Hospital at home (Primary Care)

Study	COURTNEY 2009[68]
Study type	RCT (Patient randomised; Parallel).
Number of participants	Intervention group=64. Control group=64 (n=128).
Countries and setting	Tertiary metropolitan hospital in Australia.
Duration of study	Recruitment August 2004 – December 2006. Follow up for 24 weeks.
Stratum	Overall.
Subgroup analysis within study	Quality of Life measure according to the four major admission diagnoses (cardiac, respiratory, gastrointestinal and falls).
Inclusion criteria	Inclusion criteria were chosen based on previously published research identifying risk factors for readmission. 65 years or older and admitted with a medical condition. At least 1 risk factor for readmission (aged >75, multiple admissions in previous 6 months, multiple comorbidities, lived alone, lacked social support, poor self-rated health, moderate to severe functional impairment and history of depression).
Exclusion criteria	Patients' ability to participate in the planned intervention (for example, patients who were unable to walk independently or suffered a cognitive deficit would not be able to safely manage the intervention exercise programme).
Recruitment/selection of patients	A sample of 128 participants was recruited within 72 hours of admission to medical wards at a tertiary hospital in Brisbane, Australia. An information package on the study was provided and explained to potential participants, and signed consent was obtained from all participants. Baseline data were collected before randomisation and were thus blinded. After collection of baseline data, the research nurse at the clinical site contacted the project coordinator, who was blinded to baseline data and randomly allocated participants using a computerised randomisation program to the control or intervention group.
Age, gender and ethnicity	Age Mean: 78.8 Gender (% of F): 62.3% (76/122) Ethnicity: not stated.
Further population details	Not stated.
Extra comments	-
Indirectness of population	No indirectness.
Interventions	(n=64)Intervention 1: Hospital at home-In addition to usual care, they received an intervention following the 'Older Hospitalised Patients'

Study	COURTNEY 2009[68]
	Discharge Planning and In-home Follow-up Protocol (OHP-DP)', developed by the authors. The protocol commenced within 72 hours of admission and continued within 72 hours of admission and continued throughout hospitalisation, after transfer to home and in home for 6 months. The intervention was modified to the population of older patients who are at known risk of readmission yet still relatively healthy and potentially able to live independently, because it was felt that this group would particularly benefits from a relatively low resource intensive preventative intervention. Within 72 hours of admission, a registered nurse and physiotherapist undertook a comprehensive patient and developed a goal-directed, individualised care plan in consultation with the patient, health professionals, family and caregivers. The care plan included exercise intervention, nursing intervention while participant in the hospital, intervention after discharge. The latter included a nurse home visit within 48 hours of discharge to assess access availability of support, address transitional concerns, provide advice and support and ensure that the exercise program could be safely undertaken at home. Extra home visits were provided if required. Weekly follow-up telephone calls were provided for 4 weeks, followed by monthly follow up for a further 5 months. The nurse was also available for contact between 9am and 5pm weekdays. (n=64)Intervention 2: Hospital based care/services: Participants in the control received the routine care, discharge planning and rehabilitation advice normally provided. If in-home follow-up was necessary, it was organised in the routine manner (for example, referral to community health services).
Funding	Australian Research Council Discovery Project Grant.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: HOSPITAL AT HOME (PRIMARY CARE) versus INPATIENT HOSPITAL CARE. Protocol outcome 1: Length of stay. - Actual outcome: Length of stay; Group 1: Mean (SD): 4.6 (+/-2.7); Group 2: Mean (SD): 4.7 (+/-3.3); Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness - Actual outcome: Emergency hospital readmissions; Group 1: 22.0% (21 readmissions); Group 2: 46.7% (49 readmissions); Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 3: GP presentations. - Actual outcome: Emergency GP visits; Group 1: 25.0% (13 emergency GP visits); Group 2: 67.3% (86 emergency GP visits); Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 4: Quality of Life. - Actual outcome: Health-related Quality of Life: Physical Component and Mental Component summary score; Group 1: Physical: Mean (SD): 43.8 (+/-9.4), Mental: Mean (SD): 59.4 (+/-5.1); Group 1: Physical: Mean (SD): 26.0 (+/-9.9), Mental: Mean (SD): 48.3 (+/-7.7); Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness .	
Protocol outcomes not	Mortality, avoidable adverse events, patient and/or carer satisfaction, length of stay, number of avoidable admissions.

