

Original Article

Quality of Telehealth-Delivered Inpatient Palliative Care During the Early COVID-19 Pandemic¹

Ann A. Soliman, MD, Kathleen M. Akgün, MD, MS, Jane Coffee, MSW, APRN, Jennifer Kapo, MD, Laura J. Morrison, MD, FAAHPM, Elizabeth Hopkinson, Dena Schulman-Green, PhD, and Shelli L. Feder, PhD, APRN, ACHPN

Yale New Haven Hospital (A.A.S.), New Haven, CT; VA Connecticut Healthcare System (K.M.A., S.L.F.), Yale School of Medicine, New Haven, CT; Yale School of Nursing (J.C.), West Haven, CT; Yale University (J.K., L.J.M., E.H.), New Haven, CT; NYU Rory Meyers College of Nursing (D.S.G.), New York, NY

Abstract

Context. Consequent to increasing COVID-19 infection rates, the Palliative Care (PC) service at a large New England hospital shifted from in-person to telehealth-delivered PC (TPC).

Objectives. We compared the quality of TPC to in-person PC during the early COVID-19 pandemic.

Methods. We conducted an electronic health record review of PC consultations of patients hospitalized during three periods: pre-COVID January, 2020-February, 2020 (in-person); peak-COVID March, 2020-June, 2020 (majority TPC); and post-peak September, 2020-October, 2020 (majority in-person). We examined the relationship between these periods and PC delivery characteristics and quality measures using descriptive and bivariate statistics.

Results. Of 377 patients, 50 were pre-COVID (TPC=0%), 271 peak-COVID (TPC=79.3%), and 56 post-peak (TPC<2%) (representation of PC consult: pre- and post-peak=samples; peak-COVID=all consults). Mean age was 69.3 years (standard deviation=15.5), with 54.9% male, 68.7% White, and 22.8% Black. Age and sex did not differ by period. PC consultations were more likely for goals of care (pre=30.0% vs. peak=53.9% vs. post=57.1%; $P=0.005$) or hospice (4.0% vs. 14.4% vs. 5.4%, $P=0.031$) during peak-COVID compared to pre-COVID. Rates of assessment of physical (98.0% vs. 63.5% vs. 94.6%, $P<0.001$) and psychological symptoms (90.0% vs. 33.1% vs. 67.9%, $P<0.001$) were lower during peak relative to pre-COVID and post-peak periods. There were no differences in assessment of patients' social needs, family burden, or goals of care across periods.

Conclusion. The PC service provided high-quality inpatient PC using TPC despite significant strain during the early COVID-19 pandemic. Developing and testing strategies to promote comprehensive symptom control using TPC remains a priority to adjust to potential unmet PC needs. *J Pain Symptom Manage* 2022;000:1–10. Published by Elsevier Inc. on behalf of American Academy of Hospice and Palliative Medicine.

Key Words

Palliative care, telehealth, COVID-19, end-of-life care, hospice, goals of care

Key Message

During the early COVID-19 pandemic, an inpatient telehealth-based PC team adapted to deliver high-quality care across several domains while demonstrating areas for improvement including in symptom assessment, participation in goals of care conversations, and family engagement. Future priorities include development of

scalable delivery models that integrate and sustain telehealth-delivered PC while maintaining care quality.

Introduction

Prior to COVID-19, telehealth was used sporadically for palliative care (PC) delivery, primarily to promote

Editorial Comment: Debra Parker Oliver, PhD. Associate Editor.

This paper examines critical comparisons for Telehealth during COVID-19 and will help inform our practices with Telehealth moving forward.

Address correspondence to: Ann A Soliman, MD, 330 Cedar Street, LMP 1093, PO Box 208030, New Haven, CT. E-mail: ann.soliman@yale.edu

Accepted for publication: 27 September 2022.

quality home care near the end of life.¹⁻⁴ During the early phases of the COVID-19 pandemic, telehealth-delivered palliative care (TPC) proliferated. Facing increasing demand for services and restrictions on in-person encounters, PC teams shifted to TPC with rapid, widespread use in inpatient settings in Western countries.^{4,5}

Numerous challenges to providing TPC during the COVID-19 pandemic have been identified. Caring for previously healthy patients with no underlying serious illness before COVID-19 infection as well as decreased in-person communication due to visitation restrictions often left families unable to tend to the bedside needs of their loved ones. Inadequate discharge options and ill-prepared community resources further contributed to longer lengths of stay and greater PC needs among hospitalized patients during the early pandemic.^{6,7} Demand for inpatient PC surged and was prioritized for previously healthy patients facing increased risk of in-hospital mortality.⁸⁻¹⁰ However, studies from this period included small sample sizes or exclusively focused on COVID-19 patients.^{11,12} Clinical practice guidelines released during the pandemic provide recommendations for TPC delivery.^{13,14} However, few studies have examined the quality of TPC delivery relative to in-person PC during this period.¹⁵

As the COVID-19 pandemic continues, incorporating TPC more permanently is being considered. A better understanding of care quality across PC delivery modalities could identify priority areas for provision of TPC. We sought to compare the characteristics and quality of inpatient PC delivered during three periods of the early COVID-19 pandemic: in-person delivered care (pre-pandemic), telehealth care (peak-pandemic), and return to majority in-person care (post-peak).

Methods

Sample

We conducted a retrospective electronic health record (EHR) review of patients admitted between January 1, 2020 and October 31, 2020 to a large tertiary hospital which was a regional epicenter during the early COVID-19 pandemic. We identified patients evaluated by the inpatient PC consultation team during the observation period. The PC team cares for patients with both cancer and non-cancer primary diagnoses based on referral from the primary medical team. The team is interdisciplinary with physicians, nurse practitioners, a nurse coordinator, social worker, chaplain, pharmacist, psychologist, and art therapist, with participating trainees from these disciplines. Typically, two teams of physicians, medical trainees and nurse practitioners see new and follow-up consultation patients

daily (teams divided for patients with cancer and non-cancer primary diagnoses). The daily inpatient census prior to COVID was 40-50 patients/day, returning to these numbers post-peak.

