

Continuity, Coordination, and Transitions of Care for Patients with Serious and Advanced Illness: A Systematic Review of Interventions

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Abstract

Objectives: Continuity, coordination, and transitions of care are key to high-quality medical care for patients with serious and advanced illness. We conducted a systematic review to evaluate the impact of interventions targeting these areas in this population.

Methods: We searched PubMed, CINAHL, PsycINFO, Cochrane, and DARE from 2000 through 2011. We included prospective controlled studies targeting continuity, coordination, and transitions for patients with advanced illness that reported patient centered outcomes. Of 13,014 citations, 23 studies met inclusion criteria. Two investigators extracted and checked data on population, interventions, methods, outcomes, and methodological quality.

Results: Four of the six studies evaluating patient satisfaction (67%) and four of the six studies evaluating caregiver satisfaction (67%) showed statistically significant improvements in these outcomes in the intervention compared to the control group. Only three of the nine studies (33%) measuring quality of life and five of the 16 (31%) measuring health care utilization showed improvement. Results were similar across different types of interventions.

Conclusions: Many studies were limited by methodologic issues such as use of measurement tools not developed for patients with advanced disease and small sample size. Interventions and outcomes were too heterogeneous for meta-analysis. We found moderate evidence that interventions targeting continuity, coordination, and transitions in patients with advanced and serious illness improve patient and caregiver satisfaction, but low evidence for other outcomes. Further research is needed on how to target these domains for outcomes such as health care utilization.

Introduction

CONTINUITY, COORDINATION, AND TRANSITIONS of care are key domains for improving quality of care for patients with advanced and serious illness. These three concepts are key standards for quality palliative care¹ and key determinants of satisfaction with care for patients at the end of life.^{2,3} Continuity can be defined as the exchange of knowledge and the relationships between providers and patients or families, or between providers and/or provider groups; an example of improving continuity is standard assessment of palliative care needs. Coordination can be defined as the alignment of care across providers and settings; an example is a palliative care

nurse coordinating care among the radiation, medical, and surgical oncologists for a patient. Finally, transitions of care generally refers to care across settings or providers of care. Improving transitions in palliative care often refers to facilitation, when appropriate, of patient care goals to more comfort-oriented care; an example is helping appropriate patients transition to hospice care.

Due to the complexity of care for patients with advanced and serious illness, these domains of care are often not well addressed. For example, despite the benefits of hospice care on improved end-of-life outcomes such as family satisfaction with care,⁴ timely transition to hospice care frequently does not occur in the United States. In 2009, less than half of

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Accepted February 8, 2013.

patients who died ever received hospice care.¹ Specific types of quality improvement interventions have been developed and evaluated to meet these needs, such as the inclusion of an additional provider (a nurse or social worker) to provide case management to specifically target these domains, or the use of specialized palliative care service teams.⁵

Although previous systematic reviews have addressed specific types of interventions targeting continuity and coordination, such as specialized palliative care,^{6,7} these reviews have not addressed the full spectrum of types of interventions targeting these domains or evaluated the effectiveness of different components of interventions. We therefore conducted a systematic review to investigate if interventions focusing on continuity, coordination, and transitions of care for patients with advanced and serious illness improve different patient and caregiver centered outcomes, including quality of life, satisfaction, and health care utilization, and to identify which components are associated with effective interventions.

Methods

As part of a larger systematic review⁸ on interventions to improve health care in patients with advanced and serious illness, we included studies that had a primary focus on continuity, coordination, and transitions of care.

Definition of studies targeting improvements in continuity, coordination, and transitions of care

For the definition of continuity, coordination, and transitions, we included interventions that targeted improving the relationship between patients or families and providers, the relationship between providers (e.g., developing interdisciplinary teams), and on improving information exchange (e.g., improving patient assessment in palliative care domains) (continuity); improving alignment of care across providers and setting (e.g., case management) (coordination); and improving care across settings or providers of care (e.g., facilitating hospice referrals) (transitions).

Intervention components

Because of the heterogeneity of the interventions, we classified interventions by five key components (studies could have multiple components). *Patient/family/caregiver involvement* refers to an intervention focused directly on them, for example through education. *Coordination* refers to interventions which utilized an additional provider to coordinate health care. *Care plans* refers to interventions that incorporated care plans or order sets with directions to follow for providers (e.g., comfort care orders, flow sheets). *Palliative care specialist* refers to interventions employing any type of specialist palliative care providers. Finally, *additional assessments* refers to any assessment (e.g., questionnaires, predefined assessment lists) that was added to usual care as part of the intervention.

