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Palliative Care Transitions From Acute Care to Community-Based Care—A Systematic Review

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Abstract

Context. Although the literature on transitions from hospital to the community is extensive, little is known about this experience within the context of palliative care (PC).

Objective. We conducted a systematic review to investigate the impact of receiving palliative care in hospital on the transition from hospital to the community.

Methods. We systematically searched MEDLINE, Embase, ProQuest, and CINAHL from 1995 until April 10, 2018, and extracted relevant references. Eligible articles were published in English, included adult patients receiving PC as inpatients, and explored transitions from hospital to the community.

Results. A total of 1514 studies were identified and eight met inclusion criteria. Studies were published recently (>2012; $n = 7$, 88%). Specialist PC interventions were delivered by multidisciplinary care teams as part of inpatient PC triggers, discharge planning programs, and transitional care programs. Common outcomes reported with significant findings consisted of length of stay ($n = 5$), discharge support ($n = 5$), and hospital readmissions ($n = 6$) for those who received inpatient PC. Most studies were at high risk of bias.

Conclusion. Heterogeneity of study designs, outcomes, findings, and poor methodological quality renders it challenging to draw conclusions regarding PC's impact on the transition from hospital to home. Further research should use standardized outcomes with randomized controlled trial and/or propensity matched cohort designs. J Pain Symptom Manage 2019;58:721–734. © *2019 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.*

Key Words
Palliative care, transition, transitional care, discharge planning, readmission

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Background

Palliative care is defined as treatment aimed at relieving suffering, improving quality of life, and addressing the physical, psychological, social, cultural, emotional, and spiritual needs of persons with serious illness.[1] Evidence suggests that palliative care often improves resource utilization and patient outcomes[2,3]; palliative care is associated with reduced hospital expenditures and readmission rates,[4,5] as well as patients who received palliative care report better patient quality of life and lower rates of depression, and in some cases, there is a modest survival benefit.[3,6]

Patients receiving palliative care often have serious illness, and due to the fluctuating burden of serious illness, these individuals often move between different care settings. This movement between settings is termed a transition of care, or transition, and has been previously defined as a "[c]oordinated and continuous movement of patients between health care locations, providers, or different levels of care as their medical condition and care needs change."[7] For the purposes of this review, we have defined transitions as a change in patient health care settings.

These transitions across health care settings are often associated with new or worsening symptoms, delays in discharge and follow-up, miscommunication about follow-up, and disruption in the continuity of care.[7–10] Moreover, poorly executed transitions are associated with high rates of health service use, health care spending, and lapses in quality and safety.[9] Owing to the complex needs and frailty of patients receiving palliative care, the challenges associated with care transitions may be heightened, which would result in these patients requiring greater support during transitions.

Although patients receiving palliative care often transition across a variety of settings, a frequent transition is from the hospital to the community. This transition is of particular interest because patients prefer to receive care in their home or nonacute care setting and, in the instance of end of life, often want to die at home.[11] Ways to facilitate a successful transition to the community in this context, especially given the heightened vulnerability of palliative care population, have been largely understudied.

Previous research has suggested that the involvement of palliative care clinicians could improve the outcomes of the transition from the hospital to the community,[12] and the aforementioned benefits of palliative care might translate to smoother care transitions. However, the specific interventions and subsequent transition-related outcomes have not been systematically synthesized. The purpose of this systematic review was to describe how inpatient-specialized palliative care programs support the transition of patients from the hospital to the community setting. We sought to understand the nature of these interventions and their impact upon transition-related outcomes. This review's definition of patient, intervention, comparator, outcome, timing, and setting (PICOTS) appears in Table 1.

Methods

Search Strategy

We searched four databases: MEDLINE, Embase, ProQuest, and CINAHL. We developed a search strategy with the assistance of a librarian (C.W.); Appendix A details our MEDLINE search strategy, which we adapted for other databases. Using subject headings, MeSH terms, and keywords, we searched palliative care and care transition related terms, including supportive care, patient discharge, and patient transfer (Appendix A). Searches were limited to studies of adults aged 19 years or older, published in English from 1995 until April 10, 2018; we also searched for relevant articles from the reference lists of included articles. We excluded gray literature (i.e., non–peer reviewed), commentary pieces, case studies, systematic reviews, and published protocols. The study was registered on Prospero (ID #CRD42018109662).

Study Selection

We downloaded the search results into Endnote software (V.X8, Clarivate Analytics, Phildelphia, PA),[13] deduplicated the references, and added the articles obtained through reference list searches. Eligible studies needed to 1) be published from 1995 to April 10, 2018; 2) consist of human participants over 19 years old who have a serious illness; 3) be published in English; 4) consist of an experimental or quasi-experimental study design (e.g., before-after study design, or control group); 5) encompass a specialized palliative care intervention provided to a patient during an inpatient hospitalization; 6) have a comparison group not receiving palliative care (including pre-post designs); and 7) examine at least one patient-oriented outcome or health care utilization outcome related to a transition from the hospital to the community. Specialist palliative care interventions were defined as care that is delivered by health care professionals who are specialty trained in palliative care, such as certified physicians, palliative care nurses, and palliative care–trained social workers, pharmacists, and chaplains[14] and did not need to have a specific transition component. Outcomes were considered related to a transition if they addressed transitional measures defined by the literature as system-based issues (e.g., coordination,

