

Brief Report

The Surprise Question Can Be Used to Identify Heart Failure Patients in the Emergency Department Who Would Benefit From Palliative Care



Emily L. Aaronson, MD, MPH, Naomi George, MD, Kei Ouchi, MD, MPH, Hui Zheng, PhD, Jason Bowman, MD, Derek Monette, MD, Juliet Jacobsen, MD, and Vicki Jackson, MD, MPH

Department of Emergency Medicine (E.L.A., J.B., D.M.), Massachusetts General Hospital, Harvard Medical School; Lawrence Center for Quality and Safety (E.L.A.), Massachusetts General Hospital and Massachusetts General Physicians' Organization; Department of Emergency Medicine (N.G., K.O., J.B.), Brigham and Women's Hospital, Harvard Medical School; Biostatistic Center (H.Z.), Massachusetts General Hospital, Harvard Medical School; and Division of Palliative Care (J.J., V.J.), Department of Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts, USA

Abstract

Context. Heart failure (HF) is associated with symptom exacerbations and risk of mortality after an emergency department (ED) visit. Although emergency physicians (EPs) treat symptoms of HF, often the opportunity to connect with palliative care is missed. The “surprise question” (SQ) “Would you be surprised if this patient died in the next 12 months?” is a simple tool to identify patients at risk for 12-month mortality.

Objectives. The objective of this study was to assess the accuracy of the SQ when used by EPs to assess patients with HF.

Methods. We conducted a prospective cohort study in which clinicians applied the SQ to patients presenting to the ED with symptoms of HF. Chart review and review of death records were completed. The primary outcome was accuracy of the surprise question to predict 12-month mortality. A univariate analysis for potential predictors of 12-month mortality was performed.

Results. During the study period, 199 patients were identified, and complete data were available for 97% of observations ($n = 193$). The one-year mortality was 29%. EPs reported that “they would not be surprised” if the patient died within the next 12 months in 53% of cases. 42.7% of these patients died within 12 months compared to 13.3% in the “would be surprised” group. There was a strong association with death in the “not surprised” group (odds ratio 4.85, 95% CI 2.34–9.98, $P < 0.0001$). The sensitivity, specificity, positive predictive value, and negative predictive value of the SQ were 78.6%, 56.9%, 42.7%, and 86.7%, respectively, with c -statistic = 0.68.

Conclusion. The SQ screening tool can assist ED providers in identifying HF patients that would benefit from early palliative care involvement. *J Pain Symptom Manage* 2019;57:944–951. © 2019 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

Key Words

Emergency medicine, palliative care, mortality, surprise question

Introduction

Heart failure (HF) is a clinical syndrome characterized by a constellation of symptoms and signs caused by either structural or functional cardiac abnormalities that result in reduced cardiac output and/or

increased intracardiac pressures.¹ HF affects 5.1 million Americans, resulting in over 1 million hospitalizations annually. Unlike any other cardiac-related diagnosis, the prevalence of HF is rising.^{2–4} The cost of caring for patients with HF is estimated at \$31

Address correspondence to: Emily L. Aaronson, MD, MPH, Lawrence Center for Quality and Safety, Massachusetts General Hospital, 55 Fruit St, Bulfinch Building, Suite 280, Boston, MA 02115, USA. E-mail: emily.aaronson@mgh.harvard.edu

Accepted for publication: February 11, 2019.

billion annually and is expected to triple by 2030. This enormous financial burden is intrinsically related to recurrent symptom exacerbations prompting unscheduled and prolonged hospitalizations.^{2,3,5,6}

Patients living with HF often struggle with poorly controlled physical symptoms, such as shortness of breath, dyspnea, and fatigue. Rates of depression, anxiety, and psychosocial stress are prevalent among patients with HF and their family members.⁷⁻¹² Palliative care aims to decrease the stress, pain, and other suffering associated with having a life-limiting illness.¹³ In both inpatient and outpatient oncology patients, palliative care has been associated with both increased quality of life and family satisfaction, as well as decreased hospital length of stay and overall direct costs.¹⁴⁻²⁰

A recent randomized trial of HF patients suggested that palliative care for patients with advanced HF can increase quality of life and spiritual well-being and decrease anxiety and depression when compared to usual care alone.²¹ Despite this, little progress has been made to improve access and increase utilization of palliative care services. Often, patients with HF do not receive palliative care until the last month of life, if at all.²²⁻²⁵

Patients suffering with symptoms due to HF account for over 848,634 of the 129,843,000 emergency department (ED) visits annually.^{26,27} Prompted by poorly controlled symptoms such as dyspnea, ED visits are more common among HF patients with advanced disease and worsening illness trajectory. These symptomatic patients likely represent a group who would benefit from palliative care services. However, ED providers lack a strategy to rapidly identify them,²⁸⁻³⁰ and their illness trajectory is often difficult to predict.

