Outcomes for Women and Men Who Attend a Heart Failure Clinic: Results of a 12-Month Longitudinal Study

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ABSTRACT

Background: Although prevalence of heart failure (HF) is similar in women and men, more men are admitted to specialized HF clinics, possibly owing to a perception that men benefit more. Our aim was to describe 1-year outcomes in men and women attending specialized HF clinics.

Methods and Results: We enrolled 531 newly referred patients (mean age 66 years, 26% women) to 1 of 6 HF multidisciplinary clinics in Quebec. Data were collected at time of entry to the clinic and 6 and 12 months later. The 3 main outcomes, mortality, disease evolution (New York Heart Association functional class, quality of life, 6-minute walk), and number of hospital admissions/emergency department visits were analyzed separately. Survival was higher in women than in men (adjusted hazard ratio 2.53, 95% confidence interval 1.10–5.80). Both women and men improved over the 12-month period in terms of quality of life, 6-minute walk, and lower use of hospital and emergency department. Persons who at entry to the clinic had more severe disease showed more improvement. Deterioration over the year was associated with higher number of comorbidities, but not with age or gender.

Conclusions: Both men and women with HF who attend specialized HF clinics improved, including those with more severe disease. (J Cardiac Fail 2011;17:540–546)

Key Words: Heart failure, outcomes, specialized clinics.

Specialized heart failure (HF) clinics are effective in managing this complex condition and improving outcomes such as quality of life, reduction in emergency room visits, hospitalization frequency and length of stay; and reduced cost of care.1–3 Clinical guidelines suggest that the multidisciplinary organization of care in a specialized clinic is the model of choice.4 Furthermore, there is evidence that dedicated HF clinics adhere strongly to recommended guidelines regarding use of cardiac resynchronization therapy and HF education.5

However, these clinics have considerably higher proportions of men than women.6,7 Reasons for this disparity may include difference in the type of HF encountered (depressed vs preserved systolic function HF),7 referral bias on the part of the physician,7–9 possibly related to either the perception that men have more serious disease than women or ageism bias (discrimination because of age),10 because women with HF tend to be older than men. Other reasons for this disparity may be due to inability to attend the clinic for logistic reasons, such as living alone and lacking transport support to the clinic, caring for an ailing husband, or personal preferences to be followed by a family physician. Another potential explanation may be that men actually benefit more than women from this type of intervention.

To determine whether outcomes differ between men and women, we prospectively followed a cohort of newly referred consecutive patients to 1 of 6 participating HF clinics for a period of 1 year. Specifically, we wished to

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determine, whether there were differences in mortality, disease progression, and hospital admissions and to describe factors associated with these outcomes over the 12-month period.

Methods

Access-Clinic is a prospective observational cohort designed to compare men and women regarding severity at entry, management, and outcome over a 12-month period. We enrolled patients with HF who were newly admitted to 1 of 6 HF multidisciplinary clinics in the province of Quebec, Canada. All new patients were eligible if they could speak either English or French. The clinics ranged in size from 165 to 350 patients. Personnel included HF cardiologists, clinical nurses, pharmacists (3 sites), dieticians and social workers available on demand, a psychiatrist (1 site), and research nurses.

Data were collected from the clinical software database used at these clinics (Vision Cardiologie) as well as questionnaires that were administered to the patients at time of entry to the clinic and 6 and 12 months later. Clinical information extracted from the database included New York Heart Association (NYHA) functional class, left ventricular ejection fraction (LVEF), patient’s age and gender, dates seen at the clinic, medications prescribed, and comorbidities. The NYHA functional class,11 evaluated by the cardiologist or clinic nurse at each visit, has good prognostic value.12 To reduce problems with reproducibility between different observers,11 a training session was held at the beginning of the study to ensure consistency in evaluation of this measure.