Starting in March 2020, most inpatient consults transitioned to exclusively telehealth-delivered care as institutional and departmental guidelines focused on infection prevention. TPC consultations included calls and/or video visits using secure videoconferencing software for patients hospitalized and their family members outside the hospital. TPC consultations were scheduled at the convenience of the patient and family. To compare PC quality over time and by modality, we selected patients for the review during three periods defined by the date of admission: “pre-pandemic” (January 1-February 29, 2020); “peak-pandemic” (March 1-May 30, 2020); and “post-peak” (September 1-October 31, 2020). We selected these periods to compare care delivered before and during the time of maximum system-wide change and the most TPC, as well as to evaluate changes during a hybrid time when some traditional in-person models resumed (Appendix A). We allowed three months between the peak and post-peak periods to permit time for the PC service to acclimate to the changing landscape of care delivery during this time.

We included all charts of patients admitted during “peak” periods in this study. Using a random number generator, we selected charts from the “pre” and “post” periods; this included patients seen by the inpatient PC team, including established outpatient PC patients, regardless of primary discharge diagnosis. We excluded patients if they were not seen by a medical provider (i. e., physician, nurse practitioner) from the PC consultation team during admission, or if the consultation consisted of non-billable patient interactions of only clinician-to-clinician communication without an assessment of the patient. We included only one admission per patient in the analysis. Throughout the study, some PC consults were placed by “trigger” for specific criteria. Pre-pandemic trigger criteria were for hematology/oncology conditions. During peak-pandemic and post-peak periods, trigger criteria for PC were for COVID-19 diagnosis and age ≥ 65 years. Rates of PC consultations from triggers were similar across the three periods (pre=12.0%; peak=16.6%; post=12.5%, $P=0.575$).

Data Collection Instrument

We designed the data abstraction form using Research Electronic Data Capture (REDCap) software, a secure web-based application designed to support data capture research studies.^{16,17} Using an iterative development process, we distributed the form to PC stakeholders at the participating hospital, revised based on group feedback, pilot-tested the form, and made

final revisions following discussion among the research team. The final data abstraction form included 120 questions in four content domains: patient demographics; clinical and hospital characteristics; PC delivery characteristics; and PC quality metrics. We also collected data on race, ethnicity, primary language, and religion from the EHR; clinical and hospital characteristics were extracted from the discharge summary, as were medical/surgical procedures and other order entries. Additional data included code status upon admission and discharge (including date of code status change, if applicable) and the date of the first positive SARS-CoV2 PCR test, if applicable. We recorded Palliative Performance Scale (PPS) scores from PC consultation notes when available.^{18,19}

Palliative Care Delivery Characteristics. We recorded PC delivery characteristics from the PC consultation order, including the primary reason for consultation, primary diagnosis (cancer vs. non-cancer), and consultation request and completion dates. We used the first PC consultation note to record modality (in-person vs. telehealth vs. telephone, grouping the latter two categories together for analysis due to low frequency of telephone-only), provider discipline, and patient treatment location at the time of initial consultation (i.e., ICU vs. medical floor). If present, we reviewed the initial PC social work and/or PC chaplain notes for additional PC quality metrics. Unless specified otherwise, we included only the initial PC team member consultation note for data abstraction. We did not collect information from follow-up consultation encounters.

Palliative Care Quality Metrics. We identified PC quality metrics derived from the National Consensus Project (NCP) clinical practice guidelines. The guidelines group PC delivery into eight domains: structure and/or processes and ethical and/or legal aspects of care; physical, psychological, social, spiritual, and cultural interventions; and end-of-life care.^{13,20,21} Our quality metrics included the completion of advance care planning (ACP) documentation, discussion of healthcare proxy and/or surrogate, documentation of code status, and the involvement of the PC team in a subsequent goals of care conversation during hospitalization. We also examined if the PC clinician documented spiritual distress, family burden, and physical, psychological, and social needs.

In addition to the initial PC consultation note, we identified ACP documents and life sustaining treatment preferences from the EHR's designated ACP tab (which contains links to scanned, dated copies of ACP documents, including MOLST, health care proxy documents, advanced directives, and code status orders). We documented the date of entry of any of these documents and/or orders and denoted timing relative to

initial PC consultation. We reviewed charts for documented identification of health care proxy and/or surrogate and code status at the time of the initial consultation. We also searched for PC team involvement in a goals of care (GOC) conversation or family meeting after initial consultation but during the same admission, and associated date of the meeting. PC team involvement in subsequent GOC meetings was ascertained by searching the chart for exact text "goals of care" or "family meeting" and reviewing search results for a documented meeting with PC involvement. We also compared rates of PC team involvement in subsequent GOC meetings across time periods by hospital lengths of stay (0-4 days vs. 5+ days after PC consultation) and among patients who died during the admission.

We abstracted documentation of patient and family-reported spiritual beliefs (spiritual/religious needs or distress), physical symptoms (screening for pain, dyspnea, and other), psychological symptoms (emotional or psychological needs), social needs, family burden, and GOC.²² Social needs included the assessment of relationships and environmental and social factors that affect quality of life and patient/family functioning. Family burden was assessed by documented discussion about family involvement in patient care. We defined assessment of GOC if the exact phrase "goals of care" was included in the initial consultation note (usually a templated section within standardized PC consultation notes).

