas: American Heart Association; 2008. ©2008, American Heart Association

[3] Sarwat I. Chaudhry, MD; Yongfei Wang, MS; John Concato, MD, MPH; Thomas M. Gill, MD; Harlan M. Krumholz, MD, SM, Patterns of Weight Change Preceding Hospitalization for Heart Failure, Circulation. 2007;116:1549-1554

[4] American Heart Association. Heart Disease and Stroke Statistics — 2008 Update. Dallas, Texas: American Heart Association; 2008. ©2008, American Heart Association

[5] Roger VL, Weston SA, Redfield MM, Hellermann-Homan JP, Killian J, Yawn BP, Jacobsen SJ. Trends in heart failure incidence and survival in a community-based population. *JAMA*. 2004;292:344 –350

[6] American Heart Association. Heart Disease and Stroke Statistics — 2008 Update. Dallas, Texas: American Heart Association; 2008. ©2008, American Heart Association

[7] Ariel Linden, Dr.P.H., M.S. and Julia Adler-Milstein. Medicare Disease Management in Policy Context, HealtH Care FinanCing review/Spring 2008/Volume 29, Number 3

Current Population Based Interventions – Increases in body weight are associated with hospitalization for heart failure and begin at least one week before admission. Daily information about patients' body weight identifies a high-risk period during which interventions can be implemented to avert decompensated heart failure[8]. Current intervention systems use scales and self-reporting via Integrated Voice Response (IVR) and internet enabled scales. Interdictions come via telephonic notifications (calls by nurses, etc).

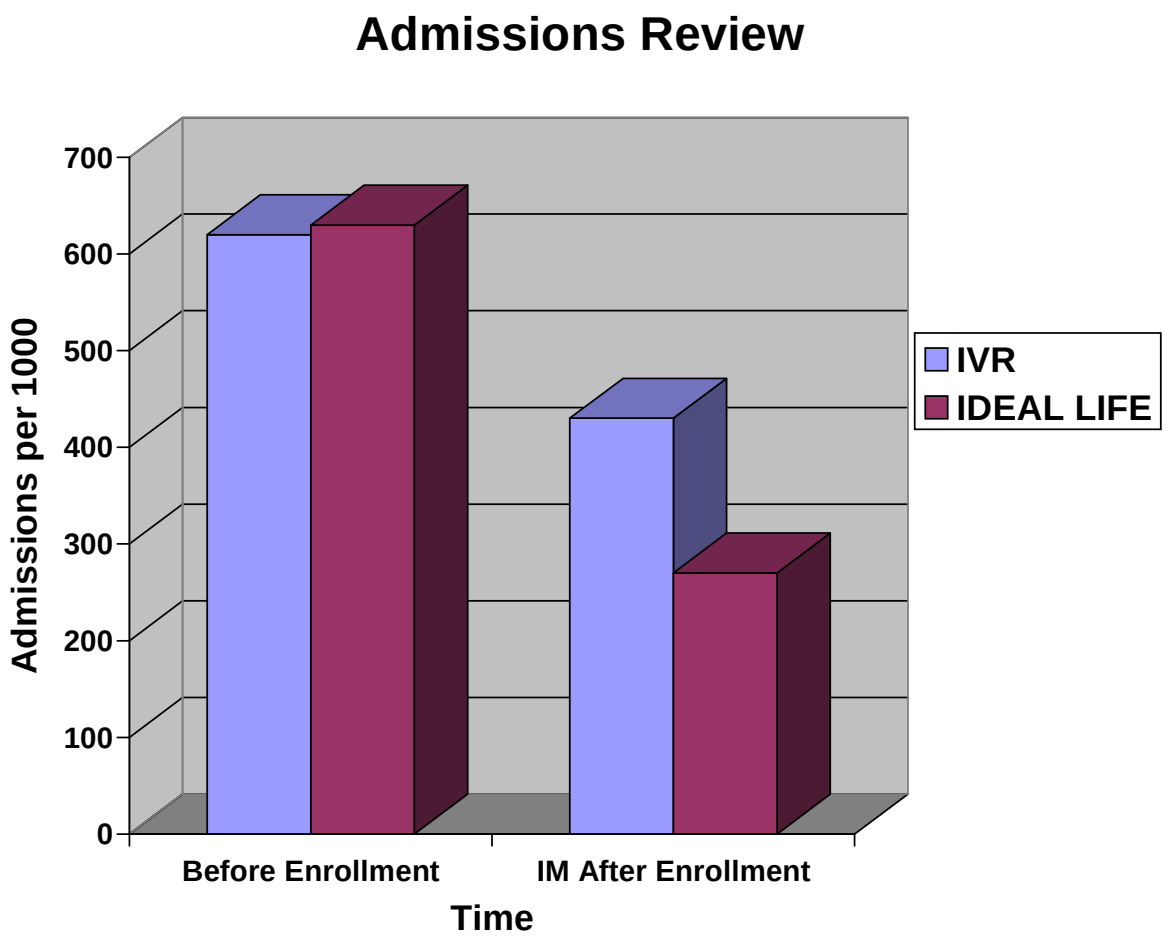
The IDEAL LIFE Solution™ - The IDEAL LIFE CHF program has been successfully tested and has been shown to decrease readmissions and optimize at-home treatment. Through the use of a wireless internet enabled scale, combined with the remote IDEAL LIFE information management platform™ a patient's weight is immediately communicated remotely to the CHF automatic data analysis engine. Within seconds of stepping on a scale, information is logged and analyzed with alerts generated and communicated in an appropriate manner.