Palliative care specialists aim to identify patients with palliative care needs and thus most appropriate for palliative care engagement. The surprise question, which asks clinicians "would you be surprised if this patient died in the next 12 months?" has been tested in several areas outside the ED as an easy screening tool that relies only on the clinician's impression to predict prognosis.³¹⁻³⁶ Within the ED, this tool was recently tested on all patients over 65 and showed promise, with a sensitivity of 77% and a negative predictive value of 90%.³⁷ Previous studies have also looked at the accuracy of the surprise question (SQ) for HF patients among primary care physicians,³⁸ cardiologists,³⁹ and specialized heart failure nurses.⁴⁰ However, the ability of the SQ to identify patients with HF who are at high risk for one-year mortality in the ED is unknown.

Our primary objective was to study the performance of the SQ in patients who present to the ED with symptoms related to their HF. Our secondary objective was to identify other clinical predictors of 12-month

mortality that could be used in conjunction with the SQ to increase efficacy.

Methods

Study Design

We conducted a prospective cohort study at a single, urban, academic hospital in the northeastern U.S. from November 2016 to February 2017. The study site has an annual ED volume of 110,000 visits, and is an STEMI Receiving Center with active heart failure and cardiac transplant programs. The study protocol was approved by the institutional review board (2015P000286).

Study Participants

We included patients receiving care in the ED, whose symptoms were attributed to HF exacerbation by the treating ED clinician (attending, resident, or PA) responsible for their care. Throughout each shift, research assistants (RAs) asked the attending providers if they had any patients in the ED for symptoms related to their HF or an HF exacerbation. Patients who carried a diagnosis of HF but whose ED complaint was not perceived by the ED care team to be related to an HF exacerbation were excluded.

We designed our study to reflect the current practice environment, which incorporates staffing by a heterogeneous group of clinicians including advanced practice providers including residents, physician assistants, and attending physicians. As such, once a patient was identified, the RA asked the responsible clinician or the attending physician to respond to the question "Would you be surprised if this patient died in the next 12 months?" ED clinicians were instructed to respond "no" if they would not be surprised if the patient died. Enrollment was conducted during the day and evening. We excluded patients cared for by EPs who were unwilling to participate, as well as shifts when the RA was not available to conduct enrollment.

Variables

Trained RAs abstracted demographic data and clinical variables from the hospital's electronic medical record. Demographic information included name, age, date of birth, sex, and residence of origin (i.e., home dwelling vs. nursing home). Clinical variables to be collected were determined a priori based on literature review of HF mortality prediction models and consensus among authors. These included presence or absence of multiple comorbidities, annual ED utilization, use of HF pharmacotherapy and HF devices, ED laboratory results, ED disposition, most recent transthoracic echocardiography results, and previous palliative care consultation. To ensure quality

of data abstraction, a physician investigator reviewed the charts and reabstracted data for all eligible patients. Patient name and date of birth were used to match patients to the Massachusetts Registry of Vital Records and Statistics, a statewide database that catalogs all deaths in Massachusetts. Date of death, as well as marital status, was obtained from this registry (see study flow in Fig. 1).

The primary outcome was the accuracy of the SQ in predicting one-year mortality among HF patients presenting to the ED with a symptom exacerbation.

Analysis

Patients were classified into one of two groups, based on the EPs response to the SQ: patients in whom the EP answered that they “would not be surprised” if the patient died in the next 12 months, and those

who “would be surprised” if the patient died in the next 12 months. We calculated the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of the SQ response and one-year mortality. A *P*-value of 0.05 was used for statistical significance. Bivariate analysis of all variables was performed using two-sample t-test and chi-square test. SDs and 95% CI were calculated. Logistic regression model was used to assess the association between one-year mortality and our independent variables. All analyses were performed using SAS software v 9.4 (Copyright © 2017 SAS Institute Inc., Cary, NC, USA).

