

## **A systematic review on the effectiveness of continuity of care and its role in patient satisfaction and decreased hospital readmissions in the adult patient receiving home care services**

Michelle Santomassino, MS, RN, FNP-BC, DNPc<sup>1</sup>

Gwendolyn D. Costantini, MS, RN, FNP-BC, DNPc<sup>1</sup>

Michele McDermott, MS, RN, FNP-BC, DNPc<sup>1</sup>

Denise Primiano, MS, RN, FNP-BC, DNPc<sup>1</sup>

Jason T. Slyer, DNP, RN, FNP-BC<sup>1</sup>

Joanne K. Singleton, PhD, RN, FNP-BC, FNAP<sup>2</sup>

1.Pace University, New York, NY

2.Pace University, College of Health Professions, Lienhard School of Nursing and New Jersey Center for Evidence Based Practice at UMDNJ School of Nursing; A Collaborating Centre of the Joanna Briggs Institute

### **Centre submitting review:**

Pace University, College of Health Professions, Lienhard School of Nursing and the New Jersey Center for Evidence Based Practice at the University of Medicine and Dentistry of New Jersey School of Nursing; A Collaborating Centre of the Joanna Briggs Institute

**Corresponding author:** Michelle Santomassino, RN, FNP-BC, DNPc  
Email: [ms92753p@pace.edu](mailto:ms92753p@pace.edu)

## Executive summary

### Background

Continuity of care, a concept that in its broadest terms describes patient and provider coordination across time and settings, has evidenced a positive correlation with patient satisfaction and hospital readmission rates. Home health care, where patients receive care from a variety of healthcare practitioners, is one area where these measures are being investigated to determine the effectiveness of continuity of care.

### Objective

To examine and synthesize the best available evidence related to the effectiveness of continuity of care interventions and their impact on patient satisfaction and all-cause hospital readmissions rates in the adult patient who is receiving home care services.

### Inclusion Criteria

#### *Types of participants*

Male and female aged 18 years or older receiving home care services, regardless of diagnosis, stage or severity of disease, co-morbidities, or previous treatment received.

#### *Types of intervention*

All types and models of interventions for continuity of care delivered by nurses to patients receiving home care services were considered for inclusion in the review.

#### *Types of outcomes*

Patient satisfaction and hospital readmissions.

#### *Types of studies*

In this review randomised controlled trials were considered for inclusion. In their absence, other research designs, such as non-randomised controlled trials, quasi-experimental studies, and before and after studies were considered for inclusion.

### Search Strategy

Published and unpublished literature in the English language was sought from the inception of the databases through November 1, 2011. The databases searched included: Academic Search Premier, CINAHL ERIC, Health Reference Center Academic, MEDLINE via PubMed, ProQuest Nursing and Allied Health Source, ProQuest Health Management, Cochrane Central Register of

Controlled Trials, EMBASE, Health Source Nursing Academic, PsycINFO and Bio-Med. A search of the grey literature and virtual hand searching of relevant journals was also performed.

### **Methodological quality**

Two reviewers evaluated the included studies for methodological quality using standardised critical appraisal instruments from the Joanna Briggs Institute.

### **Data Collection**

Data were extracted using standardised data extraction instruments from the Joanna Briggs Institute.

### **Data synthesis**

Statistical pooling via meta-analysis was not possible. The results are presented in narrative form.

### **Results**

Two randomised controlled trials and two quasi-experimental studies were included in this review. In one randomised controlled trial, 66% of patients rated their overall satisfaction with care as very good or excellent as compared with 63% of those receiving usual care at 24 months ( $p=0.31$ ). Another randomised controlled trial reported no statistically significant difference between groups ( $p$  value not reported). In one quasi-experimental study there was higher satisfaction rate amongst intervention patients with a mean difference of 16.88 (95%CI[16.32, 17.43] compared with 14.65 (95%CI[13.61, 15.68] in the control group ( $p=0.001$ ).

In one randomised controlled trial there was no statistically significant difference between intervention and control groups in hospital admission rates per 1000 at year two (700 vs. 740;  $p=0.66$ ). Another randomised controlled trial showed no difference in readmissions at 90 days between groups (36% vs. 35%; no  $p$  value reported). In one quasi-experimental study, the mean number of hospital readmissions per patient was higher in the intervention group compared to the control group (0.75; 95% CI[ 0.47, 1.03] vs. 0.66; 95% CI[ 0.40, 0.91];  $p=0.599$ ). In another quasi-experimental study, a statistically significant higher number of intervention group patients in the intervention group were discharged and remained at home (34 or 82.9%), compared to the control group (20 or 51.3%) ( $p<0.05$ ).

### **Conclusions**

Home care interventions that include nurses and advanced practice nurses with specialised training in the care of the population served as the direct provider along with collaboration with an

interdisciplinary team in a high-risk patient populations contributed to reduced hospital readmission rates. The outcomes of the included studies suggest that consistently scheduled home care services promote patient satisfaction.

### ***Implications for practice***

This review concluded that the utilisation of an advanced practice nurse with specialised training in a specific disease process in collaboration with a multidisciplinary team can affect readmission rates and patient satisfaction.

### ***Implications for research***

Further research is needed that captures a diverse patient population in terms of age and illness and the role that an advanced practice nurse can play.

### **Keywords**

home care, home health, home-based interventions, visiting nurse, continuity of care, readmission; patient satisfaction.

## **Background**

Continuity of care is a concept that is being explored internationally. It describes the connection and coordination of care between patients and providers across time and settings.<sup>1</sup> Studies have evidenced a positive correlation between continuity and patient outcomes including health care utilisation and patient satisfaction.<sup>2,3</sup> A systematic review evaluated 18 English language retrospective cohort and cross-sectional design studies from the years 2000 to 2005 that included a diverse patient population with ages across the lifespan and who were predominantly cared for in an ambulatory care setting by physicians. The review explored the relationship between continuity of care, defined as physician continuity or physician and interdisciplinary team communication. Outcomes identified that health care utilisation is decreased and patients are happier when continuity of care is present.<sup>2</sup> A positive correlation was also noted in a literature review consisting of six English language clinical trials taking place between the years of 1996 and 2005 that looked at continuity of care in chronically ill patient either in the hospital or a psychiatric setting.<sup>3</sup> The interventions included transitional care for the hospitalised patient as well as interdisciplinary collaboration in the psychiatric population. It has been evidenced when looking at patient satisfaction alone, results were not consistently linked to high continuity.<sup>4</sup> In a systematic review consisting of 12 English language studies of various designs that explored this variable singularly, it was ascertained that satisfaction was dependent on the patient's perception of continuity.<sup>4</sup> Therefore, it would appear that there is a connection between continuity of care and high levels of patient satisfaction that needs to be explored.

The World Health Organization, an agency responsible for providing leadership in global health matters, is involved in a number of continuity of care projects across various disciplines around the world. They support the idea of patient-centred care and believe that continuity is a provider's responsibility in ensuring this provision.<sup>5</sup> The Joint Commission International has identified continuity in their hospital standards for accreditation that focus on continuity as a factor to ensure patient safety.<sup>6</sup>

Continuity of care has different meanings to different stakeholders. In a multidisciplinary review of the concept of continuity of care, various perceptions were identified. In primary care, continuity is viewed as the relationship between one patient and one clinician. In the field of acute care nursing, continuity is viewed as communication between nurses, and in mental health it is viewed as a consistent relationship between a patient and a team of clinicians with accessibility playing a key role.<sup>7</sup> As noted earlier, the two fundamental elements to continuity, regardless of setting, are care of a patient and care over time.

Three types of continuity exist in every discipline; informational, management, and relational.<sup>7</sup> Informational continuity focuses on communication between providers over time. It is concerned with more than just medical data but important personal knowledge that is necessary for caregivers to form a trusting bond with the patient. Management continuity focuses on the care of the patient with multiple co-morbidities who is managed by multiple providers. It centres around the importance of shared management plans so that all clinicians are working together to optimise the patient's health. Relational continuity bridges care across the past, present, and future. There exists a set of core providers who establishes predictability for the patient.<sup>7</sup> The context of care determines which of these three types of continuity are employed.

Over the past several years, international efforts have heightened to ensure the delivery of high quality patient care and simultaneously curtail health expenditures. In order to determine which current practices would benefit from improvement and to further identify effective interventions, outcome measures must be analysed. Two outcomes that are employed worldwide as measures of success include patient satisfaction and hospital readmission rates.

Patient satisfaction is recognised as the patient's perception of the care he or she is receiving. Providers have come to believe that this is an important indicator of health care quality. Many practices provide their clients with satisfaction surveys, which are then analysed in order to learn where changes might be made. Health care has become a competitive market and Internet technology has empowered patients, which has led them to be identified as health care consumers. Their satisfaction is crucial to positive outcomes as it is linked to patient trust.<sup>4</sup> A patient who trusts his clinician is more likely to: seek guidance from that provider, follow pertinent advice, and report symptom improvement.<sup>8</sup> These are all essential elements to maintaining an optimal health status and decreasing the use of hospitals and emergency rooms.

Hospital readmission rates are identified as the number of recurrent hospitalisations by a single patient over a specific timeframe. The exorbitant cost of a hospitalisation is without question and it has been evidenced that a proportion of readmissions are avoidable.<sup>9</sup> The United States government has now imposed payment regulations on health care institutions when a patient with Medicare insurance is brought back into the hospital within 30 days of discharge. Hospitals are facing penalties such as Medicare reimbursement denials for excessive re-hospitalisations. Readmissions give insight into quality so providers are beginning to look beyond the 30-day timeframe imposed by Medicare and realising that recurrent admissions within longer time periods are also an issue. This has been a major driving force behind prioritisation of this outcome.

