

Cochrane reviews

Study	Takeda 2012 ¹³³
Study type	Systematic review – Clinical service organisation for heart failure
Number of studies (number of participants)	25 RCTs (n=5,942 participants) (19 studies from the Cochrane review included in our review)
Countries and setting	Conducted in Spain, Italy, Sweden, the Netherlands, the United Kingdom, China (Hong Kong), Canada, USA, New Zealand and Australia
Duration of study	Databases were searched through to January 2009 (update to search done in 2005)
Stratum	Overall
Subgroup analysis within study	-
Inclusion criteria	This review focused on adults aged 18 and over who had at least 1 admission to secondary care with a diagnosis of heart failure. In the original review the authors included randomised controlled trials (RCTs) reporting any follow up period, for this update they only included randomised controlled trials with a minimum of 6 months follow-up.
Exclusion criteria	Studies dealing principally with patients with cardiac disorders other than heart failure, or with heart failure arising from congenital heart disease and/or valvular heart disease, were excluded.
Recruitment/selection of patients	This review focused on adults aged 18 and over who had at least 1 admission to secondary care with a diagnosis of heart failure. In the original review the authors included randomised controlled trials (RCTs) reporting any follow up period, for this update they only included randomised controlled trials with a minimum of 6 months follow-up. Studies dealing principally with patients with cardiac disorders other than heart failure, or with heart failure arising from congenital heart disease and/or valvular heart disease, were excluded. The interventions were classified into 3 models: 1) case-management interventions, where patients were intensively monitored by telephone calls and home visits, usually by a specialist nurse; 2) clinic interventions involving follow up in a specialist CHF clinic; 3) multidisciplinary interventions (a holistic approach bridging the gap between hospital admission and discharge home delivered by a team).

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Age, gender and ethnicity	For the majority of the included studies, the mean/median age of patients was between approximately 67 and 80 years old. The mean/median ages of patients in 12 of the studies were in the late 60s or early 70s, 8 of the studies had patients whose mean/median ages were in their mid 70s (Aldamiz-Echevarria 2007; Blue 2001; Cline 1998; Holland 2007; Krumholz 2002; Lopez 2006, Mejhert 2004, Naylor 2004), and 3 studies had patients whose mean or median age was 77 or more (Del Sindaco 2007, Kwok 2008; Stromberg 2003). Two studies had considerably younger patients, with a median of 63.5 (range 25-88) in the study by Kasper 2002 and a mean of 56 (SD = 10) in the Capomolla 2002 study.
Further population details	NR
Extra comments	-
Indirectness of population	No indirectness
Interventions	<p>Clinical service interventions (defined as inpatient, outpatient or community based interventions or packages of care) directed specifically at patients with heart failure were included. This excluded the simple prescription or administration of a pharmaceutical agent(s) to patients with heart failure. Interventions could include or exclude patients' relatives or carers. These interventions included:</p> <ul style="list-style-type: none"> • Case management, defined as “the active management of high-risk people with complex needs, with case managers (usually nurses) taking responsibility for caseloads working in an integrated care system” (DoH 2004) • Clinical interventions such as enhanced or novel service provision (for example the introduction of a specialist nurse led heart failure clinic) • Multidisciplinary interventions such as disease management interventions, defined as “a system of coordinated healthcare interventions and communications for populations with long-term conditions in which patient self-care is significant” (Royal College of Physicians 2004) <p>The following types of interventions were not included in this review:</p> <ul style="list-style-type: none"> • Interventions that were primarily educational in focus • Interventions that only consisted of exercise programmes • Interventions described as cardiac rehabilitation programmes. Cardiac rehabilitation was defined as a structured programme offered to individuals after a cardiac event to aid recovery and prevent further cardiac illness. Cardiac rehabilitation programmes typically achieve this through exercise, education, behaviour change, counselling and support and strategies that are aimed at targeting traditional risk factors for cardiovascular disease (Taylor 2010). • “Generic“ interventions, not exclusively aimed at patients with heart failure, directed at reducing readmission or morbidity in populations of older people with a variety of long term conditions.
Funding	Not stated