Results

During the study period, 199 patients were identified as eligible for inclusion. Of these, six providers

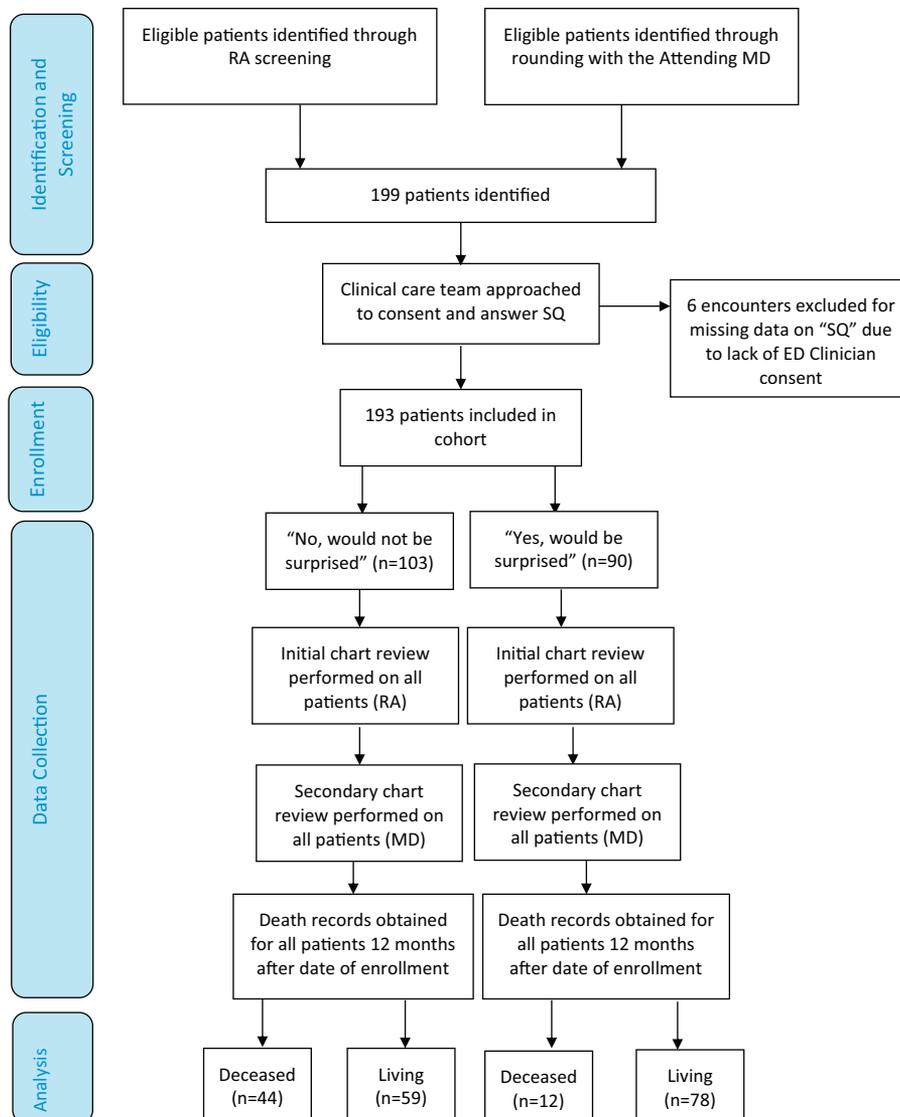


Fig. 1. Study flow. ED = emergency department; SQ = surprise question.

Table 1
Baseline Characteristics, Grouped by EP Response to SQ (N = 186)