Data sources

We searched the electronic databases PubMed, CINAHL, PsycINFO, Cochrane, and DARE (details in Appendix A) from 2000 through December 2011. We reviewed reference lists of included articles for potentially relevant studies. MeSH terms included palliative care and quality improvement; keywords included cancer, terminally ill, hospice care, patient

care planning, and quality assurance (detailed search strategy is in Appendix A). We also identified systematic reviews that might contain relevant articles and reviewed these reference lists as well.

Study eligibility criteria, participants, and interventions

We included randomized controlled trials and prospective controlled studies (prospective before-after studies or studies with a nonrandomized control group). We included all ages of patients and all settings, including inpatient facilities, outpatient care, nursing homes and hospices. Specific inclusion criteria were that studies must be composed primarily of seriously ill patients or those with advanced disease who were unlikely to be cured, recover, or stabilize (definition adapted from the National Consensus Project).⁹ Since many studies combined populations (e.g., cancer survivors, patients with early-stage disease, and patients with advanced disease), we included studies where more than 50% of the included population would fit the above definition. When results were reported separately, we abstracted only the results for the relevant population.

We focused on key patient-centered outcomes related to the domains of interest, including patient satisfaction and quality of life (QOL), family or caregiver burden and/or satisfaction and/or QOL, health care utilization (e.g., potentially avoidable utilization such as admissions, length of stay, diagnostic interventions), location of death (e.g., home versus hospital), hospice referral, and do-not-resuscitate and advanced directive status (see full report for details).² We excluded studies that did not report patient-centered outcomes (e.g., studies of staff knowledge). We excluded studies published before 2000, since both interventions to improve health care and palliative care practice have changed substantially since that time, and the pre-2000 literature has been well-addressed in earlier reviews.¹⁰

Study appraisal and synthesis methods

Two members of the review team independently assessed each title and abstract using DistillerSR, an online systematic review software program. Disagreements were resolved by the reviewers or by consensus. The full text of eligible articles was retrieved and evaluated by two reviewers for inclusion criteria and to identify the target of the intervention.

One reviewer recorded details about study design, interventions and their components, study population, outcome measures, results (including study statistics), and study quality (using risk of bias assessment),¹¹ and a second reviewer checked data for accuracy. For study quality, we assessed randomization generation, concealment of allocation, masking of patient, personnel and outcome assessors, how incomplete outcome data was addressed and selective outcome reporting. All evidence was graded for the strength of the best available evidence, including grading study quality with the risk of bias in relevant studies, using the Grade of Recommendations Assessment, Development, and Evaluation (GRADE) Working Group criteria adapted by the Agency for Healthcare Research and Quality.¹² For classification of overall quality, we started with high quality for RCTs and downgraded a study if there was a lack of documentation of important factors (e.g., blinding, concealment); for non-RCTs we started with low quality and upgraded a study if appropriate.

We used descriptive statistics to summarize our findings across the entire set of studies, and to describe results by outcome and by components of the intervention. We could not perform meta-analysis due to intervention and outcome heterogeneity.¹³

Results

The literature search identified 13,014 unique citations. During the title and abstract review process, we excluded 12,567 abstracts that did not meet one or more of the eligibility criteria (see Figure 1), and at article review, we excluded an additional 351 articles that did not meet one or more of the eligibility criteria. Ninety-three articles were eligible for the systematic review. There were 23 studies described in 26 articles that we categorized as continuity, coordination, or transitions of care. All but two of the included studies compared an intervention to usual care; these two studies compared the same intervention with and without information exchange between providers.

Twelve studies were RCTs, four had concurrent controls, and seven were prospective before-after studies. Five studies were conducted in an inpatient setting, four in a home care setting, four in an ambulatory setting, three in nursing homes, one in hospice, one in a rehabilitation unit, and five in mixed settings. Fifteen studies (65%) were multicenter studies. One study reported only within group comparisons and, therefore, the outcomes are not further analyzed here.¹⁴ All studies

were in adults, with a mean age (by study) between 62 and 84. Most included patients with mixed illnesses (nine studies) or cancer patients only (seven studies) (see Table 1). In 11 studies, the intervention was provided by the existing staff. In nine studies, the intervention was provided by an external team or consultant, and in three studies both approaches were used.