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
	Aldamiz-Echevarria 2007 ⁴ RCT Spain	<p>Intervention:</p> <ul style="list-style-type: none"> • Home visits by physicians and nurses, for clinical examination, tests/analyses as required, and adjustment of medication as required (note this intervention was not HF specific, but was intended to reduce readmissions across a range of medical and surgical conditions). • Additional nursing staff home visits 2, 5 and 10 days after discharge for education for patients and relatives about HF (basic facts and management, that is, symptoms, life style, diet and therapy) • Patients received educational manual and a phone number for queries <p>Comparator: usual care (referral to primary care physician)</p>	<p>Patient (n= 279) hospitalised for heart failure</p> <p>Mean (SD) age: 75.3 (11.1) versus 76.3 (9.4) Percentage male: 38.7 versus 40.1 Ethnicity: not stated</p>	<p>Mortality, admissions, presentations to ED</p> <p>Risk of bias (assessed in Cochrane review) Risk of bias: Selection – Low, selective reporting - Low, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 15 days 6 and 12 months follow-up</p>
	Atienza 2004 ⁸ RCT Spain	<p>Intervention: discharge and outpatient management programme</p> <ul style="list-style-type: none"> • 1 to 1 single education session for patients and carers prior to discharge and session with primary care physician post discharge to reinforce education • teaching brochure to reinforce education, covering: diagnosis of HF, information about the disease (pathogenesis etc.), symptoms of HF, symptoms and signs of worsening HF, what to do if condition worsens, lifestyle advice, medication education for carers • cardiologist outpatient clinic every 3 months, 	<p>Patients (n=338) with congestive heart failure discharged from cardiology wards of 3 participating hospitals</p> <p>Median age (IQR) 69 (61-74) in intervention group, 67 (58-74) in usual care group Male sex (both groups) 203 (60%), (intervention group</p>	<p>Mortality, admissions Risk of bias (assessed in Cochrane review) Risk of bias: Selection – Low risk, selective reporting - Low, other-unclear risk</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Median duration of intervention: 509 days (IQR 365-649)</p> <p>1 year follow-up</p>

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		including medication review <ul style="list-style-type: none"> • patient given specific/tailored self-management plan • visit with primary care physician scheduled within 2 weeks of discharge • tele-monitoring component -a facilitated telephone monitor (SCT) providing a 24 hour mobile phone contact number which patients were encouraged to contact as necessary. Patients could also telephone the HF team for advice during office hours Comparator: discharge planning according to the routine protocol of the study hospitals	101/164, 62%), (control group 102/174, 59%) Ethnicity: not given		
	Blue 2001 ^{11,12} RCT UK (Scotland)	Intervention Group: "Specialist nurse intervention" During index hospitalisation: Patients were seen by a HF nurse prior to discharge. After discharge: Home visit by HF nurse and within 48 hours of discharge. Subsequent visits by HF nurse at 1, 3, and 6 weeks and at 3, 6, 9 and 12 months. Scheduled phone calls at 2 weeks and at 1, 2, 4, 5, 7, 8, 10 and 11 months after discharge. Additional unscheduled home visits and telephone contacts as required Home visits covered: Patient education about HF and its Rx, self-monitoring and management. Patients were given a booklet about HF which included a list of their drugs, contact details for HF nurses, blood	Patients (n=165) admitted as an emergency to the acute medical admissions unit at 1 hospital with HF due to LV systolic dysfunction. Actual age of study subjects: usual care mean 75.6 years (SD 7.9), intervention 74.4 years (SD 8.6). Male sex: 58% Ethnicity: not given.	Unplanned admissions within 90 days of discharge, length of stay Risk of bias (assessed in Cochrane review) Risk of bias: Selection – Low , selective reporting - Low, other-unclear risk	In Cochrane review: Clinical service organisation for heart failure Duration of intervention: up to 12 months 12 month follow-up Also looked at: admission rates in the moderate risk subgroup compared to the high risk sub group

