

# Implementation of a palliative care consultation trigger tool for hospitalised patients with acute decompensated heart failure

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## ABSTRACT

Heart failure is a leading cause of hospitalisations. Integration of palliative care services with medical therapy in the management of hospitalised patients with heart failure is imperative. Unfortunately, there are no standardised criteria for palliative care referrals among hospitalised patients with acute decompensated heart failure. The objective of our quality improvement project was to develop and implement a palliative care consult trigger tool for hospitalised patients with acute decompensated heart failure. We found that among eligible patients, palliative care referrals were underused, likely contributing to misalignment of goals of care and suboptimal advance care planning. We developed a trigger tool and designed and implemented structured multicomponent educational interventions to improve the appropriateness and timeliness of inpatient palliative care consultations in this high-risk population. The educational interventions led to a significant increase in the rate of appropriate inpatient palliative care consultations among hospitalised patients with acute decompensated heart failure (46.3% vs 27.7%; p=0.02). In addition, palliative care referrals resulted in better alignment of goals of care at the time of hospital discharge, as measured by a significant increase in the completion rate of a healthcare proxy form (11.4% vs 47.2%; p<0.001) and a Medical Order for Life-Sustaining Treatment form (2.0% vs 24.1%; p<0.001), as well as the establishment of a Do-Not-Resuscitate order (2.7% vs 29.6%; p<0.001). Furthermore, the intervention resulted in a significant decrease in the hospital readmission rate up to 90 days post-discharge (43.6% vs 8.3%; p<0.001). This quality improvement project calls for the development and adoption of standardised criteria for palliative care referrals to benefit hospitalised patients with heart failure and reduce symptom burden, align goals of care and improve quality of life.

## INTRODUCTION

Heart failure affects approximately 6.2 million individuals in the USA.<sup>1</sup> Despite the use of intense guideline-directed medical therapies, heart failure is a chronic and progressive disease that leads to poor quality of life and premature death.<sup>2</sup> As the disease progresses, decisions on advanced therapies, including

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Although the incorporation of palliative care services for the management of heart failure is endorsed by clinical practice guidelines, palliative care consultations, especially in the hospital setting, remain underused, which is attributed in part, to lack of standardised triggers.

## WHAT THIS STUDY ADDS

⇒ This quality improvement project highlights the successful development and implementation of a structured trigger tool to improve appropriate and timely palliative care consultations in hospitalised patients with heart failure.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Given the progressive and debilitating nature of heart failure, it is imperative that standardised criteria for palliative care services be developed and validated to deliver high-value, patient-centred care.

inotropic support, left ventricular assist device use, implantable cardiac defibrillator implantation, renal replacement therapy and heart transplantation must be carefully considered as part of shared decision-making.<sup>3</sup> In addition, physical and emotional symptoms, loss of independence and disruption of social life, coupled with the financial burden of this debilitating chronic disease, can be exceedingly challenging for patients and their families.<sup>4</sup> Therefore, to minimise the inevitable suffering that occurs in later stages of heart failure, it is critical to align early on, patients' goals of care and treatment options.

Palliative care provides an interdisciplinary approach that focuses on the care and well-being of patients with serious chronic illnesses. This patient-centered approach includes the assessment of chronic debilitating symptoms and the psychological burden of chronic illnesses, the identification of care goals and the provision of supportive

care through complex clinical decision-making. While there are several reports on the advantage of palliative care implementation in improving the quality of life of patients suffering from chronic debilitating illnesses, most studies originate from the oncology literature.<sup>5</sup> In a non-oncological setting such as heart failure, palliative care is underused. In fact, patients with less advanced stages of heart failure have a similar burden of symptoms as patients with cancer. In advanced heart failure, there is a higher rate of symptoms, depression and spiritual malaise compared with advanced cancer.<sup>6</sup> Early involvement of palliative care allows for better alignment of patient care with their wishes and focuses on symptom control and quality of life, ultimately aiding in the reduction of unnecessary healthcare costs.<sup>7</sup> Additionally, early integration of palliative care has been recognised as a key part in the management of hospitalised patients with decompensated heart failure.<sup>8</sup>

Although palliative care is a class-1 recommendation for all patients with heart failure, in accordance with the latest heart failure guidelines by the American College of Cardiology/American Heart Association (ACC/AHA), there are no set triggers or indications to request inpatient palliative care consults.<sup>9</sup> We performed a quality improvement study aimed at reviewing the existing literature to identify triggers for palliative care consults in hospitalised patients with heart failure and implementing a trigger tool to increase appropriate palliative care consultations in hospitalised patients with heart failure, with the goal of aligning patient care with their desired wishes, and long-term, reducing unnecessary hospital readmissions.

