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The Evidence Behind the Evidence: A Deeper Dive Into the Management of Chronic Heart Failure

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During the Academy of Managed Care Pharmacy's 27th Annual Meeting & Expo held in San Diego (April 7-10, 2015), Dr Greenberg, a nationally renowned cardiologist, and Ms Fitch, a principal from Milliman, Inc, a leading actuarial firm, delivered a presentation intended to demonstrate that chronic heart failure is an epidemic growing to unsustainable levels and characterized by escalating costs and high hospitalization and mortality rates. Although patients are managed with current standard-of-care therapies, these challenges persist, and present a significant burden to the US health system, thereby creating a need for newer treatment options.

CHRONIC HEART FAILURE

Introduction

Heart failure (HF) is a condition in which the heart is unable to supply adequate blood flow to meet the body's metabolic needs. As a result, muscles tire more easily, and kidney function may be impaired. Reduction in kidney function leads to an increase in fluid in the bloodstream and increased cardiac workload, as the heart must work harder to pump blood.^{1,2} The syndrome may be subdivided into systolic HF (also known as HF with reduced ejection fraction [HFrEF]) and diastolic HF (also known as HF with preserved ejection fraction [HFpEF]).³ In systolic HF, the heart muscle is unable to contract fully, reducing its ability to pump blood. In diastolic HF, the heart cannot relax properly due to stiffening of the muscle, particularly the muscle of the left ventricle. Consequently, the heart is unable to properly fill with blood, a condition known as abnormal ventricular filling.^{1,2}

Symptoms of HF vary widely, and can include difficulty breathing due to fluid overload and congestion in the lungs and accumulation of fluid (edema) in the legs and liver.^{1,2}

Risk factors for HF include hypertension, diabetes mellitus, obesity, and coronary artery disease.^{1,4}

Pathophysiology

HF is a progressive disease that may have a slow onset due to chronic hypertension, but it can be exacerbated by acute events, such as myocardial infarction (MI), that damage the heart and impair its ability to contract or relax.⁵ The body responds by activating a number of compensatory mechanisms to maintain cardiac output (the amount of blood the heart pumps per minute).

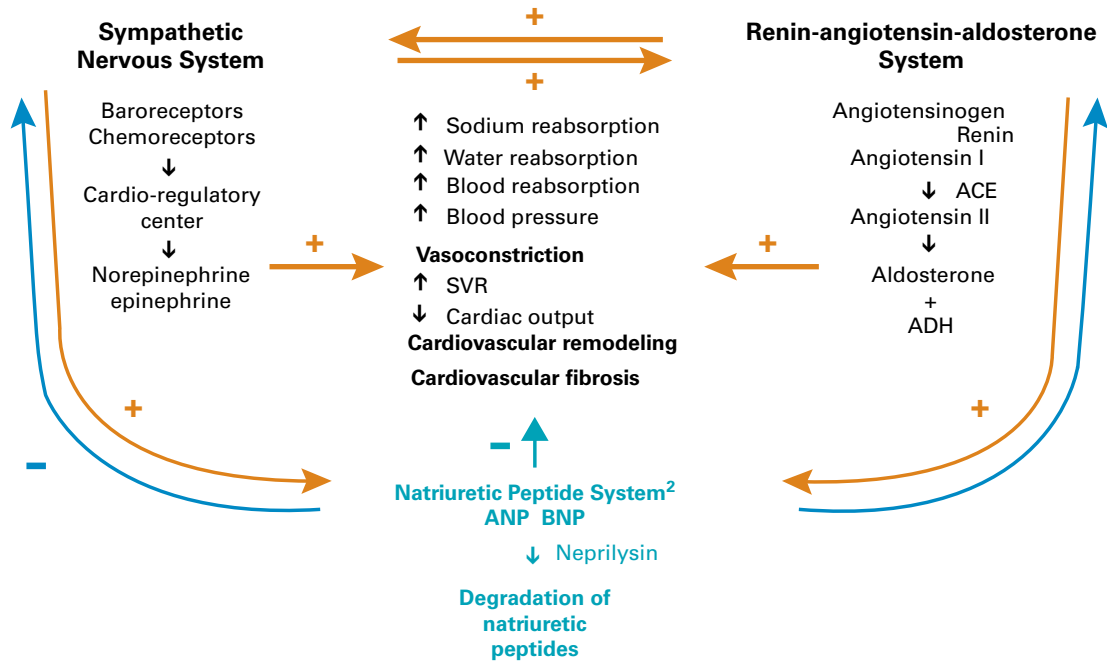
Compensatory Mechanisms

The body's compensatory neurohormonal responses include activation of the sympathetic nervous system (SNS) and the renin-angiotensin-aldosterone system (RAAS). Activation of the SNS leads to increased contractility of the heart muscle, helping to maintain cardiac output. In HF, reduced renal perfusion leads to activation of the RAAS, as the body tries to maintain blood pressure by increasing sodium and water retention, thereby increasing blood volume.⁵