Study	COURTNEY 2009[68]
reported by the study	

Study	KWOK 2008[173]
Study type	RCT (Patient randomised; Parallel).
Number of participants	Intervention group=49. Control group=56 (n=105).
Countries and setting	Prince of Wales Hospital, a major teaching hospital in Hong Kong.
Duration of study	Recruitment September 1999 – February 2001. Follow up for 6 months.
Stratum	Early discharge.
Subgroup analysis within study	No.
Inclusion criteria	> 60 years of age. Residing within the region. At least one hospital admission for chronic heart failure in the 12 months prior to the index admission.
Exclusion criteria	Communication problems but without caregivers. Residing in a nursing home. Terminal diseases with a life expectancy of less than 6 months.
Recruitment/selection of patients	Eligible subjects were identified and recruited by a research nurse on the day or the day before hospital discharge. After obtaining written consent from the subjects, the research nurse recorded demographic data, functional status, cognitive function, psychological state and a general health questionnaire. The ward nurses then phoned a second research assistant who assigned trial grouping according to a random number table. The group assignment was made known to patients. One intervention and two control group subjects dropped out because of moving out of Hong Kong and the development of symptomatic cancer.
Age, gender and ethnicity	Age. Mean (SD); Intervention: 79.5 years (+/-6.6). Control: 76.8 years (+/-7.0). Gender. (% of M): Intervention: 45.0% (22/49). Control: 45.0% (25/56). Ethnicity: not stated.

Study	KWOK 2008[173]
Further population details	The intervention group subjects were more likely to be recipients of 'comprehensive social security allowance' and had greater economical handicap.
Extra comments	
Indirectness of population	No indirectness.
Interventions	(n=49) Intervention 1: Hospital at home- The subjects were visited by a designated community nurse before they were discharged from the hospital. The objectives were to provide health counselling, such as drug compliance, dietary advice and to encourage subjects to contact the community nurse via a telephone hotline during office hours when they developed symptoms. The community nurse carried a pager and a mobile phone. The trained clerk, who answered the hotline, relayed the message from the subjects to the community nurse via the pager. The subjects were then visited by the community nurse at home within seven days of discharge. During the home visits, the community nurse checked vital signs and signs for poor control of CHF –ankle swelling, dyspnoea and basal crepitation on auscultation. Medications were checked and compliance encouraged. Avoidance of salty and high fat foods and regular physical exercise were promoted. Home care and day care services were arranged if social support was found to be insufficient. The community nurse thereafter performed weekly home visits for another month and monthly thereafter. The community nurse liaised closely with either a geriatrician or a cardiologist in their respective hospitals. After liaison, the community nurse could alter medication regime, arrange urgent hospital outpatient appointments and clinical admission. When subjects were readmitted, the community nurse visited the patient in hospital and provided background information to attending doctors. Subjects who refused further home visits were monitored by the community nurse by telephone. n=56) Intervention 2: The control subjects received usual medical and social care, except that they were followed up in the hospital outpatient clinics by the same group of designated geriatricians or cardiologists.
Funding	Health Services Research Committee/Health Care & Promotion Fund of Hong Kong.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: HOSPITAL AT HOME (PRIMARY CARE) versus INPATIENT HOSPITAL CARE. Protocol outcome 1: Readmission. - Actual outcome: Readmission rates; Group 1: 46.0% (21 readmissions); Group 2: 57.0% (49 readmissions); Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Mortality. - Actual outcome: Death; Group 1: 4/49; Group 2: 8/56; Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Avoidable adverse events, quality of life, patients and/or carer satisfaction, length of stay, number of presentations to ED, number of avoidable admissions, reduced GP presentations.