The results section is organized as follows: summary of the evidence for each of the patient/caregiver-centered outcomes; summary for different intervention components for patient/caregiver-centered outcomes overall; summary for health care utilization; and summary for other outcomes.

Evidence for patient/caregiver-centered outcomes: Patient or caregiver QOL and satisfaction and caregiver burden

Nine studies evaluated QOL of patients.^{15–23} Five of these nine studies were of good quality and all but one were RCTs. Only three studies (33%) showed a statistically significant improvement on QOL of patients with the intervention compared to the control group (see Table 1).^{16,17,23}

Seven studies assessed patient satisfaction;^{17,21,22,24–27} four were RCTs. The overall quality ranged from poor to good. One trial reported QOL for within group comparison only and was therefore not included in the analysis.²⁴ Of the other six studies, four (67%) showed statistically significant benefits from the intervention.^{21,24,26,27} Three studies measured both patient satisfaction and QOL,^{17,21,22} two studies found

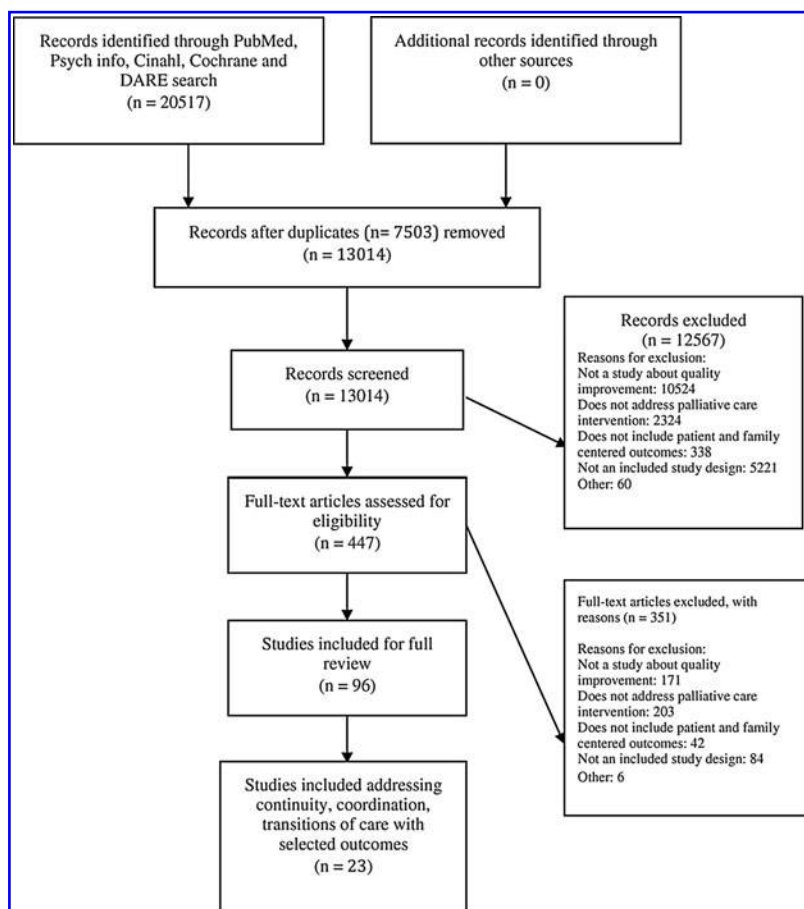


FIG. 1. Article flow for systematic review.

significant improvements for only one of the outcomes, and the remaining study found no effect on either outcome.²²

Six studies reported caregiver satisfaction;^{17,27–30,34} three were RCTs. Four of these studies (67%), including the three RCTs, showed statistically significant improvements in the intervention groups (see Table 2).^{17,27,29,34} Three studies reported caregiver burden^{17,20,28} (two RCTs); none showed a significant difference between the groups. Only one low-quality study reported caregiver QOL,²⁷ and showed statistically significant improvement. Among the three studies evaluating at least two of these three caregiver outcomes, two had conflicting findings for the different outcomes and one found that neither caregiver burden nor satisfaction showed a statistically significant improvement with the intervention.²⁸

Strength of evidence was moderate for patient and caregiver satisfaction and low for other outcomes.

