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# Physician Continuity Improves Outcomes for Heart Failure Patients Treated and Released From the Emergency Department

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## ABSTRACT

**OBJECTIVES** The goal of this study was to evaluate the effect of physician continuity for patients with heart failure (HF) treated and released from the emergency department (ED).

**BACKGROUND** Although current guidelines recommend early follow-up after hospital discharge, it is unclear if it is beneficial in patients sent home from the ED and whether this follow-up should be with a familiar physician.

**METHODS** This was a retrospective cohort of all adults treated and released from 93 EDs in Alberta, Canada, from 1999 to 2009 with a first-time most responsible diagnosis of HF. Cox proportional hazards models with time-varying covariates for post-ED outpatient visits were used.

**RESULTS** In 12,285 patients (mean age 74.9 years), the rate of death or all-cause hospitalization at 6 months was lower in those who saw a familiar physician (37.3%; adjusted hazard ratio [aHR]: 0.89 [95% confidence interval (CI): 0.83 to 0.96]) in the first month versus those with no outpatient visits (58.1%; aHR: 1.00 [referent]) or visits only with unfamiliar physicians (40.2%; aHR: 1.04 [95% CI: 0.94 to 1.15]). Taking into account all outpatient visits over each observation period and excluding those without follow-up, death or hospitalization was less common in those patients being followed up by a familiar physician (aHR of 0.79 [95% CI: 0.71 to 0.89] at 3 months; aHR of 0.86 [95% CI: 0.77 to 0.95] at 6 months; and aHR of 0.87 [95% CI: 0.80 to 0.96] at 12 months compared with unfamiliar physician follow-up). Any follow-up within 30 days of ED release was associated with a lower risk of repeat ED visit or death at 6 months (aHR: 0.78 [95% CI: 0.73 to 0.82] for familiar physicians; aHR: 0.79 [95% CI: 0.72 to 0.86] for unfamiliar physicians).

**CONCLUSIONS** Early follow-up after an ED visit is associated with better outcomes, particularly if conducted with a familiar physician. (J Am Coll Cardiol HF 2014;2:368–76) © 2014 by the American College of Cardiology Foundation.

Heart failure (HF) is a growing burden on the healthcare system, responsible for >1 million U.S. emergency department (ED) visits yearly (1). HF is projected to have a total economic cost in the United States of $42.9 billion by 2020 (2). Although most patients with HF who present to the ED are admitted to the hospital, approximately 25% to 35% are discharged directly from the ED (3,4). Outcome data for these "treated and released" patients are limited because most studies of HF epidemiology and outcomes have focused on hospitalized patients. However, we have recently reported mortality and hospitalization rates in these patients that are as bad as those for patients admitted to the hospital (4), and another Canadian study reported that patients treated and released from the

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ED actually have worse 30-day outcomes than those admitted (3), suggesting less than optimal triage in EDs.

Early outpatient follow-up, especially with physicians familiar with that patient, is associated with better outcomes for HF patients discharged from the hospital (5,6). In those treated and released directly from the ED, early follow-up (within 4 weeks) has also been shown to be associated with reduced hospitalizations and mortality (7). However, those findings

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arose from a landmark analysis in which patients with events in the first 100 days of the ED visit were excluded, and patients were "locked in" to comparator groupings based on visits before the landmark time, a method shown to provide potentially distorted estimates of treatment effect (8). Although the 2013 American Heart Association Heart Failure Guidelines recommend early follow-up after hospital discharge, they do not make any specific recommendations for early follow-up post-ED release (9).

In many Canadian EDs, this follow-up is facilitated by referring the patient to an urgent access clinic associated with that ED; thus, the question of whether continuity of care is important arises. Several studies have shown that in patients admitted to the hospital, post-discharge follow-up with a physician familiar with that patient results in lower rates of mortality and/or rehospitalization (6,10–12). However, to our knowledge, there are no published studies evaluating whether the benefits of physician continuity extend to HF patients treated and released directly from the ED. This information is important because to achieve recommended target follow-up times, continuity is often sacrificed.

We thus designed the present study to examine whether outcomes differed for HF patients treated and released from the ED if they followed up with physicians who knew them (i.e., treated them previously or saw them during the ED visit) compared with following up with a physician unfamiliar with their case.

## METHODS

**STUDY SETTING AND DATA SOURCE.** Alberta is a Canadian province with a government-funded universal healthcare system providing free access to physicians, hospitals, and EDs to 3.7 million people. We used de-identified linked data from 4 administrative databases for this study. The Ambulatory Care Classification System database records all patient visits to EDs with coding for up to 10 conditions, including the most responsible diagnosis assigned by the attending ED physician at the time of discharge from the ED. The Health Practitioner Claims Database tracks all physician claims for services and includes up to 3 diagnoses per encounter; it is linked with the College of Physicians & Surgeons of Alberta to provide information on physician specialty. The Alberta Health Care Insurance Plan registry tracks vital status of all Albertans and includes date of death or emigration from the province. The Discharge Abstract Database includes admission date, discharge date, most responsible diagnosis, up to 25 other diagnoses, and the acuity for all hospitalizations to any of the acute care hospitals in Alberta.

**STUDY COHORT.** We identified all patients discharged alive from an ED ("treated and released") between January 1, 1999, and June 30, 2009, with a most responsible diagnosis of HF (International Classification of Diseases-Ninth Revision-Clinical Modification, code 428.x or International Classification of Diseases-10th Revision, code 150.x). These diagnostic codes have been shown to be accurate in Alberta, with a positive predictive value of 91% when validated against a random chart audit of 4,008 patients (13). We selected only the patient's first ED treated-and-released visit for a most responsible diagnosis of HF for our analysis. Patients who were admitted to the hospital within 1 day of the index visit were excluded from our primary analysis because the databases we used only record day of service rather than time, and thus we could not be certain that an admission the day after an ED index visit was not part of the same episode of care. In a sensitivity analysis, patients admitted within 2 days of their index ED visit were excluded. Note that even if patients are held in the ED awaiting a ward bed in the hospital, they are coded as "admitted inpatients" in the Discharge Abstract Database from the date the decision to admit was made, not the date they finally arrived on an inpatient ward. In a separate sensitivity analysis, we excluded patients discharged from the ED back to a long-term care facility.

**OUTCOMES.** Our primary outcome of interest was death or urgent/emergent admission to the hospital within 6 months of an ED visit at which they were treated and released. This composite outcome is highlighted by the American Heart Association's Get With The Guidelines-Heart Failure project, the Canadian Cardiovascular Society, and the Joint Commission as a patient-relevant and important outcome (14–17). Our primary analysis used a 6-month time frame, but we also analyzed 3- and 12-month time frames as secondary outcomes and examined

**ABBREVIATIONS AND ACRONYMS**

**ACE-I** = angiotensin-converting enzyme inhibitor
**aHR** = adjusted hazard ratio
**CI** = confidence interval
**HF** = heart failure
**ED** = emergency department
**UPC** = usual provider of continuity