Table 1
Study Eligibility Criteria

PICOTS Question	How Does Inpatient-Specialized Palliative Care Involvement Impact Patient Outcomes and Health Care Utilization Across the Transition Trajectory?
Population	Any adults that: • Had any type of advanced progressive illness or any serious illness that requires management of pain or other distressing symptoms, such as difficulty breathing or swallowing, OR • Are not being treated with curative intent (as defined by the study authors); OR • Have a life expectancy of less than two years (as expressed by the study authors)
Intervention	Any inpatient specialist palliative care. Specialist palliative care is defined as care that is delivered by health care professionals who are palliative care specialists, such as physicians who are board certified in this specialty, palliative care nurses, and palliative care–trained social workers, pharmacists, and chaplains[14]
Comparator	A comparison group that did not receive inpatient specialist palliative care
Outcome(s)	Study reported on at least one transitional measure, as defined by those taken from the transitions of care literature.[7,9] These include patient-reported quantitative outcomes and health care utilization
Timing	The specialist palliative care intervention was delivered before discharge to the community and patients were followed up after discharge
Setting	Hospital and community

communication, utilization) and patient-reported outcomes (e.g., symptoms, behavioral changes).[7,10]

Four authors (S. R. I., S. S., A. K., and T. K.) screened 10 abstracts together to ensure consistency in interpretation of eligibility criteria and then each author independently reviewed the remaining abstracts. Abstracts that met the criteria were then dual-reviewed as full-text articles by two authors out of four authors (S. R. I., S. S., A. K., and T. K.). For all selected full-text articles, the authors further reviewed the reference list to hand-pull relevant articles that met our inclusion/exclusion criteria. Throughout the selection process, uncertainties were discussed among the authors until consensus was reached. We reported our results following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement (Fig. 1).[15,16]

Data Extraction

Four authors (S. R. I., S. S., A. K., and T. K.) then abstracted data from the full-text articles that met the inclusion criteria into a preformatted Microsoft Excel template, including first author, year of publication, country, objective, study design, inpatient setting, sample size, inclusion/exclusion criteria, intervention and comparison group, outcome measures, and results. Each author independently abstracted data from the same three articles and then compared their extractions to ensure a consistent approach. For all remaining articles, one author abstracted the data and a second author checked the abstracted data by re-reviewing each article.

Data Synthesis and Analysis

We synthesized the common characteristics of studies into a descriptive summary of quantitative findings. All authors were involved in the interpretation of the findings. We could not perform meta-analyses because the identified studies were too heterogeneous in designs, populations, interventions, and outcomes.

Quality Appraisal

Two reviewers (C. W. and K. W.) independently assessed risk of bias and one reviewer adjudicated disagreements (S. R. I.). For two randomized controlled trials (RCT), we used the Cochrane Collaboration's Risk-of-Bias Tool Version 2.[17] For the six nonrandomized intervention studies, we used the Newcastle Ottawa Scale, where scores from 3–5 stars represent low quality, scores from 6–9 represent moderate quality, and studies are assessed on selection of intervention and control groups, comparability of groups, and outcomes.[18]

Results

The database searches identified 1630 records (Fig. 1). An additional 85 identified by manually searching bibliographies of articles selected for full-text review. After duplicates were removed ($n = 201$), we screened the abstracts of 1514 articles for inclusion/exclusion criteria. The abstract review resulted in 106 full texts potentially eligible for inclusion. Of these, eight articles remained after full-text review and were included in the study.

Description of Studies

Seven of the eight studies were published after 2012. Table 2 summarizes the study designs, objectives, populations, outcome measures, and results. We identified six quasi-experimental studies,[19–24] and two RCTs.[25,26] Studies were largely conducted in the U.S., 75%[19–22,24,26] with one study each in Singapore,[23] and Hong Kong.[25] Two studies focused exclusively on patients with cancer,[20,22] one study examined patients with end-stage heart failure,[25] and the remainder had populations with mixed diseases.[19,20,23,24,26] There were three types of specialist

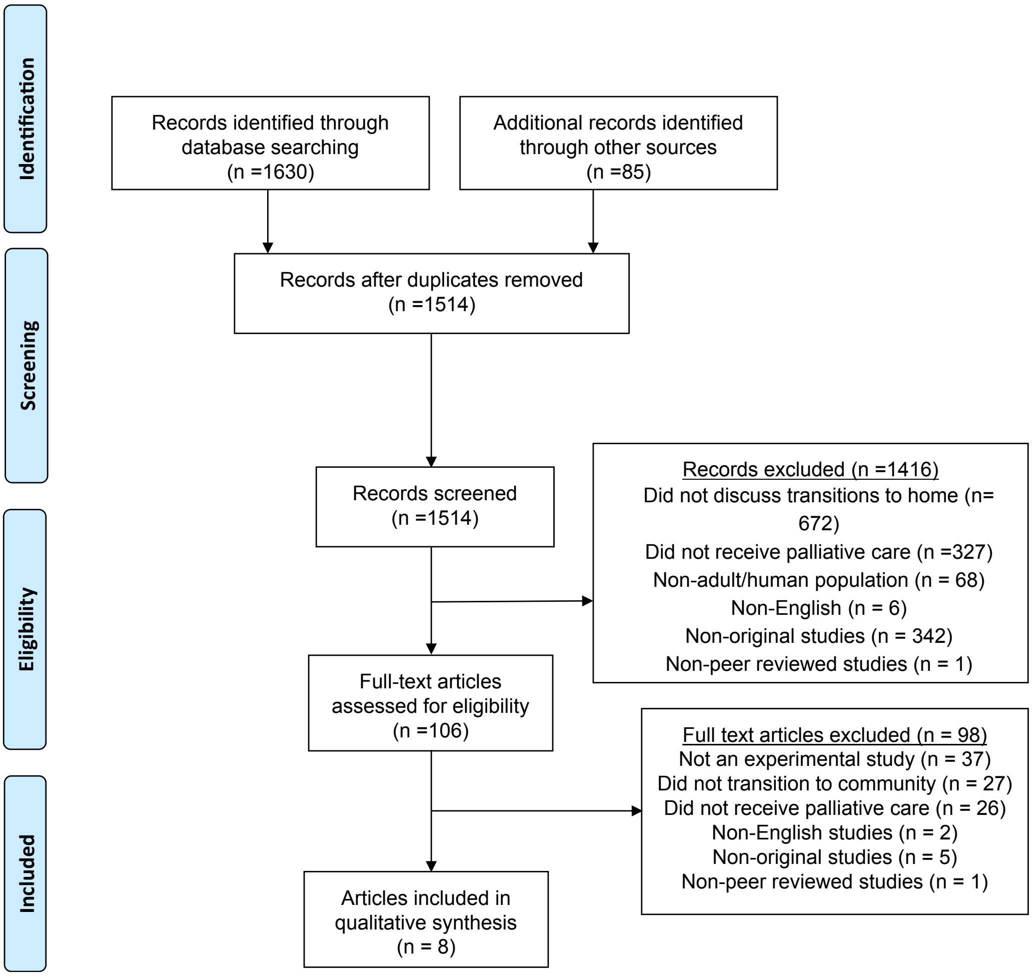

Fig. 1. Study PRISMA diagram. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