These responses are intended as short-term responses to changes in blood pressure



Figure 1. Pathophysiology of Chronic HF Involves 3 Interrelated Systems^{4,6}



ACE indicates angiotensin-converting enzyme; ADH, antidiuretic hormone; ANP, atrial natriuretic peptide; BNP, B-type natriuretic peptide; SVR, systemic vascular resistance.

or renal perfusion (blood flow to the kidneys); however, overactivation of these mechanisms causes the development and progression of HF.^{5,6}

In the setting of HF, as in many biologic processes, there is sustained maladaptive overactivation of regulatory systems as well as counter-regulatory systems. For instance, the natriuretic peptides are activated in patients with HF. Natriuretic peptides are endogenous hormones considered beneficial in HF. Atrial natriuretic peptide and B-type natriuretic peptide (BNP) are found at higher plasma levels in patients with HF.⁵ Atrial natriuretic peptide and BNP are believed to act to oppose the actions of RAAS; for example, by promoting vasodilation, excretion of sodium and water, and inhibition of the SNS. Recognition of this counter-regulatory system has been important for the development of new approaches to treating patients with HF.

Figure 1^{4,6} shows a simplified schematic of the SNS, the RAAS, and

the natriuretic peptide system and their potential interrelationships in the pathophysiology of chronic HF.^{4,6}

Classification of HF

The American College of Cardiology Foundation (ACCF) and the American Heart Association (AHA) have developed a classification of HF based on the development of disease and disease progression. Figure 2³ highlights the stages of HF according to the ACCF/AHA.³

Stage A includes patients who are at risk for developing HF, but have no structural heart disease or symptoms of HF. Stage B includes patients with structural heart disease, but no signs or symptoms of HF. Stage C includes patients with structural heart disease with current or prior symptoms of HF. Stage D includes patients with refractory HF requiring specialized interventions.³

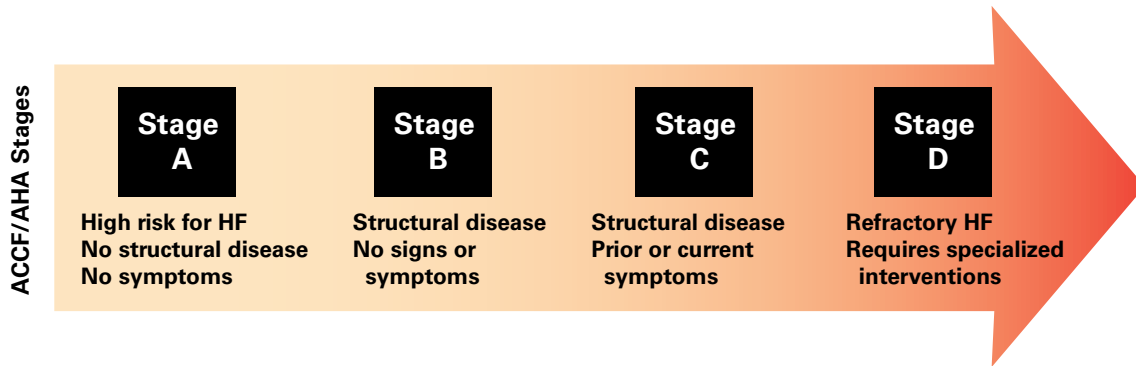
By contrast, the New York Heart Association (NYHA) classes focus on exercise capacity and the symptoms

of HF. NYHA class I patients have no limitation of physical activity, and ordinary physical activity does not cause symptoms of HF. NYHA class II patients have slight limitation of physical activity. They are comfortable at rest, but ordinary physical activity results in symptoms of HF. NYHA class III patients have marked limitation of physical activity. They are comfortable at rest, but less than ordinary physical activity results in symptoms of HF. NYHA class IV patients are unable to carry on any physical activity without symptoms of HF, or experience symptoms of HF at rest.³

Patients With Chronic HF Are at Risk for Mortality

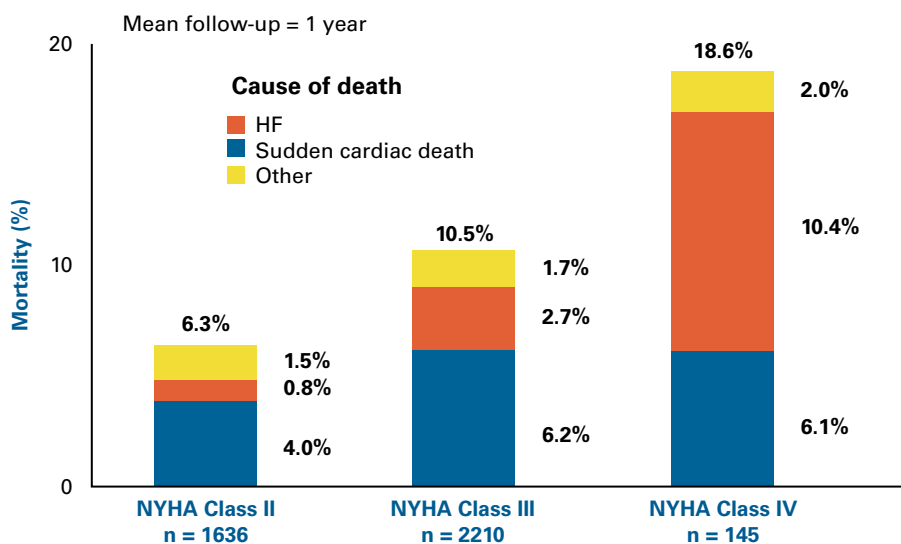
HF is associated with a mortality rate of approximately 50% within 5 years of initial diagnosis in those 65 years and older.^{3,7,8} Patients with chronic HF are at risk for mortality regardless of NYHA class (not including NYHA class I).⁹ Common