Procedures and Study Variables

Five investigators (AAS, SLF, KMA, JC, EH) reviewed 443 charts using the data abstraction form. We excluded 66 records because the patient was not seen by a PC clinician during the admission (e.g., patient died or discharged before evaluation or "curbside"-only consultation). The remaining 377 charts included 50 pre-pandemic, 271 peak-pandemic, and 56 post-peak charts. We enhanced data quality by limiting acceptable entries for each field. To verify interrater reliability, the team reviewed a sample of charts in duplicate with responses compared between one common reviewer (AAS) and each of the other reviewers (SLF, KMA, JC, EH). We calculated interrater reliability using Cohen's Kappa coefficient for each item in the data abstraction form. Kappa coefficients for each question ranged from -0.074 to 1, with the median Kappa coefficient for the overall data abstraction form of 0.83 (IQR 0.52-1.0).

Statistical Analysis

We used descriptive and bivariate statistics to examine patient demographics, clinical characteristics, PC characteristics, and quality metrics within and across periods. We used Analysis of Variance (ANOVA) to

compare means for all parametric continuous variables across the three periods (pre, peak, and post-peak), and performed Tukey's post-hoc analysis for statistically significant findings from the ANOVA. The study was powered to detect differences among the three periods using one-way ANOVA tests. We used Kruskal-Wallis test and Pearson's Chi-Squared test as appropriate for the analysis of non-parametric variables to compare demographics, clinical characteristics, PC characteristics, and quality metrics across three periods, considering P values < 0.05 as statistically significant. In sensitivity analyses, we identified the reason for the initial PC consultation and the quality metrics assessed during the initial PC consultation stratified by COVID-19 status across periods. We conducted statistical analysis using IBM SPSS Statistics (version 28.0.0).

Results

Patient and Clinical Characteristics

Of 377 patients, 50 were pre-COVID (TPC=0%), 271 peak-COVID (TPC=79.3%), and 56 post-peak (TPC<2%). Patient demographics were similar across periods in age, sex, race, ethnicity, and primary language ($P > 0.05$ for all; [Table 1](#)). The sample was fairly diverse, with 22.8% Black or African American and 10.6% Hispanic or Latino during all periods. There were significant differences in discharge disposition.

Patients were more likely to die during hospitalization during peak compared with pre- and post-peak periods ($P = 0.035$). Length of stay was not different across periods (median: pre=9.0 days [interquartile range, IQR 4.0-17.0], peak=13.0 days [IQR 7.0-24.0], post=11.0 days [IQR 6.0-22.0]; $P = 0.166$). However, ICU length of stay was significantly longer during the peak (median in days=0 [IQR 0-6.12]), compared to pre=0 (IQR 0-0) and post=0 days (IQR 0-3.26); (mean in days: pre=1.77, peak=5.70, post=3.12; $P = 0.014$ for comparisons across periods). Patients hospitalized during the peak period had median Palliative Performance Scale scores of 50% (IQR 40-60%) relative to pre=35% (IQR 20-50%) and post=40% (IQR 40-50%); ($P = 0.002$).

Palliative Care Delivery Characteristics

There was no difference in the median number of PC encounters during hospitalization by any PC clinician across periods (pre=2.0 [IQR 1.0-4.0], peak=2.0 [IQR 1.0-3.0], post=2.0 [IQR 1.0-4.0]; $P = 0.160$, [Table 2](#)). There was no significant difference in time to initial PC consultation (pre=2.0 [IQR 1.0-7.0], peak=4.0 [IQR 2.0-11.0], post=5.0 [IQR 1.0-9.0]; $P = 0.309$). Most patients were seen by more than one PC clinician during hospitalization ($P = 0.095$). A chaplain saw most patients during admission, and many were seen by the dedicated PC chaplain, with no significant difference across periods ($P = 0.350$).

Table 1
Patient Demographic and Clinical Characteristics

Variables	Pre [n (%)], $n = 50$	Peak [n (%)], $n = 271$	Post [n (%)], $n = 56$	P value
Age (years) [Mean (standard deviation)] ^a	64.7 (15.6)	70.1 (15.8)	70.5 (13.5)	0.074
Sex				
Male	29 (58.0)	145 (53.5)	33 (58.9)	0.679
Female	21 (42.0)	126 (46.5)	23 (41.1)	
Race				
White or Caucasian	37 (74.0)	177 (65.3)	45 (80.4)	0.124
Black or African American	10 (20.0)	66 (24.4)	10 (17.9)	
Other	3 (6.0)	28 (10.3)	1 (1.8)	
Ethnicity				
Hispanic or Latino	5 (10.0)	33 (12.2)	2 (3.6)	0.273
Non-Hispanic	45 (90.0)	231 (85.2)	53 (94.6)	
Other	0 (0.0)	7 (2.6)	1 (1.8)	
Language				
English	45 (90.0)	240 (88.6)	54 (96.4)	0.205
Non-English	5 (10.0)	31 (11.4)	2 (3.6)	
Discharge Disposition				
Home	21 (42.0)	79 (29.2)	24 (42.9)	0.035
Hospice (home or facility)	14 (28.0)	53 (19.6)	15 (26.8)	
Facility (SNF or LTC)	10 (20.0)	60 (22.1)	9 (16.1)	
Died	4 (8.0)	72 (26.6)	7 (12.5)	
Other	1 (2.0)	7 (2.6)	1 (1.8)	
SARS-CoV2 Positive	0 (0.0)	107 (39.5)	6 (10.7)	<0.001
In ICU at time of consultation	3 (6.0)	74 (27.3)	8 (14.3)	0.001
Primary consultation diagnosis: cancer	46 (92.0)	89 (32.8)	48 (85.7)	<0.001
Length of stay (days) [Median (IQR)]	9.0 (4.0-17.0)	13.0 (7.0-24.0)	11.0 (6.0-22.0)	0.166
ICU length of stay (days) [Median (IQR)]	0 (0-0)	0 (0-6.12)	0 (0-3.26)	0.014
Palliative Performance Scale (if used ^b) [Median (IQR)]	50 (40-60)	35 (20-50)	40 (40-50)	0.002

^aSNF = Skilled Nursing Facility; LTC = Long Term Care; ICU = Intensive Care Unit.