palliative care interventions reported in the included studies: using a screening tool to initiate inpatient palliative care consultation,[19,20,24] discharge planning for the community,[23] and interventions that spanned hospital and the community.[21,22,25,26] Fig. 2 depicts how the studies are organized according to these three core components of the transition to the community: the hospital discharge planning process, the transition itself, and outcomes once the patient is discharged.[27] Across the studies, the most commonly assessed outcomes consisted of length of stay in the hospital,[19,20,24,26] discharge destinations,[19,22,24] support available upon discharge,[19,20,22,23,25] and readmissions.[19,20,22,23,25,26] No single outcome was assessed across every study included in the review. Table 3 provides a description of the studies and their outcomes.

Specialist Palliative Care Teams

For all the included studies, specialist palliative care in the inpatient setting was delivered as part of a multidisciplinary team, with varying composition. Every study employed the use of a palliative care nurse, with four studies reporting having one palliative care nurse[21,22,25,26] and one study having two palliative care nurses.[23] Seven of the teams encompassed a minimum of one palliative care physician on the team[19–21,23–26] and five teams also had an available social worker.[19–21,24,26] Additional features of the teams consisted of chaplains,[19–21,26] nurse practitioners,[19,20] case managers,[24,25] and pharmacists.[23]

Nature of the Interventions

Screening Tool for Inpatient Palliative Care Consultation. Three studies[19,20,24] utilized a set of criteria to increase palliative care consults in the intervention group and determine how this impacted outcomes. Liberman et al.[24] accomplished this by using an electronic tool to trigger goals of care discussions in the emergency department, whereas Zalenski et al.[19] and Adelson et al.[20] both identified patients using eligibility screening criteria. Interventions were based on different hospital settings: general hospital (i.e.,

Table 2
Summary of Included Studies

First Author	Study Objective	Study Design	Sample Description	Outcome Measures	Results
Experimental studies					
Adelson et al.,[20] 2017, USA	To assess the impact of triggers for an automatic PC consultation	Cohort: prospective pre/post intervention	N: 113 Diagnosis: cancer Age(mean (SD)): *preintervention:* 60 (13); *postintervention*: 57 (13) Gender: *preintervention:* 31 (65); *postintervention*: 36 (55) Race: white: 21 (44); African American: 7 (14); Hispanic: 8 (17); other: 12 (25)	General hospital—solid tumor list • Receipt of PC consultation • Length of stay • Referral rates to hospice • Readmission rates • Discharge location and services	Patients in the intervention group were more likely to receive PC consultation (80% vs. 39%; $P < 0.01$) No significant change in LOS (11 days vs. 14 days; $P = 0.15$) Hospice referral rates increased (from 14% to 26%; $P = 0.03$) from preintervention to intervention group 30-day readmission rates decreased (from 35% to 18%; $P = 0.04$) from preintervention to intervention group Patients in the intervention group were less likely to be discharged home without service (25% vs. 52%; $P = 0.003$) Patients in the intervention group were more likely to be discharged to home with any home-based services (32% vs. 19%; $P = 0.05$)
Laguna et al.,[21] 2012, USA	To examine the impact of an IPC consultation on pain at several key time points throughout the hospital stay and after hospital discharge.	Experimental	N: 484 Diagnosis: mixed Age: 80 (8.3) Gender: 242 (50) Race: white: 179; black: 96; Latino: 110; unknown: 68	General hospital • Pain intensity	Pain intensity was significantly reduced from baseline scores (1.56) to scores taken at two hours (0.91; $P < 0.001$), at 24 hours (0.77; $P < 0.001$), hospital discharge (0.40; $P < 0.001$), and 10-days after discharge (2.04; $P = 0.001$) No significant pain difference between those discharged with support and those without ($P = 0.145$)
Liberman et al.,[24] 2017, USA	To investigate the effectiveness of an advanced illness management program in the ED	Experimental: prospective pre/post intervention cohort study	N: 82 Diagnosis: mixed Age: 67—99 years Gender: baseline: 8 (38.1); intervention: 20 (32.8) Race: NR	Emergency department • Receipt of PC consultation • Discharge location • Presence of advanced illness • ED-led goals of care (GOC) discussion • Hospital length of stay	Compared to baseline, there was no significant difference of the intervention group to receive a PC consultation (61.7% vs. 61.9%; $P = 1.000$). Patients in the intervention were more likely to be discharged to home hospice (39.3% vs. 0.0%; P-value <0.0001), to be identified as having advanced illness (90.2% vs. 0.0%; $P < 0.0001$), receive an ED-led GOC (83.6% vs. 0.0%; $P < 0.0001$), and have a longer median hospital length of stay (2.0 vs. 0.0; $P = 0.0003$)

(*Continued*)