Study	RICH 1993[241]
Study type	RCT (Patient randomised; Parallel).
Number of participants	Intervention group=63. Control group=35 n=90.
Countries and setting	Jewish Hospital at Washington University; secondary and tertiary care university teaching hospital.
Duration of study	Recruitment April 1988 – March 1989. Follow up for 3 months.
Stratum	Early discharge Readmission risk categories low (0 risk factors n=52), intermediate (1 risk factor, n=123) or high (≥ 2 risk factors, n=65) based on the presence of four independent risk factors for readmission defined in a prior study at the same institution: four or more prior hospitalisations within the preceding five-year interval, previous history of CHF, hypercholesterolemia and right bundle branch block on the admitting ECG.
Subgroup analysis within study	Moderate-risk and high-risk subgroups.
Inclusion criteria	> 70 years of age. Admitted to medical ward between April 1988 and March 1989 Definite diagnosis of CHF (presence of definite radiographic evidence of pulmonary congestion) or by the presence of typical historical and physical findings of the CHF in conjunction with symptomatic improvement following dieresis.
Exclusion criteria	Low risk for readmission, as these patients would be unlikely to benefit significantly from a program designed to reduce readmission frequency. Residence outside the catchment area. Planned discharge to a nursing home or other chronic care facility. Non-cardiac illness likely to result in non-preventable readmission (for example, terminal malignancy). Server mental incapacity or psychiatric disturbance. Patient or physician refusal. Logical and discretionary reasons.
Recruitment/selection of patients	98 patients agreed to participate. After signing appropriate informed consent documents, the subjects were stratified according to risk category and randomly assigned on a 2:1 basis to receive either the study intervention or conventional medical care as determined by the patients' usual physician. 21 patients (8%) died during the initial hospitalisation and were excluded from further analysis.
Age, gender and ethnicity	Age.

Study	RICH 1993[241]
	Mean (SD); Intervention: 80 years (+/-6.3). Control: 77.3 years (+/-6.1). Gender (% of M): Intervention: 39.7% (25/63). Control: 42.9% (15/35). Ethnicity (White). Intervention: 46.0% (29/63). Control: 57.1% (20/35).
Further population details	
Extra comments	
Indirectness of population	No indirectness.
Interventions	(n=63) Intervention 1: Hospital at home- Consisted of four components: intensive education about CHF and its treatments, a detailed analysis of medications with specific recommendations designed to improve compliance and reduce adverse effects, early discharge planning and enhanced follow-up through home care and telephone contacts. At the time of discharge, a discharge summary form was completed by the study nurse detailing medications, dietary and activity restrictions and any anticipated problem areas identified by the social worker, hospital home care representative or study personnel. This form was transmitted to a nurse working with the Jewish Hospital Home Care Division, who then visited the patient at home within 48 hours (in most cases within 24 hours) of hospital discharge. In addition to surveying the home environment and identifying any additional problem areas, the home care nurse again reinforced the teaching materials, reviewed medications, diet and activity guidelines, assisted with initiating the daily weight chart and performed a general physical assessment and cardiovascular examination. The patients were seen three times in the first week, during which time the above functions were repeated and they were subsequently seen at regular intervals in accordance with federal home-care guidelines. In addition, the study burse contacted all patients by telephone to assess their progress, answer any questions and keep communication line open. All patients were encouraged to contact study personal or their personal physicians anytime new problems, symptoms or questions occurred. (n=35) Intervention 2: Hospital based care/services-The patients randomised to standard care received all conventional treatments as requested by the patients attending physician. Such measures could include social service evaluation, dietary and medication teaching, home care and all other available hospital services. However, because these patients were not seen regularly by the study nurse and did not receive the study educational materials or the formal medication analysis, the intensity of teaching was lower for the usual-care group.
Funding	Community Research Grant-in-Aid from the American Heart Association.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: HOSPITAL AT HOME (PRIMARY CARE) versus INPATIENT HOSPITAL CARE. Protocol outcome 1: Readmission. - Actual outcome: Readmission rates; Group 1: 33.3% (21/63 readmissions); Group 2: 45.7% (16/35 readmissions); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Length of stay.	

Study	RICH 1993[241]
- Actual outcome: Total hospital days; Group 1: Mean (SEM): 4.3 (+/-1.1); Group 2: Mean (SEM): 5.7 (+/-2.0); Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Mortality, avoidable adverse events, quality of life, patient and/or carer satisfaction, number of presentations to ED, number of avoidable admissions, reduced GP presentations.