Figure 2. ACCF/AHA Stages³



ACCF/AHA indicates American College of Cardiology Foundation/American Heart Association; HF, heart failure. Adapted from Yancy CW, Jessup M, Bozkurt B, et al. *J Am Coll Cardiol.* 2013;62(16):e147-e239.

Figure 3. Patients With Chronic HF Are at Risk for Mortality, Irrespective of NYHA Class^{9,a}



HF indicates heart failure.

^aNYHA, New York Heart Association functional classifications (not including class I).

causes of death in patients with HF include sudden cardiac death, progressive failure of cardiac pumping, and organ failure due to inadequate blood supply (especially the kidneys).¹

The results of an international, multicenter, randomized study in patients with chronic HF showed that the proportion of sudden deaths generally decreased with increasing severity of HF, whereas the proportion of patients who died from worsening HF

increased with increasing severity of HF (Figure 3).⁹

Figure 4¹⁰ illustrates the progression of HF. With each hospital admission for acute HF, there is a short-term improvement; however, the patient leaves the hospital with a further decrease in cardiac function that can lead to further progression of HF.¹⁰

Every hospitalization leads to irreversible reductions in cardiac function and accumulating hospitaliza-

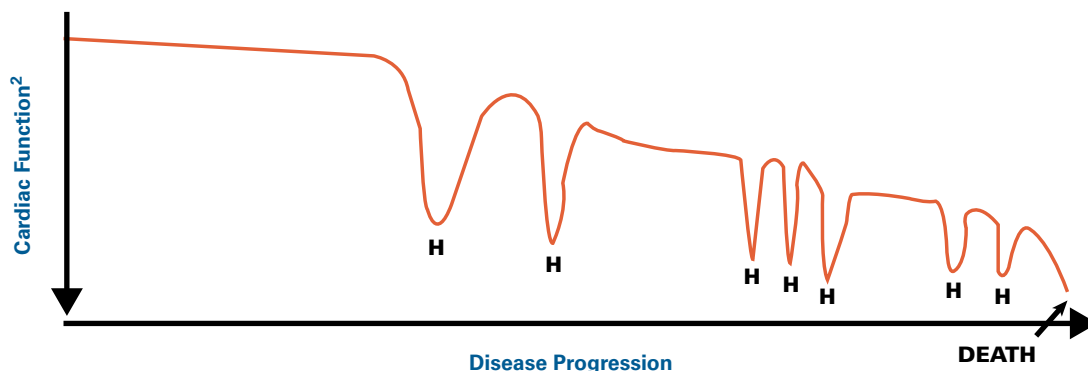
tion costs.¹⁰ Also, hospital 30-day readmission and mortality rates are key quality drivers affecting hospital reimbursements and resource utilization.¹¹

2013 ACCF/AHA Guideline Recommendations

The ACCF and the AHA have jointly issued guidelines for the management of HF. Table 1³ shows the level of evidence supporting the recommendations.³



Figure 4. Progression of HF¹⁰



H indicates hospitalization; HF, heart failure.

Adapted from Gheorghiade M, De Luca L, Fonarow GC, et al. *Am J Cardiol.* 2005;96(suppl):11G-17G.

Table 1. Chronic HF With Reduced Ejection Fraction Guideline Recommendations³

Intervention	Stage A	Stage B	Stage C
ACE inhibitors	N/A	1A	1A
ARBs	N/A	1A	1A
Beta-blockers	N/A	1B	1A
Aldosterone antagonists	N/A	N/A	1A
Diuretics	N/A	N/A	1C
Inotropic support ^a	N/A	N/A	N/A
Address hypertension, diabetes, and lipid disorders	1A	1A	1A
Lifestyle changes	1C	1C	1C

ACE indicates angiotensin-converting enzyme; ARB, angiotensin receptor blocker; HF, heart failure; N/A, not applicable.

^aInotropic support recommendations are dependent on the individual patient disease characteristics.

Level A: Multiple populations evaluated; data derived from multiple randomized clinical trials or meta-analyses.

Level B: Limited populations evaluated; data derived from a single randomized trial or nonrandomized studies.

