

## **Results of a scoping search from care coordination interventions for older adults that measured the outcome of Length of Stay (LOS) vs. a comparison group in experimental studies.**

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The objective of this brief is to explore possible positive common elements from interventions that utilized comprehensive care coordination for older adults that resulted in reducing the length of stay (LOS) in a hospital which could result in improved quality of life and lower consumption of resources.

These results are from a systematic search of 9 databases from 1995 to October 2009 using the scoping feature in the Social Work Leadership's clearinghouse, the Evidence Database on Aging Care (EDAC) [www.searchedac.org](http://www.searchedac.org)<sup>a</sup>. EDAC is a topical database that provides access to empirical studies for two topics, Outcomes of Care Coordination for Older Adults and Social Work Intervention Effectiveness. The present search was conducted to retrieve studies that measured the length of stay outcome and employed an experimental design. The search yielded 33 articles. The findings from the LOS outcomes were then classified as either positive (decreased LOS), or negative (increased LOS)/no difference between the intervention and the comparison group.

Twenty-one of the 33 studies were excluded due to the following reasons: 3 studies were excluded due to negative findings,<sup>1,2,3</sup> 17 studies showed no statistical difference between the intervention and comparison groups on LOS<sup>4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20</sup> and 1 synthesis study was excluded due to considerable heterogeneity among the primary studies<sup>21</sup> (variance between the studies beyond what would be expected due to sampling error alone).<sup>b</sup>

The 12 remaining studies<sup>22,23,24,25,26,27,28,29,30,31,32,33</sup> showed a decrease in LOS vs. comparison group.<sup>c</sup> Two of the 12 studies were meta-analyses, with Chiu reporting that 7 of the 9 studies measuring LOS outcomes showed significant reductions over the comparison group<sup>34</sup>, and Phillips reporting mixed results on LOS measures with the difference favoring interventions, although not significantly (-0.37; 95% CI -0.15 to 0.60)<sup>35</sup>.

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<sup>a</sup> See the methodologies tab at [www.SearchEDAC.org](http://www.SearchEDAC.org) for additional search and inclusion criteria.

<sup>b</sup>  $I_2 = 91.3$  Heterogeneity is a measure of inconsistency across the findings that represents the proportion of the observed variance that reflects the real difference in effect size (Borenstein, M. *Introduction to Meta-Analysis*, John Wiley & Sons, UK, 2009).

<sup>c</sup> Eight of the remaining 12 studies that showed a decrease in LOS vs. comparison group were implemented in Australia, Canada, England, Germany, Italy, and Sweden, which could impact conclusions drawn from comparisons due to possible variations among the care systems. (Asplund 2000, Beland 2006, Capomolla 2002, Day 2001, Del Sindaco 2007, Kalra 2005, McNamee 1998, Nikolaus 1999)

The 10 original studies and the 2 meta-analyses, along with their primary studies, were then systematically examined across 13 variables<sup>d</sup>. Each of the original and primary studies employed various models of care coordination, but all involved interdisciplinary teams that were composed of at least 2 of following participants: physician, physician assistant, nurse, nurse practitioner, geriatrician, psychologist, pharmacist, social worker, physical therapist, occupational therapist, speech therapist, community service member, or dietician.

**Included studies showing a decrease in LOS when compared with control group.**

<b>Author</b>	<b>LOS Outcome results</b>
<b>Beland</b> 2006	↓LOS: 50% reduction in acute hospital patients that would become “bed-blockers” (waiting to be placed) i.e. reducing hospital utilization.
<b>Capomolla</b> 2002	↓Patients re-hospitalized, (I) 9 vs. (C) 37 and number of re-hospitalizations (I)13 vs. (C) 78, both $p<0.05$
<b>Kalra</b> 2005	↓LOS: stroke unit vs. stroke team and home care, (mean) SU=32 vs. ST=29.5 comparable, and from HC=48.9
<b>McNamee</b> 1998	↓LOS: mean number of hospital days, early support, 27 vs. 54 in conventional care. ( $p<0.02$ for difference)
<b>Nikolaus</b> 1999	↓LOS: home intervention vs. assessment alone vs. control $p<0.05$
<b>Asplund</b> 2000	↓LOS: the mean length of stay for the intervention group was 1.4 days shorter compared to the control group. (adjusted) $p=0.03$
<b>Day</b> 2001	↓LOS: the mean length of stay was significantly longer in the standard care patients compared with the intervention patients.
<b>Del Sindaco</b> 2007	↓LOS: for all causes was shorter in the intervention group than the control group at 2 years. ↓LOS: for heart failure hospital admissions was shorter in the intervention group than control.
<b>Leveille</b> 1998	↓LOS: the total number of hospital days decreased markedly in the intervention group, from 116 to 33 days (72% decrease)
<b>Naylor</b> 1999	↓Control group were more likely than intervention group to be readmitted at least once during the 24 weeks following discharge.
<b>Chiu (meta)</b> 2007	↓LOS: 7 out of 9 studies-statistically significant. (10 primary studies)
<b>Phillips (meta)</b> 2004	↓↑LOS: mixed results. LOS difference favored intervention, but not statistically significant -0.37; 95% CI -0.15 to 0.60 (10 primary studies)