As is evidenced from the literature, continuity of care is important to improved patient outcomes, which is the reason for efforts around the world to focus on practice improvement in this area.<sup>5,6</sup> These efforts include continued research on practice changes to support continuity as well as clinician education on this concept. Numerous sectors of the health care industry have created position statements to stress the value of prioritising strategies to improve continuity in the provision of cost-effective high quality care. Examples of organisations include the American Medical Association and the Alberta Association of Professional Nurses.<sup>10, 11</sup>

Home care is a critical segment of patient care where continuity is fundamental to the patient's ability to achieve optimal health goals. As a phenomenon, it is defined as "care provided by professionals to people in their own homes with the ultimate goal of not only contributing to their quality of life and functional health status, but also to replace hospital care with care in the home for societal reasons".<sup>12,p.870</sup> Clinicians in this field provide care to patients with multiple co-morbidities. The clients receive regular visits by a health care provider, ensure that patients have and are taking their medications, and have the ability to identify issues that may result in hospital readmissions. The goal of home care is to provide a trusting relationship between patient and providers, as well as, open access to health care. At present a policy statement does not exist for this sector but there is strong interest in exploring the concept of continuity and planning improvement strategies to positively impact care.

Before engaging in the review it is important to understand that home care may begin in the acute care setting or in the home. Care that is initiated in the hospital is typically defined as a transitional care model. It is a term that describes the provision of services to high-risk patients as they move from one level of care to another, with the overall goal of preventing poor patient outcomes.<sup>13</sup> For the purposes of this review, the emphasis is on home care that began in the home. After the initial search of the literature was conducted it became clear that transitional care model was not our focal point and this type of model would not be used. A preliminary search of Medline, CINAHL, and the JBI Library of Systematic Reviews was performed and no existing or ongoing systematic review on this topic was identified.

**Review objective/questions**

The overall objective of this systematic review was to examine and synthesise the best available evidence related to the effectiveness of continuity of care interventions on patient outcomes.

The specific review questions asked were:

- What continuity of care interventions are most effective in improving patient satisfaction in adult patients receiving home care services?
- What continuity of care interventions are most effective in reducing all-cause hospital readmission rates among adult patients receiving home care services?

**Inclusion Criteria*****Types of participants***

The review considered studies that include all adults, male and female (aged 18 years old and above) receiving home care services that began in the home, regardless of diagnosis, stage or severity of disease, co-morbidities, or previous treatment received.

***Types of interventions/phenomena of interest***

This review considered studies that evaluated all models/types of interventions for continuity of care of adult patients delivered by registered nurses in home care settings with care that began in the home.

**Comparator:** no intervention / usual care

***Types of outcome measures***

This review considered studies that included the following outcome measures:

- All-cause hospital readmissions measured as patients who experience an unplanned admission to the same hospital, a different hospital, or another acute care facility for the same diagnosis or for a different diagnosis.
- Patient satisfaction measured by patient self-report.

### ***Types of studies***

In this review randomised controlled trials (RCTs) were considered for inclusion. Additionally, other research designs, such as non-randomised controlled trials, quasi-experimental studies, and before and after studies were considered for inclusion.

### **Search strategy**

The search strategies used sought published and unpublished full text studies written in the English language from the inception of the databases until November 1, 2011. A three-step strategy was used in this review. An initial limited search of MEDLINE and CINAHL was undertaken in an effort to formulate a comprehensive list of key words. This was followed by a more thorough search of all included databases utilising the ascertained list of search terms with the goal of locating articles appropriate to this review. Thirdly, the reference list of all studies that met the inclusion criteria and other relevant reports and articles was searched for additional studies. Studies identified through a reference list search were assessed for relevance based on the study title. For more details of the search strategy see Appendix I.

The databases searched included: Academic Search Premier, CINAHL, ERIC, Health Reference Center Academic, MEDLINE via PubMed, ProQuest Nursing and Allied Health Source, ProQuest Health Management, Cochrane Central Register of Controlled Trials (CENTRAL), EMBASE, Health Source Nursing Academic, PsycINFO and Bio-med.

The grey literature resources searched included: government health department websites such as World Health Organization and Institute of Medicine; UpToDate.com, the Virginia Henderson Library of Sigma Theta Tau International, Mednar, New York Academy of Medicine.

A hand search of appropriate journals (*Journal for Healthcare Quality, Journal of Health Services Research and Policy, Journal of the American Geriatrics Society, Home Healthcare Nurse, Home Health Care Management and Practice*) was performed with the review covering journal publications over the course of the last two years (2010 and 2011) to identify recent studies that might not yet be catalogued in indexed databases.

### **Keywords**

used: adults, admissions, hospital, hospital admission, patient outcome, acute care, acute patient care, post-discharge, home care, home health, home-based interventions, visiting nurse, continuity, readmission, and patient satisfaction.



An expanded list of keywords, including MeSH and subject heading terms, may be found in Appendix I and II.

## **Methods of the review**

### ***Assessment of methodological quality***

Papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using the standardised critical appraisal instruments from the Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) (Appendix III). Any disagreements that arose between the reviewers were resolved through discussion, or with a third reviewer.

### **Data extraction**

Data were extracted from papers included in the review using the standardised data extraction tool from JBI-MAStARI (Appendix IV). The data extracted included specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives.

### **Data synthesis**

Due to the methodological heterogeneity of included study design methods and clinical heterogeneity of the interventions and outcome measures, statistical pooling via meta-analysis was not possible. The results are presented in narrative form.

## **Review Results**

### ***Description of studies***

A total of 16,357 citations were identified by the comprehensive search of the literature. After a review of the titles and the following keywords: continuity of care, home care, home health care, patient satisfaction, readmission and rehospitalisation, 15,968 citations were excluded. Abstracts were reviewed on 389 papers and 289 were excluded. One hundred full text papers were then retrieved for further review, as additional information beyond the abstracts was needed to determine if the paper met the inclusion criteria for this review. After reviewing the full text articles, 96 were excluded for not meeting the inclusion criteria. Four articles were appraised for methodological quality and all were included in the review. Figure 1 outlines the stages of identification and retrieval of studies for inclusion. Details of included studies may be found in Appendix V. See Appendix VI for the list of excluded studies and the reasons for exclusion.



Figure 1. Flowchart stages of identification and retrieval of studies for inclusion

Two studies were RCT's, of which both addressed hospital readmission rates and patient satisfaction.<sup>15,16</sup> Two studies were quasi-experimental, one<sup>17</sup> addressed readmissions alone while the second study<sup>18</sup> addressed patient satisfaction in addition to hospital readmission rates.

Three<sup>15,16,17</sup> out of the four studies included patients age 62 or older while one study<sup>18</sup> did not specify the age range of the participants. One RCT<sup>15</sup> and one quasi-experimental study<sup>17</sup> included advance practice nurses (APNs) in the intervention while one quasi-experimental study<sup>18</sup> used a nurse case manager.

The length of follow-up for the studies ranged from two to 24 months. Three studies were conducted in the United States<sup>15,16,17</sup> and the fourth study<sup>18</sup> was conducted in Spain.

The Counsell<sup>15</sup> study was an RCT that was conducted with the goal of assessing readmission rates and patient satisfaction over the course of 24 months after implementation of the prescribed intervention. It took place in six community based health centres associated with a university-affiliated urban health care system in Indianapolis, Indiana (United States). The physicians were randomised using a pseudorandom-number generator program. The physicians were not informed of their randomisation status but the intervention physicians became aware of their status when the Geriatric Resources for Assessment and Care of the Elders (GRACE) intervention team personnel contacted them about their patients. Patients were not informed of their randomisation status by the project manager until they consented to participate in the clinical trial and completed the baseline interview. All patients were aged 65 years or older with an annual income less than 200% of the federal poverty level. The intervention group (n = 474) received services that commenced in the home with a nurse practitioner and social worker, the GRACE support team, who performed a comprehensive patient assessment. The GRACE support team then met weekly with an interdisciplinary geriatrics group led by a geriatrician, to discuss findings and develop an individualised care plan. Prior to implementation, the support team met with the patient's primary care provider to review the strategy and formulate appropriate changes. The individualised care plan consisted of activating the GRACE protocol and corresponding team suggestions for evaluating and managing common geriatric conditions. The support team met with the patient via face-face contact upon activation of the individualised care plan. After the initial implementation of the GRACE model a minimum combination of: one in home follow up visit to review the care plan, one telephone or face to face contact per month, and additional face to face home visits after an emergency department visit or hospitalisation were done. In the intervention group additional visits were made as necessary to carry out individualised care plans. The control group (n = 477) patients received usual care, which involved having access to all primary and specialty care services. The care was administered over 24 months. The authors evaluated a subpopulation within the full sample. They labelled this subgroup "high risk for hospitalisation". Patients were given a probability of repeated admission (PRA) score based on age, sex, perceived health, availability of an informal caregiver, heart disease, diabetes, physician visits, and hospitalisations. Patients with a PRA score of 0.4 or higher were considered at high risk of hospitalisation. The number of participants in this high-risk subpopulation included 112 patients in the intervention group and 114 patients in the control group. The outcome measure of patient satisfaction was evaluated through surveys with responses concerning care received ranging from excellent to poor. Readmission rates were obtained through a regional health information exchange.

The Feldman<sup>16</sup> study, an RCT, took place in a large urban, non-profit home health agency in the United States. There was randomisation of the nurses to an intervention or control group, though the authors did not describe the process of randomisation. The outcomes assessed included readmission rates and

patient satisfaction. The patients were 65 years or older with a primary diagnosis of health failure. Patients were typically very ill, frail and elderly, with an average age of 81 years old. Two thirds (68%) were admitted to home care following an acute inpatient hospital stay and one third was admitted directly from the community. The intervention consisted of using the Health Outcomes, Management and Evaluation (HOME) Plan, which is an adaptation of the heart failure guideline developed by the Agency for Health Care Policy and Research. The HOME Plan outlines twelve specific objectives to be achieved by the nurse within nine visits over a four-week period. The control group (n= 276) received usual care from the nurse. The intervention group (n = 254) received usual care from the nurse, which was augmented with the HOME Plan. Patient satisfaction was reviewed 30 days following entry into the study. Patient satisfaction was obtained from a telephone interview after 30 days of being admitted to the agency using a modified 19 item version of the Reeder-Chen "Satisfaction with Home Health Care" instrument. Hospital re-admission rates were identified through review of Medicare claim forms obtained through Health Care Financing Administration records.