Evidence for different intervention components for patient/caregiver-centered outcomes

Table 2 illustrates the components of each intervention and if the intervention was statistically significant and improved outcomes compared to the control group. Seven of the nine (78%) studies including the component of patient and/or family involvement that measured these outcomes showed a statistically significant improvement with the intervention compared to the control group on at least one of the outcomes of patient or family QOL, satisfaction or burden (results for medium- and high-quality studies only: six of the eight studies (75%) showed a significant effect). Nine of the twelve studies (75%) using additional patient assessments found a significant improvement on at least one of these outcomes (only medium- and high-quality studies: eight of 10 studies (80%)). Six of the nine (67%) studies using coordination showed improvement on at least one QOL or satisfaction outcome (all were medium- or high-quality studies). Three of the five (60%) studies using palliative care specialists found a significant improvement on at least one of the outcomes (all were medium- and high-quality studies). Five of the nine (56%) studies using care plans or order sets showed an improvement on at least one of these outcomes (results for medium- and high-quality studies only: four of six studies (67%)).

Evidence for different intervention elements for studies that measured health care utilization, e.g., admissions, length of stay

In total, 16 studies reported statistics on health care utilization^{15–17,21–28,32–37} (one reported health care utilization but no statistical testing), primarily length of stay or different types of admissions (a few studies assessed utilization of diagnostic or therapeutic interventions). Eight of these studies were RCTs. Five of these studies (31%) found a statistically significant effect in favor of the intervention compared to the control group.

Four of the eleven (36%) studies using care plans or order sets that measured this outcome showed decreased utilization (only medium- and high-quality studies: two of seven studies; 29%). Five of the fifteen (33%) using additional assessments showed decreased utilization (only medium- and high-quality studies: three of 10 studies; 30%). Three of the

ten (30%) studies with patient and/or family involvement that measured this outcome showed a significant decrease in health care utilization for the intervention (only medium- and high-quality studies: two of eight; 25%). In two of the ten (20%) studies using coordination, patients had significantly lower health care utilization with the intervention (only medium- and high-quality studies: two of nine studies; 22%). None of the five studies using palliative care specialists showed a significant effect. Strength of evidence was low for utilization.

Other outcomes

Location of death was reported as an outcome in six studies,^{23,28,31,34–36} three of which were RCTs. In three of these studies (50%),^{23,31,36} patients in the intervention groups were more likely to die at home. Four studies reported enrollment in hospice, use of hospice services or placing patients on a comfort care plan (two were RCTs).^{23,32,34,37} Two (50%) reported significant results in favor of the intervention.³²

Four studies reported on do-not-resuscitate and advanced directive status^{15,26,35,38} as an outcome of the intervention. Two were RCTs.^{15,26} Two of the four (50%) showed statistically significantly more do-not-resuscitate orders or advanced directives in the intervention group.^{15,35} Eight studies reported on overall symptom control; none of these studies showed an effect of the intervention. Strength of evidence was low for these outcomes.

Discussion

In this systematic review of interventions targeting continuity, coordination and transitions of care for patients with advanced and serious illness, in a mix of populations and settings, we found moderate strength of evidence only for the outcomes of patient and caregiver satisfaction. Strength of evidence was low for other outcomes evaluated in these studies, including patient quality of life, caregiver burden, health care utilization, location of death, and do not resuscitate orders or advance directives, and overall symptoms, although many of these outcomes were evaluated in only a few studies. The interventions that did improve outcomes were heterogeneous; most used components of coordination, patient and/or family involvement, and/or additional patient assessment. Results were similar across interventions using these different components of care.

Satisfaction is an important outcome as it reflects one of the primary goals of continuity—improved relationships and experience of care—measured from the perspective of the patient and family; our findings for patient and family satisfaction were similar. Some of the findings of this review are similar to those of previous reviews addressing subsets of this literature, particularly the effectiveness of specialized palliative care.^{6,7,10,40–44} The most recent review of specialized palliative care⁶ focused on RCTs through 2007 and the outcomes of quality of life, satisfaction, or costs. This review found that evidence was most consistent for the outcome of family satisfaction; as in our review, few studies evaluating quality of life or cost found evidence for these outcomes. The most recent review on specialized palliative care in cancer²⁵ included a wider range of studies than in our review, including retrospective and uncontrolled studies, and found