## METHODS

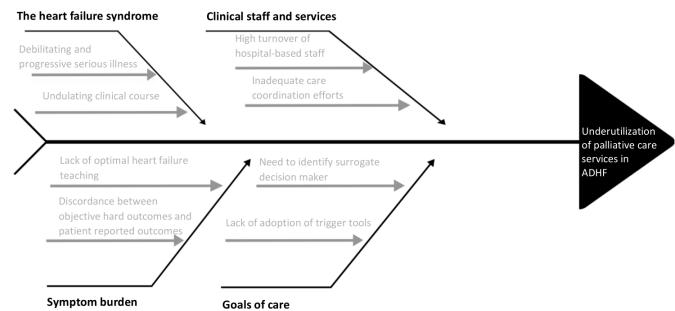
### Clinical setting and stakeholders

The quality improvement project was conducted at a 308-bed acute care teaching hospital that provides tertiary care for a large integrated healthcare system operating nine hospitals in eastern Massachusetts. During the conduct of the study spanning 2019–2020, the hospital had an average of 13 262 inpatient admissions per year, with 47% on medical services, and a dedicated cardiology service that had an average of 1285 discharges annually, representing 21% of all medical hospitalisations. We used the Standards for Quality Improvement Reporting Excellence revised guidelines 2.0 as our framework for this quality improvement report.<sup>10</sup> Our stakeholders were primarily the internal medicine residents and cardiology fellows, the palliative care consultants, and the hospital-based teaching faculty, including hospitalists and cardiologists.

The institutional review board determined that this quality improvement project was not human subjects research and did not require oversight (No. Q101-23).

### Root cause analysis

To elucidate the potential factors contributing to the underusage of palliative care services at our institution



**Figure 1** Fishbone diagram outlining the challenges that contribute to the underusage of palliative care services in hospitalised patients with acute decompensated heart failure (ADHF).

among hospitalised patients with acute decompensated heart failure, we conducted a root cause analysis. Using a fishbone diagram (figure 1), we identified several factors contributing to the magnitude of the problem, including a lack of recognition that heart failure is a debilitating serious illness with an undulating clinical course, a lack of appreciation that symptom burden is critical to quality of life, high turnover of hospital-based staff (eg, house staff), suboptimal care coordination efforts and goals of care discussions and lack of trigger tools for requesting palliative care services. After deliberation, the quality improvement team opted to focus on developing and rolling out a trigger tool for the timely request of palliative care services to assist in symptoms management, goals of care discussions and advance care planning.

### Literature search

A literature search was performed to identify the most common indications or ‘triggers’ for inpatient palliative care consultations. Three team members searched Ovid, MEDLINE, Ovid Embase and PubMed databases for publications in the English language for indications of inpatient palliative care consultations. Using keywords and subject headings, the following concepts were searched: ‘palliative care’, ‘palliative medicine’, ‘hospice care’, ‘advance care planning’, ‘terminal care’, ‘referral and consultation’, ‘referral’, ‘consultation’, ‘patient transfer’, ‘delivery of health care, integrated’ and ‘heart failure’. The search terms were combined by ‘or’ if they represented similar concepts, and by ‘and’ if they represented different concepts.

All original studies, systematic reviews, editorials, commentaries and letters were included. Case reports and conference abstracts were excluded. After the initial search of 325 citations, 143 articles meeting the inclusion criteria were retrieved. Our team divided the included articles equally, and individual members reviewed the abstract and full text of each article and created a list of most common indications for palliative care consults. The list was reviewed by our hospital palliative care team and heart failure specialists. **Box 1** summarises the list of ‘triggers’ or indicators that were identified as appropriate for an inpatient palliative care consultation, and

## Box 1 Eligibility criteria required for inpatient palliative care consultation among hospitalised patients with acute decompensated heart failure

- ⇒ NYHA class IV heart failure.<sup>4</sup>
- ⇒ ACC/AHA stage C–D heart failure.<sup>4 11</sup>
- ⇒ Presence of refractory dyspnoea (to all interventions).<sup>4 11</sup>
- ⇒ Greater than or equal to one hospitalisation for acute decompensated heart failure in the prior 6 months.<sup>4–6 11</sup>
- ⇒ ICU level of care with requirement for inotropic support in the prior 6 months.<sup>4 11</sup>
- ⇒ End-stage kidney disease (requiring maintenance dialysis).<sup>4 6 12</sup>
- ⇒ Chronic respiratory failure (requiring home oxygen).<sup>4 5 7</sup>
- ⇒ Eligibility criteria or request for hospice care.<sup>4 5 12 13</sup>
- ⇒ TNM cancer stage III/IV.<sup>7 14 15</sup>

ACC, American College of Cardiology; AHA, American Heart Association; ICU, intensive care unit; NYHA, New York Heart Association; TNM, tumour, node, metastasis.

