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**Standardizing Initial Inpatient Palliative Care Consultations for Patients Receiving
Left Ventricular Assist Devices at a Large Urban Hospital**

Deborah A. Szeto

A doctoral project completed in partial fulfillment of the requirements
for the degree of Doctor of Nursing Practice in the Valley Foundation
School of Nursing, San José State University

May 2023

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Standardizing Initial Inpatient Palliative Care Consultations for Patients Receiving Left

Ventricular Assist Devices at a Large Urban Hospital

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Doctor of Nursing Practice Program

The Valley Foundation School of Nursing

San José State University

April 30, 2023

Abstract

For patients with advanced heart failure (HF) ineligible for or awaiting heart transplantation, left ventricular assist device (LVAD) implantation can be considered. LVADs have helped to improve recipients' survival rates and quality of life. However, LVAD patients are at risk for complications such as stroke, bleeding, infection, and right ventricular failure. Moreover, events such as end-stage malignancy or progression of a neurodegenerative disorder may occur. Such complications and repeated hospitalizations can pose questions about the acceptability of LVAD therapy. As such, both the Centers for Medicare and Medicaid Services and The Joint Commission require that palliative care (PC) be part of the multidisciplinary team prior to and following VAD placement. However, execution of this mandate is unclear, leaving specifics up to the discretion of individual healthcare facilities. At our facility, all patients being evaluated for LVAD implantation must receive a PC consultation. However, confusion around the objectives and structure of this consultation persists. Therefore, the purpose of this project was to implement an evidence-based, semi-structured script to guide pre-LVAD PC consultations. Training on the script was provided to PC clinicians, and pre- and post-surveys helped to identify whether this script improved confidence in PC clinicians conducting pre-LVAD consultations. Confidence levels remained generally unchanged. However, valuable insight was gained through written feedback. Namely, clinicians felt the script provided structure and guidance but that script verbiage and flow could be improved. Moreover, clinicians expressed that communication from the HF team and a standardized workflow between PC and HF teams would be beneficial.

Keywords: LVAD, heart failure, palliative care, consultation, script, quality improvement

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Background

Currently, there are six million people living with heart failure (HF) in the United States (American Heart Association [AHA], 2017). Of these, about 10% have advanced HF (AHA, 2017). Advanced HF is characterized by severe, persistent symptoms (e.g., dyspnea, cough, fatigue, lack of appetite) and ventricular dysfunction despite optimal, guideline-based medical therapy. For patients with advanced HF, attempts are made to exclude and treat any reversible causes (e.g., valvular disease, arrhythmias, thyroid disease), along with treatment using guideline-directed medical therapy (e.g., beta-blockers, renin-angiotensin antagonists, aldosterone antagonists). If ventricular dysfunction and limiting symptoms persist, despite exhaustive attempts at medical and device-related management, patients are considered for advanced HF therapies (Truby & Rogers, 2020).

Long-term advanced HF therapies include heart transplantation, left ventricular assist devices (LVADs), and inotropes. Inotropes are primarily reserved for patients who are not candidates for more durable treatments such as LVADs and heart transplantation. Heart transplantation remains the first treatment option and gold standard for end-stage HF (Truby & Rogers, 2020). However, this is not a feasible option for many individuals, due to the shortage of donor hearts and increasing number of patients ineligible for transplant (Haeck et al., 2015; Vieira et al., 2020).

For patients ineligible for or awaiting heart transplantation, LVAD implantation may be a viable alternative. A LVAD is a battery-operated device implanted in the heart that assists the left ventricle in pumping blood to the aorta and to the rest of the body. LVADs may be temporary (bridge-to-transplant) or permanent (destination therapy). For patients awaiting heart transplantation, LVADs are considered bridge-to-transplant and will continue to support cardiac

function until transplantation occurs. For patients ineligible for heart transplant, LVADs are implanted as destination therapy (Cleveland Clinic, 2019).

The landmark Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure (REMATCH) study by Rose et al. (2001) was the first to demonstrate that long term LVAD use, when compared to medical therapy alone, improves survival rates and quality of life in patients with advanced HF ineligible for heart transplantation. Since the REMATCH study, the rate of LVAD implantation has steadily increased. In 2019, 3,198 LVADs were implanted, the highest annual volume in Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) history. Interestingly, in 2019, 73% of patients received a LVAD as destination therapy, illustrating a shift toward destination therapy (versus bridge-to-transplant) being the main reason for implantation. Improvements in technology have led to increased survival rates, with one-year survival at 86.8% for bridge-to-transplant LVADs and 80.1% for destination therapy LVADs. Furthermore, average survival for patients receiving destination therapy LVADs is approaching five years (Molina et al., 2021).

However, despite improvements in survival rates and quality of life, patients with LVADs are at risk for adverse events such as stroke, bleeding, infection, and right ventricular failure (Truby & Rogers, 2020). In fact, stroke is the leading cause of long term mortality post-LVAD implantation (Molina et al., 2021). To illustrate, in the Multicenter Study of MagLev Technology in Patients Undergoing Mechanical Circulatory Support Therapy with HeartMate 3 (MOMENTUM 3) study, over the span of two years, 58% of patients with the HeartMate 3 LVAD experienced a major infection, nearly 44% experienced bleeding (24.5% had gastrointestinal bleeding), 34% developed right heart failure, and nearly 10% experienced a stroke (5% disabling) (Mehra et al., 2019). Moreover, potentially catastrophic complications

such as intracranial hemorrhage, end-stage malignancy, or progression of a neurodegenerative disorder (e.g., dementia) may prompt discussions related to LVAD deactivation—a sensitive, often morally or ethically challenging topic for patients, caregivers, and providers. Occurrence of potentially life-altering complications, as well as repeated hospitalizations, can threaten quality of life and give rise to questions about the benefits versus burdens of LVAD therapy.

Additionally, disagreement from clinicians on what constitutes “futile” care may create confusion among patients and families in the decision-making process (Luo et al., 2016).

In light of the elevated risk for adverse events, potentially disabling complications, and need for advance care planning and decision making support among LVAD patients and their caregivers, it is understandable that both the Centers for Medicare and Medicaid Services (CMS) and The Joint Commission (TJC) require that a “palliative care specialist” be part of the multidisciplinary team prior to and following VAD placement (CMS, 2013, VADs for destination therapy section).

Palliative care (PC) is a medical specialty aimed at improving quality of life for patients with serious illnesses, as well as their families. It can be delivered alongside curative treatment, regardless of age, phase of illness, or prognosis. PC focuses on management of distressing symptoms; attention to mental, emotional, and spiritual needs; assessment and clarification of goals and preferences; and coordination of care. PC can help to decrease symptom burden, improve communication between patients, families, and providers, and increase patient and family satisfaction (Center to Advance Palliative Care [CAPC], n.d.).

PC is particularly beneficial for patients with mechanical circulatory support, including LVADs. Ideally, the PC team establishes a relationship with patients and families prior to LVAD implantation, preferably during the time when advanced HF options and therapies are being

discussed. If patients make the decision to proceed with LVAD implantation, the PC team can address LVAD-specific goals of care and discuss medical preferences should adverse events or undesired outcomes (e.g., decreased quality of life, progression of a comorbidity) occur (Luo et al., 2016). These advance care planning conversations help to not only more adequately prepare patients for potential postoperative complications but also empower families and caregivers to make more informed decisions in the future. Moreover, standardized integration of PC into the care of LVAD patients can lead to increased completion of advance directives (Swetz et al., 2011). Following LVAD implantation, the PC team can assist with symptom management, as well as provide psychosocial support for families and caregivers. At the end of life, PC teams can guide difficult decision-making related to LVAD deactivation and transitioning to comfort-focused care. PC teams can also offer bereavement and spiritual support (Luo et al., 2016). Undoubtedly, PC involvement in the LVAD process is advantageous; however, *how* to best standardize its integration remains somewhat unclear.

Literature Review

Given the relative recency of the CMS and TJC mandate, literature on operationalizing PC integration into the LVAD process is limited. A comprehensive literature search was conducted using CINAHL, PubMed, and Google Scholar databases. Keywords included “palliative care,” “heart failure,” “LVAD,” “consultation,” “workflow,” “protocol,” “development,” and “integrating.” To broaden or narrow the search, Boolean operators “AND” and “OR” were utilized. Articles were limited to those from peer-reviewed journals published within the past ten years, with the exception of landmark studies.