IDEAL LIFE Results - A study was initiated on a population of 417 CHF patients in a Medicare Special Needs Plan. The patients were divided into two populations. The first required 217 patients to call a toll free number and enter their daily body weights through the telephone over an Integrated Voice Response system (IVR). The second group of 200 patients used the IDEAL LIFE CHF program, which required patients to simply step on an IDEAL LIFE scale that automatically sent weight readings to the IDEAL LIFE information management platform™ (IL). Intervention calls were made by nurses when reported weights fell outside medical guidelines (same for both study populations).

> *Client Retention* - In the IVR group, 76 patients dropped out of the study (65% retention), while only one patient dropped out of the IDEAL LIFE group (99.5% retention). The IDEAL LIFE solution™ did not require any change in patient routine daily behavior, a key factor that contributed to the high retention rate.
>
> *Reduction in Hospitalizations* – In the three months prior to the initiation of the study, the IVR group exhibited an admission rate of 620 per 1000 and the IL group exhibited an admission rate of 630 per 1000; all related to CHF. Three months after enrollment, the IL group displayed a 57% decline in hospital admissions, or a 27% hospital admission rate; while the IVR group (65% of the number intended to manage) had a 46% decline in hospital admissions, or a 33% rate of hospital admissions.
>
> When calculating the numbers of patients intended to manage (IM), it would be expected that all those not retained on an intervention program would have exhibited consistent patterns with usual care on an ongoing basis. The differences for the IM patients groups are further striking: IM IVR patients showed a 31% decline in admissions with a 43% rate of hospital admissions while the IM IL

[8] Sarwat I. Chaudhry, MD; Yongfei Wang, MS; John Concato, MD, MPH; Thomas M. Gill, MD; Harlan M. Krumholz, MD, SM, Patterns of Weight Change Preceding Hospitalization for Heart Failure, Circulation. 2007;116:1549-1554

patients still retained a 57% decline in admissions with a 27% rate of hospital admissions.



Patient Retention Rate

Care Method	Patients Enrolled	Patients Dropout	Retention rate
IDEAL LIFE	200	1	99.5%
IVR	217	76	65%

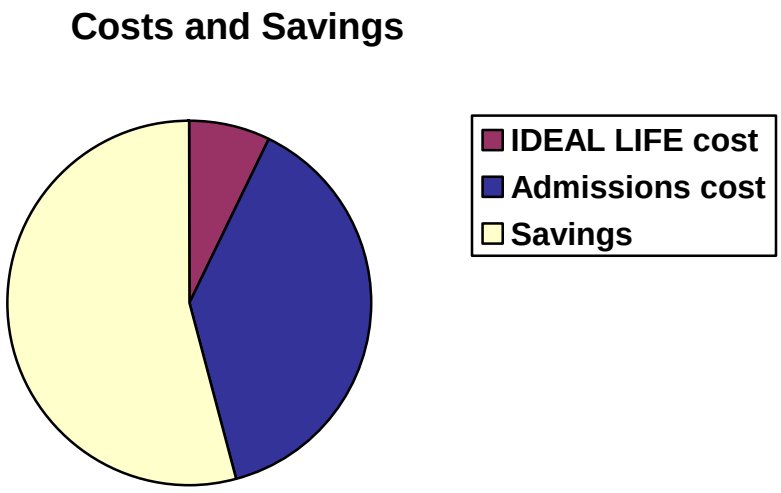
Hospital Admission Review

Care Method	Admissions per 1000 prior to enrollment	Admissions per 1000 after enrollment	Intended to Manage (IM) Admissions per 1000	Intended to Manage (IM) reduction of Admissions
IDEAL LIFE	630	270	270	57%
IVR	620	330	430	31%

Cost savings – In the chart below, cost savings for the three month program are provided. On an annualized basis, prior to enrollment in the IDEAL LIFE CHF program, the cost for total admissions (based on an average cost of $10,000 per admission[9]) was $1,260,000 per 200 patients. After enrollment in the IDEAL LIFE CHF program, the cost for total admissions was $540,000 per 200 patients. During the program, existing staff resources were utilized and when using the IDEAL LIFE Solution™ there was a realized cost savings of $636,000. Implementing the IDEAL LIFE Solution™ resulted in a return of $7.57 for every dollar invested.

Return on Investment

Care Method	Hospital Admissions for three months (200 patients)	Cost for three months (200 patients)	Cost Savings from Technology Implementation (200 patients)	Cost Savings from Technology Implementation (%)	Return on Investment
Usual Care	31.5	$315,000	-	-	-
IDEAL LIFE	13.5	$135,000	$159,000	54%	$7.57 for every $1 invested



[9] Ariel Linden, Dr.P.H., M.S. and Julia Adler-Milstein. Medicare Disease Management in Policy Context, HealtH Care FinanCing review/Spring 2008/Volume 29, Number 3