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		<p>test results and clinic appointment times. The trained HF nurses used written drug protocols and aimed to optimise patient treatment (drugs, exercise and diet) and HF nurses also provided psychological support to the patient. HF nurses liaised with the cardiology team and other health care and social workers as required</p> <p>Comparison Group: usual care "Patients in the usual care group were managed as usual by the admitting physician and, subsequently, general practitioner. They were not seen by the specialist nurses after discharge."</p>			
	Capomolla 2002 ²¹ RCT Italy	<p>Intervention Group: Comprehensive Heart Failure Outpatient Management Program delivered by the day hospital.</p> <p>During index hospitalisation: cardiac prognostic stratification and prescription of individual tailored therapy following guidelines and evidence</p> <p>After discharge: Attendance at day hospital staffed by a multidisciplinary team (cardiologist, nurse, physiotherapist, dietician, psychologist and social assistant). Patient access to the day hospital 'modulated according to demands of care process'. Care plan developed for each patient. Tailored interventions covering: cardiovascular risk stratification; tailored therapy; tailored physical training; counselling; checking clinical stability; correction of risk factors for haemodynamic instability; and health care</p>	<p>Patients (n=234) with CHF referred for admission to the Heart Failure Unit at 1 centre or the Heart Transplantation Programme. All had been hospitalised for HF.</p> <p>Actual age of study subjects: mean age 56 years (SD 10) Male sex: 84% Ethnicity: not given.</p>	<p>Mortality, admissions Risk of bias (assessed in Cochrane review) Risk of bias: Selection – unclear risk, selective reporting - Low, other-unclear risk</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: not clear. Follow-up at 12 months</p>

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		<p>education.</p> <p>Patients who deteriorate re-entered the day hospital through an open-access programme. Day hospital also offered: intravenous therapy; laboratory examinations; and therapeutic changes as required</p> <p>Comparison Group: usual care</p> <p>During admission: cardiac prognostic stratification and prescription of individual tailored therapy following guidelines and evidence</p> <p>After discharge:</p> <p>'The patient returned to the community and was followed up by a primary care physician with the support of a cardiologist'</p>			
	Cline 1998 ^{29,30} RCT Sweden	<p>Intervention Group: "Management programme for heart failure"</p> <p>During index hospitalisation patients received an education programme from HF nurse consisting of 2 visits.</p> <p>Two weeks after discharge patients and their families were invited to a 1 hour group education session led by the HF nurse and were also offered a 7 day medication dispenser if deemed appropriate. Patients were followed up at a nurse directed o/p clinic and there was a single prescheduled visit by the nurse at 8 months after discharge. The HF nurse was available for phone contact during office hours. Patients were offered cardiology outpatient visits 1 and 4 months after discharge. The inpatient and</p>	<p>Patients (n=190) hospitalised primarily because of heart failure.</p> <p>Actual age of study subjects: mean 75.6 years (SD 5.3)</p> <p>Male sex: 53%</p> <p>Ethnicity: not given</p>	<p>Mortality (at 90 days), admissions, length of stay, quality of life (at 1 year) using The Quality of Life</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – low, selective reporting - unclear risk, other-unclear risk</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 12 months</p> <p>1 year follow-up</p>

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		<p>outpatient education programme covered: HF pathophysiology, pharmacological and non-pharmacological treatment.</p> <p>Comparison Group: usual care These patients were "followed up at the outpatient clinic in the department of cardiology by either cardiologists in private practice or by GP"</p>			
	De Busk 2004 ³⁷ RCT USA	<p>Intervention: "specialist nurse intervention"</p> <ul style="list-style-type: none"> • 1 hour educational session with a nurse in the patient's medical centre • Patient received educational materials including methods for self-monitoring symptoms, body weight and medications; a dietary management workbook; food frequency questionnaires. They viewed a video on treatment process, received instructions on how to access emergency care if needed. • 45 min baseline telephone counselling session within 1 week of randomisation by experienced nurse care manager. Subsequent nurse contacts tailored to meet needs of the patient. Follow up phone calls by nurse to patient weekly for 6 weeks, biweekly for 8 weeks, monthly for 3 months, bimonthly for 6 months • Nurse care managers obtained permission from physicians to initiate and regulate pharmacologic therapy for HF according to study protocol. Nurses coordinated treatment plan with patients and physicians 	<p>Patients (n=462) hospitalised with a provisional diagnosis of heart failure in study hospitals as indicated by new onset or worsening heart failure.</p> <p>Mean age all = 72 year (SD 11)</p> <p>Ethnicity, n(%):</p> <p>White 195(86) versus 191(82);</p> <p>Black 13(5) versus 14(6);</p> <p>American Indian 9(4) versus 18(8);</p> <p>Hispanic 7(3) versus 7(3);</p> <p>Asian 4(2) versus 4(2)</p>	<p>Mortality, admissions, presentations to ED</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – Low, selective reporting - Low, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 12 months</p> <p>Outcomes reported at 1 year</p>