Integration of Palliative Care into Management of Patients with Heart Failure

Historically, PC has mainly been studied in patients with cancer; however, its benefits extend to other chronic, serious illnesses, including HF (CAPC, 2022; Luo et al., 2016; Wiskar et al., 2018). When integrated into the care of patients with HF, PC has been shown to improve symptoms, mood, and quality of life; promote advance care planning; and reduce readmissions (Wiskar et al., 2018).

Diop et al. (2017) conducted a systematic review and meta-analysis to describe the available evidence for PC interventions in patients with HF and to identify the most effective PC practices for improving patient and system level outcomes. Diop et al. (2017) included studies of individuals with a primary diagnosis of HF who experienced a PC or hospice intervention, as well as all outcomes, ages, and settings of care (e.g., outpatient, inpatient, home, hospice). 15 studies were selected—eight randomized controlled trials (RCTs), two prospective non-RCTs, and five retrospective controlled studies. Sample sizes ranged from 36 patients to 16,613 patients (mean = 2629). Demographically, though most studies included patients of older age, there was much higher variability among sex, race, and marital status. Most studies were conducted in the inpatient ($n = 5$) or outpatient ($n = 5$) settings.

With regards to interventions, Diop et al. (2017) found that the studies with improvement in the greatest number of outcomes emphasized the integration of PC into the management of patients with HF (versus interventions with little to no emphasis on integrative care). Patient quality of life improved in 83% of studies, and satisfaction improved in 67% of studies. PC interventions were associated with improved documentation of medical or care preferences (i.e., identification of healthcare agent, Physician Orders for Life Sustaining Treatment [POLST], advance directives, do not resuscitate orders, and funeral arrangements) in 71% of studies. Of note, the most commonly reported variable, resource utilization, demonstrated the most dramatic

improvement. PC interventions were associated with a decrease in resource utilization—most significantly for emergency department visits, length of stay, overall and intensive care unit (ICU) admissions, urgent care, and primary care visits—in 70% of studies. Moreover, 83% of studies showed a large reduction in overall cost of care (Diop et al., 2017).

Study findings are limited by the heterogeneity of the included studies, not only in regards to populations, but also in regards to methods, interventions, settings, measurement tools, and outcomes assessed; this prevented the authors from performing multiple meta-analyses (Diop et al., 2017). Still, the available evidence in this study highlights the need to closely integrate PC into the care of HF patients and illustrates the various benefits of PC for HF patients (improved quality of life and satisfaction, increased documentation and clarification of advance care planning) and organizations (less resource utilization) (Diop et al., 2017).

Integration of Palliative Care into Management of Patients with LVADs

Collaboration between PC and Mechanical Circulatory Support Teams

Sagin et al. (2016) conducted a qualitative study to assess the nature and impact of collaboration between PC and mechanical circulatory support teams. Semi-structured interviews were conducted with 13 mechanical circulatory support team members from eight geographically diverse facilities (seven academic medical centers and one community medical center). VAD implantation rates ranged from three to 70 VADs per year. Seven common themes related to collaboration between PC and mechanical circulatory support teams were identified:

- Improvements over time in the relationship between PC and mechanical circulatory support teams
- PC as a facilitator of advance care planning
- Hospice referral and VAD deactivation as specific areas for collaboration

- The emergence of dedicated HF PC teams
- PC as an impartial voice in decision making
- PC as extra support for mechanical circulatory support team members and staff
- Perception of improved patient and family experiences with increased PC exposure

(Sagin et al., 2016)

Several of these themes point to the benefits of PC involvement with LVAD patients and clinicians. First, interviewees described PC clinicians as an objective third party through their unbiased listening and the incorporation of patients' values and goals into treatment decisions. One interviewee described the PC team as a group that can "offer insight and guidance and focus on quality of life in a different focus than what the general clinical care team [who] kind of micro manages on a constant basis" (Sagin et al., 2016, p. 495). Similarly, interviewees appreciated the time spent by PC clinicians to understand and document patients' goals and values or reinforce risks and benefits of VAD placement, contributing to improved informed consent prior to VAD placement or preparation for end of life situations. Additionally, PC teams can act as an extra layer of support for mechanical circulatory support teams, patients, and families. For example, interviewees noted that PC clinicians often build long-term relationships and rapport with patients and families, particularly those considered "difficult" (e.g., due to family dynamics, disagreement with the mechanical circulatory support team). Emotionally, interviewees appreciated the support that PC teams provide for difficult situations such as death and dying. One interviewee shared that the nursing staff at their institution conveyed their deep gratitude for the PC team for their emotional support after the death of a patient. Overall, interviewees viewed PC involvement as beneficial to LVAD patients and their families, as well as to mechanical circulatory support teams (Sagin et al., 2016).

There were several limitations in the study conducted by Sagin et al. (2016), including the use of a convenience sample, small sample size, and heterogeneous population (most participants were VAD coordinators or nurse practitioners [NPs]; only one social worker, one physician, and one psychologist were included). Lastly, while the processes for collaboration between mechanical circulatory support and PC teams were explored, interviewees were not asked about specific topics covered in PC consultations (Sagin et al., 2016). In general, however, these interviews provide valuable insights into the positive perceptions of PC clinicians by VAD teams and the positive impact of PC on LVAD patients, families, and clinicians.

Effects of Pre-LVAD PC Consultations

In a landmark retrospective study performed *prior* to the CMS and TJC mandate requiring PC involvement before and after VAD implantation, Swetz et al. (2011) evaluated whether proactive, pre-LVAD PC consultations helped to better clarify goals of care and quality of life preferences. Patients who agreed to destination therapy LVAD implantation were offered PC consultation as part of routine care. Consultations were performed by PC physicians and “allied health practitioners” (specific fields were not delineated) (Swetz et al., 2011, p. 494). The PC team worked with patients and families to create a preparedness plan, defined as “specific advance care planning that assisted patients and families in thinking about psychosocial and financial considerations, caregiving concerns, quality of life determinants, and ethical issues that may affect clinical destination therapy outcomes” (Swetz et al., 2011, p. 494). This preparedness plan can be thought of as a LVAD-specific advance directive. Emphasis was placed on discussion of time-limited life-sustaining treatments, potential complications, and medical preferences, including blood transfusions, antibiotics, hemodialysis, artificial nutrition and hydration, and long-term mechanical ventilation. Sagin et al. (2016) explained that this

additional time spent by PC clinicians to elicit and document goals, values, and preferences is appreciated by LVAD clinicians, who may not have time or the skills to engage in such discussions. Follow up PC consultations were provided to patients who experienced adverse events, as well as those who were doing well, with the purpose in the latter group of building rapport should PC support be needed in the future (Swetz et al., 2011). As Sagin et al. (2016) noted, greater PC exposure seemed to be associated with improved patient and family experiences.

A chart review was performed on all patients ($n = 19$) who received destination therapy LVADs between January 15, 2009 and January 1, 2010. 68% of patients ($n = 13$) received proactive PC consultation, with the remaining six patients unable to participate in consultation due to emergent surgery, patient/family refusal, etc. (Swetz et al., 2011). In discussing study results, Swetz et al. (2011) described six case studies in which PC facilitated preparedness planning or influenced outcomes. In general, the authors found that both the LVAD team and families reported that pre-LVAD consultations and goals of care discussions helped to better clarify care postoperatively, including decision-making around adverse events (e.g., one family decided to discontinue a moribund's patient's life-sustaining treatments, including the LVAD, due to severe postoperative complications, a decision that was guided by the patient's preparedness plan and the rapport the family had built with the LVAD and PC teams). A key finding from the intervention was that the PC team could intervene swiftly during times of crises, due to the relationship the PC team already had with patients and families and the availability of the preparedness plan. Swetz et al. (2011) explained that they received positive feedback from both the LVAD team as well as families, which is illustrative of the positive themes expressed in the interviews conducted by Sagin et al. (2016). Notable challenges included patients and

families misunderstanding PC, clinical factors (e.g., emergent surgery) preventing pre-VAD consultations, and variable patient engagement due to severity of illness. The study's small sample size, limitation to one healthcare facility, and lack of randomization limit its generalizability (Swetz et al., 2011).

This study by Swetz et al. (2011) was the first to characterize a standardized and integrated PC approach to advance care planning for destination therapy LVAD patients. Though observational in nature, study results were clinically significant, in that both the LVAD team and families found that pre-LVAD consultations and goals of care discussions clarified post-LVAD care, particularly in regards to complications and adverse events (Swetz et., 2011).