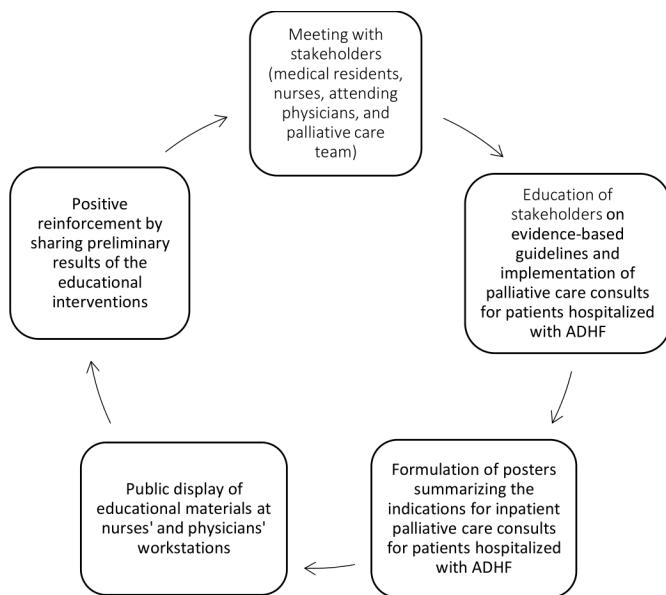
adopted for our quality improvement project, based on team consensus. They included New York Heart Association (NYHA) class IV heart failure,<sup>4</sup> ACC/AHA stage C–D heart failure,<sup>4 11</sup> presence of refractory dyspnoea (to all interventions),<sup>4 11</sup> greater than or equal to one hospitalisation for acute decompensated heart failure in the prior 6 months,<sup>4 11</sup> intensive care unit (ICU) level of care with requirement for inotropic support in the prior 6 months,<sup>4 11</sup> end-stage kidney disease (on dialysis),<sup>4 6 12</sup> chronic respiratory failure (requiring home oxygen),<sup>4 5 7</sup> eligibility criteria or request for hospice care<sup>4 5 12 13</sup> and stage III/IV cancer (based on tumour, node, metastasis (TNM) classification of malignant tumours).<sup>7 14 15</sup>

### Baseline assessment of practice pattern

The project was initiated in August 2019. In the first phase, we identified patients hospitalised on medical services with acute decompensated heart failure. An arbitrary ‘index hospitalization period’ of 6 months was defined from 1 August 2019 to 31 January 2020. We queried the electronic health record to identify all consecutive patients hospitalised with acute decompensated heart failure during this 6-month period using ‘heart failure’ as a primary diagnosis code. The primary source for the data was the hospital’s electronic health record (MEDITECH, Westwood, Massachusetts, USA).

The following baseline patient characteristics were collected: age; sex; hospital setting (ie, general medicine service and intensive care unit); comorbidities, including history of hypertension, diabetes mellitus, ischaemic heart disease, peripheral vascular disease, stroke, active cancer and end-stage kidney disease; left ventricular ejection fraction documented at time of hospitalisation ( $\leq$  vs  $>$  40%), NYHA heart failure class; ACC/AHA stage of heart failure; and number of hospital admissions for acute decompensated heart failure in the prior 6 months.

Using the prespecified eligibility criteria for a palliative care consultation, we next searched the electronic health record to identify whether these hospitalised patients



**Figure 2** Framework describing educational interventions to improve inpatient palliative care consultations in hospitalised patients with acute decompensated heart failure (ADHF).

with acute decompensated heart failure met criteria and received such a consultation. The latter was achieved by looking for a specific provider order for an inpatient palliative care consultation or a consultation note recorded by a member of the palliative care team in the medical record.

