

## Brief Report

# Patients Commonly Believe Their Heart Failure Hospitalizations Are Preventable and Identify Worsening Heart Failure, Nonadherence, and a Knowledge Gap as Reasons for Admission

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## ABSTRACT

**Background:** There are few data describing patient-identified precipitants of heart failure (HF) hospitalization. We hypothesized a patient's perception of reason for or preventability of an admission may be related to 30-day readmission rates.

**Methods and Results:** Ninety-four patients admitted with decompensated HF from July 2014 to March 2015 completed a brief questionnaire regarding circumstances leading to admission. Thirty-day outcomes were assessed via telephone call and chart review. Mean age was  $58 \pm 14$  years, with 60% blacks ( $n = 56$ ) and 41% females ( $n = 39$ ). Median left ventricular ejection fraction was 30%; 27 had preserved ejection fraction. Seventy-two patients identified their hospitalization to be due to HF ( $\pm$  another condition). Most common patient-identified precipitants of admission were worsening HF ( $n = 37$ ) and dietary nonadherence ( $n = 11$ ). Readmitted patients tended to have longer time until first follow-up appointment (21 vs 8 days). Seven of the 42 patients who identified their hospitalization as preventable were readmitted compared with 21/49 who believed their hospitalization was unpreventable ( $P = .012$ ). On multivariate regression analysis, patients who thought their hospitalization was preventable were less likely to be readmitted (odds ratio 0.31; 95% confidence interval 0.10–0.91;  $P = .04$ ).

**Conclusion:** Almost 50% of patients believe their HF hospitalization is preventable, and these patients appear to be less likely to be readmitted within 30 days. Notably, patients cite nonadherence and lack of knowledge as reasons hospitalizations are preventable. These results lend insight into possible interventions to reduce HF readmissions. (*J Cardiac Fail* 2016;■■■:■■■–■■■)

**Key Words:** Readmission, decompensated heart failure, patient-centric.

Patients hospitalized for heart failure (HF) have up to 30% risk of readmission within 30–60 days postdischarge.<sup>1,2</sup> Despite a growing focus on patient-centered care and outcomes, the patient perspective on precipitating factors for a HF hospitalization is not well-described. This study investigates patient viewpoints on reasons for HF hospitalization and prevent-

ability of admission and whether these factors play a role in HF outcomes.

## Methods

### Patient Selection

Adult patients admitted for HF requiring intravenous diuretics were recruited from July 14, 2014 to March 12, 2015. Patients were identified using daily inpatient census data, physician documentation, and medication orders and agreed to participate via written informed consent. Patients that were non-English speaking or unable to provide informed consent or complete research instruments were excluded. Patients with repeat hospitalizations were enrolled only once. All patients received HF education and discharge instructions from an HF nurse as per standard care. The Johns Hopkins Institutional Review Board approved the study.

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## Data Collection

Demographic and clinical data were collected via electronic medical record review. A study team physician collected patient-reported education level (graded on a scale of 0 [grade 0–8] to 5 [advanced degree]), baseline New York Heart Association functional class, comorbidities, and last health care encounter. Patients completed a 5-question, written multiple-choice questionnaire, asking: 1) Do you have HF? 2) What was the main reason you had to come to the hospital (HF, a different medical problem, both or neither)? 3) If you came to the hospital for HF, what was the number one reason you came to the hospital this time (10 multiple-choice options)? 4) Do you think this hospitalization could have been prevented? and, if so, 5) How could your hospitalization have been prevented? (7 multiple-choice options). Two physicians retrospectively reviewed each patient's medical record to determine whether the hospitalization was preventable (ie, avoidable by a modifiable factor) and if so then how. Thirty-day outcomes were assessed via telephone call and chart review.