Effects of Standardized PC/Mechanical Circulatory Support Protocol

Sinha et al. (2017) evaluated the effectiveness of a protocol standardizing PC consultations for mechanical circulatory support patients in increasing the rate of PC consultations and surrogate decision maker documentation. The authors provided a comprehensive overview of the protocol, which is reviewed on a quarterly basis. Once the cardiology team submits a PC referral for a patient, nurse coordinators from both PC and VAD teams engage in information sharing. Subsequently, the PC consultation occurs with an interdisciplinary team (PC physicians or advanced practice nurses, PC social worker, and PC chaplain); goals include identification and documentation of a surrogate decision maker, assistance with advance care planning (defined as medical treatment patients would want to receive if unable to speak for themselves), and provision of physical, psychosocial, and spiritual support. After the initial preoperative consultation, the details are documented in the electronic health record, and the PC team continues to collaborate with the VAD team during the VAD

evaluation process and after VAD implantation. The PC team also attends weekly meetings for patients with VADs or undergoing VAD evaluation.

Sinha et al. (2017) performed a chart review of all patients who received mechanical circulatory support devices pre- and post-protocol implementation. The authors found that the percentage of pre-mechanical circulatory support PC consults increased from 11 (72%) prior to protocol implementation to 56 (96.6%) after protocol implementation ($p < .0001$). Similarly, surrogate decision maker documentation increased from 26 (40.6%) pre-protocol to 57 (98.3%) post-protocol ($p < .0001$) (Sinha et al., 2017). However, only system outcomes (percentage of PC consultations, documented surrogate decision makers) were measured, not patient (e.g., symptom burden) or clinician (e.g., satisfaction) outcomes.

Salomon et al. (2018) conducted a chart review to understand the integration of PC services into the care of LVAD patients. Unlike Sinha et al. (2017), in which a standardized protocol was developed, implemented, and evaluated, a protocol was already in place at the institution where Salomon et al. (2018) conducted the study. The protocol was simply improved upon in light of the TJC requirement (Salomon et al., 2018). There were notable similarities between both protocols. Importantly, in both protocols, a PC team member attends weekly interdisciplinary rounds with the LVAD team (Salomon et al., 2018; Sinha et al., 2017). Overlapping areas of consultation discussion points included healthcare agent designation and general advance care planning (Salomon et al., 2018; Sinha et al., 2017). However, while Sinha et al. (2017) did not elaborate on the process and key points of advance care planning, Salomon et al. (2018) explained that the PC team discussed potential complications (e.g., hemorrhage, stroke) and encouraged patients to speak with their healthcare agents about their values and any conditions under which they might wish to deactivate the LVAD.

Similar to Sinha et al. (2017), Salomon et al. (2018) observed a rise in the rate of PC consultations (from 35% to 71%) as the workflow improved. Though Salomon et al. (2018) acknowledged that symptom and psychosocial assessments were always performed ($n = 28$; 100%), the authors explained that PC consultations generally focused on advance care planning. In contrast to the approach taken by Sinha et al. (2017), in which regular follow up was conducted even after mechanical circulatory support implantation to promote continuity of care, most patients ($n = 21$; 75%) did not receive PC services after the initial consultation.

The results of both Sinha et al. (2017) and Salomon et al. (2018) are limited by the small sample sizes and single institutions, as well as the retrospective methodology (i.e., lack of active, continuous evaluation). However, both studies provide guidance into the overall structure of PC involvement, including consultation content (with areas of similarities and differences), during the inpatient LVAD process. Interestingly, Sinha et al. (2017) highlighted the importance of continued PC involvement beyond the initial consultation, while Salomon et al. (2018) found that regular follow up was not common. An overview of the effects of standardized pre-LVAD PC consultations or protocols on outcomes is provided in Table A1.

While Sinha et al. (2017) and Salomon et al. (2018) aimed to standardize *inpatient* PC involvement in the care of mechanical circulatory support patients, Woodburn et al. (2019) outlined PC involvement from pre-implant to end of life, including the roles of both inpatient *and* outpatient PC. Woodburn et al. (2019) implemented a comprehensive approach to better support the end of life process in destination therapy LVAD patients. This quality improvement project involved (a) creation of a tool to delineate the illness trajectory of a destination therapy LVAD patient, from pre-implant to end of life, (b) standardization of the role of inpatient and outpatient PC, (c) regular meetings between the patient, caregiver, VAD coordinator, and HF and

PC attendings once patients reached the “transitional phase” (i.e., life expectancy of weeks to months) to facilitate shared decision-making, and (d) monthly multidisciplinary team debriefings to ensure consistency in patients’ plans of care. Of note, the pre-implantation consultation involved completion of a preparedness plan (as previously discussed by Swetz et al. [2011]) and review of the AD or living will; the PC team would then sign off at the time of surgery or following the initial consultation. If needed, the VAD team would request follow up assistance from the PC team for triggers such as a length of stay greater than 30 days, an ICU length of stay greater than 14 days, and/or an acute catastrophic event such as stroke (Woodburn et al., 2019). This is notably different from the approach utilized by Swetz et al. (2011), in which follow up was provided not only to patients who experienced adverse events, but also to those who were doing well.

Woodburn et al. (2019) measured quality of life in patients and caregivers pre- and post-intervention, as well as rates of preparedness plan and advance directive completion/documentation. All patients and caregivers reported statistically significant improvements in all quality of life measures (e.g., symptom impact, relationship with healthcare provider, preparation for end of life) (patient $p = .035$, caregiver $p = .046$). Additionally, completed preparedness plans increased from 52% pre-intervention to 73% post-intervention, and documented advance directives increased from 71% pre-intervention to 83% post-intervention (Woodburn et al., 2019). While not the exactly the same outcome measure, this parallels findings by Sinha et al. (2017), in which a standardized protocol helped to increase surrogate decision maker documentation. Lastly, these improvements in quality of life and advance care planning measures correspond with findings by Diop et al. (2017).

With regards to limitations, Woodburn et al. (2019) acknowledged that the PC team already had some level of engagement with the LVAD team; in other words, the project expanded on the current practice (versus building from the ground up) and did not require buy-in from stakeholders. Furthermore, patients were in various stages along the illness trajectory; if measurements were completed with all patients starting at the pre-implantation stage and finishing at the end of life stage, there may have been a greater impact on advance care planning outcomes. This quality improvement project offers a wealth of information into how to support LVAD patients and caregivers throughout the *entire* disease trajectory (i.e., not simply immediately pre- and post-LVAD implantation) through a standardized approach and use of an illness trajectory tool. Impressively, outcomes at the system, clinician, and patient level were measured. However, specific details regarding the pre-implantation consultation are not mentioned.

Conversation Guides in Serious Illness Communication

In addition to formal training and standardized documentation, use of a checklist or conversation guide is recommended to support providers in conducting conversations around serious illness (Bernacki & Block, 2014). These guides can provide structure during emotionally challenging, stressful discussions and ensure that important elements (e.g., patients' understanding of their illness, prognosis, goals, etc.) are not omitted. The Serious Illness Conversation Guide, developed using patient-tested verbiage and best practices in PC, is one of the most well-known conversation guides (Paladino & Fromme, 2019). When used in conjunction with clinician training and system-wide changes, the guide has been shown to facilitate meaningful and effective conversations between patients and providers, as well as improve clinician satisfaction in their roles (Paladino et al., 2020; You et al., 2022). The Serious

Illness Conversation guide, as well as other similar conversation tools, are valuable in promoting goal-concordant care in patients with serious illness.

Pre-LVAD Palliative Care Consultation Scripts

Chuzi et al. (2019) conducted a qualitative analysis of the contents of pre-VAD PC consultations at the authors' institution. The authors noted that they had not implemented a standard protocol or template for these consultations. Family was present for 57% of the pre-VAD consultations, and for 97% of patients, it was their first encounter with PC. Chuzi et al. (2019) found that general PC topics were not often covered. For instance, decision to undergo VAD, symptoms, unacceptable conditions, and spiritual preferences were only discussed 35%, 60%, 58%, and 6%, respectively. Many elements of preparedness planning, including device failure, post-VAD quality of life, VAD-related complications, and debilitating comorbid conditions, were infrequently discussed (10%, 54%, 49%, and 12%, respectively) (Chuzi et al., 2019). Despite the retrospective design and limitation to a single institution, this study highlights the inconsistencies in pre-VAD PC consultations lacking a standardized script or protocol.