The questionnaires included sociodemographic information, disease history (including initial HF diagnosis), health status, and the 21-item Minnesota Living with Heart Failure Quality of Life questionnaire (MLHFQ), which measures the patient’s perceptions of HF symptoms’ impact on his/her life during the preceding month and is considered to be a measure of health-related quality of life (HRQOL). Each item is graded on a scale of 0-5, with the questionnaires included sociodemographic information, disease history (including initial HF diagnosis), health status, and the 21-item Minnesota Living with Heart Failure Quality of Life questionnaire (MLHFQ), which measures the patient’s perceptions of HF symptoms’ impact on his/her life during the preceding month and is considered to be a measure of health-related quality of life (HRQOL). Each item is graded on a scale of 0-5, with the resultant global summed score ranging between 0 and 105. Higher scores indicate a lower HRQOL. Construct validity and internal consistency are high,13,14 and the scores have good correlation with prognosis15 and exercise capacity, as demonstrated by the VO2 max.16

In addition, each patient underwent a structured 6-minute walk test (6MWT), a measure of submaximal exercise capacity, which is a good reflection of daily activity limitation. Patients are instructed to walk for 6 minutes in a metered corridor; they may stop and restart as desired. At the end of 6 minutes, the total distance in meters is measured. This test is usually well tolerated by HF patients and has good reproducibility17–19 with an acceptable correlation with VO2 max,17,20 quality of life, and NYHA functional class17,18,20,21

Each of the patients signed an informed consent form, and the study was approved by the Institutional Review Boards of each of the participating institutions.

Analyses

The 3 main outcomes, mortality, disease progression, and hospital admissions/ED visits, were analyzed separately. We first used bivariate analysis and then constructed multivariate methods with factors that were associated with outcomes at \( P < .2 \). For mortality, we conducted a Cox proportional hazard model to compare women and men in terms of survival. Regarding disease progression, we used 3 separate measures. We determined changes in NYHA functional class, in HRQOL, and in the 6MWT distance. For NYHA functional class, we used an ordinal regression model, quantifying the outcome change as follows: 0 if they stayed the same, −1 if they deteriorated, and +1 if they improved. We also conducted a logistic regression, grouping improvement and remaining stable as one category, versus deteriorating as the other.

We used linear regression models for the other outcomes: change in HRQOL, change in 6MWT, and change in number of hospital admissions and ED visits. For HRQOL, a 5-point difference on the MLHFQ is considered to be “clinically significant;” therefore, we divided the score by 5 for the dependent variable in the regression analysis.22

Norms for women and men differ regarding 6MWT results; therefore, to compare men and women we used a norm-referenced quotient that accounts for differences in age, gender, height, and weight.23 By using these norm-referenced values, a percentage of the predicted value (PPV-6MWT) is calculated as the quotient of the measured 6MWT and the norm means.

The last main outcome was number of hospital admissions and ED visits over 12 months subsequent to admission to the HF clinic. We constructed linear regression models with a composite variable, change in hospital/ED use over 12 months, as the dependent variable.

We repeated all of the analyses on a subgroup of patients who entered the clinics with NYHA functional class 3 or 4, ie, considered to be more severe regarding symptoms, to explore whether women and men who enter the clinic with more severely symptomatic disease differ with respect to disease progression.

Covariates were age, comorbidity, severity at entry to the clinic (except for analysis on subgroup with more severe disease), type of HF, ischemic etiology, level of education, and social situation. Comorbidities were defined as the number of comorbid conditions (as described in the database), and we constructed models that included the following specific comorbidities: diabetes, anemia, hypertension, chronic obstructive pulmonary disease (COPD)/asthma, chronic renal failure, history of atrial fibrillation, and ischemic heart disease. Severity at entry was characterized as low if the patient had NYHA functional class 1 or 2 at entry to the clinic and high if the patient was classified at functional class 3 or 4. Education was used a proxy for socioeconomic status. Type of HF (depressed or preserved systolic function) was defined by using the cutoff for LVEF at 0.40. Social situation was evaluated as whether the person lived with someone or not.

All analyses were performed by using the statistical software SAS version 9.1.3 Windows (SAS Institute, Cary, North Carolina).