### Description of the quality improvement plan and educational intervention

The second phase involved the planning and implementation of educational sessions for all stakeholders to use the tool to trigger inpatient palliative care consultations (figure 2). In brief, this phase was divided into two educational periods. The first period was from January to February 2020 and the second period was from May to June 2020. During each period, formal conferences were conducted to introduce the quality improvement project to all stakeholders and provide education on the eligibility criteria for palliative care consultations in hospitalised patients with acute decompensated heart failure. Examples of case scenarios demonstrating the appropriate usage of eligibility criteria for inpatient palliative care consults were conducted during these formal conferences. In addition, during the second period (ie, from May 2020 to June 2020), feedback was provided to all stakeholders on the continuous monitoring of eligibility criteria for palliative care consults among hospitalised patients with acute decompensated heart failure and the request for these consults. Furthermore, educational materials (in the form of visual cues) on the eligibility criteria for palliative care consults were posted at physician and nurse workstations across the hospital as a reminder for all stakeholders to trigger, if patients met any of the prespecified criteria. Attendance rate at all conference sessions was 100% across all stakeholders.



When consulted, the palliative care provider assisted in addressing symptom management, prognostic awareness, establishment of goals of care, including code status and advance care planning with assistance in the completion of the Healthcare Proxy (HCP) form and the Medical Order for Life-Sustaining Treatment (MOLST) form, psychosocial support, communication with family members and conflict resolution, transition planning and end of life care. In brief, as part of end-of-life care discussions with patients suffering from serious illnesses, a MOLST form addresses decisions regarding life-sustaining therapies in the setting of advance care planning. The form specifically focuses on cardiopulmonary resuscitation, ventilation (including, non-invasive ventilation, intubation and mechanical ventilation), dialysis, artificial hydration and nutrition and transfer to hospital. It is based on an individual's right to accept or refuse medical treatment, even if the treatment is lifesaving. It is completed by a clinician and signed by the patient, based on the patient's own decisions, and is honoured across all healthcare settings in the state of Massachusetts.

### Post-intervention evaluation of practice and outcome measures

Following the intervention, over the ensuing 5 months (1 July 2020 to 30 November 2020), hospitalised patients with acute decompensated heart failure were identified using the same methodology. We extracted the data on those who met eligibility criteria and ascertained whether the palliative care service was consulted.

The main outcome measure of interest was to compare the percentage of hospitalised patients with acute decompensated heart failure eligible for an inpatient palliative care consultation, using our pre-established criteria (**box 1**), who received such consultation during the post-intervention period compared with the pre-intervention period.

Additional outcomes of interest included hospital length of stay, in-hospital death, advance care planning, including documentation of HCP in the medical record, completion of a MOLST form and change in code status (eg, do not resuscitate (DNR) order), as well as all-cause hospital readmission at 30 days, 60 days and 90 days, during the post-intervention period compared with the pre-intervention period. The project was headed, planned and managed at each stage by the listed authors at our institution. Monitoring progress of the project as well as discussions regarding data collection, planned intervention and evaluation of problems encountered during the project were conducted by the authors at biweekly quality improvement meetings. The data were collected in two separate pre-intervention and post-intervention indexed hospitalisation periods. Our analysis was aimed at examining whether our intervention was successful at increasing the total number of palliative care consults.

Continuous variables are reported as mean (with SD), and binary variables as counts (with percentage). Comparisons between groups were made by the Student's

t-test for continuous variables and by the  $\chi^2$  test for categorical variables. All analyses were performed using the SPSS statistical package V.22 (IBM Corporation, Armonk, New York, USA). Differences were considered statistically significant at a value of less than 0.05.

Patients were not directly involved in the development of the research question, trigger tool development or the design of the quality improvement study. Study results may be shared with patients as we hope to continue to use the trigger tool for palliative care consults in patients hospitalized with heart failure.

## RESULTS

### Baseline assessment of appropriate use of inpatient palliative care consultations

A total of 149 consecutive patients with acute decompensated heart failure were hospitalised during the baseline pre-intervention period. As shown in **table 1**, the mean age was 71 years, 72 (48.3%) were men, 135 (90.6%) were hospitalised on the general medicine service and 96 (64.4%) had heart failure with reduced ejection fraction ( $\leq 40\%$ ). In terms of eligibility criteria for an inpatient palliative care consultation, 14 (9.4%) patients had class IV heart failure (based on the NYHA classification system), and 132 (88.6%) had stage C/D heart failure (based on the AHA/ACC staging system). Twelve (8.1%) patients were hospitalised at least once for acute decompensated heart failure in the prior 6 months. Three (2.0%) patients had end-stage kidney disease, and 4 (2.7%) patients had chronic respiratory failure. There were no patients with stage III/IV cancer (based on the TNM staging system), and no patients met criteria for hospice care.