The Neff <sup>17</sup> study was a quasi-experimental trial that took place in a large multidisciplinary agency that services four counties (metropolitan and rural areas) in Ohio (United States). The outcome measure of interest to this review was re-hospitalisation. The patient's county of residence dictated the assignment to either the intervention or control group. The intervention group resided in the metropolitan area while control group resided in the rural area. The subjects were aged 62 years or older with a primary or secondary diagnosis of chronic obstructive pulmonary disease (COPD) and primarily insured by Medicare. The intervention group (n = 41) patients received services from a pulmonary care registered nurse (RN) or licensed practical nurse (LPN) who were supervised and directed by a cardiopulmonary care APN specialist. Care included home visits and telephone contacts. The APN specialist was also available by phone 24 hours a day. Aside from the supervisory role, the APN was a resource and educator for both nurses and patients. The control group (n = 39) received primary nursing care services by RN/LPN with generalised skills. Data were collected from the point home care services were initiated (time 1) to the termination of home care services (time 2). Readmission rate assessment was determined through home health care patient record review. Patient satisfaction was not evaluated in this study.

The Morales-Asencio <sup>18</sup> study was a quasi-experimental prospective trial that assessed patient satisfaction and readmissions. This was a multi-centred study that took place in four districts in Andalusia, Spain. They did stratified, consecutive sampling of all patients enrolled in the program, first by district, secondly by healthcare centre, and thirdly by group of home care services. A new model was being introduced into each of the various districts over the time period of 2002-2006. The assignment to the intervention group or the control group was based on whether the patient's home care centre was using the new model. The model consisted of two tiers of case management decision-making. In the first level, the decisions are made by general practitioners and family nurses, while a second level is led by case management nurses. There is a professional responsible for case management at the primary level of healthcare. The patients were terminally ill with progressive, incurable, multi-symptomatic disease, and dependent on someone else to assist them with their activities of daily living. The intervention group received care primarily from the community nurses and general practitioners with the support of social health workers, physiotherapists, and occupational therapist with the addition of a nurse case manager. The nurse case manager had advanced roles and was hired based on higher qualifications than the community nurses. The control group received care primarily from the community nurses, general practitioners, social health

workers, physiotherapists, and occupational therapist without the addition of a nurse case manager. Patient satisfaction was measured through a questionnaire called SATISFAD, a survey that was validated for use with home care services. Readmissions were assessed through review of the Nursing Outcomes Classification Codes.

### **Methodological quality**

Two RCTs and two quasi-experimental studies were assessed for methodological quality using the JBI-MAStARI Critical Appraisal Tools for a Randomised Control Trial/Pseudo-randomised Trial (Appendix III). Randomised/pseudo-randomised and quasi-experimental studies were included that matched criteria of the appraisal tools if at least six out of ten questions were answered as yes. A total of four studies were included in the final review, two RCTs<sup>15,16</sup> and two quasi-experimental studies.<sup>17, 18</sup>

### **Methodological quality of RCTs**

In the Counsell study,<sup>15</sup> the physicians were the point of randomisation to minimise the potential for contamination. The physicians were randomised from a stratified list formed by teaching status (faculty or resident) using the pseudorandom-number generator program called Random Number Generator for Discrete data using Alias (RNGDA) method. The control and treatment groups were comparable based on inclusion criteria of age 65 years or older, an established patient with at least one clinic visit in the past twelve months, and an income less than two hundred percentage below federal poverty level. It was not double blinded. The physicians were notified of their randomisation status but the intervention physicians became aware of their status when the Geriatric Resources for Assessment and Care of the Elders (GRACE) intervention team personnel contacted them about their patients. Patients were not informed of their randomisation status by the project manager until after consent to participate was obtained for the clinical trial. The outcome measures were reliable as evidenced by the Medical Outcome 36-Item Short-Form (SF-36) and the appropriate statistical analyses were used for between group comparisons by using t test for continuous variables, chi squared test for categorical variables, and mixed-effects regression models to assess the intervention effect on the change between baseline and the 24 month measurements.

In the Feldman study,<sup>16</sup> the nurses were randomised to either the intervention or the control group. It was not described by the authors how this randomisation occurred. The control and treatment groups were comparable based on inclusion criteria of having the same primary diagnosis of congestive heart failure and age of 65 years or older. There was no double blinding, concealed allocation or blind assessment. The reliability of the outcomes were validated by the use of validated instruments such as the Mini-Mental Status Examination (MMSE), Minnesota Living with Heart Failure Questionnaire (LHFQ), Reeder-Chen *Satisfaction with Home Health Care* instrument and the matching patient record to the National Death Index (NDI). Patient mortality was analysed using a Cox proportional hazard regression model.

**Methodological quality of Quasi-experimental studies**

In the Neff study<sup>17</sup>, a convenience sampling procedure was used. The control and treatment group were comparable because of the inclusion criteria including but not limited to gender, age, marital status and socioeconomic status. The patients were assigned to the intervention group or control group based on their county of residence. The outcomes measures were reliable based on the use of the OASIS instrument that had a Cronbach alpha of 0.88 for activities of daily living (ADL) items and 0.87 for instrumental activities of daily living (IADL) items as surveyed from admission to discharge. The appropriate statistical analyses were used.

Morales-Ascencio<sup>18</sup> was a quasi-experimental that used a stratified, consecutive sampling of all patients participating in the study. The first stratification was district, secondly by the healthcare centre and thirdly by group of home care services. The treatment and control group were comparable by the sample number in both groups, characterisation variables, variable related to clinical outcome and quality of life and variables related to the use and delivery of services. They used the Barthel index average 48.84 (SD 32.44), Lawton-Brody average 1.92 (SD 2.09), Pfeiffer test average 2.64 (SD 3.13) and Zarit test average value 58.50 (SD 14.8) to assess the multi-dimensional assessment of the patients' activities of daily living and instrumental task. The authors also used a second model to capture the assumption regarding independence of residuals with a Durbin-Watson statistical value of 1.65.

**Table 1. Results of the critical appraisal**

Citation	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q98	Q9	Q10	Comments
Counsell <sup>15</sup>	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	9 out of 10
Feldman <sup>16</sup>	U	U	U	Y	U	Y	Y	Y	Y	Y	6 out of 10, strong statistical analysis
Neff <sup>17</sup>	NA	Y	Y	Y	Y	N	N	Y	Y	N/A	6 out of 8
Morales-Ascencio <sup>18</sup>	NA	N	Y	U	Y	Y	N	Y	Y	N/A	5 out of 8

Y = Yes; N= No; U=Unclear; NA= Not Applicable

## Results

The four included studies<sup>15,16,17,18</sup> provided evidence to address the two following review questions.

### **What continuity of care interventions are most effective in improving patient satisfaction in adult patients receiving home care services?**

The Counsell study<sup>15</sup> was an RCT designed to test the GRACE intervention on health outcomes of low-income seniors living in the community. This two-year study reported patient satisfaction as slightly higher, though not statistically significant in the intervention group. In the intervention group, 66% of patients rated their overall satisfaction with care as very good or excellent as compared with 63% of those receiving usual care at 24 months ( $p=0.31$ ).

The Feldman study<sup>16</sup> was an RCT where usual care was augmented with the HOME Plan for patients with heart failure. Thirty days following study entry, patients were interviewed by telephone and asked to respond to a modified 19-item version of the Reeder-Chen instrument. Responses to patient satisfaction interviews were strongly biased toward the ceiling, as is often the case with satisfaction measures. There was no statistically significant difference in patients whose nurses received the intervention than those whose nurses did not receive the intervention. The authors did not report their actual data for this outcome. Patients with higher scores on the Living with Heart Failure Questionnaire at baseline, and those who had higher mental status scores, were more likely to be satisfied. Those who were not married (widowed, never married, separated, or divorced) were less likely than those who were married to report complete satisfaction. This was regardless of the intervention.

The Morales-Asencio study<sup>18</sup> a quasi-experimental, non-randomised, multi-centre study, consisted of a nurse-led management model, whereby a case manager supervised the community nurse. Mean differences was measured with the Barthel Index. The researchers determined a higher satisfaction rate amongst intervention patients with a mean difference of 16.88 (95%CI: 16.32-17.43) compared with 14.65 (95%CI: 13.61-15.68) in the control group ( $p=0.001$ ). This study found statically significant higher satisfaction rate among the intervention group.

### **What continuity of care interventions are most effective in reducing all-cause hospital readmission rates among adults receiving home care services?**

In the Counsell study,<sup>15</sup> an RCT evaluating the GRACE intervention, there was no significant difference in admission rates per 1000 at year one in the intervention group compared with the control group (384 [n=474] vs. 358 [n=477];  $p=0.66$ ). There was also no significant difference between intervention and control groups in hospital admission rates per 1000 at year two (700 [n=474] vs. 740 [n=477];  $p=0.66$ ).

Patients that were considered high risk for readmission based on PRA score were analysed for differences in acute care utilisation similar to the full sample. In this high-risk subgroup, there was no statistically significant difference in hospital admissions per 1000 between then intervention and control groups after the first year (705 [n=112] vs. 798 [n=114],  $p=0.60$ ). There was a statistically significant lower rate of hospital admission per 1000 for intervention patients compared to the control group in the second year (396 [n=106] vs. 705 [n=105],  $p=.03$ ).

In the Feldman study<sup>16</sup> an RCT evaluating the HOME plan, the researchers performed a Cox proportional hazard model of hospitalisation risk in order to adjust for the potential influence of prior hospitalisations. It was noted that 64 patients (35%) served by control nurses and 68 patients (36%) served by intervention nurses were readmitted to a hospital within 90 days following their initial admission to home care.

The intervention showed an increase in readmissions, there were 4 additional patients from the intervention group admitted to the hospital in comparison to the control group, however the study authors reported this as “not quite marginally significant” with  $p=0.107$ .<sup>16, p. 13</sup> The cut-off point for significance is not specified by the study authors. When looking at the subgroup of patients who were admitted to home care upon discharge from the hospital, as compared to those admitted to home care from the community, the study authors report a decrease in readmissions that was “marginally significant” with  $p=0.058$ .<sup>16, p. 13</sup> These results suggest a trend among patients of intervention nurses towards a lower rate of hospital readmission among those admitted to home care from the hospital. The overall results of this study show no statistically significant differences in readmission between the intervention and control groups.