Two studies described the development and use of a script in pre-VAD PC consultations. O'Connor et al. (2016) conducted a prospective pilot study of nurse-led, scripted, pre-VAD PC consultations at an urban, tertiary medical center. The authors created a scripted PC assessment tool using best available evidence, input from VAD programs that successfully integrated PC into the VAD process, and guidance from local cardiologists. The goal of the tool was to provide an introduction to PC, promote a discussion about advance care planning and potential adverse outcomes, and identify any patients who would need a full PC consultation (i.e., with a physician or nurse practitioner) for symptom management, psychosocial distress, or unclear goals of care. Specifically, the tool included the following topics: introduction to PC; understanding of HF and

VAD process; quality of life (e.g., functional status, pleasurable activities); coping; and advance care planning (e.g., goals, end-of-life wishes, decision maker, unacceptable treatments, VAD deactivation). A PC registered nurse was trained on the use of the tool, and consultations were documented in narrative form in the electronic health record.

Throughout a recruitment period of 14 months, 37 consultations were conducted, of which 30 patients received a VAD. All participants completed the full nurse consultation, which indicated unanimous acceptability. 89% of consultations occurred in the inpatient setting; 11% occurred in the outpatient setting (HF clinic). 75.6% ($n = 28$) of patients were undergoing evaluation for destination therapy VAD. The nurse referred six cases for full PC consultation due to more complicated needs, and in four cases, patients and families requested ongoing support. The VAD team provided consistently positive feedback and did not suggest any modifications to the script. Limitations of this study include the use of consultation completion (versus formal surveys) to represent acceptability to patients and families, small sample size and lack of demographic data on the study population, and lack of comparison of outcomes in regards to nurse-led visits versus traditional PC consultations (O'Connor et al., 2016).

Nakagawa et al. (2017) conducted a prospective, single-arm study at an academic medical center to describe the viability of a pre-VAD PC intervention in eliciting patients' goals and values in patients receiving destination therapy and bridge-to-transplant LVADs. Using available PC communication literature and expert opinions from the Columbia University Interdisciplinary LVAD team (composed of PC clinicians, cardiothoracic surgeons, HF cardiologists, and a cardiology social worker), the authors created a semi-structured interview script. Specifically, the tool included the following topics: patient comfort; understanding of LVAD therapy; patient goals and expectations (e.g., quality of life, post-LVAD goals); spiritual

needs; possible complications and unacceptable conditions (including LVAD deactivation); and decision-making and information sharing preferences. Interestingly, Nakagawa et al. (2017) indicated that they purposefully aligned the questions to emphasize unacceptable conditions as a whole, instead of specific medical complications, in order to not overwhelm patients and families. The authors also highlighted that they were very clear with patients and families that the LVAD could be deactivated at any point in time in the future. Consultations were documented descriptively in the electronic health record. After the pre-VAD consultation, the PC team was consulted as needed (e.g., for frequent readmissions, decrease in functional status, catastrophic events); patients had an average of 3.5 PC visits after the initial pre-VAD consultation.

112 patients were included in the study (Nakagawa et al., 2017). All patients were able to describe what makes their life meaningful, 101 (92%) could describe potential complications, and 79 (70.5%) could describe unacceptable conditions (Nakagawa et al., 2017). Nakagawa et al. (2017) also explored the effect of the script in improving family awareness of patients' preferences and in influencing end-of-life decision making. Family awareness of patients' preferences regarding unacceptable conditions was defined as: (a) the patient being able to clearly articulate an unacceptable condition, and (b) the family being present during the consultation *or* the patient self-reporting that they have previously discussed this with family. Following pre-VAD evaluation, family awareness increased from 37 patients (33%) to 65 patients (58%), a statistically significant improvement ($p < .01$). Of note, of 12 patients who died, five (42%) chose to deactivate their LVAD, and all five were classified as having family awareness. Limitations include lack of a control group (i.e., those who did not receive a pre-VAD consultation), not directly asking family members about their awareness of patients'

wishes, and the study being conducted at a single institution (limiting generalizability) (Nakagawa et al., 2017).

Many similarities, as well as some differences, were determined when comparing the approaches, content, and outcomes of O'Connor et al. (2016) and Nakagawa et al. (2017). Development of both scripts incorporated best available evidence and expert opinions. The consultations in the study conducted by O'Connor et al. (2016) were intentionally nurse-led, as the authors were piloting a new approach to address the increasing quantity of unseen PC consults. In contrast, the consultations in the study conducted by Nakagawa et al. (2017) were generally led by a PC physician or NP. Destination therapy and bridge-to-transplant LVAD patients were included in both studies. Moreover, both studies included family members whenever possible, though their participation was not mandatory. In examining the content of the PC consultation scripts, O'Connor et al. (2016) included questions on functional status, coping strategies, and worries, while Nakagawa et al. (2017) did not. Nakagawa et al. (2017) assessed for spiritual needs using a spiritual needs assessment tool, while O'Connor et al. (2016) did not. Both O'Connor et al. (2016) and Nakagawa et al. (2017) included questions related to patients' understanding of HF and VAD therapy, quality of life, potential complications, unacceptable conditions, VAD deactivation, and decision-making. Notably, both O'Connor et al. (2016) and Nakagawa et al. (2017) concluded that patients were engaged in discussing their values, though O'Connor et al. (2016) found that patients were more likely to share their values, instead of specific medical preferences. Table A2 provides a synthesis of the similarities and differences between the contents of various pre-LVAD PC consultations and highlights the most frequently discussed components.

Summary of the Literature

Overall, research demonstrates that pre-LVAD PC consultations or protocols favorably affect outcomes related to advance care planning. These proactive interventions facilitated increased rates of advance directive completion and documentation of healthcare agents (Sinha et al., 2017; Swetz et al., 2011). Moreover, both clinicians and families reported improved clarity around patients' goals of care (Swetz et al., 2011; Nakagawa et al., 2017). Pre-LVAD PC protocols in particular improved the rate of PC consultations (Sinha et al., 2017; Salomon et al., 2018).

In review of the contents of pre-LVAD PC consultations, several components were more observed more frequently. Most explored patients' understanding of their heart failure and/or LVADs, in addition to assessment of symptoms and spiritual needs (Chuzi et al., 2019; Nakagawa et al., 2017; O'Connor et al., 2016; Salomon et al., 2018; Sinha et al., 2017; Swetz et al., 2011). Furthermore, most included discussion about quality of life and consideration of patients' wishes regarding unacceptable conditions and potential complications (Chuzi et al., 2019; Nakagawa et al., 2017; O'Connor et al., 2016; Salomon et al., 2018; Swetz et al., 2011). Lastly, all included identification of a healthcare agent (Chuzi et al., 2019; Nakagawa et al., 2017; O'Connor et al., 2016; Sinha et al., 2017; Swetz et al., 2011).

Practice Gap & Statement of Purpose

Though the CMS and TJC mandate PC involvement in the VAD process, execution of the mandate is currently unclear. Policies or protocols outlining how and when PC should be involved are limited, leaving specifics up to the discretion of individual healthcare facilities (Wiskar et al., 2018). Those that do exist have not been sufficiently evaluated or implemented beyond single medical centers. Consequently, implementation of the directive varies widely. At this project leader's facility, all patients being evaluated for LVAD implantation must receive a

PC consultation. However, there is significant confusion around the objectives and structure of the initial PC consultation. Furthermore, the advanced HF/transplant team at this project leader's facility has a psychologist and social worker. Their psychosocial assessments and support often overlap with that of the PC team, potentially leading to repetition and inefficient use of time and resources. Not only does this create inconsistencies with each consultation, neither the PC clinician nor the patient and caregiver fully understand the role of the PC team in the LVAD process. Therefore, the purpose of this DNP project was to address this gap through implementation of an evidence-based, semi-structured script to guide pre-LVAD PC consultations. The project leader aimed to identify whether a semi-structured consultation script improved confidence in PC clinicians conducting pre-LVAD consultations.

Framework

In order to reduce process variation and improve outcomes for patients, caregivers, and clinicians, a quality improvement framework was utilized to support this project. The Model for Improvement (MFI), developed by the Institute for Healthcare Improvement (IHI) in 1996, is one of the most frequently used quality improvement frameworks in healthcare. It begins by posing three questions: (a) What are we trying to accomplish? (b) How will we know that a change is an improvement? and (c) What changes can we make that will result in improvement? A rapid cycle process called Plan Do Study Act (PDSA) is then used to test the effectiveness of small changes (Agency for Healthcare Research and Quality [AHRQ], 2013).

The PDSA cycle was developed in the 1950s by W. Edwards Deming, a statistician who utilized statistical process control tools to highlight areas of variation causing waste in manufacturing. Deming emphasized the role of processes, not individuals, as sources of variation and error—a perspective that influenced the modern view of quality improvement. In developing

the concept of PDSA, Deming essentially adapted the scientific method for industry (AHRQ, 2013; Institute for Healthcare Improvement [IHI], n.d.-a). PDSA cycles are essentially a way to quickly implement and measure the effects of small changes, with the goal of ultimately disseminating the change through the practice or organization (AHRQ, 2013).