## Statistical Analysis

Frequencies were determined for questionnaire responses. The data are reported as mean and standard deviation for normal continuous variables, median and interquartile range for nonnormal continuous variables, and as percentages of nonmissing values for categorical variables. Student 2-sample *t* test was used to compare normal continuous variables, whereas Wilcoxon rank-sum test was used to compare nonnormal continuous variables. A chi-square test was used to compare categorical variables between groups, with use of the Fisher exact test when appropriate based on sample size. Univariate analyses were performed to identify variables associated with studied outcomes. A multivariate logistic regression model of 30-day readmission was performed that included significant univariate covariates (diastolic blood pressure, Yale Readmission Risk Score, and patient-identified preventability) as well as demographic variables (age, gender, race, and education level). All statistical analyses were performed with STATA, version 13.1 (College Station, TX).

## Results

### Study Population

During the study period, there were 520 unique patients admitted for HF and seen by the HF nurse; 108 patients enrolled in the study. Ninety-four patients filled out the questionnaire, 4 of them incompletely. Fourteen patients withdrew from the study, were transferred to a surgical service, or left against medical advice.

The study cohort consisted of 94 patients with mean age  $58 \pm 14$  years, 60% blacks ( $n = 56$ ), and 41% females ( $n = 39$ ). Median education level on the 6-point scale was some college completed. Median left ventricular ejection fraction by transthoracic echocardiogram was 30 (interquartile range 15–

55%); 24 patients (25.5%) had ischemic cardiomyopathy and 27 (28.7%) had HF with preserved ejection fraction (HFpEF). The majority of patients were New York Heart Association class II or III ( $n = 72$ ). There were 19 first-time diagnoses of HF.

### Questionnaire Results

When asked “Do you have HF?”, 8/94 patients (8.5%) said no, of which 6 were new HF diagnoses and 2 had established HF with preserved ejection fraction.

When asked “What was the MAIN reason you had to come in to the hospital?” 72 patients (76.6%) identified HF as a reason for admission and 13 (13.8%) identified a different medical condition (6 of which said no to “Do you have HF?”). Notably, chief complaints of these 13 patients were: shortness of breath ( $n = 5$ ), leg swelling ( $n = 3$ ), chest pain ( $n = 1$ ), palpitations ( $n = 1$ ), syncope ( $n = 1$ ), and dysphagia ( $n = 1$ ). Nine patients said they came in for neither HF nor a different medical condition, and their chief complaints were: shortness of breath ( $n = 5$ ), leg swelling ( $n = 1$ ), fluid overload ( $n = 1$ ), chest pain ( $n = 1$ ), and laboratory test abnormality ( $n = 1$ ). Seventy of 72 patients provided a specific precipitant for their HF hospitalization (Fig. 1). The most commonly identified reason was “My heart failure was worsening” ( $n = 37$ ), whereas 11 patients reported nonadherence to dietary (either salt or fluid) restrictions.

Forty-two of 92 patients (45.7%) identified their hospitalization as preventable, with reasons being “if I had followed my salt or fluid restrictions” ( $n = 13$ ), “other” ( $n = 11$ ), “if I was better informed about my medical condition” ( $n = 10$ ), and “if I could see/talk to my provider” ( $n = 6$ ). None of the patients reported medication noncompliance, and only 1 patient reported lack of access to medication. One patient could not identify a reason. Baseline characteristics did not differ based on whether patients identified their hospitalization as preventable (Table 1). Upon 2-physician review, 38 admissions (40.4%) were preventable (Table 2).

### Outcomes

All-cause 30-day readmission rate was 30% ( $n = 29/93$ ) and HF 30-day readmission rate was 18% ( $n = 17/93$ ). One patient was lost to follow-up. Three patients died within 30 days. Patients who were readmitted at 30 days had lower discharge diastolic blood pressure ( $63 \pm 11$  vs  $69 \pm 13$  mmHg,  $P = .034$ ) and higher Yale Score ( $26.8 \pm 4.5$  vs  $24.0 \pm 4.5$ ,  $P = .008$ ) (Table 1).

Patient-identified reason for HF admission did not correlate with all-cause 30-day readmission rate. Of those who did not think their admission was preventable, 21/49 were readmitted within 30 days compared with 7/42 patients who thought their hospitalization was preventable ( $P = .012$ ). In the multivariate regression model, patient-identified “preventability” remained a predictor of 30-day readmission. Patients who identified their admission as preventable were

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