Table 2
Continued

First Author	Study Objective	Study Design	Sample Description	Outcome Measures	Results
Montero et al.,[22] 2016, USA	To examine the impact of a quality improvement project focused on reducing oncology readmissions among patients with cancer who were admitted to palliative and general medical oncology services	Experimental: prospective pre/post intervention cohort study	N: 4551 Diagnosis: cancer Age: median (range): 63 (20–100) Gender: 2397 (53) Race: white: 3474 (75.8); African American: 894 (19.6); other: 182 (0.04)	Palliative medicine and solid tumor oncology inpatient services • Discharge location • Readmission rates	Upon discharge from index admission, 69.5% of patients were discharged home, hospice (17%), or to a skilled nursing facility (11.4%) Relative to the baseline period, unplanned 30-day readmission rates during the intervention period were 4.5% lower, declining from 27.4% to 22.9% ($P < 0.005$, relative risk reduction 18%) Median time from date of discharge to readmission: 11 (range 1–30); mean 12.4 days
Tan et al.,[23] 2016, Singapore	To report the development of a structured terminal discharge framework and determine if the framework can expedite terminal discharge processes and improve nurses' experience	Experimental: prospective pre/post intervention cohort study	N: 41 Diagnosis: mixed Age: *baseline:* mean 63 (range 28–85) *Postintervention*: mean 63 (range 42–96); *caregivers*: 61 (11); no age reported for HCPs; Gender: NR Race: NR	General hospital—oncology ward • Time to conduct discharge • Family satisfaction with discharge within three days • Readmission	The average time taken to conduct a terminal discharge in the postintervention audit was shorter than the baseline (4.6 ± 2.3 hours vs. 2.9 ± 1.4 hours; $P = 0.004$) Family members were satisfied with the discharge process (NR) No patients were readmitted, but this was not reported as significant or not (NR).
Zalenski et al.,[19] 2017, USA	To determine the outcomes of receiving palliative care consultation (PCC) for patients in the intensive care unit who screened positive on palliative care referral criteria	Experimental: posttest-only control group	N: 405 Diagnosis: mixed Age: *patients with PCC*: 70.2 (14.8); *patients with no PCC*: 65.3 (15.4) Gender: *patients with PCC:* 65 (40.4); *patients with no PCC:* 115 (47.1) Race: *patients with PCC:* white: 48 (29.8); black: 62 (38.5); Hispanic: 43 (26.7); Other: 8 (5.0); *patients with no PCC:* white: 70 (28.7); black: 132 (54.1); Hispanic: 40 (16.4) Other: 2 (<1)	Intensive care unit • Conversion from full code status on admission to DNR • Discharge services • Readmission to the same hospital or hospital system within 30 days • Hospital length of stay	Unadjusted odds: Screen-positive patients who received a PCC had a statistically significant association with greater use of hospice, compared to screen-positive patients who did not receive PCC (OR 9.08; CI 4.41–18.66; $P < 0.0001$) Adjusted odds: Patients who received PCC had a stay that was 1.7 days shorter than those who did not (95% CI 3.1–1.2, NS) Patients who received PCC were more likely to be discharged from hospital with hospice services, compared to screen-positive patients who did not receive PCC (OR 7.6; CI 5.0–11.7) Patients who received PCC had reduced 30-day readmissions (AOR 0.7; 95% CI 0.5–1.0, NS) Patients who received PC had higher rates of DNR (AOR 7.5; 95% CI 5.6–9.9)

Randomized control trials					
Gade et al.,[26] 2008, USA	To assess an interdisciplinary inpatient PC consult service (IPCS) on improvements in symptom control, patient satisfaction with care, and cost of health services received over the subsequent six months after discharge	Randomized controlled trial	N: 517 Diagnosis: mixed Age: *IPCS:* 73.6 (12.6); *usual care*: 73.1 (13.2) Gender: *IPCS:* 113 (50); *usual care*: 116 (49) Race: NR	General hospital • Symptom control • Emotional support • Spiritual scale • Patient satisfaction • Survival • Advance directives at discharge • Readmissions • Length of stay	There were no differences between groups for symptom control (4 vs. 4.1; $P = .91$), emotional support (7 vs. 6.7; $P = .07$), spiritual scale (6.6 vs. 2.6; $P = .55$), or quality of life (6.4 vs. 6.3; $P = 0.78$) Mean patient satisfaction was higher for both the Place of Care Environment scale (6.8 vs. 6.4, $P < .001$) and Communication Scale (8.0 vs. 7.4; $P < 0.001$) There was no difference in survival between IPCS and UC (43 vs. 43.5; $P = 0.80$) IPCS patients completed significantly more advanced directives at hospital discharge than UC (91.1% vs. 77.8%; $P < 0.001$) There was no difference in the number of hospital readmissions (NR) Intervention group length of stay was not significantly different than usual care (7 vs. 7; $P = 0.57$)
Wong et al.,[25] 2016, Hong Kong	To examine the effects of home-based transitional PC for patients with end-stage heart failure after hospital discharge	Randomized control trial	N: 84 Diagnosis: end-stage heart failure Age: *Overall:* 78.3; *Control:* 78.4 (10); *Intervention:* 78.3 (16.8) Gender: *overall:* 52.4%; *control*: 25 (61); *intervention:* 18 (43.9) Race: NR	General hospital • All readmissions and those within four and 12 weeks after the index hospital discharge • Edmonton Symptom Assessment Scale (ESAS) • Palliative Performance Scale (PPS) • McGill quality of life—Hong Kong (MQOL-HK) • The chronic heart failure questionnaire—Chinese (CHQ) • Satisfaction with care, 11-item questionnaire • Length of stay	At 12 weeks, the readmission rate was lower in the intervention group (IG) (33.6% vs. control 61.0%; $\chi^2 = 6.8$; $P = 0.009$) No significant difference observed for four-week readmission rates The intervention group experienced significantly higher clinical improvement in depression (45.9% vs. 16.1%; $P < 0.05$), dyspnea (62.2% vs. 29.0%; $P < 0.05$) and total ESAS score (73.0% vs. 41.4%; $P < 0.05$) Quality of life (QOL) changed between the intervention group and the control as measured by McGill QOL ($P < 0.05$) and CHQ ($P < 0.01$) questionnaires The intervention group had significantly higher satisfaction with care than the control group ($P < 0.001$) There was no significant difference in the intervention group's length of hospital stay (6 days vs. 5 days; $P = 0.93$)