	All N = 193 Median (IQR)	"No, Would Not Be Surprised" n = 103 Mean (SD)	"Yes, Would Be Surprised" n = 90 Mean (SD)	P-Value ^a
Demographics (n, %)				
Age (median, SD)	74.5 (12.6)	81 (11.3)	69.5 (12.2)	<0.001
Nursing home residency	21 (10.8)	15 (14.7)	6 (6.7)	0.079
Prior palliative care involvement	25 (12.9)	19 (18.6)	6 (6.7)	0.015
More than three ED visits in the last year	59 (30.6)	37 (36.3)	22 (24.7)	0.085
Fall in the past year	72 (37.1)	42 (42.4)	33 (38.4)	0.58
One-year mortality	56 (29.0%)	44 (42.7%)	12 (13.3%)	<0.001
Clinical information				
Initial serum sodium	139 (136,142)	138.0 (5.0)	138.5 (4.39)	0.498
Initial BUN	27 (18,42)	35.2 (21.7)	30.1 (20.1)	0.100
Initial creatinine	1.4 (1.0, 1.9)	1.83 (1.3)	1.83 (1.5)	0.977
Initial BNP	3520 (1257, 9786)	13,341.9 (1,9736.1)	6193 (9,466,6)	0.003
Initial troponin	0.06 (0.03, 0.11)	0.17 (0.4)	0.12 (0.2)	0.425
Ejection fraction	51.2 (16.9)	51.3 (16.1)	50.7 (17.7)	0.793
Systolic blood pressure	140.8 (29.6)	135.8 (27.4)	146.7 (31.6)	0.011
Diastolic blood pressure	75.3 (18.5)	74.5 (20.9)	76.9 (15.8)	0.380
Heart rate	86.6 (21.5)	87.0 (22.6)	86.1 (20.2)	0.764
Disposition (n, %)				
Admitted to hospital	163 (84.5)			
ICU admission	32 (16.6)	20 (19.6)	12 (13.5)	0.248
Discharged from ED	17 (8.8)	6 (5.8)	11 (12.2)	0.42
Died in the ED	0 (0)	0	0	N/A
Other ED disposition	13 (6.7)	8 (7.8)	5 (5.6)	0.54
Comorbidities (n, %)				
Advanced COPD	54 (27.9)	33 (32.0)	21 (23.3)	0.179
CHF	166 (86)	89 (86.4)	77 (85.6)	0.865
Cancer	34 (17.6)	20 (19.4)	14 (15.6)	0.482
Advanced CNS disease ^b	24 (12.4)	12 (11.7)	12 (13.3)	0.724
Diabetes	89 (46.1)	47 (45.6)	42 (46.7)	0.886
Anemia	47 (24.4)	36 (34.9)	11 (12.2)	<0.001
Chronic renal failure	88 (45.6)	51 (49.5)	37 (41.1)	0.242
End-stage liver disease	6 (3.1)	2 (1.9)	4 (4.4)	0.420
Septic shock	7 (3.6)	5 (4.9)	2 (2.2)	0.452
Multiorgan failure	7 (3.6)	3 (2.9)	4 (4.4)	0.707
Home diuretics	147 (76.2)	79 (76.7)	68 (75.6)	0.852
HF devices (AICD, PM, LVAD, CRT)	37 (19.2)	18 (17.5)	19 (21.1)	0.522

EP = emergency physician; SQ = surprise question; IQR = interquartile range; ED = emergency department; BUN = blood urea nitrogen; BNP = brain natriuretic peptide; ICU = intensive care unit; HF = heart failure; COPD = chronic obstructive pulmonary disease; CHF = chronic heart failure; CNS = central nervous system; AICD = automatic implantable cardioverter-defibrillator; PM = pacemaker; LVAD = left ventricular assist device; CRT = cardiac resynchronization therapy; ALS = amyotrophic lateral sclerosis; MS = multiple sclerosis.

^aThe P-value is calculated by t-test for numerical covariates; and chi-square test or Fisher's exact for categorical covariates, where appropriate.

^bALS, MS, Parkinson's, dementia.

declined to answer the SQ. As such, complete data were available for 97% of observations ($n = 193$). Of the 193 patients in the sample, 56 patients died within 21 months (29%). The mean age was 74.5 years (SD 12.6 years). The overall 12-month mortality was 65.46%. The mean ejection fraction was 51.2 (SD 16.9).

Performance of the Surprise Question

EPs reported that "they would not be surprised" if the patient died in 12 months in 53% (103/193) of cases. Of the 103 patients in whom EPs reported "they would not be surprised" if the patient died in 12 months, 42.7% (44 of 103) of these patients died within 12 months. Of the 90 patients in whom EPs reported "they would be surprised" if the patient died in 12 months, only 13.3% (12 of 90) died in 12 months (Table 1).

The sensitivity, specificity, positive predictive value, and negative predictive value of the SQ were 78.6%, 56.9%, 42.7%, and 86.7%, respectively (Table 2). There was a 4.85 greater odds of death in the patients in whom the clinicians answered that they would "not be surprised" if the patient died within 12 months (odds ratio [OR] 4.85, 95% CI 2.34–9.98, $P < 0.0001$).

Description of the Cohort

During the study period, 199 patients were identified as eligible for inclusion. Of these, six providers declined to answer the SQ. As such, complete data were available for 97% of observations ($n = 193$). Of the 193 patients in the sample, 56 patients died within 21 months (29%). The mean age was 74.5 years (SD 12.6 years). The overall 12-month mortality was 65.46%. The mean ejection fraction was 51.2 (SD 16.9).

Table 2
Test Characteristics of “SQ” for One-Year Mortality

	SQ (“No”)
Sensitivity	78.6%
Specificity	56.9%
PPV	42.7%
NPV	86.7%

SQ = surprise question; PPV = positive predictive value; NPV = negative predictive value.