Results

We recruited 531 patients (392 men and 139 women) who agreed to participate from the 6 hospital-based multidisciplinary HF clinics out of a possible total of 772 eligible patients over a period of 3 years, 2005—2007. The mean age of nonparticipants was 72.93 ± 12.56 years and was higher than the mean age of participants, 65.9 ± 11.2 years (\( P < .0001 \); 36% of nonparticipants were female compared with 26.2% of participants (\( P < .01 \)). Among
Participants, the mean number of comorbidities was 3.1 ± 1.8; 57% had hypertension, 45% dyslipidemia, 36% diabetes, 24% chronic renal failure, and 15% COPD. One-third of the sample were smokers and 12% were obese. Women were older than men, more likely to live alone, have higher LVEF, and have valvular disease, and less likely to have ischemic heart disease or be treated with angiotensin-converting enzyme inhibitors or angiotensin receptor blockers at entry to the clinic (Table 1).

HRQOL and PPV-6MWT at baseline and 12 months are described in Table 2. Patients improved in terms of HRQOL score and PPV-6MWT. Regarding NYHA functional class, there were no significant differences between men and women over 12 months. There were 17% of women versus 20.3% of men who deteriorated, 69.8% of women versus 54.9% of men who remained stable, and 30.2% of women versus 24.8% of men who improved.

There were 50 deaths over the year of follow-up; fewer women died than men: 9/139 women (6.47%) versus 41/392 men (10.46%; P = .17). Bivariate analysis showed that the following factors were associated with mortality: more comorbid conditions (P = .002), a higher severity (NYHA functional class) at entry to the clinic (P = .005), preserved systolic function HF (P = .04), and older age (P = .0002). We also investigated specific comorbid conditions; chronic renal failure was the only specific comorbidity condition that was significantly associated with mortality (P = .0044). Cox regression revealed that men and older persons were at a higher risk of dying sooner (Table 3).

The ordinal regression analysis revealed that neither gender nor any of the other covariates was significantly associated with change in NYHA functional class. We also used logistic regression to assess factors associated with improvement in NYHA functional class. We limited this analysis to those in class 2 or 3, because those in class 1 could not improve and those in class 4 could not deteriorate. The logistic regression for persons who entered the clinic with NYHA functional class 2 or 3 showed that deterioration in functional class was not associated with gender; however, it was linked to being older, having more comorbidities, and living alone (Fig. 1).

Both women and men improved in terms of HRQOL. The multivariate analysis revealed that lower HRQOL (ie, higher MLHFQ score) at baseline, fewer comorbidities, and lower level of severity at entry (ie, NYHA function class < 3) were associated with improvement in HRQOL (Table 4).

Men improved in their 6MWT from 314.94 ± 94.1 m at entry to the clinic to 360.23 ± 110.6 m at 1 year after entry. Women also improved from 262.0 ± 96.6 m to 309.2 ± 113.5 m by the end of 12 months. There was no difference between them in PPV-6MWT (Table 2). In the multivariate model, 3 factors were associated with improvement in PPV-6MWT: having a lower initial PPV-6MWT, having a higher level of education, and not living alone (Table 4).

At admission to the clinic, 72.88% of the cohort had ≥1 ED visit in the preceding 6 months and 29.4% had a hospital admission. After 12 months of follow-up in the multidisciplinary HF clinic, only 17.66% had an ED visit in that year and 14.32% were hospitalized. In terms of having either an ED visit or a hospital admission, 76.33% had one or the other during the 6 months preceding entry to the clinic, and this percentage decreased to 18.38% during the year of follow-up, mainly owing to a decrease in ED visits. There were no differences between men and women in decrease in ED visits/hospital admissions. The multivariate model indicated that fewer comorbidities and higher previous health care utilization (in terms of ED visits or hospital admissions) were associated with decreased admissions/ED visits over 12 months of follow-up in the HF clinic (Table 4). Some patients were hospitalized after their ED visit. We therefore constructed separate models for ED visits and hospital admissions. The results were similar to the combined model, with a decrease in each individual health care use outcome associated with fewer comorbidities and higher previous health care use.