In order to guide the implementation of the consultation script, two PDSA cycles were conducted. The first step of the cycle is “plan,” which involves planning the test and method of data collection (IHI, n.d.-b). The project leader selected an evidence-based, semi-structured, pre-LVAD PC consultation script for implementation. The project leader then developed training for PC clinicians on the consultation script. Additionally, the project leader created pre- and post-intervention surveys that were distributed to all inpatient PC clinicians who received training on the intervention. The second step is “do,” which involves doing a small test of the intervention and making note of any unexpected occurrences (IHI, n.d.-b). The project leader and team member administered training on the script to all inpatient PC nurses, social workers, and chaplains. Moreover, the project leader utilized pre- and post-training surveys to obtain feedback on the script and evaluate effectiveness of the script in increasing confidence levels of the clinicians. The third step is “study,” which involves analyzing the data (IHI, n.d.-b). The project leader and team member reviewed results of the surveys and reflected on what was learned from the implementation. The fourth step is “act,” which involves modifying the intervention based on observations from the analysis and creating a plan for the next test (IHI, n.d.-b). Following completion of the training and pre- and post-training surveys, the project leader and team member reviewed results of the surveys and utilized this data to make modifications to the original script. The process of the first PDSA cycle was essentially repeated. The project leader and team member administered training on the revised script to all inpatient PC nurses, social

workers, and chaplains, followed by distribution of a post-training survey. The project leader and team member will review the results of the post-training survey, which will be used for further revisions to the script.

Methods

Design

This evidence-based project evaluated the effects of an evidence-based, semi-structured script (Appendix B) on improving confidence in PC clinicians conducting pre-LVAD consultations. Two PDSA cycles were utilized in implementing and revising the consultation script (Appendix C), assessing PC clinicians' confidence in using the script to conduct pre-LVAD consultations, and determining the need for further modifications to and iterations of the script.

Setting

This project was conducted at a large urban hospital in Northern California. As the only hospital in California within the parent organization with the ability to admit and manage VAD patients, the patient population ranges from patients within the local Bay Area to patients across all of Northern California. Though the hospital has been managing VAD patients since 2012, VAD implantation did not begin until 2018. Since 2018, 37 patients have received a VAD. Most VADs that are implanted are primarily left VADs (LVADs), though a couple of patients have also received right VADs (RVADs) due to biventricular heart failure.

The inpatient PC team is composed of 15 board-certified PC physicians, five registered nurses (one full-time, three part-time, and one per diem), five social workers (one full-time, two part-time, and two per diem), and two chaplains (one full-time, one per diem). Typically, the PC nurses, social workers, and chaplains conduct the pre-LVAD consultations.

Participants

Inpatient PC clinicians who conduct pre-LVAD consultations (typically nurses, social workers, and chaplains) were recruited by the project leader to receive training on the intervention. Inpatient PC clinicians who do not receive training on the intervention (i.e., PC physicians, as they typically do not conduct pre-LVAD consultations) were excluded from the project.

Measurements

The primary outcome was confidence level in inpatient PC team members in conducting initial PC consultations with patients being evaluated for LVAD implantation and their caregivers. Confidence was self-rated by clinicians on a Likert scale with five options: “not confident at all,” “slightly confident,” “somewhat confident,” “fairly confident,” and “completely confident.” Other process measures that were captured on the post-training survey included reasons for utilizing (or not utilizing) the semi-structured script, frequency of script use, and components of the script that were used.

Additional clinician-related variables that were measured through the online survey included position of inpatient PC clinician (e.g., nurse, social worker, or chaplain) and years of inpatient PC experience. See Appendix F for detailed variable definitions and sources.

Procedures

As previously discussed, at this project leader’s facility, there is no formal structure delineating the objectives and content of pre-LVAD PC consultations. Therefore, an evidence-based, semi-structured script was implemented, evaluated, and modified.

Script

In review of the literature, two semi-structured pre-LVAD consultation scripts, created by O'Connor et al. (2016) and Nakagawa et al. (2017) were located. The script by Nakagawa et al. (2017) (Appendix B) was selected due to its more robust evaluation. The script covers the following six topics: patient comfort; patient and family understanding of LVAD therapy; patient goals and expectations (e.g., quality of life, post-LVAD goals); spiritual needs; possible complications and unacceptable conditions (e.g., stroke, infection, debilitating comorbid conditions, LVAD deactivation); and decision-making and information sharing preferences.

Following training and evaluation of the original script by Nakagawa et al. (2017), the project leader and team member created a revised script by comparing the original script with the O'Connor et al. (2016) script and an advance care planning conversation script created by the parent organization (Appendix C). Clinician survey feedback and the project leader and team member's judgment were utilized in developing the revised script.

Intervention

PDSA Cycle 1. About one month prior to training on the original script, the project leader used email and Microsoft Teams to distribute a pre-training survey (Appendix D) on Microsoft Forms to PC clinicians. While staff participation in the survey was voluntary, staff were highly encouraged to participate and received several email and in-person reminders.

Next, during a routine PC staff meeting conducted on Microsoft Teams, the project leader and team member provided a 20-minute training to inpatient PC nurses, social workers, and chaplains on the original script. Using a lecture-based format with PowerPoint slides, the project leader and team member reviewed the rationale for change, objectives and content of the script, and evidence of the script's effectiveness. Handouts of the script were provided as hard copies, as well as uploaded to Microsoft Teams. As part of routine practice, the full PC meeting was

recorded and made available on Microsoft Teams, as well as emailed to any PC clinicians who were unable to attend.

1.5 months after the training, the project leader emailed a post-training survey (Appendix E) using Microsoft Forms. Again, while participation was optional, participation was encouraged, and staff received several email and in-person reminders. The results of the post-training survey were analyzed by the project leader and team member and considered for future modifications to the script. No personally identifiable information was collected.

PDSA Cycle 2. Using results from the first post-training survey, the project leader and team member created a revised script by comparing the original script with the O'Connor et al. (2016) script and an advance care planning conversation script created by the parent organization. Once the revised script was developed, the project leader and team member discussed the revisions and associated rationales through brief in-service trainings during morning huddles and with individual PC clinicians. Post-training surveys on Microsoft Forms were distributed through email approximately two weeks after the trainings. Results will be analyzed by the project leader and team member and utilized for further script revisions.

Analysis

Descriptive statistics, limited to mean, median, mode, frequencies, and percentages, were performed on all clinician variables. Pre- and post-intervention clinician survey results were reviewed to determine whether there was a change in confidence levels among inpatient PC clinicians in conducting pre-LVAD PC consultations. Intellectus Statistics (2021) was utilized for data analysis.

Ethical Considerations

The project was submitted to the regional organization's Research Determination Committee and was determined not to meet the regulatory definition of research involving human subjects; therefore, approval by the Institutional Review Board was not needed. There were minimal risks associated with this intervention. All data was stored in a password-protected file on a facility-owned computer at the hospital. Since no individual identifiers were used in data collection, all data included in the reporting of the results did not include any information that would identify PC clinicians.

Results

Demographic Data

Five out of 12 inpatient PC clinicians attended the live training, which was presented during a routine staff meeting. Attendance at staff meetings is usually composed of staff members working on the day of meetings, though any staff member is allowed to join meetings from home if desired. Several PC clinicians who were not present at the live training viewed the recording of the training. Overall, six PC clinicians (two nurses, three social workers, and one chaplain) completed the pre-training survey and five PC clinicians (three nurses, one social worker, and one chaplain) completed the post-training survey for the original script (Table 1). Participants had between 0.25 to 6 years ($M = 4.29$) of inpatient PC experience.

Script Usage

Out of the five PC clinicians who completed the post-training survey for the original script, only three (all of whom were nurses) had the opportunity to utilize the script. All three clinicians conducted one pre-LVAD PC consultation. The low number of consultations is due to the fluctuating number of patients undergoing LVAD evaluation at any given time. Out of these three participants, only one used all six components of the script, citing "[wanting] to give the

script a fair shot.” One participant used three components (“Patient and family understanding of LVAD therapy,” “Patient goals and expectations,” and “Decision-making and information sharing preferences”). One participant used two components (“Patient and family understanding of LVAD therapy” and “Possible complications and exploration of unacceptable conditions”), explaining that “it helped [me] to understand where patients and families are in terms of knowledge about their disease process; for example...if their LVAD is a destination therapy or not.”