The median age among the “no” group was 81 years versus 69.5 years in the “yes” group ($P < 0.0001$). Elevated systolic blood pressure ($P < 0.04$), brain natriuretic peptide ($P < 0.008$), blood urea nitrogen ($P < 0.002$), and troponin ($P < 0.0005$) were associated with the “no” group. Patients with prior palliative care involvement ($P < 0.02$) were also associated with “no” surprise. The only comorbidity with statistically significant difference between the groups was anemia (34.7% vs. 12.5%; $P < 0.05$). There was no statistically significant difference between the two groups in the presenting heart rate, creatinine, or serum sodium. Summary statistics of presenting features and comorbid conditions are shown in Table 1.

Predictors of Mortality

Univariate analysis for all potential predictors of 12-month mortality was performed (Table 3). The strongest associations with death were “no” to the surprise question (OR 4.85, 95% CI 2.34–9.98, $P < 0.0001$), nursing home residence (OR 5.54 95% CI 2.2–14.1 $P < 0.001$), and prior palliative care involvement (OR 6.39, 95% CI 2.64–15.47). Several clinical variables were also significantly associated with one-year mortality, including increasing blood urea nitrogen (OR 1.02 per one-unit increase, 95% CI 1.00–1.03) and increasing SBP (OR 0.98 per one-unit increase, 95% CI 0.98–0.99, $P < 0.0006$); however, these associations were small (Table 3). Initial troponin and previous ejection fraction were not predictive of death.

Discussion

The SQ is a simple and intuitive way to predict mortality that has recently been recognized as useful for EPs, for whom time constraints are paramount.³⁷ In our study, the surprise question was tested for patients with HF in the ED by EP clinicians. Clinicians reported they would “not be surprised” if their patient died

Table 3
Predictors of Mortality

	Odds Ratio (95% CI)	PValue
“No” surprise versus “yes”	4.85 (2.35, 9.98)	<0.0001
Age per one-year increase	1.04 (1.01, 1.07)	0.01
Nursing home residency: yes vs. no	5.54 (2.18, 14.12)	0.0003
Prior palliative care involvement: yes vs. no	6.39 (2.64, 15.47)	<0.0001
Clinical information		
Initial serum sodium per 1 unit increase	1.00 (0.93, 1.06)	0.88
Initial BUN per one-unit increase	1.02 (1.00, 1.03)	0.03
Initial creatinine per one-unit increase	1.05 (0.84, 1.31)	0.65
Initial troponin per one-unit increase	3.05 (0.63, 14.88)	0.17
Initial BNP per 1000-unit increase	1.04 (1.02, 1.07)	0.0007
Ejection fraction per one percentage point increase	1.00 (0.98, 1.02)	0.95
Systolic blood pressure per one-unit increase	0.98 (0.97, 0.99)	0.0006
Diastolic blood pressure per one-unit increase	0.99 (0.98, 1.01)	0.52
Heart rate per 1 bpm increase	1.01 (0.99, 1.02)	0.42
ICU admission: yes vs. no	2.12 (0.98, 4.61)	0.06
Three or more ED visits in the last year vs. < 3	2.19 (1.14, 4.19)	0.02
Comorbidities		
Acute decompensated HF: yes vs. no	1.24 (0.60, 2.55)	0.56
Advanced COPD: yes vs. no	0.74 (0.38, 1.45)	0.37
CHF: yes vs. no	0.66 (0.25, 1.73)	0.40
Cancer: yes vs. no	0.44 (0.21, 0.95)	0.04
Advanced CNS disease (ALS, MS, Parkinson’s, dementia): yes vs. no	0.41 (0.17, 0.98)	0.04
Diabetes: yes vs. no	1.21 (0.65, 2.25)	0.55
Anemia: yes vs. no	0.66 (0.33, 1.32)	0.24
Chronic renal failure: yes vs. no	0.69 (0.37, 1.29)	0.25
End-stage liver disease: yes vs. no	NA	0.19
Septic shock: yes vs. no	0.64 (0.15, 2.77)	0.55
Multiorgan failure: yes vs. no	0.37 (0.09, 1.55)	0.18
Other: yes vs. no	0.92 (0.45, 1.87)	0.82
HF drugs (diuretics): 1 vs. 0	0.73 (0.34, 1.55)	0.41
HF devices (AICD, PM): 1 vs. 0	1.53 (0.65, 3.58)	0.33

BUN = blood urea nitrogen; BNP = brain natriuretic peptide; ICU = intensive care unit; ED = emergency department; HF = heart failure; COPD = chronic obstructive pulmonary disease; CHF = chronic heart failure; ALS = amyotrophic lateral sclerosis; MS = multiple sclerosis; AICD = automatic implantable cardioverter-defibrillator; PM = pacemaker.

within 12 months in over half of the patients. Among these patients, there was a nearly fivefold increase in the odds of death. With a greater than 70% sensitivity, the SQ may meaningfully improve ED-based screening for high likelihood of palliative care needs among ED patients presenting with HF symptoms. Although the SQ did have a moderately high false-positive rate for 12-month mortality, both patients and providers are highly likely to be harmed by implementation of this screening question, thus diminishing the relative importance of the low specificity.