As shown in **table 2**, during the pre-intervention period, 72 (48%) patients met at least one criterion for an inpatient palliative care consultation, but only 20 (28%) received a consultation. The mean hospital length of stay was 5.5 days, and there were no in-hospital deaths. In terms of advance care planning, at time of hospital admission, 16 (10.7%) patients had a documented HCP form, 2 (1.3%) patients had a documented MOLST form and 4 (2.7%) patients had a DNR order. At time of hospital discharge, the number of patients with a documented HCP form increased to 17 (11.4%); the number of patients with a documented MOLST form increased to 3 (2.0%) and the same 4 (2.7%) patients maintained a DNR order. The hospital readmission rate for these patients at 30 days, 60 days and 90 days was 36.2%, 38.3% and 43.6%, respectively.

### Post-intervention assessment of appropriate use of inpatient palliative care consultations and impact on outcome measures

In the post-intervention period, a total of 108 consecutive patients with acute decompensated heart failure were hospitalised. As shown in **table 1**, the mean age was 72 years, 52 (48.1%) were men, 100 (92.6%) were admitted to the general medicine service and 62 (57.4%) had heart

**Table 1** Clinical characteristics of patients hospitalised with acute decompensated heart failure during the pre-intervention and post-intervention period

Variable	Pre-intervention period (n=149)	Post-intervention period (n=108)	P value
Age, years	71.4±5.6	72.1±5.7	0.39
Men	72 (48.3%)	52 (48.1%)	0.98
Hospital setting			0.57
Ward	135 (90.6%)	100 (92.6%)	
Intensive care unit	14 (9.4%)	8 (7.4%)	
Comorbid conditions			
Hypertension	122 (81.9%)	90 (83.3%)	0.76
Diabetes mellitus	102 (68.5%)	69 (63.9%)	0.44
Ischaemic heart disease	71 (47.7%)	51 (47.2%)	0.95
Peripheral arterial disease	33 (22.1%)	23 (21.3%)	0.87
Stroke	16 (10.7%)	10 (9.3%)	0.69
End-stage kidney disease	3 (2.0%)	2 (1.9%)	0.93
Cancer	1 (0.7%)	1 (0.9%)	0.82
Chronic respiratory failure	4 (2.7%)	3 (2.8%)	0.96
Left ventricular ejection fraction ≤40%	96 (64.4%)	62 (57.4%)	0.25
NYHA heart failure class			<0.001
I	1 (0.7%)	0 (0.0%)	
II	22 (14.8%)	51 (47.2%)	
III	112 (75.2%)	47 (43.5%)	
IV	14 (9.4%)	10 (9.3%)	
ACC/AHA heart failure stage C–D	38 (25.5%)	9 (0.1%)	<0.001
≥1 hospitalisation for acute decompensated heart failure in the prior 6 months	12 (8.1%)	16 (14.8%)	0.09

ACC/AHA, American College of Cardiology/American Heart Association; NYHA, New York Heart Association.

failure with reduced ejection fraction ( $\leq 40\%$ ). In terms of eligibility criteria for a palliative care consultation, 10 (9.3%) patients had class IV heart failure, and 66 (61.1%) had stage C/D heart failure. Sixteen (14.8%) patients were hospitalised at least once for acute decompensated heart failure in the prior 6 months. In terms of relevant comorbidities, 2 (1.9%) patients had end-stage kidney disease, and 3 (2.8%) patients had chronic respiratory failure. There were no patients with stage III/IV cancer, and no patients met criteria for hospice care.

As shown in [table 2](#), 41 (38%) patients were found to be eligible for an inpatient palliative care consultation, and 19 (46.3%) patients received such consultation, which was significantly higher, compared with eligible patients in the pre-intervention period (46.3% vs 27.7%;  $p=0.02$ ). In the post-intervention period, and compared with the pre-intervention period, we observed a significant improvement in the documentation of the HCP form at time of hospital admission (28.7% vs 10.7%;  $p<0.001$ ), which further increased at time of hospital discharge (47.2% vs 11.4%;  $p<0.001$ ). Similarly, we observed a significant increase in the completion of a MOLST form at time of both hospital admission (11.1% vs 1.3%;  $p<0.001$ ) and

hospital discharge (24.1% vs 2.0%;  $p<0.001$ ). As part of addressing code status, in the post-intervention period, and compared with the pre-intervention period, we observed a significant increase in DNR orders at time of hospital admission (11.1% vs 2.7%;  $p=0.006$ ), which further increased at time of hospital discharge (29.6% vs 2.7%;  $p<0.001$ ). The average hospital length of stay during the post-intervention period was not significantly different compared with the pre-intervention period ( $6.2\pm5.1$  vs  $5.5\pm3.9$  days;  $p=0.21$ ). Most importantly, during the post-intervention period, the 30-day hospital readmission rate was significantly lower, compared with the pre-intervention period (4.6% vs 36.2%;  $p<0.001$ ), and this trend persisted at 60 days (6.5% vs 38.3%;  $p<0.001$ ), and 90 days (8.3% vs 43.6%;  $p<0.001$ ), likely reflecting aligned goals of care and improved post-discharge care coordination efforts.