In the Morales-Asencio study,<sup>18</sup> a quasi-experimental study utilising a case manager as part of the home care team, the aim was to determine the effectiveness of a new case-management based, home care delivery model. While the mean number of hospital readmissions per patient was higher in the intervention group compared to the control group (0.75; 95% CI: 0.47-1.03 vs. 0.66; 95% CI: 0.40-0.91;  $p=0.599$ ), there were no statistically significant differences in hospital readmissions between the intervention and control group.

The Neff study<sup>17</sup> was a quasi-experimental study that evaluated the effects of adding an APN with cardiopulmonary specialisation to the home care team. There were statistically significant fewer readmissions in the intervention group compared to the control group at discharge from home care (4 vs. 11,  $p<0.05$ ). A significant higher number of intervention group patients in the APN group were discharged and remained at home (34 or 82.9%), compared to the control group (20 or 51.3%) (chi square = 9.07,  $p<0.05$ ). There was a significant difference between the intervention and control group.

## Discussion

The objectives of this review were to identify the best evidence related to the effectiveness of continuity of care interventions and how they impact patient satisfaction and hospital readmission rates in the adult patient who is receiving home care services. In the review, there were four included studies: two RCTs<sup>15,16</sup> and two quasi-experimental studies.<sup>17,18</sup> Three of the studies<sup>15,16,17</sup> addressed hospital readmission and patient satisfaction and the fourth study<sup>17</sup> addressed hospital readmission alone.

Two<sup>15,17</sup> of the four studies in this review that assessed the outcome measures of hospital readmissions were able to demonstrate a positive impact on intervention patients. Although these trials differed in design and some baseline characteristics, there were some shared commonalities. Both studies involved APNs as leaders and acting as a liaison between other providers as well as the patient. Both studies were based on specialised teams. In the Neff<sup>17</sup> trial, team members were specifically trained in the care of the patient with chronic pulmonary disease. In Counsell,<sup>15</sup> team members were specialists in the field of geriatrics. Collaboration was a key component to the interventions in both of these trials. Both interventions had specialists that could be relied on for disease management concerns. Finally, the two



studies demonstrated positive outcomes in high-risk patient populations. In fact, in the Counsell<sup>15</sup> RCT, it was only with the high-risk population that reduced readmissions were noted.

In terms of patient satisfaction, the only study was able to demonstrate a statistical significance in comparison with the control group was the case manager trial by Morales-Asencio.<sup>18</sup> It is unclear why in this particular study patient satisfaction was improved with the case manager as compared to the other two trials, which had consistent patient contact and follow-up. This was the only study conducted outside the United States. The Spanish healthcare system may have had an influence on the study results. It is not possible to clearly state based on this one study that a particular action will improve patient satisfaction in the home care setting. All of the three studies<sup>15,16,18</sup> that reported on this outcome revealed that their subjects were generally happy with their care. Both control and treatment patients in all three studies received consistent home care services. This consistency and structure may have led to patient satisfaction.

The intervention that used APNs, as demonstrated in the Neff<sup>17</sup> and Counsell<sup>15</sup> studies, may have an advantage in decreasing hospital readmission rates specifically in high-risk populations. The APNs in the Counsell<sup>15</sup> study did not show a significant improvement in patient satisfaction and the cause is unclear. Despite this one finding, the use of APNs should still be considered in home care services.

The studies in this review that had an intervention where the healthcare provider had specialised training and/or education demonstrated improved outcomes. In the Neff study,<sup>17</sup> team members were specifically trained in the care of the patient with chronic pulmonary disease and the study showed a decrease in hospital readmission rates. The Counsell study<sup>15</sup> had a geriatrics interdisciplinary team led by a geriatrician and this study demonstrated a decrease in hospital admission rates. The Morales-Asencio study<sup>18</sup> had the nurse case manager who had an advanced role and higher qualification, which was not explicitly discussed within the article, had a higher rate of patient satisfaction. Therefore, in three out of the four included studies additional or specialised training and/or education lead to an improvement in patient outcomes. The interventions that were led by RNs, community nurses, and/or LPNs who were trained in a specific home care model and/or disease process also demonstrated improved outcomes.

Another theme identified in three studies included in this review involved collaboration among health care providers. An interdisciplinary team effort may lead to improved outcomes. Collaboration of various disciplines enables the patient to receive a more holistic approach to their medical condition. The various disciplines can take their best resources and apply them to the patient and their condition. The interdisciplinary team would be working together to enhance services to the patient and possibly provide complementary services.

There is very little research on home care with regards to continuity of care and hospital readmissions or patient satisfaction. This review suggests that a collaborative team with specialised clinicians, combined with APN involvement in a high-risk population, may lead to reduced readmission rates. Consistent home care services with strong follow-up may lead to higher patient satisfaction ratings.

### **Limitations of the review**

This review included two RCTs and two quasi-experimental studies. One of the studies did not identify the age of the population studied.<sup>18</sup> Statistics used to analyse data varied widely. The variation in the duration of study periods of the included studies review did not allow for natural trends to occur. The

studies used community nurses, nurse case manager and APNs, whereas one study<sup>16</sup> was specifically protocol driven. The study populations were recruited from single<sup>16,17</sup>, multicentre<sup>15,18</sup>, and multidistrict settings<sup>18</sup>, the constant variable was all participants were eligible for home care services. Although all of the interventions took place in an urban setting, three<sup>15,16,17</sup> were based in the United States and one<sup>18</sup> in Spain. Results from these studies cannot be generalised to other healthcare systems. Rural or suburban areas were not evaluated in the articles reviewed. Large cities may have more resources and diversity among common diagnoses. Due to the heterogeneity amongst studies, the results of the outcomes were not generalisable to the other populations of persons with different diagnostic categories.

Three of the four articles included patients who were age 62 years and older. Age specific competencies were not identified in the literature for the adults aged 18 to 64 years old. This age range may also have different teaching and learning styles that should be addressed. Two of the four studies were disease specific while other studies assessed other specific patient characteristics. There was limited research in regards to all-cause home care services.

This review focused on at home care interventions that started with the patients in the home and did not look at pre discharge care that led to the home care services. Transitional care models were not included in order to obtain a clearer look at the concept of continuity of care in home care and the relationship to hospital readmission and patient satisfaction.

## Conclusions

This review indicates that collaboration with an interdisciplinary team, as well as, specialised training and/or education of nurses to care for a specific population provides the greatest potential for reducing hospital admissions. The review also suggests that the patient population best impacted by continuity of care interventions includes those at high risk for re-hospitalisations. The studies did not reveal any one specific intervention that improved patient satisfaction. It was demonstrated that the provision of consistent, regularly scheduled home care visits does improve patient satisfaction in comparison with the absence of these services.

### *Implications for practice*

This review suggests that the utilisation of an APN with specialised training in a specific disease process in collaboration with a multidisciplinary team can affect readmission rates and patient satisfaction (Level 2; JBI Levels of evidence<sup>19</sup>).

The care provided by APNs in the United States has been based on providing a patient with a comprehensive health assessment while teaching and educating the patient and family about health promotion and disease prevention. Some roles an APN may hold are the direct provider of care, consult or liaison to other nurse generalists or to other types and levels of provider, or the supervisor of the home care services. The APN can be an expert for whom other healthcare team member can collaborate with in providing a patient with an appropriate and comprehensive approach to health care services and delivery.

The APN directed and/or an interdisciplinary intervention with specialised clinicians led to decreased hospital readmission rates in the studies included in this review. Investment in nurse training of specific disease processes has the potential to improve patient outcomes, particularly in regards to health care utilisation (Level 2). The nurse as an educator provides an opportunity to learn the needs, wants, and

desires of the patient and/or family members. The understanding of the patient and family's needs while in the home setting may allow for adjustments to be made and addressed early. Early intervention may also help decrease the number of patients returning to the hospital.

### ***Implications for research***

Future research should be directed toward further defining continuity of care and home care in relation to the effects on hospital readmission and patient satisfaction. There is also the need to see if the same interventions are effective on adult patients with chronic conditions across the lifespan that require home care services. There should be further investigation in the cost-effectiveness of the role of the APN in the provision of continuity of care in the home care setting in terms of reducing hospital readmissions. Cultural aspects of the patients should be evaluated as a variable in future studies. There needs to be further exploration of the link between patient satisfaction and specific continuity of care interventions. Although continuity has been examined in a variety of health care settings, there is limited research in the home care setting, thereby providing an opportunity to further explore this health care sector through new inquiries.

### ***Conflicts of Interest***

There are no conflicts of interest regarding this systematic review.

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**Appendix I: Search Strategy**

<b>Via EBSCOhost</b>	<b>ID #</b>	<b>Keywords/ MeSH</b>	<b>Citations</b>
<b>CINAHL</b>	S1	“home care”	
	S2	(MH “Home Health Care”) OR “home health care”	
	S3	“visiting nurse *”	
	S4	“home based”	
	S5	“community health nursing”	
	S6	(MH “Frontier Nursing Service”) OR “frontier nursing service”	
	S7	S1 or S2 or S3 or S4 or S5 or S6	
	S8	(MH “Continuity of Patient Care” ) OR “continuity of patient care”	
	S9	“care pathways” or interdisciplinary or “integrated care” or continuity or “patient care team” or multidisciplinary” or “primary health care” or “patient centred” or “integrated health care delivery”	
	S10	(MH “Patient Centered Care”) OR “patient centered care”	
	S11	(MH “Health Care Delivery, Integrated”) OR “health care delivery, integrated”	
	S12	(MH “Multidisciplinary Care Team” OR “multidisciplinary care team”	
	S13	S8 or S9 or S10 or S11 or S12	
	S14	(MH “readmission”) OR “readmission”	
	S15	Rehospitalisation or rehospitalization or “re-hospitalisation” or “re-hospitalization”	
	S16	(MH “Patient Satisfaction”) or “patient satisfaction”	
	S17	Readmit*	
	S18	S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17	
	S19	S7 and S13 and S18	<b>3853</b>
<b>Academic Search Premier</b>		S7 and S13 and S18	<b>1158</b>
<b>Health Source Nursing Academic</b>		S7 and S13 and S18	<b>590</b>
<b>PsychInfo</b>		S7 and S13 and S18	<b>797</b>
<b>ERIC</b>		S7 and S13 and S18	<b>82</b>