PC = palliative care; IP = inpatient; EA/EDV = emergency admissions/emergency department visit; PCU = palliative care unit; PCT = palliative care team; PCMT = palliative care mobile team; UC = usual care; ED = emergency department; IQR = interquartile range; OR = odds ratio; HR = hazard ratio; NS = not significant; NR = not reported.

various units throughout the hospital),[20] the emergency department,[24] and the intensive care unit.[19] Compared to usual care, two studies[19,20] found that patients receiving the standardized criteria intervention to initiate a palliative care consultation were more likely to receive a palliative care consultation (80% vs. 39%; $P < 0.01$) and (83.6% vs. 0.0%; $P < 0.0001$), respectively. However, Liberman et al.[24] did not find the intervention made a significant difference as to whether patients received a palliative care consultation (61.7% vs. 61.9%; $P = 1.000$).

The study authors found that the screening tool interventions impacted several other patient outcomes spanning from hospital to postdischarge. Regarding those outcomes assessed in hospital, the most common was length of stay[19,20,24] and discussions of goals of care.[19,24] In their univariate analysis, Adelson et al.[20] found no significant difference in length of stay between the intervention and preintervention groups (11 days vs. 14 days; $P = 0.15$), whereas Liberman et al.[24] and Zalenski et al.[19] found conflicting outcomes, with the intervention group experiencing longer median stays (univariate analysis; 2 days vs. 0 days; $P < 0.001$) and a stay that was 1.7 days shorter (adjusted odds ratio [AOR]; 95% CI 3.1−1.2), respectively. Patients in the intervention group were more likely to have goals of care discussions (83.6% vs. 0.0%, $P < 0.0001$),[24] have higher rates of do-not-resuscitate orders (AOR 7.5; 95% CI 5.6−9.9),[19] and change their code status to do-not-resuscitate (74.1% vs. 19.6%; $P < 0.0001$; OR = 11.79 [95% CI 7.21−19.30]).[19]

During the transition to the community, receipt of inpatient palliative care consults led to impacts on discharge disposition and the support received at discharge. Both Liberman et al.[24] and Zalenski et al.[19] found that patients in the intervention group were more frequently discharged to home hospice, compared to the control group (39.3% vs. 0%; $P < 0.0001$) and (AOR 7.6 (95% CI 5.0−11.7), respectively. Although findings from Adelson et al.[20] support this overall trend, the authors did not find a significant difference in the intervention group being discharged with home hospice (15% vs. 8%; $P = 0.26$).[20] Regarding discharge supports, Zalenski et al.[19] and Adelson et al.[20] found that patients in the intervention group were more likely to receive a visiting nurse or home attendant services, compared to the control group (32% vs. 19%; $P = 0.05$).[20]

Once in the community, patients in the intervention groups experienced decreased 30-day readmissions.[19,20] For Adelson et al.,[20] a univariate analysis demonstrated a decrease in readmission rates from 35% to 18%($P = 0.04$) from the preintervention to intervention group. Similarly, Zalenski et al.[19] showed that patients who received palliative care consultations had reduced likelihood of 30-day readmissions, compared to a control group (AOR 0.7; 95% CI 0.5−1.0); however, this was not statistically significant.

Generally, the findings of studies using a screening tool for inpatient palliative care consultation are limited by low-quality ratings[20,24]; although one study had a relatively high rating, it did not have an adequate follow-up period nor account for missing data.[19]

Discharge Planning for the Community. One study focused on improving the process for rapid terminal discharge (i.e., when a patient makes a sudden request to be discharged home to die) through streamlining the process (e.g., prescriptions), incorporating tools to support physicians and nurses (e.g., information guides), and providing a caregiving guide for families.[23] The intervention was associated with a reduced time to discharge (2.9 hours with the intervention vs. 4.6 hours at baseline; $P = 0.004$); and generally, nurses and families reported satisfaction with the intervention.[23] In this study, there were no hospital readmissions, but the authors did not report whether this was statistically significant compared to baseline. This study was limited by a small sample size, a pre-post design susceptible to biases, a lack of controlling for confounders, and no accounting for patients lost to follow-up.

Spanning the Hospital and the Community. Four studies[21,22,25,26] entailed interventions that provided transitional palliative care in both the hospital and the community, two of which were RCTs.[25,26] Of these, three studies examined patient-reported outcomes.[21,25,26] Wong et al.[25] used an RCT design to examine the effect of a transitional care nurse who conducted a predischarge palliative care assessment and followed up with the patient in-person and over the phone after discharge for 12 weeks. Compared to a control group, there were improvements in clinical depression (45.9% vs. 16.1%; $P < 0.05$), dyspnea (62.2% vs. 29.0%; $P < 0.05$), total Edmonton Symptom Assessment Score (73.0% vs. 41.4%; $P < 0.05$), and patient satisfaction (48.84 vs. 36.55; $P < 0.001$). Significant change over time between the two groups was observed for quality of life (McGill Quality of Life; $P < 0.05$ and Chronic Heart Failure Questionnaire; $P < 0.01$). Laguna et al.[21] investigated a palliative care consultation program's impact on patient-reported pain. Discharge plans were discussed with the patient's primary care physicians. The authors found that pain intensity decreased significantly from baseline scores compared to scores taken at hospital discharge (1.56 vs. 0.4; $P < 0.001$). The second RCT, Gade et al.,[26] examined the impact of an inpatient specialist palliative care consultation on 6-month outcomes after discharge. The palliative care team communicated the patient's discharge plan