Level C: Very limited populations evaluated; only consensus opinion of experts, case studies, or standard of care.

Class I: Procedure/treatment should be performed or administered.

Class IIa: It is reasonable to perform procedure/administer treatment.

Class IIb: Procedure/treatment may be considered.

Class III: Not helpful, no proven benefit, excess cost without benefit, or harmful to patients.

Adapted from Yancy CW, Jessup M, Bozkurt B, et al. *J Am Coll Cardiol.* 2013;62(16):e147-e239.

ECONOMIC IMPACT AND BURDEN OF DISEASE

HF Carries a Significant Burden in the United States

The incidence and prevalence of HF are steadily increasing. There are 870,000 new HF cases diagnosed annually. Approximately 5.7 million persons in the United States have clinically manifest HF, and the prevalence continues to rise.¹²

In the United States, the total (direct and indirect) medical cost of HF is forecasted to rise 2.5-fold by 2030—from \$21 billion in 2012 to \$53 billion. Hospitalizations account for the majority (80%) of direct costs for HF.¹³ HF is the number 1 cause of hospitalization in people 65 years or older.¹⁴ Also of concern are the penalties that Medicare is levying on hospitals for excess readmissions. In 2014, hospi-

tals were to be charged \$227 million in Medicare readmission penalties (based on original admissions for at least 1 of 3 conditions—heart attack, HF, or pneumonia between 2009 and 2012).¹¹

Quantifying the Burden of HF Among Medicare Fee-for-Service Beneficiaries

An analysis of actual Medicare paid claims was conducted to quantify the burden of HF. The HF



Table 2. Methodology¹⁵

Data Source	Denominator	Claim Type (at least 1)	HF ICD-9 Code (in any position)	Eligibility Category	30-Day All-Cause Readmissions
<ul style="list-style-type: none"> Medicare 5% sample (FFS beneficiaries) 2011-2012 	<ul style="list-style-type: none"> Eligibility in all months of 2011 and for ≥1 month in 2012 Part A and B eligibility in all months of the study period No HMO enrollment in any portion of the study period 	<ul style="list-style-type: none"> Acute inpatient Emergency department Non-acute inpatient Outpatient 	<ul style="list-style-type: none"> 398.91 402.01 402.11 402.91 404.01 404.03 404.11 404.13 404.91 404.93 428.xx 	<ul style="list-style-type: none"> Aged/dual eligible Aged/not dual eligible Disabled, end-stage renal disease (ESRD) Institutionalized (non-ESRD) 	<ul style="list-style-type: none"> Calculated using a modified version of the Agency for Healthcare Research and Quality readmission methodology

ESRD indicates end-stage renal disease; FFS, fee for service; HMO, health maintenance organization; ICD-9, *International Classification of Diseases, 9th Revision*.

Table 3. Cost Comparison: HF Population Versus Nationwide Non-HF Medicare FFS Population^{15,a}

Status	Allowed PMPM (non-HF)	Allowed PMPM (HF)	Percent of Medicare Members (non-HF)	Percent of Medicare Members (HF)	Percent of Medicare Spend (non-HF)	Percent of Medicare Spend (HF)
Aged/dual eligible	\$794	\$2996	7.3%	1.4%	5.4%	3.8%
Aged/not dual eligible	\$709	\$3020	63.9%	7.2%	42.7%	19.1%
Disabled	\$761	\$3327	14.8%	0.9%	10.6%	2.7%
ESRD	\$5411	\$10,171	0.7%	0.5%	3.3%	4.4%
Institutionalized (non-ESRD)	\$2033	\$4393	2.4%	1.0%	4.2%	3.8%
Total	\$791	\$3482	89.0%	11.0%	66.2%	33.9%

ESRD indicates end-stage renal disease; FFS, fee for service; HF, heart failure; PMPM, per member per month.

^aAllowed costs include patient cost sharing. Costs have been trended to 2014.

population was evaluated using the Medicare 5% sample data for 2011 and 2012 and quantified cost drivers that present opportunity for better management.¹⁵

A cost comparison was conducted between the nationwide Medicare fee-for-service (FFS) HF population and the FFS population excluding HF (non-HF).¹⁵

The criteria used to identify the study population and calculate various metrics as part of the descriptive,

retrospective claims data analysis are shown in *Table 2*.¹⁵ The prevalence of cardiac and non-cardiac comorbidities was also evaluated.¹⁵

The results of the analyses revealed that patients with HF represent a substantial financial burden (cost and utilization) in the Medicare FFS population. *Table 3*¹⁵ shows the outcomes in this population.¹⁵

The prevalence of HF among Medicare beneficiaries is 11%. However, beneficiaries with HF con-

tributed to 34% of the total Medicare spend versus 66% for those without HF.¹⁵

Compared with beneficiaries without HF, the allowed per member per month (PMPM) medical costs were about 2 times as high in those with HF who had ESRD or were institutionalized and nearly 4 times as high in the other HF eligibility category populations, including the largest category, aged/not dual eligible.¹⁵