Confidence Levels

Of the six participants who completed the pre-training survey, one rated themselves as “slightly confident,” two as “somewhat confident,” and three as “fairly confident” in conducting pre-LVAD PC consultations (Table 1). Of five participants who completed the post-training survey, one selected “slightly confident,” one selected “somewhat confident,” and three selected “fairly confident.” No participants rated themselves as “not confident at all” or “completely confident” on either the pre- or post-training surveys. In general, following training on the script, no change in confidence levels was observed, as shown in Figure 1.

Table 1

Participant Characteristics and Survey Results

Variable	Pre-training	Post-training
Position, n (%)		
Registered nurse	2 (33.3)	3 (60)
Social worker	3 (50)	1 (20)
Chaplain	1 (16.7)	1 (20)
Confidence levels, n (%)		
Not confident at all (1)	0 (0)	0 (0)
Slightly confident (2)	1 (16.7)	1 (20)
Somewhat confident (3)	2 (33.3)	1 (20)
Fairly confident (4)	3 (50)	3 (60)
Completely confident (5)	0 (0)	0 (0)
Overall Confidence, <i>M (SD)</i> *	3.33 (0.82)	3.40 (0.89)

Number of script uses in LVAD consultations, n	N/A	3
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*M= mean; SD= standard deviation

Figure 1

Confidence Levels of Palliative Care Clinicians



Qualitative Data

Responses to open-ended survey questions on pre- and post-training surveys were reviewed and grouped by theme (Table 2).

Lack of Consultation Structure and Consistency

Participants shared a desire for structure and consistency during pre-LVAD PC consultations, which was improved with implementation of the scripts. Thus, the structure that the scripts provided assisted participants with directing consultations by offering clarity and consistency. On post-training surveys, participants shared that “the script offers added structure and verbiage which is helpful with the LVAD population” and “helped to some degree to establish a conversation that would flow.”

Lack of Clarity Around Role of Palliative Care

On both pre- and post-training surveys, participants discussed the evolving clarity around the role of the PC team in the care of patients undergoing LVAD evaluation. As one participant wrote, “There has been a lot of confusion in our department as to our role and the direction palliative care consults should take with this patient population.” With the implementation of the semi-structured scripts, a better understanding of how the PC team supports patients undergoing LVAD evaluation continues to emerge. On the post-training survey for the original script, one participant wrote that “prior to your project...we had no real direction for these consults” but that they “feel more confident in the direction we are heading and the clarity of our role which will continue to evolve.”

Need for Improved Collaboration with Advanced Heart Failure Team

Importantly, participants verbalized a need for improved collaboration and dialogue with the advanced HF/transplant team. One participant shared that although they feel confident conducting pre-LVAD PC consultations, “the lack of confidence is not being well integrated into the CV [cardiovascular] team treating the patient; e.g., not knowing what education they have already provided, what their expectations are of our team, what timing would be best for the consultation, etc.” Having details such as a patient’s “overall condition/prognosis with or without LVAD,” as the same participant explained, would help PC clinicians to better understand each patient’s unique situation.

Need for Improved Script Verbiage and Flow

Lastly, while participants appreciated the structure and guidance provided by the original script, many felt that the language and flow could be improved, resulting in creation of the revised script. For instance, in the original script, no introduction was included. One participant explained, “I don’t particularly like how it starts out – sort of right to the point. No getting to

know the patient or ice breaking.” Furthermore, participants also wished that the original script was “more conversational” and felt that it was “clunky” and “could be adapted to flow better.” Consequently, the project leader and team member added an introduction in the revised script, in addition to improving script verbiage and flow throughout each section.

Table 2

Themes and Supporting Quotes from Pre- and Post-Training Surveys

Theme	Quotes
Lack of pre-LVAD PC consultation structure and consistency	<ul style="list-style-type: none"> • It would be good to have some consistency to our LVAD meetings. • I have experience adapting GOC conversations to many different medical situations. The script offers added structure and verbiage which is helpful with the LVAD population. • I feel that the script assisted with keeping the meeting on track. • Helped to some degree to establish a conversation that would flow. • The LVAD meetings are awkward, so it helps to have this for guidance.
Lack of clarity around role of PC	<ul style="list-style-type: none"> • There has been a lot of confusion in our department as to our role and the direction palliative care consults should take with this patient population. • Prior to your project...we had no real direction for these consults. I feel more confident in the direction we are heading and the clarity of our role which will continue to evolve.
Need for improved collaboration with advanced heart failure team	<ul style="list-style-type: none"> • I feel fairly confident that I can adapt a palliative care meeting to the individual patient's medical situation in most circumstances, including pre-LVAD; the lack of confidence is related to not being well integrated into the CV [cardiovascular] team treating the patient; e.g., not knowing what education they have already provided, what their expectations are of our team, what timing would be best for the consultation, etc. • Would be helpful to have a clear vision of our role on a case by case basis with direct input from HF [heart failure team] pertaining to patients’ overall condition/prognosis with or without LVAD. For instance, it is helpful to have the HF psych/social assessment prior to our meeting to avoid overlap and re-questioning.

Need for improved script verbiage and flow	<ul style="list-style-type: none"> • I don't particularly like how it starts out – sort of right to the point. No getting to know the patient or ice breaking. • I think it's a good foundation but it's clunky, could be adapted to flow better.
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Discussion

In this project evaluating a semi-structured script to guide pre-LVAD PC consultations, we found that script use did not improve PC clinician confidence. However, participants felt that the scripts offered some degree of structure and consistency to pre-LVAD PC consultations and provided clarity to the role of the PC team in patients undergoing LVAD evaluation. Participants also highlighted the need for closer collaboration between PC and advanced HF/transplant teams.

Our finding that the script did not change clinician confidence differs from the findings of previous research on PC conversation guides. In particular, the Serious Illness Conversation Guide, a landmark script, has been implemented and evaluated across a variety of disciplines and settings and found to improve confidence in communication skills (Tam et al., 2019; Wasp et al. 2021; Zehm et al., 2022). One possible explanation for the difference in results is that clinicians in these studies received more intensive training than what was provided in this project. In general, trainings were several hours long and consisted of a didactic component, personal reflection, and role play with feedback (Tam et al., 2019; Wasp et al. 2021; Zehm et al., 2022). Using active, learner-centered strategies such as role play, feedback, and group discussions were found to be most effective in teaching communication skills to physicians (Berkhof et al., 2011). This contrasts with the training provided in this project, which was merely didactic and comparatively brief in length.

Another key difference was that participants in studies involving the Serious Illness Conversation Guide were often clinicians who were less likely to be familiar or comfortable with

facilitating PC conversations (e.g., medical students, interns, residents, etc.), compared to the inpatient PC clinicians who participated in this project, who had an average of 4.29 years of inpatient PC experience. All PC clinicians should be able to conduct basic conversations related to goals of care and advance care planning (Hökkä et al., 2020; Quill & Abernethy, 2013). For the PC clinicians at this facility, the issue lies within LVAD-specific conversations, due to the unclear role of the PC team, lack of consistency in consultations, and need for potentially beneficial information (e.g., patient-specific prognostic data) from the advanced HF/transplant team prior to the pre-LVAD PC consultation. Thus, these factors likely affected clinicians' self-reported confidence and cannot be rectified by implementation of and training on a script alone. Notably, there were no previous studies evaluating improvement in clinician confidence with implementation of a semi-structured script to guide pre-LVAD PC consultations. Therefore, evidence to support interventions to improve PC clinician confidence in conducting pre-LVAD PC consultations is limited.

Though all PC clinicians should be familiar with conducting general goals of care conversations, the nature of pre-LVAD PC meetings can present its own challenges, even for experienced clinicians. For instance, certain topics such as device deactivation in the setting of a terminal illness or unacceptable condition and LVAD-related complications are unique to patients undergoing LVAD evaluation. A semi-structured script provides a foundation for these conversations. However, since these topics can be challenging or unfamiliar, ongoing training of PC clinicians (e.g., on LVAD complication rates, the process of LVAD deactivation, transitioning to hospice care with a LVAD, etc.) by the advanced HF/transplant teams could potentially improve PC clinicians' confidence levels in conducting pre-LVAD consultations.

Opportunities to provide interdisciplinary education could also improve the effectiveness of both PC and HF teams in working with each other and with patients (Sagin et al., 2016).