Database Searched		Keywords/MeSH	Citations
<b>MEDLINE via Pubmed</b>		((("Home care services"[MeSH Term] OR ("home" [All Fields]	
	AND	"care" [All Fields]	
	AND	"services" [All Fields] OR "home care services" [All Fields]	
		) OR ("home care agencies" [MeSH Terms] OR ("home" [All Fields]	
	AND	"care" [All Fields]	
	AND	"agencies" [All Fields] OR "home care agencies" [All Fields])	
		OR ("home care services, hospital-based" [MeSH Terms] OR ("home" [All Fields]	
	AND	"care" [All Fields]	
	AND	"services" [All Fields]	
	AND	"hospital-based" [All Fields] OR "hospital-based, home care services" [All Fields]	
	AND	"care" [All Fields]	
	AND	"services" [All Fields]	
	AND	"hospital" [All Fields]	
	AND	"based" [All Fields] or "home care services, hospital based" [All Fields]	
		OR ("community health nursing" [MeSH Terms] OR ("community" [All Fields]	
	AND	"health" [All Fields]	
	AND	"nursing" [All Fields] OR "community health nursing" [All Fields] OR "home care" [All Fields]	
		OR "home-based" [All Fields] OR "visiting nurse" [All Fields] OR "visiting nurse" [All Fields]	
		OR "frontier nursing services" [All Fields])	
	AND	((("continuity of patient care" [MeSH Terms] OR ("continuity" [All Fields]	
	AND	"patient" [All Fields]	
	AND	"care" [All Fields] OR ("continuity of patient care" [All Fields])	
		OR "care pathways" [All Fields] OR "integrated care" [All Fields] OR interdisciplinary [All Fields]	
		OR "continuity" [Journal] OR "continuity" [All Fields] OR	

		("patient care team" [MeSH Terms] OR ("patient" [All Fields])	
	AND	"care" [All Fields]	
	AND	"team" [All Fields] OR "patient care team" [All Fields] OR ("interdisciplinary studies" [MeSH] OR ("interdisciplinary "[All Fields])	
	AND	"studies" [All Fields] OR "interdisciplinary studies" [All Fields] OR "multidisciplinary " [All Fields] OR ("primary health care" [MeSH Terms] OR ("primary " [All Fields]	
	AND	"health" [All Fields]	
	AND	"care" [All Fields] OR "primary health care" [All Fields]) OR ("patient –centered care" [MeSH] OR ("patient-centered" [All Fields]	
	AND	"care" [All Fields] OR "patient-centered care" [All Fields] OR ("patient" [All Fields]	
	AND	"care" [All Fields]) OR "patient centered care [All Fields]) OR "patient centred" [All Fields] OR "integrated health care delivery" [All Fields] OR "multidisciplinary care team" [All Fields]))	
	AND	(readmission [All Fields] OR ("re-hospitalisation" [All Fields] OR "re-hospitalization [All Fields] OR (rehospitalization [All Fields] OR rehospitallisation [All Fields]) OR ("patient satisfaction" [MeSH Terms] OR ("patient " [All Fields] AND "readmission" [All Fields]) OR "patient readmission" [All Fields] ))	
	AND	"satisfaction" [All Fields]) OR "patient satisfaction" [All Fields] OR (readmit [All Fields] OR readmittances [All Fields] OR readmits [All Fields] OR readmits/ encourage [All Fields] OR readmittance [All Fields] OR readmittances [All Fields] OR readmitted [All Fields] OR readmitted/referred [All Fields] OR readmitted' [All Fields] OR readmitting [All Fields] OR readmittance [All Fields] OR (" patient readmission"[MeSH Terms] OR (" patient" [All Fields] AND "readmission" [All Fields]) OR "patient readmission" [All Fields] ))	
	AND	"readmission" [All Fields]) OR "patient readmission" [All Fields] ))	<b>1237</b>



Database Searched		Keywords/MeSH	Citations
<b>New York Academy of Medicine</b>		("home care " OR home care services" OR "home care agencies" OR "home health care" OR "visiting nurses OR "home-based" OR "community health nursing" OR "visiting nurse")	
	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR "patient centered" OR "multidisciplinary care team" OR "integrated health care delivery")	
	AND	(readmission OR "re-hospitalization" OR rehospitalization OR "patient satisfaction" OR readmit* OR "patient readmission")	<b>0</b>
<b>Virginia Henderson Library International of Sigma Theta Tau</b>		("home care " OR home care services" OR "home care agencies" OR "home health care" OR "visiting nurses OR "home-based" OR "community health nursing" OR "visiting nurse")	
	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR "patient centered" OR "multidisciplinary care team" OR "integrated health care delivery")	
	AND	(readmission OR "re-hospitalization" OR rehospitalization OR "patient satisfaction" OR readmit* OR "patient readmission")	<b>0</b>
<b>ProQuest Health Management (allied health nursing)</b>		("home care " OR home care services" OR "home care agencies" OR "home health care" OR "visiting nurses OR "home-based" OR "community health nursing" OR "visiting nurse")	
	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR	

		“patient centered” OR “multidisciplinary care team” OR “integrated health care delivery”)	
	AND	(readmission OR “re-hospitalization” OR rehospitalization OR “patient satisfaction” OR readmit* OR “patient readmission”)	<b>488</b>
<b>Biomed Central</b>		(“home care “ OR home care services” OR “home care agencies” OR “home health care” OR “visiting nurses OR “home-based” OR “community health nursing” OR “visiting nurse”)	
	AND	(“continuity of patient care” OR “care pathways” OR “integrated care” OR interdisciplinary OR continuity OR “patient care team” OR multidisciplinary OR “primary health care” OR “patient centered care” OR “patient centered” OR “multidisciplinary care team” OR “integrated health care delivery”)	
	AND	(readmission OR “re-hospitalization” OR rehospitalization OR “patient satisfaction” OR readmit* OR “patient readmission”)	<b>0</b>
<b>Google Scholar</b>		(“home care “ OR home care services” OR “home care agencies” OR “home health care” OR “visiting nurses OR “home-based” OR “community health nursing” OR “visiting nurse”)	
	AND	(“continuity of patient care” OR “care pathways” OR “integrated care” OR interdisciplinary OR continuity OR “patient care team” OR multidisciplinary OR “primary health care” OR “patient centered care” OR “patient centered” OR “multidisciplinary care team” OR “integrated health care delivery”)	
	AND	(readmission OR “re-hospitalization” OR rehospitalization OR “patient satisfaction” OR readmit* OR “patient readmission”)	<b>7340</b>
<b>ProQuest Allied Health Nursing</b>		(“home care “ OR home care services” OR “home care agencies” OR “home health care” OR “visiting nurses OR “home-based” OR “community health nursing” OR “visiting nurse”)	

	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR "patient centered" OR "multidisciplinary care team" OR "integrated health care delivery")	
	AND	(readmission OR "re-hospitalization" OR rehospitalization OR "patient satisfaction" OR readmit* OR "patient readmission")	<b>488</b>
<b>Cochrane Central Register of Controlled trials (CENTRAL)</b>		("home care " OR home care services" OR "home care agencies" OR "home health care" OR "visiting nurses OR "home-based" OR "community health nursing" OR "visiting nurse")	
	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR "patient centered" OR "multidisciplinary care team" OR "integrated health care delivery")	
	AND	(readmission OR "re-hospitalization" OR rehospitalization OR "patient satisfaction" OR readmit* OR "patient readmission")	<b>75</b>
<b>UpToDate</b>		("home care " OR home care services" OR "home care agencies" OR "home health care" OR "visiting nurses OR "home-based" OR "community health nursing" OR "visiting nurse")	
	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR "patient centered" OR "multidisciplinary care team" OR "integrated health care delivery")	
	AND	(readmission OR "re-hospitalization" OR rehospitalization OR "patient satisfaction" OR readmit* OR "patient readmission")	<b>0</b>

<b>World Health Organization(WHO)</b>		("home care " OR home care services" OR "home care agencies" OR "home health care" OR "visiting nurses OR "home-based" OR "community health nursing" OR "visiting nurse")	
	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR "patient centered" OR "multidisciplinary care team" OR "integrated health care delivery")	
	AND	(readmission OR "re-hospitalization" OR rehospitalization OR "patient satisfaction" OR readmit* OR "patient readmission")	<b>118</b>
<b>Robert Wood Johnson</b>		("home care " OR home care services" OR "home care agencies" OR "home health care" OR "visiting nurses OR "home-based" OR "community health nursing" OR "visiting nurse")	
	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR "patient centered" OR "multidisciplinary care team" OR "integrated health care delivery")	
	AND	(readmission OR "re-hospitalization" OR rehospitalization OR "patient satisfaction" OR readmit* OR "patient readmission")	<b>2</b>
<b>Health Reference Center</b>		("home care " OR home care services" OR "home care agencies" OR "home health care" OR "visiting nurses OR "home-based" OR "community health nursing" OR "visiting nurse")	
	AND	("continuity of patient care" OR "care pathways" OR "integrated care" OR interdisciplinary OR continuity OR "patient care team" OR multidisciplinary OR "primary health care" OR "patient centered care" OR "patient centered" OR "multidisciplinary care	

		team” OR “integrated health care delivery”)	
	AND	(readmission OR “re-hospitalization” OR rehospitalization OR “patient satisfaction” OR readmit* OR “patient readmission”)	<b>0</b>

Database Searched	Search ID	Keywords/MeSH	Citations
<b>EMBASE</b>	#1	(Continuity of care)	
	#2	continuity	
	#3	continuity AND (‘patient’/exp OR patient’) AND care	
	#4	#1 OR #2 OR #3	
	#5	‘home’/exp OR home AND care	
	#7	‘home’/exp OR home AND care AND (‘nurse’/exp OR nurse	
	#8	‘home’/exp OR home AND (‘health’/exp OR health)	
	#9	‘home’/exp OR home AND (‘health’/exp OR health) AND care	
	#10	‘home’/exp OR home AND (‘health’/exp OR health) AND care AND services	
	#11	‘home’/exp OR home AND (‘health’/exp OR health) AND (‘nurse’/exp OR nurse)	
	#12	‘home’/exp OR home AND (‘health’/exp OR health) AND services	
	#13	#5 OR #6 OR #7 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12	
	#14	‘patient’/exp OR patient AND(‘satisfaction’/exp OR satisfaction)	
	#15	#4 AND #13 AND #14	<b>111</b>
	#16	continuity AND of AND care	
	#17	continuity	
	#18	continuity AND of AND (‘patient’/exp OR patient) AND care	
	#19	#16 OR #17 OR #18	
	#20	readmission	
	#21	‘hospital’/exp OR hospital AND readmission	
	#22	‘re hospitalization’	
	#23	#20 OR #21 OR #22	
	#24	#13 AND #19 AND #23	<b>18</b>