TABLE 1. STUDY DESIGN, POPULATION, SETTING, AND INTERVENTION

<i>Author, year</i>	<i>Study design, sample size</i>	<i>Population (diseases, mean age)</i>	<i>Setting (s)</i>	<i>Intervention comparison</i>	<i>Intervention details</i>
Aiken, 2006 ¹⁵	RCT 192	COPD, CHF 69	Home	Case management/ coordinated care versus usual care	Home-based case management by nurse case managers, coordinated with patients' existing source of medical care
Badger, 2009 ³¹	Pre-post 437	Mixed illnesses no age reported	Nursing home	Gold Standards Framework in Care Homes versus usual care	Identifying, assessing, and treating needs and symptoms, improving coordination within institution and with outside providers
Bailey, 2005 ³⁵	Pre-post 203	Mixed illnesses 68	Hospital	ICCP versus usual care	Staff education and support to identify patients who were actively dying and implement care plans guided by a comfort care order set template
Bakitas, 2009 ¹⁶	RCT 322	Mixed cancer 65	Ambulatory	Multicomponent, psychoeducational intervention versus usual care	Telephone calls, education, encourage patient activation, self-management, and empowerment
Bookbinder, 2005 ¹⁴	Pre-post 257	Mixed illnesses >70	Hospital	PCAD pathway versus usual care	Care pathway, daily flow sheet, physician order sheet with standard orders for symptom control
Brumley, 2003 ²⁴	Controlled study 300	COPD, CHF, cancer 74	Home	Home-based Palliative Care versus usual care	Care team (patient and family plus a physician, nurse, and social worker) coordinates and manages care and provides assessment
Brumley, 2007 ²⁵	RCT 297	COPD, CHF, cancer 72	Home	Home-based Palliative Care versus usual care	As above
Casarett, 2005 ³⁴	RCT 205	Mixed illnesses 84	Nursing home	Structured interview and notification of residents' physicians versus same as above but no notification	Structured interview and notification of residents' physicians about residents' eligibility for hospice care
Cohen, 2010 ³⁷	Controlled study 133	Dialysis patients with poor prognosis 70	Ambulatory	Intervention to facilitate hospice referral versus usual care	Renal supportive care teams encouraged advance care planning, discussed hospice resources, and offered general support
Dudgeon, 2008 ²⁸	Controlled study 200	Mixed cancer 66	Ambulatory, hospital, home	Palliative care integration project versus usual care	Implementation of assessment tools, collaborative care plans, symptom management guidelines
Engelhardt, 2006 ²⁶	RCT 275	COPD, CHF, mixed cancer 70	Hospital, home	Advanced illness coordinated care program versus usual care	Six sessions with care coordinator who helped with provider communication, care coordination, support

(continued)

TABLE 1. (CONTINUED)