Study	STEWART 1998[281] STEWART 1999[280]
Study type	RCT (Patient randomised; Parallel).
Number of participants	Home based intervention=49. Usual care=48 (n=97)
Countries and setting	Cardiology Unit of the Queen Elizabeth Hospital/University of Adelaide, Woodville, South Australia.
Duration of study	6 month follow up.
Stratum	Overall.
Subgroup analysis within study	n/a.
Inclusion criteria	Presence of CHF (defined on the basis of a formal demonstration, impaired systolic function and persistent functional impairment indicative of New York Heart Association class 2, 3 or 4 statuses. Acute ischemia or infarction with previously documented CHF were included. Being discharged home and requiring continuous pharmacotherapeutic intervention for a chronic condition. Patients with CHF who were determined to be at high risk for unplanned readmission were identified on the basis of 1 or more unplanned admissions for acute heart failure before study entry.
Exclusion criteria	Acute MI or unstable angina pectoris. Presence of terminal malignancy requiring palliative care. Home address outside catchment area.
Recruitment/selection of patients	Not stated.
Age, gender and ethnicity	Age. Years (SD); Intervention: 76 years (+/-11). Control: 74 years (+/-10). Gender. M:F; Intervention: 22:27. Control: 25:23.

Study	STEWART 1998[281] STEWART 1999[280]
	Ethnicity (Non-English speaking background). Intervention: 10/49. Control: 9/48.
Further population details	Not stated.
Extra comments	-
Indirectness of population	No indirectness.
Interventions	(n=49) Intervention 1: Hospital at home- Before discharge, patients assigned to an HBI (n=49) were visited by the study nurse (S.P.) and counselled in relation to complying with the treatment regimen and reporting any sign of clinical deterioration or acute worsening of their heart failure. One week after discharge, these patients were visited at home by the study nurse and pharmacist. On arrival, the study pharmacist performed an assessment of the patient's knowledge of the prescribed medications (via questionnaire) and the extent of compliance (via pill count). Patients who demonstrated poor medication knowledge (<75% composite knowledge score of dosage, intended effect, potential adverse effects, and special instructions) or malcompliance (≥15% deviation from prescribed dosage at discharge) received a combination of the following: (1) remedial counselling, (2) initiation of a daily reminder routine to enhance timely administration of medications, (3) introduction of a weekly medication container enabling pre-distribution of dosages, (4) incremental monitoring by caregivers, (5) provision of a medication information and reminder card, and (6) referral to a community pharmacist for more regular review thereafter. Patients were further evaluated by the study nurse to detect any clinical deterioration or adverse effects of prescribed medication since discharge; those requiring medical review were immediately referred to their primary care physician. After the home visit, all patients' primary care physicians were contacted by the study nurse to inform them of the home visit and to discuss the need (if any) for further remedial action or more intensive follow-up thereafter. (n=48) Intervention 2: Hospital based care/services- Patients assigned to the UC group (n=48) received the pre-existing levels of post discharge care: all patients in the UC group had appointments to be reviewed by their primary care physician or cardiologist (in the hospital's outpatient department) within 2 weeks of discharge. Furthermore, 13 patients (27%) were receiving regular home support (for example, domiciliary care or community nurse visits) after discharge.
Funding	Commonwealth Department of Health and Family Services, Canberra, Australia, through the Pharmaceutical Education Program.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: HOSPITAL AT HOME (PRIMARY CARE) versus INPATIENT HOSPITAL CARE. Protocol outcome 1: Readmission. - Actual outcome: Unplanned Readmission rates; Group 1: 24/49 readmissions; Group 2: 31/48 readmissions. Risk of bias : Selection - Low, Outcome reporting - high, other-unclear risk Protocol outcome 2: Mortality. - Actual outcome: Out of hospital deaths; Group 1: 6/49; Group 2: 12/48. Risk of bias : Selection - Low, Outcome reporting - high, other-unclear risk	

Study	STEWART 1998[281] STEWART 1999[280]
Protocol outcomes not reported by the study	Avoidable adverse events, quality of life, patient and/or carer satisfaction. Length of stay, number of presentations of ED, number of avoidable admissions, reduced GP presentations.