**Appendix II: Keywords/search terms used for the search strategy**

Home care (KW)

Home care services (MeSH)

Home care agencies (MeSH)

Home health care (CINAHL)

Visiting nurse (KW)

Home-based (KW)

Home Care Services, Hospital Based (MeSH)

Community health nursing (KW)

Frontier Nursing Service (CINAHL)

Continuity of patient care (MeSH, CINAHL)

Care pathways (KW)

Integrated care (KW)

Interdisciplinary (KW)

Continuity (KW)

Patient care team (MeSH)

Multidisciplinary (KW)

Primary health care (MeSH)

Patient centered care (MeSH, CINAHL)

Patient centred (KW)

Health Care Delivery, Integrated (CINAHL)

Multidisciplinary care team (CINAHL)

Integrated health care delivery (KW)

Readmission (CINAHL)

Re-hospitalization (KW)

Patient satisfaction (MeSH, CINAHL)

Readmit\* (KW)


Patient readmission (MeSH)

Rehospitalisation (KW)

Re-hospitalisation (KW)

KW: Keyword

**Appendix III: MASTARI critical appraisal tool**



**MAStARI - Meta Analysis of Statistics Assessment and Review Instrument**

[Reviews](#)      [Study](#)      [Logout](#)      [About](#)

Select

Detail

Assessment

Extraction

Results

Meta-Analysis

**Assessment for : Author - Journal (2011)**

Type: Primary

User: catalin1

Design: Randomised Control Trial / Pseudo-randomised Trial

Criteria	Yes	No	Unclear	Not Applicable	Comment
1) Was the assignment to treatment groups truly random?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
2) Were participants blinded to treatment allocation?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
3) Was allocation to treatment groups concealed from the allocator?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
4) Were the outcomes of people who withdrew described and included in the analysis ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
5) Were those assessing outcomes blind to the treatment allocation?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
6) Were the control and treatment groups comparable at entry?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
7) Were groups treated identically other than for the named interventions?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
8) Were outcomes measured in the same way for all groups?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
9) Were outcomes measured in a reliable way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>
10) Was appropriate statistical analysis used?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 80%;" type="text"/>

Include

Reason

**Appendix IV: Data Extraction Tool**

**JBI Data Extraction Form for Experimental/Observational Studies**

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Reviewer \_\_\_\_\_ Date \_\_\_\_\_  
 Author \_\_\_\_\_ Year \_\_\_\_\_  
 Journal \_\_\_\_\_ Record Number \_\_\_\_\_

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**Study Method**      RCT       Quasi-RCT       Longitudinal   
                          Retrospective       Observational       Other \_\_\_\_\_

**Participants**  
 Setting \_\_\_\_\_  
 Population \_\_\_\_\_  
 Sample size \_\_\_\_\_  
 Intervention 1 \_\_\_\_\_      Intervention 2 \_\_\_\_\_      Intervention 3 \_\_\_\_\_

**Interventions**  
**Intervention 1** \_\_\_\_\_  
 \_\_\_\_\_  
**Intervention 2** \_\_\_\_\_  
 \_\_\_\_\_  
**Intervention 3** \_\_\_\_\_  
 \_\_\_\_\_

**Clinical outcome measures**

Outcome Description	Scale/measure



**Study results**

Dichotomous data

Outcome	Intervention ( ) number / total number	Intervention ( ) number / total number

Continuous data

Outcome	Intervention ( ) mean & SD (number)	Intervention ( ) mean & SD (number)

**Authors Conclusions**

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**Comments**

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**Appendix V: Details of included studies**

<b>Author, Date, Country</b>	<b>Study Design</b>	<b>Sample Setting, Types of Participants, Sample Size</b>	<b>Duration of Study</b>	<b>Types of interventions and comparator</b>	<b>Outcome Measures for readmissions and Results</b>	<b>Outcome measures for patient satisfaction and results</b>
Counsell et al. <sup>15</sup> (2007), U.S.A.	Randomised controlled trial	Indigent patients age 65 and older receiving health care within the last 12 months at six community centres affiliated with Wishard Health Services in Indianapolis, Indiana. Intervention group: n=474 Control group: n=477 High-risk sample: Intervention group: n=112 Control group: n=114	24 months	Intervention: Advanced practice nurse and social worker made up the GRACE support team. The support team met with patients in the home to conduct an initial comprehensive geriatric assessment. The support team met with an interdisciplinary team, which included clinicians who were specialists in the field of geriatrics, to report findings and develop an individualised plan. The plan was discussed with the primary medical doctor in a face to face meeting. The support team then implemented the plan. The support team met with the patient	Hospital days were obtained from a regional health information exchange that captures health utilisation data. The subjects were divided into a subgroup of high risk patients through calculation of the probability of repeated admission (PRA). Results: Overall group 1 year hospitalisations intervention group vs. control group: 384 vs. 358 (P=0.66); 2 year hospitalisations intervention group vs. control group: 700 vs. 740	Survey with 5 options: excellent, very good, good, fair or poor. The percent of patients who rated satisfaction with care as very good or excellent: intervention group vs. control group: 66% vs. 63% (P=0.31)

				to review the care plan and then followed up with patient at least once a month and after any urgent care visits via telephone or in person. Additional visits were made as appropriate to implement the plan. The plan was reassessed annually. Control: usual care including access available to all services as part of usual care.	(P=0.66); High risk subgroup: 1 year hospitalisations intervention vs. control 705 vs. 798 (P=0.60); 2 year hospitalisations intervention vs. control: 396 vs. 705 (P=0.03)	
<b>Author, Date, Country</b>	<b>Study Design</b>	<b>Sample Setting, Types of Participants, Sample Size</b>	<b>Duration of Study</b>	<b>Types of interventions and comparator</b>	<b>Outcome Measures for readmissions and Results</b>	<b>Outcome measures for patient satisfaction and results</b>
Feldman et al. <sup>16</sup> (2004), U.S.A.	Randomised controlled trial	Large, urban, non-profit home health agency. Included patients newly discharged from a hospital and patients who entered home care from the community. Patients were age 65 years	90 days post enrolment in the home care study	Intervention: the HOME plan, a formal nursing protocol based on heart failure guidelines, including a consumer oriented self care guide. The nurse received training to improve patient teaching skills. The nurse's goal was to meet 12	Data was collected from Medicare claims record. 68 (36%) intervention patients and 64 (35%) control patients were readmitted within 90 days. Patients receiving home care after a hospitalisation compared with	Telephone interview conducted 30 days post admission to home care using a modified version of the 19-item Reeder-Chen Satisfaction with Home Health are

		<p>or older with a primary diagnosis of heart failure.                  Intervention group: n=188                  Control group: n=183</p>		<p>objectives over 9 home visits in a 4 week period. The agency employed a cardiopulmonary nurse specialist who held monthly meetings to assist nurses with issues surrounding care of heart failure patients.                  Control: usual care</p>	<p>patients from the community admitted to home care had a decreased chance of readmission (P=0.058)</p>	<p>instrument. There was no statistically significant difference in satisfaction between groups (numerical data was not provided by study authors).</p>
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Author, Date, Country	Study Design	Sample Setting, Types of Participants, Sample Size	Duration of Study	Types of interventions and comparator	Outcome Measures for readmissions and Results	Outcome measures for patient satisfaction and results
Morales-Ascensio et al. <sup>18</sup> (2008), Spain	Quasi-experimental, controlled, non-randomised, multi-centred trial	Public home care services delivered by primary health care in 4 districts in Andalusia, Spain. The study population included patients and caregivers initiating home care program from the Andalusia health care service. Age of the population not specified. Subgroups included: 1) terminally ill patients, 2) dependent patients who need daily living assistance, 3) recently hospital discharged patients requiring short term home care, 4) main caregivers for	Follow-up varied according to subgroup 1) terminally ill: until death 2) daily living assistance: 6 & 12 months 3) acute care: 2 months	Intervention: Addition of a case manager to the interdisciplinary home care team. The case manager had a mobile phone for better accessibility; made home visits to do a comprehensive patient assessment upon team member request; in addition to coordinating care, provided patient education, and providing proactive patient telephone follow-up. Control: usual home care and health services.	Outcomes were measured through hand written data compilation in the home and through databases at the health care centre. Information was gathered through telephone interview. Readmission rate: no statistical significance difference in the mean number of hospital readmissions but there was a trend towards increased readmissions in the intervention group. Intervention group: 0.75 (95% CI: 0.47-1.03) Control group: 0.66	Outcomes were measured through hand written data compilation in the home and through databases at the health care centre. Information was gathered through telephone interview. There was a high statistically significant higher degree of satisfaction in intervention group compared to the control group: mean difference 16.88 (95% CI: 16.32-17.43) vs. 14.65 (95% CI: 13.61-

		any of the patients Control group: n=216 Intervention group: n=247			(95% CI: 0.40-0.91) p=0.599	15.68), p=0.001.
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Author, Date, Country	Study Design	Sample Setting, Types of Participants, Sample Size	Duration of Study	Types of interventions and comparator	Outcome Measures for readmissions and Results	Outcome measures for patient satisfaction and results
Neff et. al. <sup>17</sup> (2003), USA	Prospective quasi-intervention	Large multidisciplinary agency serving 4 Ohio Counties. Patients were age 62 years or over with a primary or secondary diagnosis of chronic obstructive pulmonary disease Control group: n=39 Intervention group: n=41	Care began at home care admission. Follow-up ended at home care discharge, hospital readmission, patient transfer or death.	Intervention: An advance practice nurse directed and supervised a disease management pulmonary team. Home care nurses and the advanced practice nurses were all specialised in cardiopulmonary care. Care included home visits, nurse contacts, and 24 hour phone availability. The advanced practice nurse was a resource, educator and supervisor to nurses as well as a resource and clinical consultant to the patients. Control: Usual care performed by a generalised nurse	Readmissions were measured through the OASIS database. Decreased hospitalisations in the intervention group compared with the control group; (4 vs. 11, p<0.05, chi squared: 4.471) A significantly higher number of intervention group patients were discharged from home care and remained at home: 82.9% vs. 51.3% (chi squared 9.07, p<0.05)	Not measured in this study.