Although the configuration of the care coordination teams in the models varied, the interventions in 9 of the 10 original studies that were included showed a reduction in LOS and involved a discharge plan **and** follow-up contact/services in the home. Additionally, as mentioned above, the Chiu meta-analysis measured “post-hospital transitions,” and reported that 7 of the 9 studies that measured the number of hospital readmission days (LOS) demonstrated statistically significant reductions. The variation in mean LOS days were “reflective of a difference of at least a one-third fewer days by treatment cases [with] significant effects observed among a range of target groups and settings.” Furthermore, nurse-assisted case management post-hospital transition interventions “could reduce hospital days over periods ranging up to 12 months.”<sup>34</sup>

The Phillips’ meta-analysis reviewed comprehensive discharge planning with post-discharge support for Chronic Heart Failure patients measuring LOS as a primary endpoint, and while not reaching statistical significance compared with

<sup>d</sup> A chart examining the 13 variables from the original 10 studies and the 20 primary studies included in the meta-analyses is available at [www.SearchEDAC.org](http://www.SearchEDAC.org)

control, the LOS difference favored intervention (-0.37; 95% CI, -0.15 to 0.60). Based on a cost analysis of these interventions, “post-discharge support with a home visit could prevent 84,000 readmissions with an estimated reduction in Medicare payments of \$424 million per year.”<sup>35</sup> Phillips also explored baseline clinical characteristics of each of the studies and found they were well matched even if the populations differed across countries.

## **Results**

When comparing the 10 original studies showing positive LOS outcomes against the 21 studies showing negative/no difference in LOS outcomes, the results revealed that 9 out of 10 of the positive outcome studies had a discharge plan and phone/human contact follow-up, while only 5 of the 21 negative/no difference outcome studies employed both protocols. In the negative/no difference outcome study category 5 studies had a discharge plan and phone/human contact follow-up, 9 studies had no discharge plan, 4 studies had a discharge plan without home follow-up, and 3 studies offered home care, “if necessary.” Some of the studies in this category did not merit a discharge plan because the intervention originated in the community.

The included studies incorporated a combination of intervention settings (senior centers; academic affiliated, acute care, general care, and day hospitals); geographic areas (Europe and North America); patients (HF, COPD, MI), and intervention models. Additionally, both meta-analysis studies and the 10 original studies contained various components of discharge planning, differing on single or multiple home visits; incorporating telephone contacts of varying frequency and/or utilizing education or self-care. Although no single variable was measured between all of the care coordination interventions, the common elements that emerged among these studies showing a decrease in LOS in older populations was the incorporation of a form of discharge planning combined with follow-up at the patient’s home.

This brief suggests exploratory evidence that two common elements incorporated in care coordination models for older populations may contribute to positive LOS outcomes. The evidence suggests that interdisciplinary care coordination models that include discharge planning with home follow-up can lead to reducing length of stay and therefore, as indicated in the cost benefits calculated by Phillips, one could reasonably expect to reduce costs.

## Common features in positive LOS outcome studies.

Study	Discharge Plan	Home intervention
Asplund (2000)	Yes	Yes. Face-to-face contact.
Beland (2006)	Yes	Yes. Actively followed patients in community.
Capomella (2002)	Yes	Yes. Phone contact.
Day (2001)	None specified	No. Active support not stated.
Del Sindaco (2007)	Yes	Yes. Phone contact.
Kalra (2005)	Yes	Yes. Continuity support into community
Leveille (1998)	Yes	Yes. Phone contact at senior center.
McNamee (1998)	Yes	Yes. Rehab in home.
Naylor (1999)	Yes	Yes. Face-to face and phone contact.
Nikolaus (1999)	Yes	Yes. Face-to face within 3 days and at 3 months

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