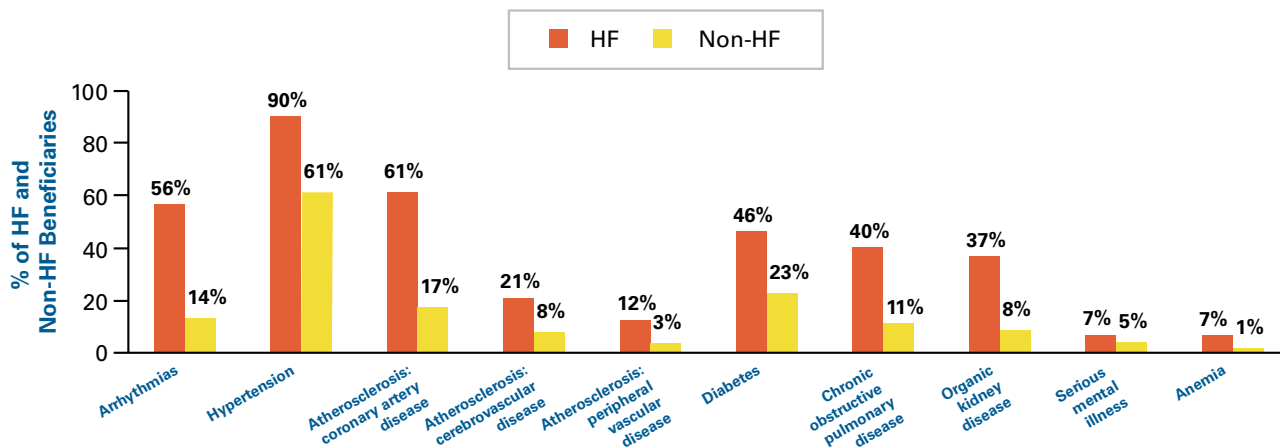


Table 4. Mortality Rate Comparison: HF Population Versus Nationwide Non-HF Medicare FFS Population¹⁵

Status	Mortality Rate (non-HF)	Mortality Rate (HF)
Aged/dual eligible	3.5%	13.8%
Aged/not dual eligible	3.9%	22.0%
Disabled	1.8%	10.0%
ESRD	11.5%	29.4%
Institutionalized (non-ESRD)	21.9%	34.7%
Total	4.1%	21.5%

ESRD indicates end-stage renal disease; FFS, fee for service; HF, heart failure.

Figure 5. Prevalence of Comorbid Conditions¹⁵



HF indicates heart failure.

HF Is One of the Leading Causes of Mortality Among HF Medicare FFS Beneficiaries

Patients with HF account for almost 40% of the total annual deaths among Medicare FFS beneficiaries. The mortality rate for the HF population is 5 times that of the non-HF population (22% vs 4%). For the HF population, mortality is highest among the institutionalized population at 35% (*Table 4*).¹⁵

The Prevalence of Comorbidities Is Higher in the HF Medicare FFS Population

The comorbidities evaluated were arrhythmias, hypertension, atherosclerosis: coronary artery disease, atherosclerosis: cerebral artery disease,

atherosclerosis: peripheral vascular disease, diabetes, chronic obstructive pulmonary disease, chronic kidney disease, serious mental illness, and anemia. The prevalence of comorbidities in the HF Medicare FFS population was substantially higher than in the non-HF population for all the comorbidities analyzed (*Figure 5*).¹⁵

Higher Hospital Utilization Among the HF Medicare FFS Population

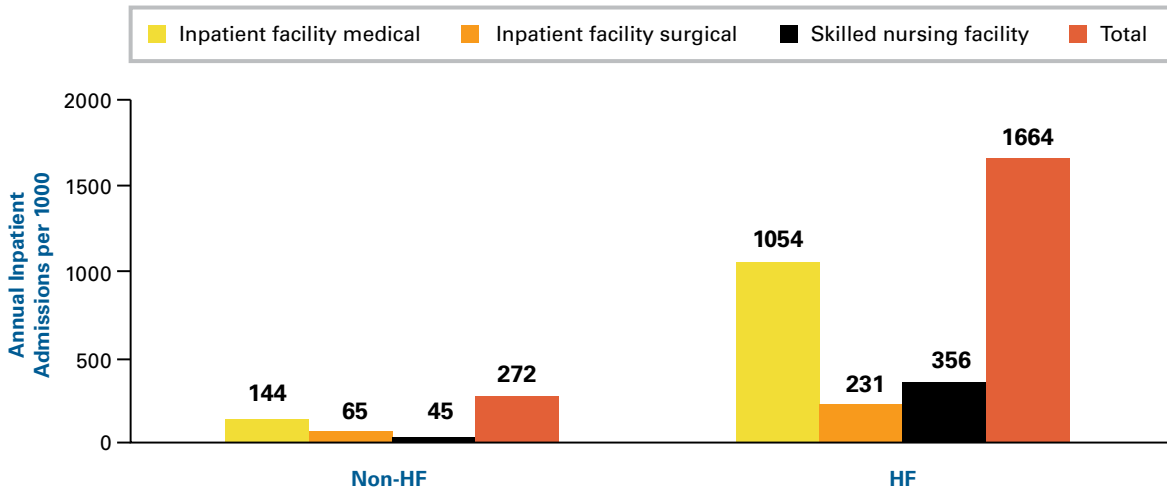
Medicare FFS beneficiaries with HF experience high hospitalization rates (*Figure 6*).¹⁵ Total annual inpatient admission rates for the HF Medicare population were 6 times higher than that of non-HF beneficiaries: 1664 versus 272, respectively. Skilled nursing facility (SNF)