## Appendix VI: Excluded studies and reason for exclusion

1. Addington-Hall JM, MacDonald LD, Anderson HR, Chamberlain J, Freeling P, Bland JM et al. Randomised controlled trial of effects of coordinating care for terminally ill cancer patients. *BMJ*. 1992; 305(6865):1317-1322.  
**Reason for Exclusion:** Explored coordination of care rather than continuity of care.
2. Aherns J. Italian study concludes "home hospitalization" benefits stroke patients. *Caring*. 2004;23(8):40-42.  
**Reason for exclusion:** Physician driven study.
3. Aliotta S, Andre J. Case management and home health care: An integrated model. *Home Health Care Management Practice*. 1997;9:1-12.  
**Reason for exclusion:** Did not measure outcome goals of this review.
4. Allen K, Hazelett S, Jarjoura D, Hua K, Wright K, Weinhardt, J, Kropp DA randomized trial testing the superiority of a post discharge care management model for stroke survivors. *Journal of Stroke Cerebrovascular Disease*. 2009;18(6):443-452.  
**Reason for exclusion:** Did not measure outcome goals of this review.
5. Applebaum R, Straker J, Mehdizadeh S, Warshaw G, Gothelf E. Using high-intensity care management to integrate acute and long-term care services: substitute for large scale system reform? *Care Management Journals*. 2002;3(3):113-119.  
**Reason for exclusion:** Physician driven study.
6. Avlund K, Jepsen E, Vass M, Lundemark H. Effects of comprehensive follow-up home visits after hospitalization on functional ability and readmissions among old patients: A randomized controlled study. *Scandinavian Journal of Occupational Therapy*. 2002;9:17-22.  
**Reason for exclusion:** Did not measure outcome goals of this review.
7. Banerjee P. The effect of homecare team visits in terminal cancer patients: Role of health teams reaching patients' homes. *Indian Journal of Palliative Care*. 2009;15(2):155-158.  
**Reason for Exclusion:** Physician driven study.
8. Bean P, Waldron, K. Readmission study leads to continuum of care. *Nursing Management*. 1995;26(9):65-68.  
**Reason for exclusion:** Intervention was not home care driven.
9. Bielaszka-DuVernay C. The 'GRACE model': in-home assessments lead to better care for dual eligibles. *Health Affairs*. March 2011;30(3):431-434.  
**Reason for exclusion:** Qualitative study.
10. Bostrom J, Tisnado J, Zimmerman J, Lazar N. The impact of continuity of nursing care personnel on patient satisfaction. *Journal of Nursing Administration*. 1994;24(10):64-68.  
**Reason for exclusion:** Did not address an intervention of interest
11. Boxall AM, Barclay L, Sayers A, and Caplan GA. Managing chronic obstructive pulmonary disease in the community. A randomized controlled trial of home-based pulmonary rehabilitation for elderly housebound patients. *Journal of cardiopulmonary rehabilitation*. 2005;25(6):378-385.  
**Reason for exclusion:** Intervention was not home care nurse driven.
12. Bowles KH, Holland DE, Horowitz DA. A comparison of in-person home care, home care with telephone contact and home care with telemonitoring for disease management. *Journal of Telemedicine and Telecare*. 2009;15:344-350.  
**Reason for exclusion:** Intervention was not home care driven.
13. Brandon AF. The effects of an advanced practice nurse-led telephone based intervention on hospital admissions, quality of life, and self-care behaviors of heart failure patients. 2008 Auburn University Thesis.  
**Reason for exclusion:** Did not measure the outcome goals of this review.
14. Brumley RD, Enguidanos S, and Cherin A. Effectiveness of a home-based palliative care program for end-of-life. *Journal of Palliative Medicine*. 2003;6(5):715-724.



- Reason for exclusion:** Does not measure outcomes of this review
15. Brumley R, Enguidanos S, Jamison, P. Increased satisfaction with care and lower costs: results of a randomized trial of in-home palliative care. *Journal of the American Geriatric Association*. 2007;55:993-1000.  
**Reason for exclusion:** Was not a home care nurse driven intervention.
16. Buurman BM, Parlevliet JL, van Deelen BA, de Haan RJ, de Rooij SE. A randomized clinical trial on a comprehensive geriatric assessment and intensive home follow-up after hospital discharge: the transitional care bridge. *BMC Health Serv Res*. 2010; 10:296-305.  
**Reason for Exclusion:** Intervention did not begin in the home.
17. Costello MC. Patient expectations and satisfaction with home health nutritional care. Temple University 1995; PH.D (222p).  
**Reason for Exclusion:** Was not home care nurse driven
18. Courtney M, Edwards H, Chang A, Parker A, Finlayson K, Hamilton K, et al. Fewer emergency readmissions and better quality of life for older adults at risk of hospital readmission: A randomized controlled trial to determine the Effectiveness of a 24-week exercise and telephone follow-up program. *Journal of American Geriatrics Society*. 2009;57:395-402.  
**Reason for exclusion:** Intervention did not begin in the home
19. Cravens DD, Mehr DR, Campbell JD, Armer J, Kruse RL, Rubenstein LZ. Home-based comprehensive assessment of rural elderly persons: The CARE project. *Journal of Rural Health*. 2005; 21(4):322-328.  
**Reason for exclusion:** Did not measure outcome goals of this review.
20. Cunliffe AL, Gladman JRF, Husbands SL, Miller P, Dewey ME, Harwood RH. Sooner and healthier: a randomized controlled trial and interview study of an early discharge rehabilitation service for older people. *Age Ageing*. 2004;33:246-252.  
**Reason for exclusion:** Did not measure outcome goals of this review.
21. Damiani G, Federico B, Venduitti A, Sicuro L, Rinaldi S, Cirio F, et al. Hospital discharge planning and continuity of care for aged people in an Italian local health unit: Does the care- home model reduce hospital readmission and mortality rates? *BMC Health Services Research*. 2009;9:22-31.  
**Reason for exclusion:** Intervention did not begin in the home.
22. D'A more J, Murray J, Powers H, Johnson C. Does telephone follow-up predict patient satisfaction and readmission? *Popular Health Management*. 2011;14(5):249-255.  
**Reason for Exclusion:** Was not home care nurse driven.
23. D'Errico E, Lewis MA. RN Continuity in home health: Does it make a difference? *Home Health Care Management & Practice*. 2010;22(6):427-434.  
**Reason for exclusion:** Did not measure outcome goals of this review
24. D'Errico E and Mockus E. RN continuity and end-result outcomes in home health care. Dissertation for University of California, 2007.  
**Reason for exclusion:** Did not measure outcome goals of this review.
25. De Wit R, van Dam F. From hospital to home: a randomized controlled trial of a pain education programme for cancer patients with chronic pain. *Journal of Advance Nursing*. 2001;36(6):742-754.  
**Reason for exclusion:** Intervention did not begin in the home.
26. Downing J, Powell R, Mwangi-Powell F. Home-based palliative care in sub Saharan Africa. *Home Healthcare Nurse*. 2010; 28(5); 298-307.  
**Reason for exclusion:** Physician-driven intervention.
27. Donlevy JA, Pietruch BL. The connection delivery model: care across the continuum. *Nursing Management*. 1996;27(5):34-36.  
**Reason for Exclusion:** Intervention did not begin in the home.
28. Dubois A, Santos- Eggiman B. Evaluation of patient satisfaction with hospital at home care. *Evaluation & The Health Professions*. 2001;(24): 84-98.  
**Reason for exclusion:** Physician-driven intervention.
29. Edes T. Innovations in home care: VA home based primary care. *Generation*

2010;34(2):29-34.

**Reason for exclusion:** Physician-driven intervention

30. Enguidanos S, Gibbs N, Jamison P. From Hospital to Home: A Brief Nurse Practitioner Intervention for Vulnerable Older Adults. *J Gerontol Nurs.* 2012;(1):1-10.

**Reason for Exclusion:** Intervention did not begin in the home.

31. Evdokimoff M. One home health agency's quality improvement project to decrease rehospitalizations: Utilizing a transitions model. *Home Healthcare Nurse.* 2011;29(3):180-193.

**Reason for exclusion:** Intervention did not begin in the home.

32. Farrero E, Escarrabill J, Prats E, Maderal M, Manresa F. Impact of a hospital-based home care program on the management of COPD patients receiving long term oxygen therapy. *CHEST.* 2001;119(2):364-369.

**Reason for exclusion:** Physician-driven intervention.

33. Ferrante D, Varini S, Macchia A, Soifer S, Badra R, Nul D, Grancelli H, Doval H. Long-term results after a telephone intervention in chronic heart failure. *Journal of the American College of Cardiology.* 2010;56(3):72:378.

**Reason for exclusion:** Was not home care nurse driven.

34. Foote M. Innovations in the Management of Heart Failure in the Home Health Care Environment. *Home Health Care Management & Practice.* 1997;9(4):35-42.

**Reason for exclusion:** Qualitative study.

35. Forbes DA. Clarification of the constructs of satisfaction and dissatisfaction with home care. *Public Health Nursing.* 1996;13(6):377-385.

**Reason for Exclusion:** Did not assess an intervention of interest.

36.

37. Formica V, Fossile E, Pellegrino R, Fatale M, Mari M, Rabuffetti M, et al. Medical care continuity (MCC) project. A pilot study of video-assisted home care within the eTEN European community program. The Italian experience. *The Support Care Cancer.* 2009;17(5):471-478.

**Reason for Exclusion:** Not an intervention of interest.

38. Giordano A, Zanelli E, Scalvini S. Home based telemanagement in chronic HF: an 8 year single-site experience. *Journal of Telemedicine Telecare.* 2011;17(7):382-386.