^b n : pre=44, peak=106, post=49.

Table 2
Palliative Care Delivery Characteristics

Variables	Pre [Median (IQR)], n = 50	Peak [Median (IQR)], n = 271	Post [Median (IQR)], n = 56	P-value
Number of Encounters by MD/DO or NP/APRN	2.0 (1.0–4.0)	2.0 (1.0–3.0)	2.0 (1.0–4.0)	0.160
Hospital Days Before Consultation	2.0 (1.0–7.0)	4.0 (2.0–11.0)	5.0 (1.0–9.0)	0.309
Hospital Days After Consultation	4.0 (2.0–8.0)	6.0 (3.0–14.0)	5.0 (2.5–12.5)	0.249

Variables	Pre [n (%)], n = 50	Peak [n (%)], n = 271	Post [n (%)], n = 56	P-value
Interdisciplinary Care ^a	26 (52.0)	154 (56.8)	23 (41.1)	0.095
Seen by any chaplain	37 (74.0)	224 (82.7)	45 (80.4)	0.350
Modality				
In-person	50 (100)	51 (18.8)	55 (98.2)	<0.001
Telehealth	0 (0)	215 (79.3)	0 (0)	
Other/unknown	0 (0)	5 (1.8)	1 (1.8)	
Trigger consult ^b	6 (12.0)	45 (16.6)	7 (12.5)	0.575

^aInterdisciplinary care defined as PC encounter including at least one additional team member from different specialty (e.g., social worker, chaplain) in addition to primary clinician.

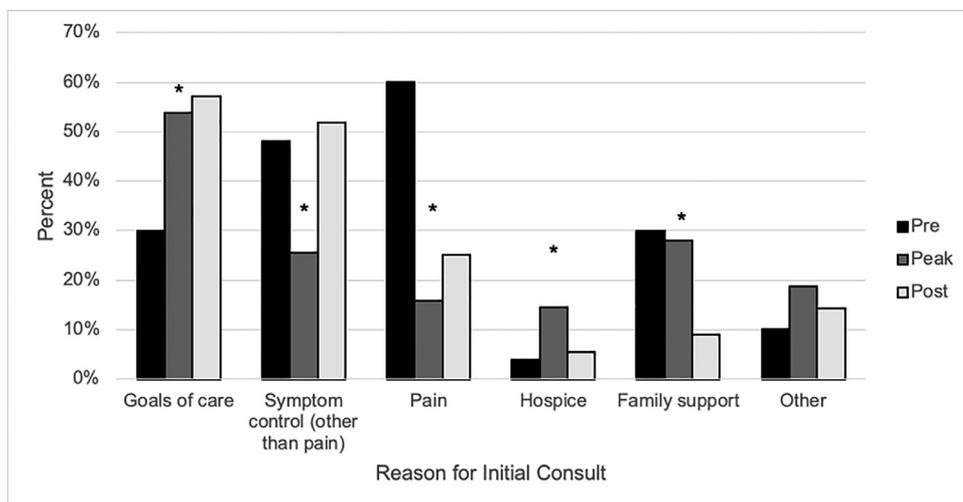
^bTrigger consult: identified by nursing or PC staff for criteria meriting consideration for PC consult, based on other ongoing trials during study period.

During the pre-pandemic period, most consultations were for pain (60%) and symptom control (48%) per the primary team's consultation order entry (Fig. 1). During peak, most consultations were for GOC (pre=30%, peak=53.9%, post=57.1%; $P = 0.005$) and hospice (pre=4%, peak=14.4%, post=15.2%; $P = 0.031$), with significantly lower rates of consultations for pain and symptom control ($P < 0.001$). Consultations for GOC remained high during the post-peak period, while consultations for symptom control increased to levels similar to pre-pandemic.

Palliative Care Team Quality Metrics

There was no significant difference in proportion of patients with an advance directive (AD) before the initial consultation (Table 3). However, of those without a

completed AD, more patients completed an AD after meeting with the PC team in non-peak periods (pre=25.0%, peak=3.2%, post=11.9%; $P < 0.001$). Code status was most frequently documented in initial PC consultations during the post-peak period. Rates of code status documentation increased from 34% pre-COVID and 33.6% peak-COVID to 58.9% post-COVID ($P = 0.001$). The PC team's involvement in GOC conversations following the initial consultation was lowest during peak-pandemic (pre=42.0%, peak=17.7%, post=37.5%; $P < 0.001$, Table 3). Rates of PC involvement in subsequent GOC discussions remained lower during the peak period among patients whose post-consultation hospital length of stay was >5 days (pre=45.5%, peak=24.4%, post=53.1%; $P = 0.002$). Among patients who died, the PC team was involved in fewer subsequent GOC



* Signifies significant difference ($p < 0.05$) between time periods for each category.

Fig. 1. Consultation order reason entered by primary team.* Signifies significant difference ($P < 0.05$) between time periods for each category.