Though progress has been made since the execution of the CMS and TJC mandate requiring PC involvement in the care of LVAD patients, the role of PC teams is still somewhat unclearly delineated and variable across institutions. While implementation of a script to guide pre-LVAD consultations offers some direction to PC teams, more clarity about the role of PC throughout the entire trajectory of a LVAD patient is needed. At what points should the PC team be reconsulted? How heavily should the PC team be involved? How can potential redundancies between PC and LVAD psychosocial teams be minimized, in order to maximize the scope and efficacy of each service? Woodburn et al. (2019) offers one example of how the role of PC was standardized throughout each phase (pre-implant, recovery, post-LVAD, transitional, end-of-life) of the expected trajectory of patients with DT-LVADs, with specific discussion points at each phase.

Additionally, as survey feedback underscored, there is a need for further collaboration and communication between PC and advanced HF/transplant teams. Importantly, the relationship and communication between teams should improve with time. In interviews with members of mechanical circulatory support (MCS) teams about the collaboration between PC and MCS teams, interviewees noted that more meaningful and structured interactions gradually arose between both teams, especially following the CMS and TJC mandate. Examples of interactions included having PC clinicians attend weekly transplant/MCS meetings and engaging in communication prior to and following pre-LVAD PC consultations (Sagin et al., 2016; Sinha et al., 2017). At the project leader's facility, formalizing both types of interactions would be a priority.

Limitations

Project findings are limited by the small sample size and disparity in the number of pre- and post-training survey responses. Out of 12 eligible clinicians, only six completed the pre-training survey and five completed the post-training survey for the original script, despite multiple email and in person reminders reminders during morning huddles and in the departmental Microsoft Teams chat. However, increasing survey participation was difficult due to the survey administration timing (during the holidays) and several staff members being out. Moreover, survey participation was not mandatory. However, despite the small sample size, valuable data was still collected, particularly in the form of written feedback from participants.

Additionally, due to project time limitations and the fluctuating number of patients admitted for LVAD evaluation, only three clinicians were able to utilize the original script.

Furthermore, project methodology (i.e., an evidence-based practice project) was limited by the inability to perform inferential research methods such as hypothesis testing, which would aim to produce generalizable research findings. Consequently, pre- and post-training survey data was not linked to individual identifiers and was unable to be tracked or used to draw specific conclusions.

Sustainability Plan

The project leader plans to continue the project beyond the original duration. If possible, the project leader hopes to conduct interviews or focus groups with LVAD patients and caregivers to explore their LVAD experience, perceptions of the PC team during the LVAD process, and content that was (or was not) discussed in a pre-LVAD PC consultation. Interview findings would be analyzed and incorporated into future script revisions. Each revision of the script will continue to be followed by education to staff and post-training surveys. Survey results

will be utilized toward future script revisions. The project leader is working to ensure that all current and future PC staff use the script for all pre-LVAD PC consultations and that the most current version of the script is incorporated into orientation for all new hires.

Moreover, the project leader and team member are beginning to create a formal workflow for pre-LVAD PC referrals. This would standardize communication between PC and advanced HF/transplant teams and hopefully provide deeper context for PC clinicians prior to pre-LVAD PC consultations. Determining what information would be most useful for PC clinicians is a priority. Additional long-term goals include more clearly identifying the role of the PC team in the care of LVAD patients and encouraging ongoing LVAD-specific education by the advanced HF/transplant team for PC clinicians.

Conclusion

Though implementation of a semi-structured script to guide pre-LVAD PC consultations did not improve PC clinician confidence, results were limited by the small sample size and low number of clinicians who were able to utilize the scripts in consultations. Research has demonstrated that communication scripts are effective in increasing self-reported confidence levels of various clinicians. However, the nature of pre-LVAD consultations presents unique challenges that a script alone likely is unable to overcome.

PC teams at facilities that perform LVAD implantation should consider utilizing semi-structured scripts to provide structure and consistency to pre-LVAD PC consultations. In addition, PC teams should more clearly delineate the role of PC teams in the care of LVAD patients, facilitate education on topics specific to the intersection of LVADs and PC, and continue to foster a more intimate partnership between advanced HF/transplant and PC teams.

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Appendix A

Table A1

Effect of Standardized Pre-LVAD Palliative Care Consultations or Protocols on Outcomes

	Swetz et al.	Sinha et al.	Salomon et al.	Nakagawa et al.
Advance directive completion	↑	—	NE	NE
Documented healthcare agent	NE	↑	NE	NE
Palliative care consults	NE	↑	↑	NE
Improved clarity around patients' goals of care	↑	NE	NE	↑
Use of hospice care at end of life	NE	—	NE	NE

Note. NE = not evaluated

Table A2*Components of Pre-LVAD Palliative Care Consultations*

	Swetz et al.	Sinha et al.	Salomon et al.	Chuzi et al.	O'Connor et al.	Nakagawa et al.
Introduction to PC	N	N	N	N	Y	N
Understanding/expectations of HF/VAD	Y	N	N	Y	Y	Y
Quality of life, may include functional status	Y	Unclear	Y	Y	Y	Y
Goals	Y	N	N	Y	Y	Y
Coping (e.g., sources of strength, worries)	N	N	N	N	Y	N
Unacceptable conditions	Y	Unclear	Y (inferred from "circumstances under which they might prefer to deactivate the device")	Y	Y	Y
Complications	Y	Unclear	Y	Y	N	Y
Situation of LVAD failure	Y	Unclear	N	Y	N	N

Development of chronic, progressive conditions	N	Unclear	N	Y	Y	Y
Medical interventions /treatments	Y	Unclear	N	Y	Y	N
LVAD deactivation	N	Unclear	Y	N	Y	Y
Healthcare agent identification	Y	Y	Y	Y	Y	Y
Advance directives (completion or documentation)	Y (considered as part of preparedness plan)	Y	Y	N	N	N
Symptom management	N	Y	Y	Y	Not included in script but assessed	Y (inferred from “patient comfort”)
Spiritual needs	Y	Y	Y	Y	N	Y

Note. Sinha et al. (2017) did not delineate what was discussed regarding “advance care planning needs,” beyond a definition of “medical care that a patient would like to receive in the future in the event the patient is unable to speak for him or herself” (pp. 584-585). This may or may not incorporate aspects of components marked as “unclear.”

Appendix B

Pre-LVAD Palliative Care Consultation Script

TABLE 1. SEMISTRUCTURED SCRIPT FOR PREVAD EVALUATION

PreVAD evaluation

- (1) Patient comfort
- (2) Patient and family understanding of LVAD therapy
 - (a) When did you hear about LVAD?
 - (b) How did you feel about LVAD as your treatment option?
 - (c) Is that BTT or DT?
- (3) Patient goals and expectations
 - (a) What makes your life meaningful? What is your quality of life?
 - (b) What are you hoping to achieve by getting a VAD? What are things you look forward to doing after getting your LVAD?
- (4) Spiritual needs (FICA tool)
 - (a) Are you a spiritual person? Are you religious?
 - (b) How important is it?
 - (c) What role do your beliefs play in regaining your health? Are you part of a spiritual or religious community?
 - (d) How would you like your healthcare provider to address these issues in your healthcare?
- (5) Possible complications and exploration of unacceptable conditions
 - (a) Having LVAD can cause its own problems, like stroke or infection. What if things do not go well?
 - (b) These complications can cause significant disability and keep you from achieving your goals.
 - (c) What is the condition you would find unacceptable?
 - (d) Debilitative comorbid conditions (not associated with LVAD. Rather, caused because LVAD prolongs survival)
 - (e) Having a LVAD as DT means that you are going to live with that pump for the rest of your life. The better you do with a LVAD, the more possibility you are going to have problems, such as cancer or dementia. They can become greater issues than heart failure.
 - (f) Are you aware that you can turn off LVAD at any future point if it no longer meets your goals of care?
- (6) Discussion-making and information sharing preferences
 - (a) Who is your healthcare agent? Have you discussed the above with that person?

BTT, bridge to transplant; DT, destination therapy; LVAD, left ventricular assist device.

From “Palliative Care Interventions before Left Ventricular Assist Device Implantation in Both Bridge to Transplant and Destination Therapy,” by S. Nakagawa, M. Yuzefpolskaya, P. C. Colombo, Y. Naka, and C. D. Blinderman, 2017, *Journal of Palliative Medicine*, 20(9), p. 978 (<https://doi.org/10.1089/jpm.2016.0568>). In the public domain. Reprinted with permission.

Appendix C

Revised Pre-LVAD Palliative Care Consultation Script

Ideally, patient's healthcare decisionmaker and/or caregiver should be present at this meeting.

Introduction

Explain palliative care consultants as members of the VAD team, who are available anytime.

Explain palliative care as extra support for symptoms and decision making.