**Reason for exclusion:** Intervention was not home care nurse driven.

39. Haggerty MC, Stockdale-Woolley R, Nair S. Respi-Care. An innovative home care program for the patient with chronic obstructive pulmonary disease. *CHEST.* 1991;100:607-612.

**Reason for exclusion:** Intervention was not home care nurse driven.

40. Hansen FR, Spedtsberg K, Schroll M. Geriatric follow-up by home visits after discharge from hospital: A randomized control trial. *Age Ageing.* 1992;21:445-450.

**Reason for Exclusion:** Physician-driven study.

41. Harrison MB, Browne GB, Roberts J, Tugwell P, Gafni A, Graham ID. Quality of life of individuals with heart failure. *Medical care.* 2002;40(4):271-282.

**Reason for exclusion:** Intervention did not begin in the home.

42. Hennessey B, Suter P. The community based transitions model: One agency's experience. *Home Healthcare Nurse.* 2011;9(4):218-230.

**Reason for Exclusion:** Intervention did not begin in the home.

43. Horton K. The use of telecare for people with chronic obstructive pulmonary disease: implications for management. *Journal of Nursing Management.* 2007;16(2):173-180.

**Reason for Exclusion:** Did not measure outcome goals of this review.

44. Hughes SL, Cummings J, Weaver F, Manheim LM, Conrad KJ, Nash K. A randomized trial of veterans administration home care for severely disabled veterans. *Medical Care.* 1990;28(2):135-145.

**Reason for exclusion:** Physician-driven intervention.

45. Hughes SL, Weaver FM, Giobbie-Hurder A, Manheim L, Henderson W, Kubal JD, et al. Effectiveness of team-managed home-based primary care: A randomized multicenter trial. *JAMA.* 2000;284(22):2877-2885.

**Reason for exclusion:** Intervention was not home-care driven.

46. Inglis S, McLennan S, Dawson A, Birchmore L, Horowitz JD, Wilkinson D, Stewart S. A new solution for an old problem: Effects of a nurse-led multidisciplinary, home-based intervention on readmission and mortality in patients with chronic atrial fibrillation. *Journal of Cardiovascular Nursing*. 2004;19(2):118-127.  
**Reason for Exclusion:** Intervention was not home-care nurse driven.
47. Inglis S, Pearson S, Treen S, Gallasch, T, Horowitz, JD, Stewart S. Extending the horizon in chronic heart failure: effects of a multidisciplinary, home-based intervention relative to usual care. *Circulation*, 2006;114(23):2466-2473.  
**Reason for exclusion:** Intervention was not home-care nurse driven.
48. Jaglal SB, Santaguida L, Kreder H, Naglie G. The at home early discharge (AHEAD) program for hip fracture patients: Results of a pilot study. *Physiotherapy Canada*. 2002;54(2):102-109.  
**Reason for exclusion:** Intervention did not begin in the home.
49. Jerant AF, Azari R, Martinez C, Nesbitt TS. A randomized trial of telenursing to reduce hospitalization for heart failure: Patient-centered outcomes and nursing indicators. *Home Health Care Services Quarterly*. 2003;22(1):1-20.  
**Reason for exclusion:** Intervention was not home care nurse driven.
50. Johansson B, Berglund G, Glimelius B, Holmberg L, Sjoden P. Intensified primary cancer care: a randomized study of home care nurse contacts. *Journal of Advanced Nursing*. 1999;30(5):1137-1146.  
**Reason for exclusion:** Did not measure outcomes studied in this review
51. King Fe, Figge J, Harman P. The elderly coping at home: a study of continuity of nursing care. *Journal of Advance Nursing*. 1986;11(1):41-46.  
**Reason for Exclusion:** Qualitative study.
52. Kravitz RL, Reuben DB, Davis JW, Mitchell A. Geriatrics home assessment after hospital discharge. 1994;42(12):1229-1234.  
**Reason for exclusion:** Intervention did not begin in the home.
53. Kwok T, Lee J, Woo J, Lee DT, Griffith S. A randomized controlled trial of community nurse-supported hospital discharge programme in older patients with chronic heart failure. *J Clin Nurs*. 2008;17(1):109-117.  
**Reason for Exclusion:** Intervention did not begin in the home.
54. Kwok T, Lum CM, Chan HS, Ma HM, Lee D, Woo J. A randomized, controlled trial of an intensive community nurse-supported discharge program in preventing hospital readmissions of older patients with chronic lung disease. *Journal of the American Geriatrics Society*. 2004;52:1240-1246.  
**Reason for exclusion:** Intervention did not begin in the home.
55. McCorkle R, Strumpf NE, Adler DC, Cooley ME, Jepson C, Lusk EJ, Torosian M. A specialized home care intervention improves survival among older post-surgical cancer patients. *Journal of the American Geriatrics Society*. 2000;48(12):1707-1713.  
**Reason for exclusion:** Did not measure outcome goals of this review.
56. Morin D, Aubin M, Vezina L, Gagnon J, Racine S, Reinharz D, Paradis M, Dallaire C, Aubin K. From hospital to home after cardiac surgery: evaluation of a Community nursing care management model. *Professional Case Management*. 2009;14(4):167-175.  
**Reason for exclusion:** Did not measure outcome goals of this review.
57. Naylor MD, Brooten D, Campbell R, Jacobsen BS, Mezey MD, Pauly MV, et al. Comprehensive discharge planning and home follow-up of hospitalized elders A Randomized clinical trial. *JAMA*. 1999;281(7):613-620.  
**Reason for exclusion:** Intervention did not begin in the home.
58. Naylor MD, Brooten DA, Campbell RL, Maislin G, McCauley KM, Schwartz JS. Transitional care of older adults hospitalized with heart failure: a randomized controlled trial. *Journal of the American Geriatrics Association*. 2004;52(5):675-684.  
**Reason for Exclusion:** Intervention did not begin in the home.
59. Naylor MD, McCauley KM. The effects of discharge planning and home follow-up intervention on elders hospitalized with common medical and surgical cardiac

conditions. *Journal of Cardiovascular Nursing*. 1999;14(1):44-54.

**Reason for exclusion:** Intervention did not begin in the home.

60. Nikolaus T, Specht-Leible N, Bach M, Oster P, Schlierf G. A randomized trial of comprehensive geriatric assessment and home intervention in the care of hospitalized patients. *Age Aging*. 1999; 28:543-550.

**Reason for exclusion:** Intervention did not begin in the home.

61. O'Connor L, Gardner A, Millar L, Bennett P. Absolutely fabulous—but are we? Carers' perspectives on satisfaction with a palliative homecare service. *Collegian*. 2009;16(4):201-209.

**Reason for Exclusion:** Did not measure outcome goals of this review.

62. Ornstein K, Smith KL, Foer DH, Lopez-Cantor MT, Soriano T. To the hospital and back home again: A Nurse-Practitioner based transitional care program for hospitalized homebound people. *Journal of the American Geriatrics Society*. 2011; 59:544-551.

**Reason for exclusion:** Intervention did not begin in the home.

63. Pearson S, Inglis SC, McLennan SN, Brennan L, Russell M, Wilkinson D, Thompson, DR, Stewart, S. Prolonged effects of a home-based intervention in patients with chronic illness. *Archives of Internal Medicine*. 2006;166: 645-650.

**Reason for exclusion:** Intervention did not begin in the home.

64. Peterson-Sgro K. Reducing acute care hospitalizations and emergent care visits through use of home health diagnosis management. *Home Healthcare Nurse*. 2007;25(10):623-627.

**Reason for exclusion:** Physician driven intervention.

65. Riegel B, Carlson B, Kopp Z, LePetri B, et al. Effect of a standardized nurse case management telephone intervention on resource use in patients with chronic Heart Failure. *Archives of Internal Medicine*; 2002;162:705-712.

**Reason for exclusion:** Not home care nurse driven.

66. Rich MW, Beckham V, Wittenberg C, Leven CL, Freedland KE, Carney RM. A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. *New England Journal of Medicine*. 1995;333:1190-1195.

**Reason for exclusion:** Intervention did not begin in the home.

67. Rich MW, Vinson JM, Sperry JC, Shah AS, Spinner LR, Chung MK, Davila-Ramon V. Prevention of readmission in elderly patients with congestive heart failure. *Journal of General Internal Medicine*. 1993;8:585-590.

**Reason for exclusion:** Physician driven intervention.

68. Rizzi M, Grassi M, Pecis M, et al. A specific home care program improves the survival of patients with chronic pulmonary disease receiving long term oxygen therapy. *Archives Physical Medicine Rehabilitation*. 2009;90:395-401.

**Reason for exclusion:** Did not measure the outcome goals of this review.

69. Russell D, Rosati RJ, Rosenfeld P, Marren JM. Continuity in home health care: is consistency in nursing personnel associated with better patient outcomes? *Journal of Healthcare Quality*. 2011. DOI: 10.1111/j.1945-1474.2010.00131.x

**Reason for exclusion:** Qualitative study.

70. Rytter L, Jakobsen HN, Ronholt F, Hammer AV, Andreassen AH, Nissen A. et al. Comprehensive discharge follow-up in patients' homes by GPs and district nurses of elderly patients. A randomized controlled trial. *Scand J Prim Health Care*. 2010;28(3):146-153.

**Reason for Exclusion:** Not an intervention of interest.

71. Scott DJ, BATTERY AK, Bowman A, Agnew R, Burrow K, Mitchell SL, Ramsay S, Knight PV. Comprehensive geriatric assessment and home-based rehabilitation for elderly people with a history of recurrent non-elective hospital admissions. *Age Ageing*. 2006;35(5):487-491.

**Reason for Exclusion:** Intervention was not home nursing care driven.

72. Shellman J, Lacey K, Clemmens D. Carelink: partners in a caring model: a cardiac management program for home care. *Home Healthcare Nurse*. 2008;26(10):582-588.

**Reason for Exclusion:** Not an intervention of interest

73. Shepperd S, Harwood D, Jenkinson C, Gray A, Vessey M, and Morgan P. Randomized controlled trial comparing hospital at home care with inpatient hospital care: Three month follow-up of health outcomes. *BMJ*. 1998;316(7147):1786-1791.  
**Reason for Exclusion:** Physician driven intervention.
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