We performed several additional analyses for each outcome. First, we limited our sample to those with more severe symptoms (NYHA functional class 3 or 4). In this subgroup, 1-year mortality was associated with male gender (hazard ratio [HR] 3.89, 95% confidence interval [CI] 1.01–15.01) and

<table>
<thead>
<tr>
<th>Table 1. Description of the Cohort Together and by Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All (n = 531)</strong></td>
</tr>
<tr>
<td>Mean age, y (SD)</td>
</tr>
<tr>
<td>Annual income &lt;$35K, %</td>
</tr>
<tr>
<td>Lives alone, %</td>
</tr>
<tr>
<td>Mean body mass index (SD)</td>
</tr>
<tr>
<td>Mean LVEF (SD)</td>
</tr>
<tr>
<td>Systolic dysfunction HF, %</td>
</tr>
<tr>
<td>Ischemic heart disease, %</td>
</tr>
<tr>
<td>Valvular disease, %</td>
</tr>
<tr>
<td>ED visit in past 6 months, %</td>
</tr>
<tr>
<td>Hospitalization in past 6 months, %</td>
</tr>
<tr>
<td>Mean no. of comorbidities (SD)</td>
</tr>
<tr>
<td>Medications at entry:</td>
</tr>
<tr>
<td>Beta-blockers, %</td>
</tr>
<tr>
<td>ACEi or ARBs, %</td>
</tr>
</tbody>
</table>

LVEF, left ventricular ejection fraction; ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker.
older age (HR: 1.08, 95% CI 1.03–1.14) independent of type
of HF. Having a higher MLHFQ score at baseline (lower
HRQOL) was associated with improvement in HRQOL
over 1 year (beta 0.12, 95% CI 0.07,0.16), but there were
no differences between men and women. Improvement in
PPV-6MWT was associated with preserved systolic function
(beta 9.95, 95% CI 1.62–18.27) but there were no differ-
ences between the genders. Improvement in ED/hospital ad-
missions was associated with higher previous health care
utilization (beta 0.92, 95% CI 0.73–1.10), but there was
no association with gender.

Second, instead of number of comorbidities, we included
specific comorbidities in the model. A history of atrial fi-
brillation (beta 1.76, 95% CI 0.55–2.96) and having ane-
mia (beta 1.38, 95% CI 0.02–2.74) were associated with
deterioration in HRQOL. Having COPD/asthma (beta
4.63, 95% CI 0.82–8.44) was associated with deterioration
in PPV-6MWT. Having chronic renal failure was associated
with increased admissions/ED visits over 1 year (beta 0.79,
95% CI 0.31–1.28).

Third, we limited follow-up to 6 months instead of
12 months; there were only 11 deaths at that point. The re-
results confirmed no differences between men and women in
terms of improvement in HRQOL or 6MWT.

**Discussion**

Patients who were newly admitted to specialized HF
clinics improved over a 12-month period in terms of quality
of life and functional capacity, as demonstrated by the
HRQOL questionnaire and the PPV-6MWT, with similar
magnitude for both women and men but higher survival
in women. Individuals with fewer comorbidities were
more likely to improve.

Female gender has been associated with better survival in
patients with HF in general, although it was not previ-
ously associated with survival in patients managed in mul-
tidisciplinary HF clinics. In general, patients with
preserved systolic function HF are more likely to be female
and have slightly better survival than those with systolic
dysfunction HF. In our sample of patients newly admitted
to the HF clinic, the majority had systolic dysfunction HF.
There were 26% women and 16% men who had preserved
systolic dysfunction HF. We did not find a difference in sur-
vival between persons with preserved systolic function HF
and those with systolic dysfunction HF. We found that mor-
tality for persons with HF is associated with advancing age,
as reported by Frazier et al. Those authors conducted
a pooled analysis of patients with systolic dysfunction who
were included in 5 randomized trials. They also found
that better survival was associated with female gender, non-
ischemic etiology, lower level of severity (NYHA func-
tional class <4), and higher LVEF. Our results concur
regarding age and gender; and although not statistically sig-
nificant, there appears to be an association between mortal-
ity and higher severity (NYHA functional class ≥3) at
tenure to the clinic.

Regarding disease evolution, the literature indicates
that patients attending HF clinics improve regarding
HRQOL and NYHA functional class. The literature suggests
that female patients may have a better prognosis than male
patients, although the reasons for this are not fully under-
stood. Further research is needed to elucidate the factors
underlying these differences.