<i>Author, year</i>	<i>Study design, sample size</i>	<i>Population (diseases, mean age)</i>	<i>Setting (s)</i>	<i>Intervention comparison</i>	<i>Intervention details</i>
Hughes, 2000 ¹⁷	RCT 188	Mixed illnesses 70	Home	Team-Managed Home-Based Primary Care versus usual home or hospice care	Home-based primary care including a care manager, 24-hour contact, prior approval of hospital readmissions, discharge planning
Jordhoy, 2000 , ³⁶ 2001 , ¹⁸ Ringdal, 2002 , ²⁹ 2001 ^{45*}	RCT 434	Mixed cancer 68	Home, ambulatory, palliative medicine unit	Comprehensive palliative care versus home care team	All in- and outpatient services occurred on Palliative Medicine Unit; unit staff served as link to community, predefined guidelines, educational programs for community
Luhrs, 2005 ³²	Pre-post 39	Mixed illnesses 72	Hospital	PCAD pathway versus usual care	Care pathway, daily flow sheet, physician order sheet with standard orders for symptom control
McMillan, 2011 ¹⁹	RCT 709	Mixed cancer 73	Hospice	Systematic feedback of assessment to IDTs versus same as above but no reports to IDTs	Standardized assessment followed by two IDT discussions
Mitchell, 2008 ²⁰	RCT 159	Mixed illnesses 68	Ambulatory, hospital	Specialist-General Practitioner case conferences versus usual care	General practitioner phoning in to a routine specialist team meeting
Moore, 2002 ²¹	RCT 202	Lung cancer 67	Ambulatory	Nurse led follow-up versus usual care	Nurse specialists assessed patients monthly or as needed by phone or in clinic
Pantilat, 2010 ⁴⁶	RCT 107	Mixed illnesses 76	Hospital	Palliative care consultation versus usual care	Comprehensive care team: palliative care team consultation with care planning, psychosocial support, caregiver training
Rabow, 2004 ²²	Controlled study 90	COPD, CHF, cancer 68	Ambulatory	Comprehensive Care Team versus usual care	Primary care physician received palliative care team consultations, patients received advance care planning, psychosocial support, and family caregiver training.
Reymond, 2011 ³⁰	Pre-post 299	Mixed illnesses not reported	Nursing home	Residential aged end-of-life care pathway	Identifying/training nurse champions, networking with specialty palliative care, educating physicians, development/implementing of end-of-life care pathway
Woo, 2011 ²⁷	Pre-post 169	Mixed illnesses (majority dementia) 84	Rehabilitation/convalescent unit	Continuous QI initiative (Plan-do-study-act) versus usual care	Service reengineering, provision of guidelines, educational material, and interactive sessions to achieve culture change
Temel, 2010 ²³	RCT 151	Metastatic lung cancer 65	Ambulatory	Early palliative care integrated with standard oncologic care versus standard oncologic care	Palliative care physician/advance practice nurse consult within three months of diagnosis and then monthly; addressed physical and psychosocial symptoms, goals of care, treatment decision making, coordination
Van der Heide, 2010 ³⁸	Pre-post 298	Mixed cancer 68	Hospital, nursing home, home	Liverpool Care Pathway for the Dying Patient versus usual care	Structuring care, facilitating audit by standardizing the monitoring of care

*Four articles reporting on the same study.
CHF, chronic heart failure; COPD, chronic obstructive pulmonary disease; QI, quality improvement; RCT, randomized controlled trial; ICCP, Inpatient Comfort Care Program; IDT, interdisciplinary team; PCAD, Palliative Care for Advanced Disease.

TABLE 2. STUDY INTERVENTION COMPONENTS (FOR STUDIES USING ONE OF THE SPECIFIED COMPONENTS) AND RESULTS FOR QUALITY OF LIFE, SATISFACTION, AND HEALTH CARE UTILIZATION

Study	Intervention included:							Intervention improved for key outcomes ($p < 0.05$)		
	Study quality	Involvement of patient/family/caregiver	Coordination	Care plans, order sets	Palliative care specialists	Additional assessments of patient	Other	Patient QOL; caregiver burden or QOL	Patient satisfaction; family satisfaction	Health care utilization
Aiken, 2006 ¹⁵	High	X	X	X		X		No n/a		No
Brumley, 2007 ²⁵	High	X	X	X		X			Yes	Yes
Casarett, 2005 ³⁴	High					X			n/a n/a Yes	Yes
Mitchell, 2008 ²⁰	High						X			
Moore, 2002 ²¹	High		X			X		No No No	Yes	No
Bakitas, 2009 ¹⁶	Medium	X	X	X	X	X		n/a	n/a	No
Brumley, 2003 ²⁴	Medium	X	X	X		X		Yes		No
Engelhardt, 2006 ²⁶	Medium	X	X			X		n/a		Yes
Hughes, 2000 ¹⁷	Medium	X	X			X		Yes No	No between group statistics Yes	Yes
Jordhoy, 2000, ³⁶ 2001, ¹⁸ Ringdal 2002, ²⁹ 2001 ⁴⁵	Medium	X	X	X	X	X		Yes No	n/a No Yes	No
McMillan, 2011 ¹⁹	Medium					X (same for control group)		No n/a	n/a Yes	No
Rabow, 2004 ²²	Medium	X	X	X	X (same for control group)	X		No n/a	No n/a	No
Temel, 2010 ²³	Medium	X	X	X	X	X		Yes n/a		No (for all)*
Badger, 2009 ³¹	Low			X		X				Yes
Bailey, 2005 ³⁵	Low			X		X				No
Book-binder, 2005 ¹⁴	Low			X		X				No statistics
Cohen, 2010 ³⁷	Low			X		X	X			No
Dudgeon, 2008 ²⁸	Low			X	X (in 1/5 facilities)	X		n/a No	n/a No	No
Luhrs, 2005 ³²	Low	X	X	X		X				No
Reymond, 2011 ³⁰	Low			X		X			n/a No	No statistics
v.d. Heide, 2010 ³⁸	Low			X		X		n/a	n/a	n/a
Woo, 2011 ²⁷	Low	X	X	X		X		n/a n/a No	Yes Yes Yes	Yes

n/a, outcome not measured; QOL, quality of life.