admission rates for the HF Medicare FFS population were almost 8 times as high as SNF admission rates in the non-HF population.¹⁵

Most HF Medicare beneficiaries have 1 or more inpatient admissions annually; 60% have 1 or more admissions, while 31% have 2 or more admissions (*Table 5*).¹⁵

In addition to high admission rates, HF Medicare FFS beneficiaries have high readmission rates (*Table 6*).¹⁵ They were responsible for 55% of the total Medicare readmissions. HF Medicare beneficiaries had an all-cause 30-day overall readmission rate of 28%, versus 16% in the non-HF population. The rate of all-cause readmission following HF admissions was 31%. Readmissions were all-

Figure 6. Inpatient Admission Rates for HF and Non-HF Medicare Beneficiaries¹⁵



HF indicates heart failure.

Table 5. Inpatient Admission Rates for HF Medicare Beneficiaries¹⁵

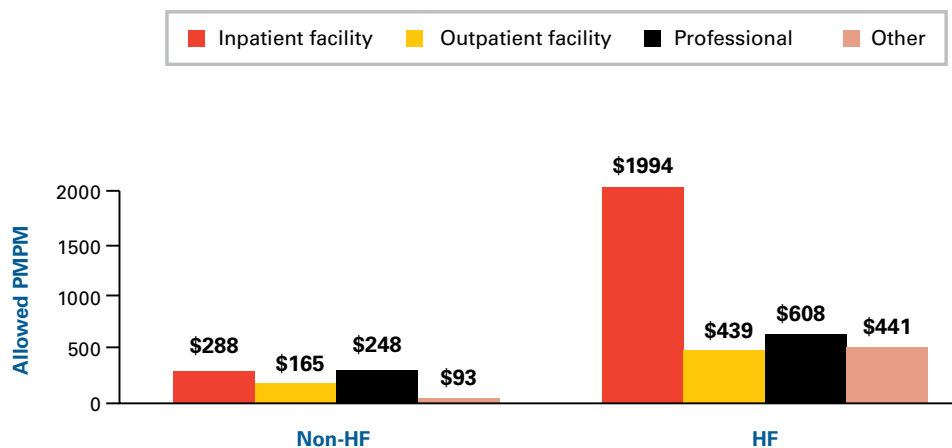
Inpatient Admission Count (per HF beneficiary)	HF Population Having Any Admission(s)	
	Count of Medicare Beneficiaries	% of HF Population
1	45,968	29%
2	24,763	15%
3	12,376	8%
4	6271	4%
5	3301	2%
6+	3912	2%
Total	96,591	60%

HF indicates heart failure.

Table 6. Inpatient Readmission Rates for HF and Non-HF Medicare Beneficiaries¹⁵

Type	Rate for HF Population	Rate for Non-HF Population
All-cause readmissions following all-cause admissions	28%	16%
All-cause readmissions following HF admissions	31%	—
HF readmissions following HF admissions	10%	—

HF indicates heart failure.

**Figure 7. Allowed PMPM Costs by Major Service Category^{15,a}**

PMPM indicates per member per month.

^aCosts have been trended to 2014. Inpatient facility includes medical, surgical, psych, substance abuse, acute rehab, skilled nursing facility, and maternity. Outpatient facility includes all services delivered in an outpatient facility including emergency department, ambulatory surgery, radiology, lab, pathology, physical therapy/occupational therapy/speech therapy, and dialysis. Professional includes all professional claims associated with both inpatient and outpatient services, including office visits. Other includes home care, durable medical equipment, and ambulance. Allowed cost includes patient cost sharing.

cause admissions within 30 days of inpatient discharge. (Inpatient rehab admissions following acute inpatient admissions were not considered readmissions.)¹⁵

Greater PMPM Costs for Medicare FFS Beneficiaries

Medicare FFS beneficiaries with HF are an expensive population with high PMPM costs. Overall, the HF Medicare population accrued higher medical costs in each of the service categories depicted in the bar chart compared with the non-HF population.¹⁵

Allowed PMPM costs per category are shown in *Figure 7*.¹⁵

HF Medicare beneficiaries had 4 times the average PMPM costs compared with the non-HF Medicare FFS population: \$3482 allowed PMPM versus \$791 allowed PMPM, respectively.¹⁵

A Medicare Part D analysis was conducted based on membership and total pharmacy cost information for

members with 12 months of Medicare eligibility with some form of pharmacy coverage based on the MEPS 2010 to 2012 data sets.¹⁵ (MEPS is a large-scale survey of individuals, families, medical providers, and employers in the United States.)