**Table 2.** Functional Capacity and Quality of Life Changes Between Referral and 1 Year in Patients Attending the HF Clinic

<table>
<thead>
<tr>
<th>Factor</th>
<th>Entry to the Clinic</th>
<th>12 mo After Entry</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota Living with Heart Failure Quality of Life total score* (SD)</td>
<td>All 45.64 (24.0)</td>
<td>28.11 (22.85)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Men 43.83 (23.98)</td>
<td>27.85 (23.09)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Women 50.36 (23.50)</td>
<td>28.77 (23.32)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Percent predicted value 6-minute walk test (SD)</td>
<td>All 50.64 (13.56)</td>
<td>58.51 (17.63)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Men 50.12 (12.95)</td>
<td>57.73 (15.93)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Women 51.96 (15.03)</td>
<td>60.51 (21.36)</td>
<td>.0083</td>
</tr>
</tbody>
</table>

*Higher score indicates worse health-related quality of life.

**Table 3.** Factors Associated With Mortality Over 12 Months of Follow-Up in the HF Clinic (Cox Regression)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Hazard Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male gender</td>
<td>2.53</td>
<td>1.10–5.81</td>
</tr>
<tr>
<td>Age (y)</td>
<td>1.05</td>
<td>1.02–1.09</td>
</tr>
<tr>
<td>No. of comorbidities</td>
<td>1.17</td>
<td>0.99–1.38</td>
</tr>
<tr>
<td>Systolic dysfunction HF</td>
<td>0.65</td>
<td>0.33–1.26</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>0.67</td>
<td>0.35–1.28</td>
</tr>
<tr>
<td>NYHA functional class ≥ 3</td>
<td>1.74</td>
<td>0.93–3.24</td>
</tr>
<tr>
<td>Years of education</td>
<td>1.00</td>
<td>0.95–1.06</td>
</tr>
<tr>
<td>Lives alone</td>
<td>1.31</td>
<td>0.70–2.43</td>
</tr>
</tbody>
</table>

**Fig. 1.** Factors associated with deterioration in NYHA functional class (logistic regression; n = 303).
Table 4. Disease Progression, Emergency Department Visits, and Hospital Admissions After 12 Months of Follow-Up in a HF Clinic, β* (95% CI)

<table>
<thead>
<tr>
<th></th>
<th>Improvement in HRQOL</th>
<th>Improvement in PPV-6MWT</th>
<th>Improvement in No. of ED/Hospital Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted $R^2$ for model</td>
<td>0.40</td>
<td>0.12</td>
<td>0.68</td>
</tr>
<tr>
<td>MLHF score at baseline</td>
<td>0.14 (0.12, 0.16)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PPV-6MWT at baseline</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>ED or Hospital admissions in year before entry in clinic</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Male</td>
<td>—0.30 (−1.37, 0.78)</td>
<td>−1.81 (−5.55, 1.93)</td>
<td>−0.26 (−0.70, 0.17)</td>
</tr>
<tr>
<td>Age (y)</td>
<td>0.02 (−0.02, 0.06)</td>
<td>−0.04 (−0.19, 0.10)</td>
<td>−0.0004 (−0.02, 0.02)</td>
</tr>
<tr>
<td>Number of comorbidities</td>
<td>−0.29 (−0.57, −0.02)</td>
<td>−0.90 (−1.93, 0.13)</td>
<td>−0.15 (−0.24, −0.01)</td>
</tr>
<tr>
<td>Systolic dysfunction HF</td>
<td>0.07 (−1.08, 1.23)</td>
<td>2.53 (−1.76, 6.83)</td>
<td>−0.33 (−0.81, 0.14)</td>
</tr>
<tr>
<td>Ischemic Etiology HF</td>
<td>−0.12 (−1.09, 0.85)</td>
<td>0.03 (−3.47, 3.52)</td>
<td>0.17 (−0.22, 0.57)</td>
</tr>
<tr>
<td>NYHA (3/4)</td>
<td>−3.36 (−4.47, −2.25)</td>
<td>−3.52 (−7.38, 0.35)</td>
<td>−0.42 (−0.87, 0.03)</td>
</tr>
<tr>
<td>Education (y)</td>
<td>0.03 (−0.06, 0.12)</td>
<td>0.52 (0.17, 0.87)</td>
<td>−0.01 (−0.05, 0.03)</td>
</tr>
<tr>
<td>Lives alone</td>
<td>−0.38 (−1.32, 0.57)</td>
<td>−5.12 (−8.63, −1.61)</td>
<td>0.04 (−0.36, 0.44)</td>
</tr>
</tbody>
</table>

HRQOL, health-related quality of life; 6MWT, 6-minute walk test; ED, emergency department; NYHA, New York Heart Association functional class.