* $p = 0.05$; Yes for just the subgroup that died.

Pantilat 2010 is not included in this table because it did not measure any of these outcomes.

more evidence to support the outcomes of hospital admissions and satisfaction than quality of life.

Several older systematic reviews have addressed the target of continuity in related areas, although focusing on broader populations or only specific types of interventions. One previous review of case management in end-of-life care found mixed effects for outcomes (primarily health care utilization),¹⁰ and a review of improved coordination for supportive cancer care found little evidence to support portable medical records and mixed effects for palliative care–home care coordination.¹⁰

The studies targeting these domains had a number of limitations. Although we identified a few high-quality studies with consistent evidence across outcomes, in general, the quality of evidence was moderate to low. Many studies were limited by numerous methodological issues such as insufficient power for reported outcomes (particularly utilization), measuring outcomes not specifically targeted by the intervention, and using measurement tools (especially for quality of life outcomes) not specific for populations with advanced disease.

Our review also has several limitations. This review focuses on studies that we classified with a primary target of continuity, coordination, or transitions of care; studies focusing on other targets, such as communication or pain management, or on multiple targets, were addressed separately in the larger project.⁸ Meta-analyses were not possible as the interventions and outcomes were too heterogeneous. The comparison of different components of the interventions was also limited by study heterogeneity and by the relatively small number of studies for each component and outcome. Finally, we focused on prospective studies with the intent of limiting to higher-quality studies, and did not address the substantial number of retrospective studies in this population evaluating health care utilization outcomes.

In conclusion, we found moderate strength of evidence for interventions targeting continuity, coordination, and transitions of care in patients with advanced and serious illness only for the outcomes of patient and family satisfaction. Future research should address other outcomes for which we found low strength of evidence, including health care utilization. Large multicenter trials are ongoing in the field of palliative care, which should improve the quality and quantity of current evidence. Ideally, future studies should use some of the instruments newly developed and validated for sensitivity to interventions in palliative care populations (particularly for quality of life); the use of more general instruments may explain why some interventions did not show an effect. Ideally, future interventions should specifically describe the targets of the intervention and define primary and secondary outcomes that best fit those targets. Finally, development of measurement instruments is still needed in some key areas, such as caregiver burden.

Acknowledgments

This project was funded under Contract No. HHSA-290-2007-10061-I-EPC3 from the Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services. The Agency for Healthcare Research and Quality reviewed contract deliverables for adherence to contract requirements and quality. The authors of this report are responsible for its

content. Statements in the report should not be construed as endorsement by the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.

Author Disclosure Statement

No conflicting financial interests exist.

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(Appendix follows →)

APPENDIX A: DETAILED SEARCH STRATEGY (ALL 2000–2011)

PubMed	((Cancer[tiab] AND care[tiab]) AND (communication[mh] OR communication[tiab] OR psychosocial[tiab] OR distress[tiab] OR (pain[tiab] AND management[tiab]))) NOT (editorial[pt] OR comment[pt])
PsychInfo	(Cancer AND Care) AND Communication OR psychosocial OR distress OR (Pain AND management) from 2000 to 2011
1	Cancer AND care
2	Communication OR psychosocial OR distress
3	Pain AND management
4	S2 OR S3
5	S1 AND S4
6	S1 AND S4 from 2000 to 2011
1	Cancer AND care
2	Communication MeSH
3	(Cancer AND care) AND (Communication)
4	Communication
5	(Cancer AND care) AND (Communication MeSH OR Communication tiab)
6	Psychosocial OR distress
7	Pain MeSH
8	Pain
9	Management
10	(Cancer AND care) AND (Communication MeSH OR Communication tiab OR psychosocial OR distress OR ((pain MeSH OR pain tiab) AND management))
11	(Cancer AND care) AND (Communication MeSH OR Communication tiab OR psychosocial OR distress OR ((pain MeSH OR pain tiab) AND management)) from 2000–2011
DARE	Cancer AND care AND (communication OR psychosocial OR distress OR (pain AND management)) from 2000–2011

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