Medicare Part D spending on HF Medicare beneficiaries is approximately 2 times the amount of an average Medicare beneficiary. Among non-low-income beneficiaries, the allowed Medicare Part D PMPM cost for an HF beneficiary is \$411, compared with \$189 for the average beneficiary. As for low-income beneficiaries (incomes <150% of the federal poverty level), the allowed Medicare Part D PMPM for an HF beneficiary is \$622 PMPM versus \$377 PMPM for the average beneficiary.¹⁵

SUMMARY

Payer Considerations in the Treatment of HF

The incidence and prevalence of HF are steadily increasing.¹² The direct

cost of HF treatment in the United States was estimated at \$21 billion in 2012. Total cost of care for HF (direct and indirect costs) is predicted to rise 2.5-fold by 2030.¹³

Based on a recent cost analysis, the prevalence of HF among Medicare FFS beneficiaries is 11%; however, patients with HF contribute 34% of the total spend. HF Medicare FFS beneficiaries account for 39% of total annual Medicare FFS deaths and 42% of total Medicare FFS admissions. HF Medicare FFS beneficiaries have 4 times the average PMPM costs (\$3482) of the non-HF population (\$791).¹⁵

Evidence Gaps in HF

Clinical trials have demonstrated that although mortality rates can be reduced with available pharmacotherapies, patients with HF are still at risk for morbidity and mortality despite optimized treatment.^{3,16-18} Future research will need to focus on novel pharmacologic therapies.³



ASK THE PRESENTER

Editors from *The American Journal of Managed Care* sat down with Dr Greenberg and Ms Fitch to gain additional insight on the impact of HF on patients, efforts to reduce hospitalizations among patients with HF, the potential impact of treatments, drivers of spending in patients with HF, and opportunities for improving the management of HF.

Q & A With Barry H. Greenberg, MD

AJMC: How is the burden of HF growing as the population ages?

BHG: HF is, in general, a disease of older people. Risk factors are common in the population, and the longer people live with them, the more likely these risk factors are to cause cardiovascular disease. HF is the final common pathway of many cardiovascular diseases such as hypertension, coronary artery disease, and valvular heart disease. As the older population is growing, HF is increasing in prevalence, not only in the United States but in virtually every other country around the world.

AJMC: Based on your experience, how does HF impact patients on a daily basis in terms of clinical symptoms and quality of life?

BHG: I think that the impact depends in part on the severity of the HF and the patient's ability to adapt. Adaptive measures include changes in activities, changes in diet, and compliance with the medical regimen. I think we've really come a long way over the last several decades in improving quality of life and outcomes in HF. It's certainly not perfect yet, but it's a lot better than before, and people can do reasonably well, although there is a need for new therapies to help them do even better.

Lifestyle choices clearly influence the clinical course for patients with HF, I think, such that individuals who are not taking their medications, or are taking them erratically, individuals who have a high-salt diet, take in more fluid than they should, are going to be more prone to developing congestion and getting themselves hospitalized.

AJMC: What is your approach in patients with HF who are hospitalized? Is hospitalization a marker of higher risk?

BHG: We try to use the hospitalization as a teaching moment and also, I think, a watershed moment in the patient's clinical course, because it really does indicate an increased level of risk for both recurrent hospitalization and mortality. So we try to see if there are any triggers that led to the hospitaliza-

tion, such as the compliance issues that we talked about. We make sure that their medical therapy is optimized and that we didn't overlook something in the diagnosis, and then educate the patients. I think that's really critical, that the patients understand what the disease is and what they can do to help themselves avoid doing poorly in the future.

We've now recognized, I think, that a single admission does represent higher risk—the likelihood of hospitalization, rehospitalization, and mortality over the next 12 months is substantially higher than if they hadn't had that index hospitalization.

AJMC: Are there other types of markers or risk factors that you've seen associated with high-utilization patients?

BHG: I think that patients with advanced functional class and more symptomatic patients do less well. Also, there are a whole host of other markers that we use including biomarkers and standard serum chemistries.

AJMC: What are some of the new developments in our understanding of the pathophysiology of HF?

BHG: The central paradigm of understanding HF for the last couple of decades has been one based on activation of neurohormonal systems in response to cardiac damage. By and large, this activation leads to adverse effects due to high levels of angiotensin II that come about through activation of the RAAS and high levels of catecholamines as a manifestation of activation of the SNS, which lead over time to the progressive deterioration in cardiac function that ultimately leads to worsening HF.

At the same time, other systems are activated and some of them are counter-regulatory, and it turns out that the natriuretic system is one of these other, counter-regulatory systems. The release of natriuretic peptides can actually counteract many of the adverse effects of the RAAS and the SNS. So there's almost this check-and-balance that's going on. We've learned to block the activation of the RAAS and the SNS, resulting in a profound improvement in patient outcomes.