Importantly, nearly all the clinicians in this study were willing and able to answer the SQ without receiving any disease-specific training, training on the SQ, or training in HF prognostic tools. Although feasibility of the SQ is not tested here, our finding of high clinician participation rates is consistent with two previous studies looking at EP clinicians' use of the SQ (participation > 80%).³⁸ High participation rates in our study lend support to findings from a single-center study by Strout et al., which showed high levels of acceptability and feasibility of the SQ among ED clinicians. Based on our findings, we believe that the SQ may be a feasible tool to use in the ED to identify HF patients most likely to benefit from palliative care.

Previous studies have looked at the accuracy of the SQ among primary care physicians caring for patients with HF,³⁹ cardiologists,⁴⁰ and specialized heart failure nurses.⁴¹ Performance of the SQ among these groups varied greatly, with the study of primary care physicians reporting the lowest sensitivity (11.6%), the study looking at cardiologists in the middle (35.3%), and the study looking at heart failure nurses with the highest (88.6%). Based on our findings, the SQ performs better when used by EPs in the ED on symptomatic HF patients than it does by PCPs in the clinic setting and cardiologists caring for HF patients on an inpatient ward. This may be because acute HF exacerbations, or symptomatic heart failure, are in fact a better reflection of patients' trajectory or could be accounted for by a bias exerted on the outpatient teams that know the patient best—reflecting their knowledge of the patient when they were healthier earlier in the course of their illness. Literature has indeed supported that as the duration of the relationship with patients increases, and the time since the last contact decreases, prognostic accuracy decreases.⁴² A previous study evaluating the performance of the SQ among all older (age > 65) adults presenting to the ED found similar sensitivity (77%), and specificity (56%) as we have reported here.³⁸

Although other prognostic tools have been developed to predict mortality in the HF population, most are used at the time of hospital discharge or only assess near-term mortality.^{43–46} Instead, here we

assessed a tool that can be practically applied in the ED in the absence of any other variables.

Using this tool, it should be noted that our study suggests that over half of the patients presenting to the ED with symptoms related to heart failure would screen “positive.” If this was used as a trigger for palliative care consultation, institutions would have to ensure that they had the infrastructure to support what would likely be a marked increase in the volume of consultations. Alternatively, screening positive could help the team understand where to use the primary palliative care skills they have learned or connect with other outpatient resources that may be available to them.

Finally, our study provides insight into basic demographic characteristics and comorbidities of patients who present to the ED with HF and palliative care needs. Although the characteristics of patients who receive a palliative care consultation in the ED have been reported⁴⁷ and the general characteristics of patients presenting to the ED with HF exacerbations were described 15 years ago,⁴⁸ there is nothing in the literature describing the characteristics of patients with HF and palliative care needs. Understanding this population is essential for palliative care planning and for the development of effective support care programs.

There were several limitations to our study. Our primary outcome was 12-month mortality and was obtained using the database from the Massachusetts Department of Health. As such, patients who died in the surrounding states would not have been captured. Our study did not aim to assess the skills or capabilities of the practitioner answering the question to predict mortality and was instead designed to reflect the current practice environment of our ED that is staffed by residents, physician assistants, and attending physicians. As such, in a hospital in which only attending physicians staff the ED, the performance of the question may be different. In addition, patient identification depended on screening by RAs and identification by the treating team. As such, patients may have been missed, and our data cannot be used to comment on the prevalence of HF in the ED. Finally, by nature of the way that patients were identified for the study (on periodic rounds by the RA throughout the shift), multiple patients were often identified at one time. These patients were often at different stages in their medical workup and, as such, the EPs were often answering the SQ with variable familiarity with the patients. This limits our ability to identify an “ideal time” in the workup to ask providers this question. There does not seem to be any consensus in prior application of the SQ in the ED as to what the ideal time is to ask this question. The EPs familiarity with patients is likely influenced by their practice environment and if they work at an

institution with long lengths of stay and boarding (in which EPs can care for patients for a day or more) or if they work in an environment in which HF patients are covered by the inpatient team upon decision to admit.

Conclusion

Based on this study, the SQ appears to be a valuable tool for identifying HF patients in the ED who would benefit from palliative care. Future research should further investigate what interventions increase access to palliative care for this patient population in the ED, and the impact of such interventions on the health care system, patient survival, and quality of life.