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		Comparator: usual care (no details given)			
	Del Sindaco 2007 ³⁸ RCT Italy	<p>Intervention: disease management programme (DMP) combining hospital clinic-based and home based care</p> <ul style="list-style-type: none"> teams included a cardiologist experienced in geriatrics, specialised nurses and the patient's primary care physician programme components: discharge planning, continuing education, therapy optimisation, improved communication with healthcare providers, early attention to signs and symptoms and flexible diuretic regimes. patients given a written list of recommendations, a weight chart, a contact number available 6h/day, and an education booklet follow-up via hospital clinic visits, periodical nurse's phone calls patients attended heart failure clinics within 7 to 14 days of discharge and at 1, 3 and 6 months thereafter for optimisation of treatment and education primary care physicians assessed adherence to treatment, evaluated adverse effect and co-morbidities, and monitored diet <p>Control: usual care Optimised treatment and standard education. All treatments and services ordered by primary care physician and/or cardiologist. Baseline clinical</p>	<p>Elderly patients (n=184) discharged home after hospitalisation due to heart failure</p> <p>Age: Control: 77.5 (SD 5.7), Intervention: 77.4 (SD 5.9) Percentage male: Control: 52.8, Intervention: 51.2 Ethnicity: not stated</p>	Mortality, admissions, quality of life	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 24 months</p> <p>Follow-up at 24 months</p>

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		evaluation and therapeutic plan documented			
	Doughty 2002 ^{44,45} RCT New Zealand	<p>Intervention: 'integrated heart failure management programme'</p> <p>After discharge: Outpatient review at heart failure clinic within 2/52 of discharge from hospital: clinical status reviewed, pharmacological treatment based on evidence based guidelines, one-to-one education with study nurse, education booklet provided. Patient diary for daily weights, Rx record & clinical notes provided. Detailed letter faxed to GP and follow up phone call to GP. Follow up plan aiming at 6 weekly visits alternating between GP and HF clinic. Group education sessions for patients run by cardiologist and study nurse: 2 sessions offered within 6 weeks of discharge and one at 6 months post d/c. Telephone access to study team for GPs or patients during office hours Group education sessions covered: education about disease; monitoring daily body weight and action plans for weight changes; medication; exercise; diet.</p> <p>Comparison: usual care</p>	<p>Patients (n=197) admitted to general medical wards with a primary diagnosis of heart failure.</p> <p>Actual age of study subjects: mean 73 years (SD 10.8, range 34 to 92 years). Male sex: 60% Ethnicity: 'NZ European' 79%</p>	<p>Mortality, admissions, quality of life, length of stay</p> <p>Risk of bias (assessed in Cochrane review) Risk of bias: Selection – high, selective reporting - Low, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 12 months</p> <p>Outcomes at 12 months</p>
	Ducharme 2005 ⁴⁷ RCT Canada	<p>Intervention: multi-disciplinary heart failure clinic with phone follow-up from nurses</p> <ul style="list-style-type: none"> evaluation at clinic within 2 weeks of hospital discharge; rapid access to cardiologists, clinician nurses, dieticians and pharmacists, with access to social workers and other medical specialists as required follow-up phone call from nurse within 72 	<p>Patients (n=230) seen at the emergency department of or admitted to the Montreal Heart Institute with a primary diagnosis of congestive heart</p>	<p>Mortality, admissions, presentations to ED, quality of life, length of stay</p> <p>Risk of bias (assessed in Cochrane review) Risk of bias: Selection</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 6 months</p>