*Negative beta value indicates an inverse relation between the variable and the outcome.

$^1β < .05$.
$^2P < 0.1$.

Martensson et al$^{32}$ reported that there was a mean improvement of 2 points on the MLHFQ between baseline and 12 months in their nurse-led intervention on HRQOL and depression, but there were no significant gender differences. Our results of a 17-point difference on the MLHFQ are better than the 12-point difference reported by a Dutch study,$^{30}$ even though the proportion of women followed by their HF clinic group was higher than in the present study (33% vs 26%). It must be noted that the Dutch study was a randomized trial and that the number of patients in the intervention arm (those who attended the HF clinic) was only 118, compared with 531 in our cohort study.

Six-minute walk distance improved for both men and women over the 12-month period. Because persons with HF and a 6MWT $>300$ m have a lower risk of death,$^{33}$ the improvement in women may be especially important. Using norm-referenced values (PPV-6MWT), we did not find any differences between men and women regarding improvement: they both improved significantly from baseline values. Those who had a lower PPV-6MWT initially tended to improve more, as did those who had higher educational level. We used educational level as a proxy for socioeconomic status, which is often related to better health status. Among those with more severe disease at entry, persons with preserved systolic function improved more than those with systolic dysfunction HF in terms of PPV-6MWT.

Reduction in ED visits and/or hospitalizations is a main goal of the specialized HF clinics and has been shown in several studies evaluating these interventions.$^{3,29,34}$ We did not find a difference between men and women regarding this outcome, and there was a significant decrease in ED visits and hospitalizations in our cohort. Furthermore, this reduction was associated with a higher initial use of hospital care, which may imply that HF clinics are especially beneficial for those who were previously “higher users” of hospital care.

Patients who “have room to improve” (ie, those with lower HRQOL, lower PPV-6MWT, and more previous hospital admissions or ED visits) do so, especially if they have fewer comorbidities. Thus, patients with more severe disease in terms of HRQOL, function, or health care use, may benefit from HF clinic interventions.

The strengths of the present study include the use of a clinical sample with a rich amount of data (clinical and patient reported) and a 12-month follow-up. In this clinical cohort of patients with HF newly admitted to multidisciplinary clinics, just over one-fourth of the study participants were women, which is lower than the 37% cited as a weighted average of studies on HF clinics.$^6$ Participants in our study were younger than nonparticipants and tended to be male. This may explain the relatively large improvements in 6MWT. There are several limitations to the present study. There were 531/772 patients who agreed to participate. Nonparticipants were older, so our results may not be applicable to older populations. However, the mean age of our cohort is similar to that in other HF clinics.$^6$ Another limitation is that in assessing disease progression and hospital or ED admission, the analysis excluded those who died before the 12-month follow-up. If those with the lowest HRQOL and 6MWT were those who were most likely to die, then our results would tend to be overly optimistic regarding improvement. Nevertheless, in our analysis of a subgroup of persons with more severe disease at entry to the clinic, we noted that improvement was not associated with gender. Furthermore, analyses at 6 months (with only 11 deaths within that interval, instead of the 50 at 12 months) revealed no differences between men and women with respect to improvement in outcomes. Although we did not include certain covariates in the analyses (eg, medications), all patients were being treated at the same clinics with similar standards of care regarding appropriateness of medications. Finally, our analyses reflected change from entry into the clinic; without
a control group, we were able to display change over time but unable to determine whether HF clinics are effective in improving the condition.

The implications of the present study are that both men and women with HF who attend specialized HF clinics improved over the one year follow-up. Selection criteria for HF clinics should be based on patients most likely to improve regardless of sex.

Acknowledgments

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Disclosures

None.

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