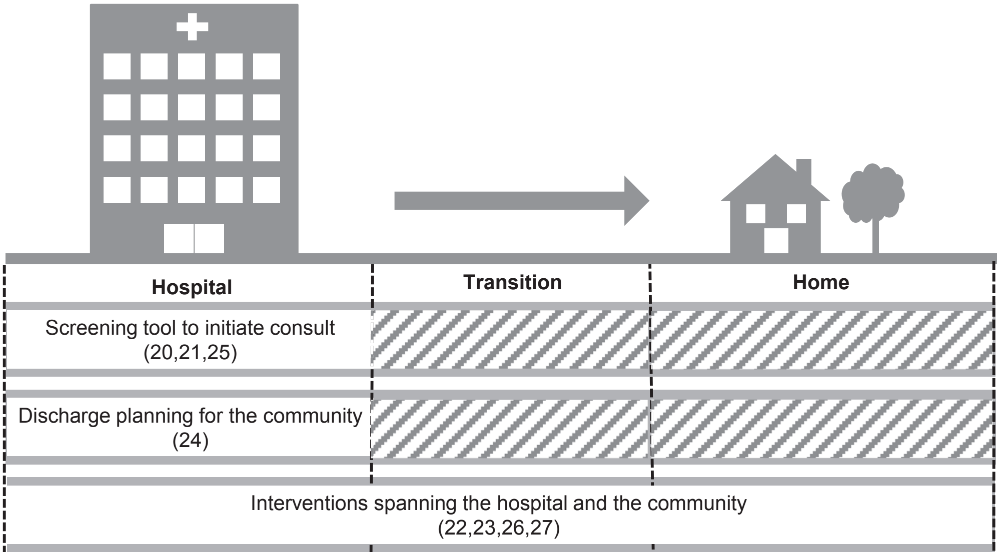

Fig. 2. Components of the transition from hospital to home.

with discharge planners and primary care physicians. With respect to patient-reported measures, the authors found no differences on symptom control (4 vs. 4.1; $P = 0.91$), levels of emotional support (7 vs. 6.7; $P = 0.07$), spiritual support (6.6 vs. 6.2; $P = 0.55$), or quality of life (6.4 vs. 6.3; $P = 0.78$) between the intervention group and the controls. However, they did find higher satisfaction of care in the intervention group for both place of care (6.8 vs. 6.4; $P < 0.001$) and provider communication scales (8 vs. 7.4; $P < 0.001$).

Montero et al.[22] featured an in-hospital physician and nurse education program regarding the discharge process, and after discharge, patients received one palliative or oncology nurse follow-up call and one health care provider follow-up appointment. After discharge, Montero et al.,[22] Wong et al.,[25] and Gade et al.[26] demonstrated reduced readmission rates in the intervention group. Montero et al.[22] found that 30-day readmission rates during the intervention period declined from 27.4% to 22.9% ($P < 0.005$). Meanwhile, Wong et al.[25] showed lower mean number of readmissions between the intervention group and controls (0.42 vs. 1.10; $P = 0.001$) and at 12 weeks showed a lower readmission rate for the intervention group as compared to controls (33.6% vs. 61.0%, $\chi^2 = 6.8$; $P = 0.009$). In contrast to this, Gade et al.[26] did not find a significant difference between number of readmissions for the intervention group and the scores were not reported.

All studies in this group were at high risk of bias. The study by Wong et al.[25] was at high risk of bias due to deviation from the intended intervention, missing outcome data, and selection of the reported result. The study by Gade et al.[26] was at high risk of bias due to measurement of the outcome, the randomization process, deviation from the intended intervention, and selection of the reported result. The study by Montero et al.[22] was at high risk of bias due to lack of adjustment for potential confounding variables and limited participant follow-up. The study by Laguna et al.[21] was at high risk of bias due to the structure of the pre-post design, self-report of outcomes, limited participant follow-up, and high numbers of patients lost to follow-up.

Bias and Quality of Included Studies

The results of the quality assessments for nonrandomized intervention studies appear in Table 4; Newcastle scores ranged from three to seven, with common areas of bias being comparability of intervention and control groups and outcome (i.e., whether there were blind assessments of outcomes, sufficient length of follow-up, and missing data that might skew results). The RCT by Wong et al.[25] was deemed at high risk of bias across domains of deviation from the intended intervention, missing outcome data, and selection of the reported result; low risk for measurement of the outcome; and with some concerns for the randomization process. The RCT by Gade et al.[26] was also deemed at high risk of bias in the domain of measurement of the outcome, low risk for missing outcome data, and with some concerns for the randomization process, deviation from the intended intervention, and selection of the reported result.

Discussion

The transition from hospital to the community in the context of palliative care is a challenging process given patients' vulnerable health status. Our systematic review of articles reporting on the transition