(continued)



Q & A With Barry H. Greenberg, MD (continued)

AJMC: What do you feel are some of the biggest challenges to managing HF currently?

BHG: Sometimes the diagnosis of HF is delayed, and early recognition is quite helpful, I think. So the challenges include identifying HF, getting patients on the right medications, and reinforcing with patients how important it is for them to take their medications on a regular basis. Also, a challenge is educating patients so that they can recognize some of the more subtle signs and symptoms of their doing poorly and bring those to the attention of

providers who can help adjust their medical therapy appropriately.

AJMC: Any additional comments?

BHG: HF is a common and growing problem that has a profound impact on patients and their families as well as on our healthcare system. Recognizing HF and getting patients on appropriate therapies can clearly improve outcomes; however, there remains a lot of work to do in this area, as current therapies are not perfect.

Q & A With Kathryn V. Fitch, RN, MED

AJMC: How does the prevalence of HF compare with the healthcare costs for patients with HF?

KVF: In the analysis we performed on the Medicare 5% sample, we identified an 11% prevalence rate of HF, and that population accounted for 34% of the spend in the total Medicare FFS population.¹⁵ So the ratio of spend to the total population is 3 to 1. By contrast, in diabetes, for example, the ratio is 2 to 1, I would say. Their share of the spend is twice that of the total population, whereas the HF spend is 3 to 4 times as high as the total population.

AJMC: What were some of the drivers of spending in patients with HF?

KVF: Patients with HF do have more comorbidities, and obviously they have higher risk for exacerbations and hospitalizations. What we saw in particular driving the costs was the inpatient admissions. Of the patients with HF, 60% had 1 or more admissions during the year. What's interesting is that because of the prevalence being 11% and the rate of admissions being so much higher, if we looked at all Medicare admissions, 42% of those are being contributed just by people with HF.¹⁵ Not to say that they're all HF admissions, but they're coming from people with HF.

AJMC: What is the readmission rate for patients with HF versus those without HF, and why are readmissions important from a financial perspective?

KVF: For HF, the readmission rate when a patient with HF is admitted to the hospital is 28%. These

patients are coming back within 30 days, not necessarily for HF, but being readmitted, whereas of the patients without HF, 16% are being readmitted. The other interesting point is that among the FFS Medicare population, 55% of all readmissions are coming from people with HF.¹⁵

I provide consulting services to many providers who are Accountable Care Organizations (ACOs), who are in the Medicare Shared Savings Program, or who have Medicare Advantage ACO contracts. After the release of these data, I have been encouraging them to focus on HF in terms of trying to get shared savings and bring down total population costs, because patients with HF touch so many of the metrics that they can control in terms of exacerbations, emergency department visits, hospitalizations, and even SNF stays.

AJMC: How do you see treatments in the pipeline affecting these costs?

KVF: For patients with HF, we saw that 49% of their total costs are from inpatient facility fees.¹⁵ These were not all HF admissions, but if those admissions, and particularly HF admissions, can be reduced with more efficacious therapies, it's going to have a big impact.

AJMC: Are there other concerns or complications (eg, infections) related to inpatient admissions?

KVF: We didn't look for that, but that's obviously something that's well published in terms of an increased risk for complications, accidents, infections.

(continued)



Q & A With Kathryn V. Fitch, RN, MEd (continued)

Also, the downstream costs when the patient leaves the hospital, whether they go to an SNF or get home care, you have that additional cost that can be avoided along with costs for the follow-up that's required.

AJMC: From your perspective and based on your research, what do you feel are some of the biggest challenges to improving outcomes in patients with HF?

KVF: I think a lot of people don't understand their own data. Now that many providers are taking on population risk, particularly as part of the Medicare ACO program, many don't understand that HF is a big cost driver, and they also don't know how they compare with best practice, if you will. So one of the things we're doing now actually is developing benchmarks for inpatient admission rates and other services among patients with HF. We're looking on a regional basis to determine, on a risk-adjusted basis, best practice, if you will. We would like to determine the lowest rate of admissions per thousand, and the distribution by percentile in these rates. We're finding that there are differences in inpatient admission rates on a risk-adjusted basis. So I think that one

of the challenges is for organizations to understand whether they are more well managed or more loosely managed. In general, there is room to be better managed overall.

AJMC: Where do you see the benchmarks coming from?

KVF: I think that Medicare itself with the quality outcome measures that they have for ACOs, and also with the reporting that hospitals have to do for Medicare, they're getting at some of that variation and report carding, if you will. On the ACO side, they have to report on their readmission rates after HF admissions, use of discharge beta-blockers, and other quality-of-care practice patterns.

AJMC: Any additional comments?

KVF: HF is a major cost driver, particularly in the Medicare population, and there is variation in utilization and cost regionally. These patients may be very expensive, but can we do anything about it? The presence of variation indicates that there is an opportunity for better management.



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