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
		<p>hours of hospital discharge and then monthly</p> <ul style="list-style-type: none"> • After baseline evaluation, clinic cardiologists individualized treatment plan • One-on-one education of the patient and family with the study nurse initiated at first clinic visit (disease process, symptoms and signs of HF, fluid and sodium intake restrictions, body weight monitoring, medications and compliance, recommendations regarding exercise and diet. • patient diary (for example, daily weight, medication record, clinical notes) • individualized dietary assessments; pharmacist evaluated medications • monthly visits with both a cardiologist and nurse at the clinic • Patients advised to call clinic nurse if symptoms worsened. <p>Comparator: standard care</p>	<p>failure</p> <p>Mean (SD) age: 68 (10)/10 (10)</p> <p>% male: 83 (73)/82 (71)</p> <p>ethnicity: not stated</p>	<p>– Low, selective reporting - Low, other-low</p>	<p>Outcomes at 6 months</p>
	<p>Jaarsma 2000^{68,69}</p> <p>RCT</p> <p>The Netherlands</p>	<p>Intervention: 'Supportive educational intervention'</p> <p>During index admission: Intensive education by study nurse using standard nursing care plan</p> <p>After discharge: Study nurse phoned patient within 1 week of discharge to assess potential problems and made appointment for home visit. At home visit education continued. Between discharge and home visit patient could contact study nurse if</p>	<p>Patients (n=179) admitted to the cardiology unit of 1 hospital with HF symptoms and diagnosis verified with Boston score.</p> <p>Actual age of study subjects: not given for original group, those</p>	<p>Quality of life, presentations to GP, admissions, mortality (at 9 months)</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – Low, selective reporting - Low, other-unclear risk</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: up to 10 days after discharge from index admission, on average</p>

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		<p>they encountered problems.</p> <p>After home visit patient encouraged to contact their cardiologist, GP or emergency heart centre with any problems. Educational component covered: symptoms of worsening failure, sodium restriction, fluid balance and compliance and individuals' problems, and included education and support to patients' family.</p> <p>Comparison: usual care.</p> <p>"A nurse or physician, depending on his or her individual insight into the patients' questions, provided these patients with education about medication and lifestyle". Usual care patients did not receive structured education</p>	<p>who remained at 9 months were mean age 72 years (SD 9) at baseline.</p> <p>Male sex: of those who remained at 9 months, 60%</p> <p>Ethnicity: not given</p>		<p>1 week*</p> <p>Outcomes reported at 9 months</p>
	<p>Jaarsma 2008⁷⁰</p> <p>RCT</p> <p>The Netherlands</p>	<p>Intervention: disease management program</p> <p>basic intervention:</p> <ul style="list-style-type: none"> • During index hospital stay: patient education by HF nurse according to protocol and guidelines, behavioural strategies used to improve adherence • Within 2/52 of d/c telephone call to patient from HF nurse • During regular visits to cardiologist at the outpatient clinic (at 2, 6, 12 and 18 months after d/c) additional visits to HF nurse. Additional visits just to the HF nurse at the outpatient clinic at one, 3, 9, & 15 months after d/c. Telephone access to HF nurse Monday to Friday 9am -5 pm, patients (and families) encouraged to contact their nurse if any change in their condition or any questions. 	<p>Patients (n=1049) admitted to hospital for HF</p> <p>Age: intensive: 70 (SD 12), basic: 71 (SD 11), control: 72 (SD 11)</p> <p>Percentage male: intensive: 61, basic: 66, control: 60</p> <p>Ethnicity: Not stated</p>	<p>Mortality, admissions, quality of life</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – Low, selective reporting - Low, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 18 months</p>