Then, acknowledge patient's feelings and the nature of this conversation. This may feel scary and that it is coming at you really fast, with lots of information, but if you could do your best to imagine different, less desirable circumstances that might arise, it will help your family in the long run if ever they need to make decisions for you that would honor your wishes.

Decision Maker/Advance Directive

If you are unable to make your own medical decisions, who is your decision maker? Have you completed your advance directive? If advance directive already on file, confirm accuracy of healthcare agents.

Understanding

Begin by clarifying the meaning of "LVAD." For the purposes of this conversation, any time I mention 'LVAD,' this stands for left ventricular assist device.

Can you share what you know about how your heart is functioning?

What has the heart failure team explained to you about your treatment options moving forward?

What would a LVAD provide in terms of survival and quality of life?

What has the LVAD team told you to expect from the surgery?

How confident are you that a LVAD is the right choice for you?

Have you been told you are eligible for a heart transplant?

Ask decisionmaker: What would you add?

Quality of Life

Can bring up anything that was notable in patient's LCP conversation, if it has already been done

In your activities of daily living (e.g. bathing, dressing), what are you able to do on your own, and what do you need help with?

What gives your life joy? Hobbies? Travel? Family? Friends?

What are your goals?

Ask decisionmaker: What would you add?

Spiritual/Coping

FICA Tool

Are you a spiritual person? Are you religious?

How important is it?

What role do your beliefs play in regaining your health? Are you part of a spiritual or religious community?

How would you like your healthcare provider to address these issues in your healthcare?

Whether or not patient expresses that they are spiritual or religious, ask about other coping strategies. What [else] gives you strength to get through difficult times?

Ask decisionmaker: What would you add?

Advance Care Planning/Hopes/Worries

What are you hoping for?

What worries you the most right now?

Would you like to share any other worries you have or other things that may be bothering you?

Are you aware that if you choose to have a LVAD implanted, you are agreeing to be full code? By this, I mean you are agreeing to chest compressions, intubation, and additional aggressive interventions if indicated.

If things were not going as planned or the way you had hoped (e.g., stroke, infection, complications from surgery), and you needed life support (e.g., mechanical ventilation, a feeding tube, etc.), for a limited or extended period of time, would you find this acceptable?

Having a LVAD placed may mean you need it for the rest of your life. Were you told that you will have the option of turning off the LVAD if you find your quality of life is diminishing or

you are diagnosed with another life-limiting illness such as cancer, dementia, stroke, etc.? What are your thoughts about that?

Ask decisionmaker: What would you add?

Conclusion

Is there anything else you would like to add?

Obviously, we cannot determine how your LVAD journey is going to go, but it is important for you to talk with your family and healthcare decisionmaker so they make decisions for you that you would choose for yourself, if necessary.

Lastly, all of our patients are different. Sometimes we only meet once like we are doing now, and other times, families or physicians will call us in if they feel like further discussion is warranted. We want to make sure that you know that we are available if you need support or if you are not sure what the next steps should be.

Appendix D

Palliative Care Clinician Pre-Training Survey

Standardizing Initial Inpatient Palliative Care Consultations for Patients Receiving Left Ventricular Assist Devices at a Large Urban Hospital

My name is Deborah Szeto, and I am a registered nurse on the palliative care team at Kaiser Permanente Santa Clara Medical Center. I am also a student at San Jose State University in the Doctor of Nursing Practice program. My project chair is Dr. Robin Whitney. I am conducting my doctoral project on standardizing pre-LVAD palliative care consultations through the implementation of a semi-structured script. You will be receiving training on a semi-structured script, which you will be encouraged to utilize when conducting pre-LVAD palliative care consultations. The purpose of this pre-training survey is to gather information on palliative care clinicians' (nurses, social workers, and chaplains) confidence levels in conducting pre-LVAD consultations. The survey should take no more than 10 minutes. There is no compensation for participation. No personally identifying information will be collected. The only individuals who will have access to survey responses are myself (Deborah Szeto) and my team member (Ann Walls, RN). Your participation in this survey is completely voluntary. Your decision to participate or not participate will not impact your employment status at Kaiser Permanente Santa Clara Medical Center or relations with San Jose State University. You also have the right to skip any question you do not wish to answer. If you have questions or need further information, please contact me at deborah.szeto@sjsu.edu. You may also contact my project chair, Dr. Robin Whitney, at robin.whitney01@sjsu.edu. Your completion of the survey indicates your willingness to participate.

1. Please choose your position:
 - a. Registered nurse
 - b. Social worker
 - c. Chaplain
 2. Please state the number of years you have worked in inpatient palliative care (round to nearest 0.25 years; for example: 2.25 years, 4.5 years, 5.75 years).
 3. How confident are you in conducting the initial, pre-LVAD palliative care consultation?
 - a. Not confident at all
 - b. Slightly confident
 - c. Somewhat confident
 - d. Fairly confident
 - e. Completely confident
 4. Please share any comments you have about why you selected the answer you chose for question 3.
-

Appendix E

Palliative Care Clinician Post-Training Survey

Standardizing Initial Inpatient Palliative Care Consultations for Patients Receiving Left Ventricular Assist Devices at a Large Urban Hospital

My name is Deborah Szeto, and I am a registered nurse on the palliative care team at Kaiser Permanente Santa Clara Medical Center. I am also a student at San Jose State University in the Doctor of Nursing Practice program. My project chair is Dr. Robin Whitney. I am conducting my doctoral project on standardizing pre-LVAD palliative care consultations through the implementation of a semi-structured script. You recently received training on a semi-structured script. The purpose of this post-training survey is to gather information on usage of the semi-structured script, as well as palliative care clinicians' (nurses, social workers, and chaplains) confidence levels in conducting pre-LVAD consultations. The survey should take no more than 15 to 20 minutes. There is no compensation for participation. No personally identifying information will be collected. The only individuals who will have access to survey responses are myself (Deborah Szeto) and my team member (Ann Walls, RN). Your participation in this survey is completely voluntary. Your decision to participate or not participate will not impact your employment status at Kaiser Permanente Santa Clara Medical Center or relations with San Jose State University. You also have the right to skip any question you do not wish to answer. If you have questions or need further information, please contact me at deborah.szeto@sjsu.edu. You may also contact my project chair, Dr. Robin Whitney, at robin.whitney01@sjsu.edu. Your completion of the survey indicates your willingness to participate.

1. Please choose your position:
 - a. Registered nurse
 - b. Social worker
 - c. Chaplain

2. Have you used the semi-structured script (parts of it OR its entirety) to conduct a pre-LVAD PC consultation since receiving the training?

Yes:

If yes, why? *Select all that apply.*

- a. Yes, because I prefer to have structure during consultations.
- b. Yes, because I felt the script helped to guide the conversation.
- c. Yes, because I felt the script helped to better elicit patients' values, goals, and preferences.
- d. Yes, other (please elaborate in free text)

Please explain why you selected your answer(s).

No:

If no, why not? *Select all that apply.*

- e. No, because I felt the script was overly structured.
- f. No, because I felt the script would not help to guide the conversation.
- g. No, because I felt the script would not help to elicit patients' values, and goals and preferences.
- h. No, because I felt that using the script would be too time-consuming.
- i. No, other (please elaborate in free text)

Please explain why you selected your answer(s).

-
-
-
3. Which components of the semi-structured script did you use? *Select all that apply.*
(*Include image of script.*)

- a. I did not use the script.
- b. Patient comfort
- c. Patient and family understanding of LVAD therapy
- d. Patient goals and expectations
- e. Spiritual needs
- f. Possible complications and exploration of unacceptable conditions
- g. Decision-making and information sharing preferences

Please explain why you selected your answer(s).

-
-
-
4. How many pre-LVAD PC consultations have you used the semi-structured script at?

- a. 0 (I have not used the script.)
- b. 1
- c. 2
- d. 3
- e. 4
- f. 5 or more

5. How confident are you in conducting the initial, pre-LVAD palliative care consultation?

- a. Not confident at all
 - b. Slightly confident
 - c. Somewhat confident
 - d. Fairly confident
 - e. Completely confident
6. Please share any comments you have about why you selected the answer you chose for question 5.

7. Please share any feedback you have about the consultation script.

Appendix F**Variables and Operational Definitions**

Variable Name	Operational Definition
Confidence level	Self-rated confidence of PC clinician in conducting pre-LVAD PC consultations
Clinician type	Position of inpatient PC team member (i.e., registered nurse, social worker, chaplain)
Inpatient PC experience	Number of years worked in inpatient PC
Frequency of script use	Number of pre-LVAD PC consultations the script was used at