Table 3
Palliative Care Quality Metrics

Variables	Pre [<i>n</i> (%)], <i>n</i> = 50	Peak [<i>n</i> (%)], <i>n</i> = 271	Post [<i>n</i> (%)], <i>n</i> = 56	<i>P</i> -value ^a
AD on file prior to consultation	14 (28.0)	83 (30.6)	14 (25.0)	0.682
AD discussed during initial consultation ^b	9 (25.0)	15 (8.0)	9 (21.4)	0.003
AD completed after initial consultation (during current admission) ^b	9 (25.0)	6 (3.2)	5 (11.9)	<0.001
Surrogate/proxy discussed during initial consultation	16 (32.0)	79 (29.2)	17 (30.4)	0.968
Of those for whom surrogate was discussed, one was identified	11 (68.8)	75 (94.9)	16 (94.1)	0.003
Code status documented during initial consultation	17 (34.0)	91 (33.6)	33 (58.9)	0.001
Initial consultation assessed patient/family understanding of illness	43 (86.0)	170 (62.7)	40 (71.4)	0.004
PC team involved in GOC conversation after initial consultation	21 (42.0)	48 (17.7)	21 (37.5)	<0.001
Among patients whose length of stay was >5 days after PC consultation ^c	10 (45.5)	40 (24.4)	17 (53.1)	0.002
Among patients who died during admission ^d	8 (88.9)	20 (23.8)	2 (20.0)	<0.001
Quality metrics documented in the initial consultation note				
Spiritual beliefs	21 (42.0)	125 (48.1)	16 (28.6)	0.053
Physical symptoms	49 (98.0)	165 (63.5)	53 (94.6)	<0.001
Psychological symptoms	45 (90.0)	86 (33.1)	38 (67.9)	<0.001
Social needs	43 (86.0)	201 (77.3)	44 (78.6)	0.178
Family burden	39 (78.0)	171 (65.8)	36 (64.3)	0.125
Goals of care	37 (74.0)	194 (74.6)	42 (75.0)	0.842

^aGOC = Goals of Care (i.e., designated meeting with patient, family, primary medical team, and/or subspecialty teams to discuss overall plan of care); AD = Advanced Directive.

^bOf patients without an existing AD prior to consultation.

^cLonger post-consultation length of stay, *n* = 218 (22=pre, 164=peak, 32=post).

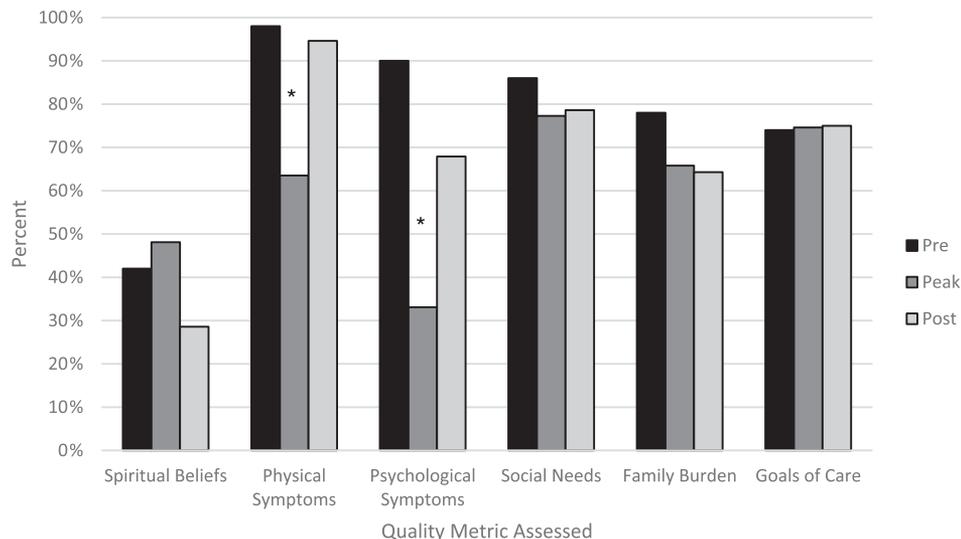
^dIn-hospital death, *n* = 103 (9=pre, 84=peak, 10=post).

meetings during peak compared to the pre-pandemic period (pre=88.9%, peak=23.8%, post=20.0%; *P* < 0.001).

Rates of documentation of spiritual beliefs, family burden, social needs, and GOC were similar across time points (*P* > 0.05 for all; Fig. 2). Physical and psychological symptoms were less commonly documented during the peak period (physical symptoms: pre=98.0%, peak=63.5%, post=94.6%, *P* < 0.001;

psychological symptoms: pre=90.0%, peak=33.1%, post=67.9%, *P* < 0.001); however, fewer consultations for PC were placed explicitly for symptom management during this time.

Across all periods, patients with COVID-19 (*n* = 113) were less likely to receive a PC consultation for symptom control (COVID-19=10.6% vs. non-COVID-19=41.7%; *P* < 0.001) and pain (COVID-19=3.5% vs. non-COVID-19=31.4%; *P* < 0.001) compared to



* Signifies significant difference (*p*<0.05) between time periods for each category.

Fig. 2. Palliative care quality metrics documented in the initial consultation note. * Signifies significant difference (*P* < 0.05) between time periods for each category.

patients hospitalized for other conditions ($n = 264$). COVID-19 patients were less likely to have documented assessment of physical and psychological symptoms in initial PC consultation notes compared with non-COVID-19 patients ($P < 0.001$).