## DISCUSSION

The trajectory of heart failure includes an initial relatively stable phase requiring routine medical management, followed by phases of decline and frequent

**Table 2** Process and outcome measures of interest during the pre-intervention and post-intervention period

Variable	Pre-intervention period (n=149)	Post-intervention period (n=108)	P value
Eligible patients for a palliative care consult (%)	72 (48.3)	41 (38.0)	0.09
Eligible patients receiving a palliative care consult (%)	20 (27.7)	19 (46.3)	0.02
HCP form			
At hospital admission	16 (10.7%)	31 (28.7%)	<0.001
At hospital discharge	17 (11.4%)	51 (47.2%)	<0.001
MOLST form			
At hospital admission	2 (1.3%)	12 (11.1%)	<0.001
At hospital discharge	3 (2.0 %)	26 (24.1%)	<0.001
DNR order			
At hospital admission	4 (2.7%)	12 (11.1%)	0.006
At hospital discharge	4 (2.7%)	32 (29.6%)	<0.001
Hospital length of stay, days	5.5±3.9	6.2±5.1	0.21
In-hospital death	0 (0%)	0 (0%)	-
All-cause hospital readmissions (%)			
At 30 days	54 (36.2)	5 (4.6)	<0.001
At 60 days	57 (38.3)	7 (6.5)	<0.001
At 90 days	65 (43.6)	9 (8.3)	<0.001

DNR, Do-Not-Resuscitate; HCP, Healthcare Proxy; MOLST, Medical Order for Life-Sustaining Treatment.

hospitalisations, and ultimately a terminal phase of unavoidable deterioration lasting for days and weeks.<sup>16</sup> Moreover, ageing among patients with heart failure per se, is associated with development of multiple comorbidities, including frailty, thus adding onto the downward spiral of the disease.<sup>14</sup> Despite the use of evidence-based guideline directed therapy, quality of life becomes progressively poor, with feelings of fear, hopelessness, vulnerability and sense of burden to family members. Hospitalisations due to heart failure are on the rise. In the USA, compared to 2014, hospitalisation rates related to heart failure increased from 4.2 to 4.9 per 1000 adults in 2017, highlighting the burden of the disease for patients and healthcare systems.<sup>17</sup> To tackle this global problem, the WHO has recommended developing guidelines and tools to integrate palliative care into global disease control and health systems.<sup>18</sup> Palliative care uses a multidisciplinary approach and seeks to improve quality of life and address the physical, psychological and social needs of the patient. Therefore, along with medical management, an equal focus should be placed on improving quality of life and treating patients with heart failure holistically. In addition, several organisations, including the ACC/AHA, the International Society of Heart and Lung Transplantation and the European Society of Cardiology, have recognised the early integration of palliative care among patients with heart failure.<sup>19</sup>

Although implementation of palliative care services is a class-1 indication in the ACC/AHA guidelines, palliative care consultations, especially in the hospital setting, remain suboptimal.<sup>20</sup> This is attributed in part to lack of

standardised triggers, along with other factors such as an unpredictable trajectory, attitudes and beliefs of palliative care from both patients and providers, and lack of inpatient palliative care resources.<sup>21</sup> The identification of patients with heart failure in need of palliative care services remains a vexing issue. The 2013 ACC/AHA guidelines state that palliative care or hospice care should be considered 'throughout the hospital stay, before discharge, at the first visit after discharge, and during follow-up in selected patients', and that 'palliative and supportive care are effective for patients with symptomatic advanced heart failure to improve quality of life'.<sup>22</sup> The latest 2022 ACC/AHA guidelines recommend implementing palliative care consults in specific instances, including patients with refractory heart failure symptoms and those with multiple comorbidities and frailty, and to assist in major medical decisions, such as placement of left ventricular assist device, which in and of itself requires a palliative care consult for Medicare coverage.<sup>11</sup> One study advocated for the administration of standardised symptom assessment scores to identify patients with heart failure who may be eligible for palliative care.<sup>12</sup> There is a lack of consensus regarding referral criteria for palliative care services in hospitalised patients with heart failure. Our goal was to formulate a list of common-sense indications that would act as a trigger tool for inpatient palliative care consults.