Disclosures and Acknowledgments

The authors have no conflicts of interest to disclose. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

1. Ponikowski P, Voors AA, Anker SD, et al. Guidelines for the diagnosis and treatment of acute and chronic heart failure. *Eur Heart J* 2016;37:2129–2200.
2. Mozaffarian D, Benjamin EJ, Go AS, et al. Heart disease and stroke statistics—2015 update: a report from the American Heart Association. *Circulation* 2015;131:e29–e322.
3. Goldfinger JZ, Adler ED. End-of-life options for patients with advanced heart failure. *Curr Heart Fail Rep* 2010;7:140–147.
4. Stuart B. Palliative care and hospice in advanced heart failure. *J Palliat Med* 2007;10:210–228.
5. Kaul P, McAlister FA, Ezekowitz JA, et al. Resource use in the last 6 months of life among patients with heart failure in Canada. *Arch Intern Med* 2011;171:211–217.
6. Unroe KT, Greiner MA, Hernandez AF, et al. Resource use in the last 6 months of life among medicare beneficiaries with heart failure, 2000-2007. *Arch Intern Med* 2011;171:196–203.
7. Gadoud A, Jenkins SMM, Hogg KJ. Palliative care for people with heart failure: summary of current evidence and future direction. *Palliat Med* 2013;27:822–828.
8. Blinderman CD, Homel P, Billings JA, Portenoy RK, Tennstedt SL. Symptom distress and quality of life in patients with advanced congestive heart failure. *J Pain Symptom Manage* 2008;35:594–603.
9. Bekelman DB, Havranek EP, Becker DM, et al. Symptoms, depression, and quality of life in patients with heart failure. *J Card Fail* 2007;13:643–648.
10. Barclay S, Momen N, Case-Upton S, Kuhn I, Smith E. End-of-life care conversations with heart failure patients: a systematic literature review and narrative synthesis. *Br J Gen Pract* 2011;61:49–62.
11. Low J, Pattenden J, Candy B, Beattie JM, Jones L. Palliative care in advanced heart failure: an international review of the perspectives of recipients and health professionals on care provision. *J Card Fail* 2011;17:231–252.
12. Hopp FP, Thornton N, Martin L. The lived experience of heart failure at the end of life: a systematic literature review. *Health Soc Work* 2010;35:109–117.
13. Goodlin SJ. Palliative care in congestive heart failure. *J Am Coll Cardiol* 2009;54:386–396.
14. Temel JS, Greer JA, Muzikansky A, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. *N Engl J Med* 2010;363:733–742.
15. Teno JM, Clarridge BR, Casey V, et al. Family perspectives on end-of-life care at the last place of care. *JAMA* 2004;291:88–93.
16. Ciemins EL, Blum L, Nunley M, Lasher A, Newman JM. The economic and clinical impact of an inpatient palliative care consultation service: a multifaceted approach. *J Palliat Med* 2007;10:1347–1355.
17. Hughes SL, Cummings J, Weaver F, et al. A randomized trial of the cost effectiveness of VA hospital-based home care for the terminally ill. *Health Serv Res* 1992;26:801–817.
18. Rummans TA, Clark MM, Sloan JA, et al. Impacting quality of life for patients with advanced cancer with a structured multidisciplinary intervention: a randomized controlled trial. *J Clin Oncol* 2006;24:635–642.
19. Gelfman LP, Meier DE, Morrison RS. Does palliative care improve quality? A survey of bereaved family members. *J Pain Symptom Manage* 2008;36:22–28.
20. Morrison RS, Penrod JD, Cassel JB, et al. Cost savings associated with US hospital palliative care consultation programs. *Arch Intern Med* 2008;168:1783–1790.
21. Rogers JG, Patel CB, Mentz RJ, et al. Palliative care in heart failure: the PAL-HF randomized, controlled clinical trial. *J Am Coll Cardiol* 2017;70:331–341.
22. Bakitas M, Macmartin M, Trzepkowski K, et al. Palliative care consultations for heart failure patients: how many, when, and why? *J Card Fail* 2013;19:193–201.
23. Howlett JG. Palliative care in heart failure: addressing the largest care gap. *Curr Opin Cardiol* 2011;26:144–148.
24. Whellan DJ, Goodlin SJ, Dickinson MG, et al. End-of-life care in patients with heart failure. *J Card Fail* 2014;20:121–134.
25. O’Leary N, Murphy NF, O’Loughlin C, Tiernan E, McDonald K. A comparative study of the palliative care needs of heart failure and cancer patients. *Eur J Heart Fail* 2009;11:406–412.
26. Centers for disease Control and Prevention. Ambulatory Health Care Surveys. Available at: http://www.cdc.gov/nchs/data/ahcd/nhamcs_emergency/2010_ed_web_tables.pdf. Accessed January 10, 2019.
27. Blecker S, Ladapo JA, Doran KM, et al. Emergency department visits for heart failure and subsequent hospitalization or observation unit admission. *Am Heart J* 2014;168:901–908.