Discussion

In a study from a large single academic center, we found that the quality of PC documented by telehealth and hybrid models remained generally high throughout the early COVID-19 pandemic. The PC team documented the assessment of several quality metrics consistently across periods, including spiritual beliefs, family burden, social needs, and patient and/or family GOC. However, physical and psychological symptom assessment and patient and/or family understanding of illness were less frequently documented during peak-COVID compared with pre- and post-peak. Our study adds to the growing body of research on TPC by examining quality metrics of TPC implementation. This study is distinctive in its evaluation of care delivery before, during, and after the largest early COVID-19 peak.¹⁵ Our findings support the role of TPC as a means to improve access to PC while preserving aspects of care quality, especially for periods of strain experienced during high-demand clinical waves as seen during the first year of the COVID-19 pandemic.^{2,4,23}

This study highlights a dynamic time during the early COVID-19 pandemic. The PC team had to rapidly restructure systems to care for a new, suddenly seriously ill patient population, while providers faced their own psychological and physical tolls. Given these challenges, we expected reductions in care quality in peak and post-peak periods compared to pre-pandemic. Yet, the PC team provided quality care in various domains and quickly adapted structures and processes following the early peak-pandemic period. Our results suggest potential for further, measured improvements in TPC implementation outside of this strained period.

We found lower rates of physical and psychological symptom assessment during the peak period relative to pre-pandemic and post-peak. Similarly, primary medical teams requested PC consultations during the peak period primarily for GOC (53.9%) and for hospice (14.4%), with relatively fewer consultations for symptom management. We speculate that due to the surge of critically ill patients with incident disease requiring GOC and end-of-life planning, the PC team was consulted primarily to ease the burden of these needs during peak-pandemic. These findings likely reflect time constraints and pressures of the medical teams, patient acuity, and unprepared families being asked to make (or accept) decisions to limit life-sustaining treatments during the peak period.

Most PC consultations included GOC assessments, regardless of time period. However, there were fewer

subsequent GOC meetings involving the PC team documented during the peak period relative to pre-pandemic and post-peak. This may be due to communication, staffing, and family visitation restrictions, all of which were significant barriers to care delivery for patients during the COVID-19 pandemic.⁶ Using clinician surveys and semi-structured interviews, one study demonstrated that family meetings for COVID-19 patients and their families conducted via remote telehealth modalities (March-April 2020) produced high-quality GOC communication.²⁴ Our findings underscore the need for additional resources devoted to infrastructure and fostering familiarity with telehealth for patient and/or family communication, as well as a need for structures and processes to coordinate timely, patient-centered GOC conversations in inpatient settings.

Use of TPC could expand the reach of PC teams, particularly for patients or families who cannot easily leave home, live at a prohibitive distance, or in the event of a future pandemic. TPC may be useful to enhance interdisciplinary and remote care, as well as targeted symptom management and patient-reported outcomes, and to facilitate communication among treatment teams, consultants, and family members at different locations.^{4,25} Specific PC interventions may be more amenable to TPC than others, though more research is needed to identify the most beneficial applications of TPC. We focused specifically on quality metrics at the time of initial consultation, but TPC may be particularly useful for follow-up consultation to provide more frequent assessments and improve continuity of care.^{26,27}

Our study has several limitations. We identified quality metrics, such as discussions of GOC, as present only if they were documented in the medical record; we were unable to assess communication that occurred but was not documented. We did not collect information from follow-up consultations. As PC outcomes are often accomplished over time (vs. at initial visit), we may underestimate our reported outcomes. We did not assess patient or family perceptions of PC and TPC quality during this time. While our patient sample was demographically diverse, our study findings may not be generalizable to other hospitals or health care systems. This was a descriptive study, and we did not examine associations between patient characteristics and quality metrics. These features might explain the differences in quality metrics found in our study. We also did not attempt to measure primary PC delivery by the treatment teams (i.e., without specialty, referral-based PC), and we do not know how or if treatment teams were functioning in this role independently. In addition, the post-peak period may have included a time of increasing COVID-19 inpatient cases, which occurred in the region in October 2020.

We grouped telephone and video consultations as TPC due to low frequency of documented telephone-

only visits; thus, we are unable to describe differences between these modalities. It is also possible that in some instances, PC consultations were both in-person and telehealth in cases where a telehealth visit was infeasible. Ongoing research is warranted to evaluate the quality of telehealth and hybrid models of PC delivery over time and as COVID-19 becomes endemic with effective treatments and vaccinations.

Conclusion

The inpatient PC service under study was able to provide high-quality TPC in several domains, even under significant strain during the rapidly evolving early COVID-19 pandemic. Increasing familiarity and infrastructure for telehealth during the COVID-19 pandemic has resulted in an opportunity to evaluate TPC as a means of expanding access to PC services in broader patient populations with serious conditions resulting in hospitalization. In addition, PC symptom assessment and involvement in family support and GOC conversations may be areas for improvement in TPC delivery. Research is needed to identify optimal utilization of inpatient TPC and ways to best integrate this modality into standard PC delivery beyond the

initial pandemic surge, as well as ascertaining patient- and family-related outcomes associated with different PC modalities.