We initially conducted a root cause analysis to identify reasons for decreased palliative care consults in our hospital; this was highlighted by the fishbone diagram in figure 1. Thereafter, a review of the existing literature

was performed to identify the most common indications for palliative care consults, outlined in [box 1](#). These criteria were ultimately used as a trigger tool for inpatient palliative care consults. Most of these criteria had been summarised in a systematic review that advocated for the use of disease-based triggers, including progression of heart failure despite optimal medical therapy, ACC/AHA stage C–D heart failure, multiple hospitalisations for heart failure exacerbations and ICU level of care and/or ionotropic support.<sup>11</sup> Due to the level of subjectivity, physical and psychological symptoms were not included. Other narrative reviews have advocated for palliative care referrals among hospitalised patients with acute decompensated heart failure when there are other comorbidities, such as chronic lung disease, end-stage kidney disease, and cancer.<sup>12 13 15</sup>

During our pre-intervention period, we found that only 28% of eligible patients with acute decompensated heart failure received a palliative care consultation. We introduced our trigger tool through multipronged educational sessions aimed at engaging all our stakeholders involved in this project. During the post-intervention phase, multiple cycles of education and re-education on the use of the trigger tool were implemented to increase yield of palliative care consultations. As a result, in the post-intervention period, palliative care consultations increased to 46% among our eligible patients, almost doubling from the baseline period, making our intervention a success. Additionally, unlike other quality improvement projects on palliative care consults in heart failure, our project included trending process-related variables such as completion of HCP and MOLST forms as well as addressing code status and documenting DNR orders. We observed a significant increase in the documentation of these surrogate process measures in the post-intervention period. Furthermore, during the post-intervention period, all-cause hospital readmission rates decreased significantly up to 90 days post discharge, compared with the pre-intervention period, likely resulting in lower healthcare costs.

### Limitations

The generalisation of our results is limited in part by the small sample size and a single-centre intervention. In addition, the post-intervention period occurred during the COVID-19 pandemic, which may have confounded our findings, as we observed a reduced number of hospitalisations for heart failure, compared with the pre-intervention period. Limited staffing of providers, including nurses, advanced practice practitioners and physicians, due to COVID-19 related illness, might have also resulted in less inpatient palliative care referrals. However, we observed a significant increase in palliative care consultations during the post-intervention period, arguing against this potential concern. In our hospital, palliative care services are not available on weekends. This too could have led to fewer palliative care referrals for patients whose hospital course lasted only a weekend.

Although not significant, the hospital length of stay was higher in the post-intervention period compared with the pre-intervention period, likely due in part to challenges with timely hospital discharges amid the pandemic. This might have also increased the opportunity to initiate a palliative care referral, resulting in higher consultation rates. Additionally, exploration of patient-related experiences and outcomes was not factored into this project. As the timeline of this quality improvement project included two separate indexed hospitalisation periods, the project did not extend into follow-up of these patients in the ambulatory setting after hospital discharge to monitor other outcomes, including improvements in quality of life, family caregiver outcomes and patient and caregiver satisfaction with care. Furthermore, this project had only one Plan-Do-Study-Act (PDSA) cycle with two distinct educational session phases. Although there was a significant increase in inpatient palliative care consults, multiple PDSA cycles would have shed light on whether our efforts are sustainable long-term. Finally, some of the literature reviewed by our team to identify triggers for palliative care consults, was based on expert opinion rather than peer-reviewed specific criteria. Further research is clearly needed to identify appropriate and timely triggers for palliative care referral.

### CONCLUSIONS

Despite the many advances in the management of heart failure, the progressive physical and psychological hurdles of this chronic disease can burden patients and caregivers. As guidelines begin to stress the inclusion of palliative care as part of an interdisciplinary and holistic treatment approach for patients with heart failure, it is important that clinicians have at their disposal, appropriate and timely triggers for palliative care referral.

### IMPLICATIONS

As heart failure management becomes more personalised, it is imperative to integrate palliative care with medical therapies in a need-based and time-based manner. Our report demonstrates the holistic involvement of palliative care services in the care of these patients, which includes addressing process-related variables such as completion of HCP and MOLST forms. The adoption of a trigger tool allows for a standardised and consistent personalised care plan for hospitalised patients with heart failure. Furthermore, the results of our project highlight the importance of integrating palliative care to not only help with symptom management and quality of life, but also reduce hospital readmission rates and healthcare costs. A further extension of this project would be to include palliative care consults as part of a care bundle in both the hospital and ambulatory setting.