28. DeVader TE, Albrecht R, Reiter M. Initiating palliative care in the emergency department. *J Emerg Med* 2011;43:803–810.
29. Lamba S, DeSandre PL, Todd KH, et al. Integration of palliative care into emergency medicine: the improving palliative care in emergency medicine (IPAL-EM) collaboration. *J Emerg Med* 2014;46:264–270.
30. Wu FM, Newman JM, Lasher A, Brody AA. Effects of initiating palliative care consultation in the emergency department on inpatient length of stay. *J Palliat Med* 2013;16:1362–1367.
31. Moss AH, Ganjoo J, Sharma S, et al. Utility of the “Surprise” question to identify dialysis patients with high mortality. *Clin J Am Soc Nephrol* 2008;3:1379–1384.
32. Moss AH, Lunney JR, Culp S, et al. Prognostic significance of the “surprise” question in cancer patients. *J Palliat Med* 2010;13:837–840.
33. Lilley EJ, Gemunden SA, Kristo G, et al. Utility of the “surprise” question in predicting survival among older patients with acute Surgical conditions. *J Palliat Med* 2017;20:420–423.
34. Lakin JR, Robinson MG, Bernacki RE, et al. Estimating 1-year mortality for high-risk primary care patients using the “surprise” question. *JAMA Intern Med* 2016;176:1863–1865.
35. Pang WF, Kwan BCH, Chow KM, et al. Predicting 12-month mortality for peritoneal dialysis patients using the “surprise” question. *Perit Dial Int* 2013;33:60–66.
36. White N, Kupeli N, Vickerstaff V, Stone P. How accurate is the “Surprise Question” at identifying patients at the end of life? A systematic review and meta-analysis. *BMC Med* 2017;15:139.
37. Ouchi K, Jambaulikar G, George NR, et al. The “surprise question” asked of emergency physicians may predict 12-month mortality among older emergency department patients. *J Palliat Med* 2017;21:236–240.
38. Haydar S, Almeder L, Michalakes L, Han P, Strout D. Using the surprise question to identify those with unmet palliative care needs in emergency and inpatient settings: what do clinicians think? *J Palliat Med* 2017;20:729–735.
39. Barnes S, Gott M, Payne S, et al. Predicting mortality among a general practice-based sample of older people with heart failure. *Chronic Illn* 2008;4:5–12.
40. Fenning S, Woolcock R, Haga K, et al. Identifying acute coronary syndrome patients approaching end-of-life. *PLoS One* 2012;7:e35536.
41. Haga KK, Murray SA, Reid J, et al. Identifying patients with chronic heart failure: a comparison of the gold standards framework with a clinical prognostic model. *Heart* 2011;1:A8.
42. Christakis NA, Lamont EB. Extent and determinants of error in doctors’ prognoses in terminally ill patients: prospective cohort study. *BMJ: Br Med J* 2000;320:469–473.
43. Scrutinio D, Ammirati E, Guida P, et al. The ADHF/NT-proBNP risk score to predict 1-year mortality in hospitalized patients with advanced decompensated heart failure. *J Hear Lung Transpl* 2014;33:404–411.
44. Escobar A, García-Pérez L, Navarro G, Bilbao A, Quiros R. A one-year mortality clinical prediction rule for patients with heart failure. *Eur J Intern Med* 2017;44:49–54.
45. Pocock SJ, Wang D, Pfeffer MA, et al. Predictors of mortality and morbidity in patients with chronic heart failure. *Eur Heart J* 2006;27:65–75.
46. Miró Ò, Rossello X, Gil V, et al. Predicting 30-day mortality for patients with acute heart failure in the emergency department. *Ann Intern Med* 2017.
47. Grudzen CR, Hwang U, Cohen J a, Fischman M, Morrison RS. Characteristics of emergency department patients who receive a palliative care consultation. *J Palliat Med* 2012;15:396–399.
48. Hugli O, Braun JE, Kim S, Pelletier AJ, Camargo C a. United States emergency department visits for acute decompensated heart failure, 1992 to 2001. *Am J Cardiol* 2005;96:1537–1542.