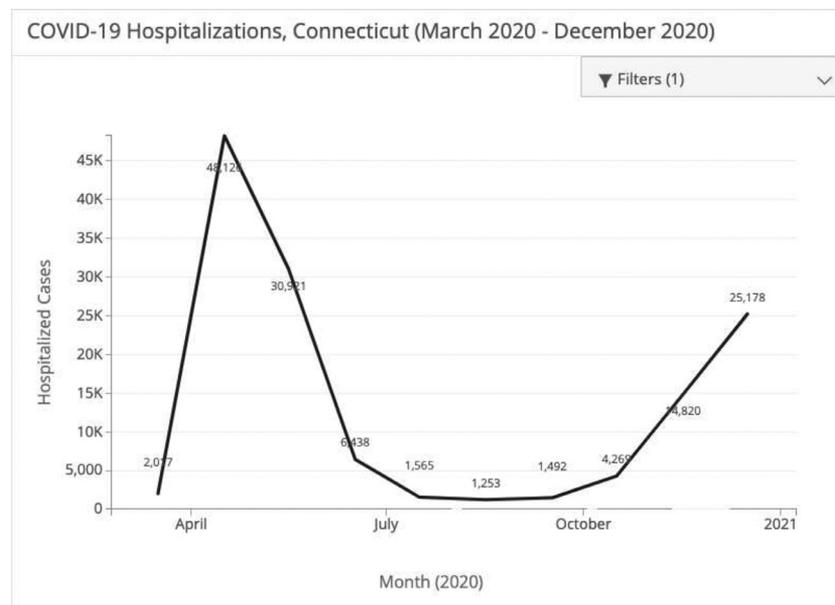
Conflict of Interest

The authors have no conflicts of interest to disclose. The analysis described here is based on work supported by the National Heart, Lung, and Blood Institute, the Yale Center for Implementation Science, and the Department of Veterans Affairs, Veterans Health Administration, which had no role in the design, methods, participant recruitment, data collection, analysis, or preparation of this article or in the decision to submit this article for publication. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the United States Department of Veterans Affairs or the United States Government.

Acknowledgments

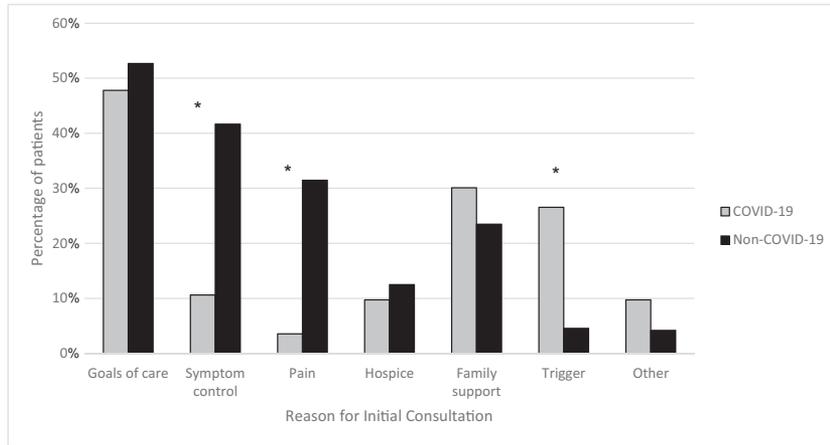
We would like to thank Leslie Blatt, APRN for her involvement and contributions to this manuscript.

APPENDIX A: COVID-19 Hospitalization Rate in Connecticut, March – December 2020



^a Source: CT Department of Public Health. Accessed April 19, 2022. <https://data.ct.gov/d/f2ak-kcqu> for source data.

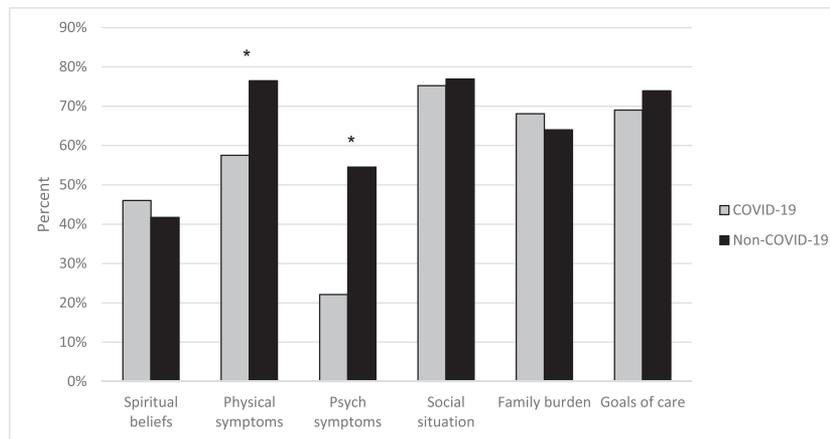
APPENDIX B: Consultation Order Reason Entered by Primary Team by COVID-19 Status



^a Combined data from all time periods grouped together, stratified by COVID-19 positivity.

^b Multiple reasons for consultation allowed, cumulative percentages may total greater than 100%

APPENDIX C: Quality Metrics Documented in the Initial Consultation by COVID-19 Status



^a Combined data from all time periods grouped together, stratified by COVID-19 positivity.

^b Multiple independent domains assessed; cumulative percentages may total greater than 100%