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periods, statistical analysis, manuscript writing. SC—create outline of the project, data collection during pre-intervention and post-intervention periods, manuscript editing. JC—create outline of the project, data collection during pre-intervention and post-intervention periods, manuscript editing. AV—create outline of the project, manuscript editing. JL—create outline of the project, manuscript editing. LT—create outline of the project, manuscript editing. BLJ—corresponding author, guarantor, create outline of the project, obtaining IRB approval, statistical analysis, manuscript editing.

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## REFERENCES

- 1 Virani SS, Alonso A, Benjamin EJ, et al. Heart disease and stroke statistics-2020 update: a report from the American Heart Association. *Circulation* 2020;141:e139–596.
- 2 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;70:331–41.
- 3 Chuiz S, Pensa AV, Allen LA, et al. Palliative care for patients with heart failure: results from a heart failure society of America survey. *J Card Fail* 2023;29:112–5.
- 4 Chang YK, Kaplan H, Geng Y, et al. Referral criteria to palliative care for patients with heart failure: a systematic review. *Circ Heart Fail* 2020;13:e006881.
- 5 Hui D, Meng Y-C, Bruera S, et al. Referral criteria for outpatient palliative cancer care: a systematic review. *Oncologist* 2016;21:895–901.
- 6 Bekelman DB, Rumsfeld JS, Havranek EP, et al. Symptom burden, depression, and spiritual well-being: a comparison of heart failure and advanced cancer patients. *J Gen Intern Med* 2009;24:592–8.
- 7 Hritz CM. Palliative therapy in heart failure. *Heart Fail Clin* 2018;14:617–24.
- 8 Romanò M. Barriers to early utilization of palliative care in heart failure: a narrative review. *Healthcare (Basel)* 2020;8:36.
- 9 Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA guideline for the management of heart failure: executive summary: a report of the American College of Cardiology/American Heart Association joint committee on clinical practice guidelines. *J Am Coll Cardiol* 2022;79:1757–80.
- 10 Ogrinc G, Davies L, Goodman D, et al. SQUIRE 2.0 (standards for quality improvement reporting excellence): revised publication guidelines from a detailed consensus process. *BMJ Qual Saf* 2016;25:986–92.
- 11 Timmons MJ, MacLver J, Alba AC, et al. Using heart failure instruments to determine when to refer heart failure patients to palliative care. *J Palliat Care* 2013;29:217–24.
- 12 López-Candales AL, Carron C, Schwartz J. Need for hospice and palliative care services in patients with end-stage heart failure treated with intermittent infusion of Inotropes. *Clin Cardiol* 2004;27:23–8.
- 13 Riley JP, Beattie JM. Palliative care in heart failure: facts and numbers. *ESC Heart Fail* 2017;4:81–7.
- 14 Coventry PA, Grande GE, Richards DA, et al. Prediction of appropriate timing of palliative care for older adults with non-malignant life-threatening disease: a systematic review. *Age Ageing* 2005;34:218–27.
- 15 Davidson PM, Macdonald PS, Newton PJ, et al. End stage heart failure patients - palliative care in general practice. *Aust Fam Physician* 2010;39:916–20.
- 16 Allen LA, Stevenson LW, Grady KL, et al. Decision making in advanced heart failure: a scientific statement from the American Heart Association. *Circulation* 2012;125:1928–52.
- 17 Agarwal MA, Fonarow GC, Ziaeian B. National trends in heart failure hospitalizations and readmissions from 2010 to 2017. *JAMA Cardiol* 2021;6:952–6.
- 18 Ventafridda V. According to the 2002 WHO definition of palliative care. *Palliat Med* 2006;20:159.
- 19 Dalgaard KM, Bergenholz H, Nielsen ME, et al. Early integration of palliative care in hospitals: a systematic review on methods, barriers, and outcome. *Palliat Support Care* 2014;12:495–513.
- 20 Meyers DE, Goodlin SJ. End-of-life decisions and palliative care in advanced heart failure. *Can J Cardiol* 2016;32:1148–56.
- 21 Gelfman LP, Kavalieratos D, Teuteberg WG, et al. Primary palliative care for heart failure: what is it? How do we implement it *Heart Fail Rev* 2017;22:611–20.
- 22 Yancy CW, Jessup M, Bozkurt B, et al. 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association task force on practice guidelines. *J Am Coll Cardiol* 2013;62:e147–239.