Table 3

Description of Included Intervention Studies and Their Outcomes

					Outcomes										
Intervention Type	Study	Quality	Description of the Intervention	Comparator Group	Receipt of Palliative Care	Goals of Care Discussion	Readmission Rates	Time to Discharge Home	Hospital Length of Stay	Discharge Location	Likelihood of Home Discharge With Services	Support on Discharge	Survival	Symptom Management	Satisfaction
Trigger for inpatient PCC	Liberman et al.,[24] 2017	3 stars	A multipronged approach to screen patients in the ED for advance illness needs (using a readmission trigger tool), provide ED providers training for goals of care discussions, conduct ED staff–led goals of care (GOC) discussions, and develop safe discharge to hospice. Case management, social work, and PC providers were available.	At baseline, collected data on patients in the ED who would meet eligibility criteria.	Yes	Yes[17]	—	—	Yes[17]	Yes[17]	Yes[17]		—	—	—
Trigger for inpatient PCC	Adelson et al.,[20] 2017	3 stars	Development of standardized criteria, or triggers, for a patient to receive an automatic PCC. The consultation included symptom assessment and treatment, establishment of GOC and ACP using standardized communication protocols, and transition planning. PC team comprised PC-boarded physician, nurse practitioners, social worker, chaplain, and trainees.	Preintervention usual care, who were monitored for a 6-week observation period before the intervention.	Yes[17]		Yes[17]	—	Yes	Yes[17]	Yes[17]	Yes[17]	—	—	—
Trigger for inpatient PCC	Zalenski et al.,[19] 2017	6 stars	Upon admission, ICU teams used a screening tool for patients that assessed risk factors for palliative care needs. Nurses presented the patients' screening scores at interdisciplinary rounds, and the attending physician made the decision whether to order a PCC. The palliative care team composition varied by hospital.	Patients identified by the trigger tool as having PC needs, but who did not receive a palliative care consultation.		Yes[17]	Yes	—	Yes	—	Yes[17]	Yes[17]	—	—	—
Hospital discharge planning process	Tan et al.,[23] 2016	3 stars	The Structured Terminal Discharge Framework consisted of: streamlining the discharge process including prescriptions, infuser preparation, and caregiver education; information guide and discharge checklist for doctors and nurses; education sessions for nurses regarding the workflow changes; and caregiving guide for families.	Preintervention usual care, who were monitored for a six-month observation period before the intervention.			Yes	Yes[17]	—	—	—		—	—	Yes
Transitional care spanning hospital and home	Montero et al.,[22] 2016	5 stars	Physician and nurse education regarding the new discharge process. Postdischarge nursing phone calls within 48 hours of discharge, including topics like symptom management, medication compliance. Postdischarge follow-up appointments within five days.	Medical oncology patients during preintervention period.			Yes[17]	—	—	Yes	—		—	—	—

Transitional care spanning hospital and home	Laguna et al.,[21] 2012	4 stars	Patients received inpatient palliative care for comprehensive assessment of pain and symptom relief, care planning.	Preintervention usual care was compared with postintervention.									Yes[17]	
Transitional care spanning hospital and home	Gade et al.,[26] 2008	High risk of bias[17]	Inpatient palliative care team provided consultation on intervention patients to the attending, involved subspecialists and staff. The teams collaborated with the staff physicians and discharge planners in preparing for the patient's discharge.	Control group received usual care, where patients had access to social workers and chaplains.	Yes[17]	Yes		Yes				Yes	Yes	Yes[17]
Transitional care spanning hospital and home	Wong et al.,[25] 2016	High risk of bias[17]	A nurse case manager (qualified PC nurse) conducted a predischarge assessment and after discharge, followed the patient for four weeks via weekly home visits/telephone calls, then monthly home visits and telephone calls for until the end of 12 weeks.	Both groups received usual care including PC consultation, discharge advice on symptom management, and referrals. Control group received two social calls.		Yes[a]	—	—	—	—		—	Yes[17]	Yes[17]

[a]Note: significant.

from hospital to the community comprised eight intervention studies. Most of the studies were published in the last 7 years, with varied populations, interventions, and findings. Across interventions, there was no universally reported outcome. The few commonly assessed outcomes were length of stay,[19,20,24–26] discharge with supportive care services,[19,20,22,23,25] and hospital readmissions.[19,22,23,25,26,28] Overall, the studies were heterogeneous in design and results and were of low quality.

Regarding outcomes, of the eight studies, four assessed patient-reported outcomes[21,25,26] and/or patient satisfaction scales.[23,25,26] Generally speaking, most studies found improvements in symptom scales[21,25] and patient satisfaction with care.[23,25,26] Surprisingly, Gade et al.[26] did not find a significant difference between the symptom scores in the intervention and the control group. This is inconsistent with previous literature, where in their systematic review Kavalieratos et al.,[5] along with others,[29,30] have found improvement in patient quality of life and symptoms. That only half the studies reported on symptom scales and patient-reported outcomes was unexpected as many other palliative care and transitions of care studies use these scales to assess the impact of interventions.[5,30–32] To consider the impact of either a palliative care intervention or a transition without understanding how it directly affects patients may omit components of potential intervention benefit. Thus, future research should incorporate more patient-reported outcomes and standardize these across studies.

The other prominent outcomes found in this review focused on health care utilization consisting of length of stay,[19,20,24–26] discharge with supportive care services,[19,20,22,23,25] and hospital readmissions.[19,20,22,25,26] For patients receiving the intervention, three studies[20,25,26] found no significant change in patients' length of stay. This is in contrast to other literature reviews on the impact of palliative care.[12,31,33] Conversely, the transitions literature suggests that these initiatives do not impact length of stay.[7,10] With respect to discharge with supportive care, patients who received the intervention were more likely to receive support at home.[19,20,22,23,25] This finding is novel in our review. Although there is substantial literature placing an emphasis on integration between care teams in different settings,[12] that a significant number of patients were discharged with supportive care highlights that palliative care might confer continuity benefits for patients during transitions between settings. Regarding hospital readmissions, only two of six studies did not report significant reductions in readmissions.[23,26] This finding is in line with the previous literature in both palliative care and transitions of care, which suggests a relationship between these

Table 4

Quality of Nonrandomized Control Trial Intervention Studies, as Assessed by Newcastle Ottawa Scale[22]

Study	Selection (max 4)	Comparability (max 2)	Outcome (max 3)	Total (max 9)
Adelson et al., 2017[20]	**		*	***
Laguna et al., 2012[21]	***	*		****
Liberman et al., 2017[24]	**		*	***
Montero et al., 2016[22]	****	*		*****
Tan et al., 2016[23]	**		*	***
Zalenski et al., 2017[19]	****	*	*	******

programs and reduced readmissions.[33,34] The outcomes reported here span the entire transition trajectory; however, few studies included outcomes that reflect core principles of transitions of care such as care coordination and continuity, which are deemed essential for care transitions of medically complex patients.[7,10,32] In particular, there is a lack of outcomes examining communication and education.[7,10,32] Moving forward, future research should examine whether the current utilization outcomes assessed are meaningful to palliative care patients when considering the quality of their transitions.