References

- Funderskov KF, Raunkjaer M, Danbjørg DB, et al. Experiences with video consultations in specialized palliative home-care: qualitative study of patient and relative perspectives. *J Med Internet Res* 2019;21:e10208. <https://doi.org/10.2196/10208>.
- Hennemann-Krause L, Lopes AJ, Araújo JA, Petersen EM, Nunes RA. The assessment of telemedicine to support outpatient palliative care in advanced cancer. *Palliat Support Care* 2015;13:1025–1030. <https://doi.org/10.1017/s147895151400100x>.
- Demiris G, Oliver DR, Hensel B, Dickey G, Rantz M, Skubic M. Use of videophones for distant caregiving: an enriching experience for families and residents in long-term care. *J Gerontol Nurs* 2008;34:50–55. <https://doi.org/10.3928/00989134-20080701-02>.
- Calton B, Abedini N, Fratkin M. Telemedicine in the time of coronavirus. *J Pain Symptom Manage* 2020;60:e12–e14. <https://doi.org/10.1016/j.jpainsymman.2020.03.019>.
- Fadul N, Elsayed AF, Bruera E. Integration of palliative care into COVID-19 pandemic planning. *BMJ Support Palliat Care* 2021;11:40–44. <https://doi.org/10.1136/bmjspcare-2020-002364>.
- Kamal AH, Thienprayoon RM, Aldridge M, et al. Specialty palliative care in COVID-19: early experiences from the palliative care quality collaborative. *J Palliat Med* 2021;24:1689–1696. <https://doi.org/10.1089/jpm.2020.0440>.
- Feder S, Smith D, Griffin H, et al. “Why couldn’t I go in to see him?” Bereaved families’ perceptions of end-of-life communication during COVID-19. *J Am Geriatr Soc* 2021;69:587–592. <https://doi.org/10.1111/jgs.16993>.
- Heath L, Yates S, Carey M, Miller M. Palliative care during COVID-19: data and visits from loved ones. *Am J Hosp Palliat Care* 2020;37:988–991. <https://doi.org/10.1177/1049909120943577>.
- Lovell N, Maddocks M, Etkind SN, et al. Characteristics, symptom management, and outcomes of 101 patients with COVID-19 referred for hospital palliative care. *J Pain Symptom Manage* 2020;60:e77–e81. <https://doi.org/10.1016/j.jpainsymman.2020.04.015>.
- Moriyama D, Scherer JS, Sullivan R, Lowy J, Berger JT. The impact of COVID-19 surge on clinical palliative care: a descriptive study from a New York hospital system. *J Pain Symptom Manage* 2021;61:e1–e5. <https://doi.org/10.1016/j.jpainsymman.2020.12.011>.
- Lopez S, Finuf KD, Marziliano A, Sinvani L, Burns EA. Palliative care consultation in hospitalized patients with COVID-19: a retrospective study of characteristics, outcomes, and unmet needs. *J Pain Symptom Manage* 2021;62:267–276. <https://doi.org/10.1016/j.jpainsymman.2020.12.015>.
- Sun H, Lee J, Meyer BJ, et al. Characteristics and palliative care needs of COVID-19 patients receiving comfort-directed care. *J Am Geriatr Soc* 2020;68:1162–1164.
- Ferrell BR, Twaddle ML, Melnick A, Meier DE. National consensus project clinical practice guidelines for quality palliative care guidelines, 4th Edition. *J Palliat Med* 2018;21:1684–1689. <https://doi.org/10.1089/jpm.2018.0431>.
- Janssen DJA, Ekström M, Currow DC, et al. COVID-19: guidance on palliative care from a European Respiratory Society international task force. *Eur Respir J* 2020;56. <https://doi.org/10.1183/13993003.02583-2020>.
- Hancock S, Preston N, Jones H, Gadoud A. Telehealth in palliative care is being described but not evaluated: a systematic review. *BMC Palliat Care* 2019;18:114. <https://doi.org/10.1186/s12904-019-0495-5>.
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009;42:377–381. <https://doi.org/10.1016/j.jbi.2008.08.010>.
- Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. *J Biomed Inform* 2019;95:103208. <https://doi.org/10.1016/j.jbi.2019.103208>.
- Olajide O, Hanson L, Usher BM, Qaqish BF, Schwartz R, Bernard S. Validation of the palliative performance scale in the acute tertiary care hospital setting. *J Palliat Med* 2007;10:111–117. <https://doi.org/10.1089/jpm.2006.0125>.
- Ho F, Lau F, Downing MG, Lesperance M. A reliability and validity study of the palliative performance scale. *BMC Palliat Care* 2008;7:10. <https://doi.org/10.1186/1472-684X-7-10>.
- Kamal AH, Bull J, Ritchie CS, et al. Adherence to measuring what matters measures using point-of-care data collection across diverse clinical settings. *J Pain Symptom Manage* 2016;51:497–503. <https://doi.org/10.1016/j.jpainsymman.2015.12.313>.
- Dy SM, Kiley KB, Ast K, et al. Measuring what matters: top-ranked quality indicators for hospice and palliative care from the American Academy of Hospice and Palliative Medicine and Hospice and Palliative Nurses Association. *J Pain Symptom Manage* 2015;49:773–781. <https://doi.org/10.1016/j.jpainsymman.2015.01.012>.
- Kamal AH, Bull J, Kavalieratos D, et al. Development of the quality data collection tool for prospective quality assessment and reporting in palliative care. *J Palliat Med* 2016;19:1148–1155. <https://doi.org/10.1089/jpm.2016.0036>.
- Mitchell S, Maynard V, Lyons V, Jones N, Gardiner C. The role and response of primary healthcare services in the delivery of palliative care in epidemics and pandemics: A rapid review to inform practice and service delivery during the COVID-19 pandemic. *Palliat Med* 2020;34:1182–1192. <https://doi.org/10.1177/0269216320947623>.
- Kuntz JG, Kavalieratos D, Esper GJ, et al. Feasibility and acceptability of inpatient palliative care e-family meetings during COVID-19 pandemic. *J Pain Symptom Manage* 2020;60:e28–e32. <https://doi.org/10.1016/j.jpainsymman.2020.06.001>.
- Funderskov KF, Boe Danbjørg D, Jess M, Munk L, Olsen Zwisler AD, Dieperink KB. Telemedicine in specialized palliative care: Health care professionals’ and their perspectives on video consultations—A qualitative study. *J Clin Nurs* 2019;28:3966–3976. <https://doi.org/10.1111/jocn.15004>.
- Webb M, Hurley SL, Gentry J, Brown M, Ayoub C. Best practices for using telehealth in hospice and palliative care. *J Hosp Palliat Nurs* 2021;23:277–285. <https://doi.org/10.1097/NJH.0000000000000753>.
- Calton BA, Rabow MW, Branagan L, et al. Top ten tips palliative care clinicians should know about telepalliative care. *J Palliat Med* 2019;22:981–985. <https://doi.org/10.1089/jpm.2019.0278>.