The diversity of each studies' interventions makes it challenging to draw out the aspects that were most effective at improving outcomes. Researchers within both the palliative care literature and the transitions literature have identified elements of models that improve care[10,12,32,35]; however, it is not clear how these overlap. In our findings, the identified interventions spanned the transition trajectory, were implemented by various means, and utilized multidisciplinary teams to provide palliative care. An examination of the intervention components is discussed in the following.

Interventions were conducted before discharge, during discharge planning, and both before and after discharge. Within the transitions of care literature, models of care are focused on timely arrangement of postdischarge care,[32] whereas palliative care has largely advocated for early integration with treatment-focused care, irrespective of location. In both sets of literature, these junctures when care should be initiated have been distinguished as vulnerable time points for patients.[36] However, in the interventions delivered in this review, there were no common trends in the results to indicate if one time point of intervention is more likely to lead to better results.

A diverse array of intervention components seemed to demonstrate positive outcomes for patients. Many facets of these interventions are in line with previous research wherein experts have recommended additional supports and resources be used to mitigate potential challenges for this patient population.[7,9,10] Further work should test which components of these interventions—using screening tools to initiate inpatient palliative care consults, patient educational material, provider training or checklists, patient follow-up calls—most improve transitions and postdischarge outcomes.

Palliative care teams providing care to patients in this review were composed of multidisciplinary personnel, with all patients receiving palliative care from at least two palliative care team members. The multidisciplinary quality of these teams likely heavily contributed to the potential improvement of patient transition outcomes because both the palliative care literature[12,33,37] and the transitions of care literature[10,32] advocate for the use of multidisciplinary teams to improve patient and utilization outcomes. With respect to palliative care, researchers have found that separate from transitions, multidisciplinary palliative care teams lead to improved patient outcomes,[33,37] although it is not clear what impact specific team composition has on outcomes.[37] Regarding transitions of care, experts indicate the use of teams demonstrates better coordinated discharges, improved communication among health care staff, and better managed patient outcomes after discharge.[10,32] Interestingly, pharmacists have been identified as being essential to team composition as they provide a wealth of knowledge on medication management for patients.[32] Despite this, only one study[23] in this review had a team that included a pharmacist, yet their findings do not highlight any pharmacist-specific outcomes and thus we cannot draw any conclusions on the impact of a pharmacist on the palliative transition to the community. Further research is needed to identify the ideal team composition to promote improvements in transitions of care within the context of palliative care, optimize the roles of each team member, and better understand how teams impact palliative-specific outcomes, such as location of death.

Across the studies, the variety of interventions tested and outcomes explored render us unable to draw definitive conclusions regarding the most effective approaches used by palliative care teams to improve transitions. Heterogeneous outcomes across studies have been identified as a challenge in synthesizing outcomes in palliative care at both the patient and health care utilization level.[31] Despite these challenges, emergent patterns suggest that certain interventions may be associated with particular outcomes. For instance, interventions where either an inpatient discharge process was piloted or transitional care spanning hospital and community program was tested show promise for shortening the time to conduct discharge and reducing readmissions, respectively. Furthermore, using a set of criteria to initiate an inpatient palliative care consultation often led to an improved likelihood of receiving supportive care services after discharge. Considered together, these findings support the notion that receiving palliative care may better assist patients transition to and stay in the community setting.

Clinical Implications

Improving the transition process for patients receiving palliative care is an essential step to delivering high-quality palliative care. Our findings have implications for clinicians working in inpatient settings who are seeking to implement interventions that may improve the transition from hospital to the community. Specifically, palliative care involvement in the hospital to the community transition may decrease readmission rates and increase the likelihood of discharges with supportive care services. Employing transitional programs or streamlined inpatient discharge processes also showed promise for improving utilization outcomes. Most studies were at high risk of bias and deemed to be of low quality, and our findings should be applied cautiously to clinical care. There were also only two RCTs in this review. Thus, among patients with palliative care involvement, there is a need for further high-quality research to tease out the components that have the greatest impact on improving transitions from hospital to the community.

Limitations

While the main search strategy was broad, our selection criteria may have missed articles; we excluded gray literature, case studies, commentary pieces, systematic reviews, and protocols. Furthermore, studies discussing transitions from the hospital to the community were excluded if they did not mention palliative care or supportive care, and this may have resulted in our review representing a subset of the literature surrounding the expansive area of transitions at end-of-life.

Conclusions

Heterogeneity of study designs, outcomes, and findings in this field, as well as low quality of study designs, renders it challenging to draw conclusions regarding the impact of palliative care on the transition from the hospital to the community. Yet, no evidence exists to suggest interventions were harmful. Rather, studies' outcomes suggest that palliative care involvement during transitions may have the potential to increase the likelihood of being discharged with support services and decrease hospital readmission rates. Future research should use standardized outcome measures and ideally test the effectiveness of interventions using high-quality study designs.

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Appendix A. Search Strategy

Database(s): Ovid MEDLINE: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE® Daily, and Ovid MEDLINE® 1946-Present
Search Strategy: 2018/04/10.

#	Searches	Results
1	palliative care.mp. or exp Palliative Care/	57,222
2	exp Terminal Care/ or end of life.mp.	55,541
3	"supportive care".mp.	13,056
4	exp Patient Transfer/	7238
5	"discharge planning".mp. or exp Patient Discharge/	26,025
6	1 or 2 or 3	110,347
7	4 or 5	32,649
8	6 and 7	668
9	limit 8 to (English language and humans and yr = "1995 -Current" and ("young adult (19 to 24 years)" or "adult (19 to 44 years)" or "young adult and adult (19-24 and 19-44)" or "middle age (45 to 64 years)" or "middle aged (45 plus years)" or "all aged (65 and over)" or "aged (80 and over)") and English)	310