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		<p>Intensive intervention: basic intervention plus: Home visit by HF nurse within 10 days of d/c to assess coping, CHF health status general health, and medical, health care and social support. Second home visit 11 months after discharge, Weekly telephone calls by the HF nurse in the first month after discharge then monthly calls. - Out of hours back up to provide 24 hour telephone coverage. - HF nurse to consults multidisciplinary team at least once during both index admission and once during follow up to optimise her advice for each patient.</p> <p>Control: standard management by cardiologist and, subsequently, GP</p>			
	<p>Kasper 2002⁷⁷</p> <p>RCT</p> <p>USA</p>	<p>Intervention Group: 'multidisciplinary program' During index hospitalisation: CHF cardiologist designed an individualised treatment plan which included medication, diet and exercise management After discharge: 'Telephone nurse co-coordinator' phoned patients within 72 hours of discharge and then weekly for 1st month, bi-weekly in 2nd month and then monthly. Monthly follow up with CHF nurses (usually in CHF clinic). 'Primary care physicians' (66% internal medicine physicians, 29%cardiologists) received regular updates from CHF nurses and were notified of abnormal lab results. All intervention patients</p>	<p>Patients (n=200) admitted to 1 of 2 hospitals with a primary diagnosis of CHF</p> <p>Actual age of study subjects at recruitment: median 63.5 years (range 25-88 years)</p> <p>Male sex: 61%</p> <p>Ethnicity: 'white' 64%</p>	<p>Admissions (at 6 months), mortality, quality of life, Risk of bias (assessed in Cochrane review) Risk of bias: Selection – Low, selective reporting - Low, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 6 months.</p> <p>Outcomes at 6 month reported</p>

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		<p>received: pill sorter, list correct medications, list of dietary and exercise recommendations, 24 hour telephone contact number and patient educational material. If required and financial resources limited patients also received: 3g sodium 'Meals on Wheels' diet, weigh scale, medications, transport to the clinic and a phone. CHF cardiologist saw patients at 6 months. Content of CHF nurse follow up: aimed to implement the treatment plan designed by CHF cardiologist which included initiation and titration of drugs, a low sodium diet and exercise recommendations</p> <p>Comparison group: Usual care.</p> <p>This was care by the patients' primary physicians (73% internal medicine physicians, 26% cardiologists). CHF cardiologist designed treatment plan for each patient "documented in patient's chart without further intervention"</p>			
	<p>Kimmelstiel 2004⁷⁸ RCT USA</p>	<p>Intervention: Specialized Primary and Networked Care in HF (SPAN-CHF)</p> <ul style="list-style-type: none"> • Home visit from nurse-manager within 3 days of discharge, focusing on dietary and medical compliance, daily weights, self-monitoring, and early reporting of changes in weight or clinical status. • Teaching tool 'Patient and Family Handbook' given to patients during home visit, including sections on HF (definition), medications, low-salt diet, importance of daily weight, and clinical signs and symptoms that should 	<p>Patients (n=200) were enrolled during an index HF hospitalisation or within 2 weeks of discharge.</p> <p>Age: Control: 73.9 (SD 10.7), Intervention 70.3 (SD 12.2)</p> <p>Percentage male: Control: 58.3,</p>	<p>Admissions (during first 90 days), length of stay, admissions (at 1 year)</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – low, selective reporting - unclear risk, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 90 days, followed by passive surveillance (nurse-manager available for incoming calls but</p>

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		<p>prompt a call to the SPAN-CHF</p> <ul style="list-style-type: none"> nurse or primary care physician (plus contact phone numbers). During home visit, nurse performed cardiovascular examination and symptom assessment. Weekly or biweekly phone calls from nurse-manager to patients focused on identifying changes in clinical condition and education reinforcement. Patients had 24-hr 7-day telephone access to nurse managers, and were instructed to report changes in clinical status and relevant weight change. Frequent communication between nurse-managers, primary care physicians and HF specialist. <p>Comparator: usual care</p>	<p>Intervention: 57.7 Ethnicity: Not stated</p>		<p>didn't make scheduled calls) for clinically stable patients or continuation for patients with overt clinical instability (class A)</p>
	<p>Krumholz 2002⁸¹</p> <p>RCT USA</p>	<p>Intervention: 'Education and Support'</p> <p>After discharge:</p> <p>Initial hour long face to face consultation with experienced cardiac nurse within 2 weeks of discharge using a teaching booklet. Following this weekly telephone contact for 4 weeks, bi-weekly for 8 weeks then monthly until 1 year. Initial consultation covered: patient knowledge of illness; the relation between medication and illness; health behaviours and illness; knowledge of early signs and symptoms of decompensation, where and when to obtain assistance. Follow up phone calls reinforced these domains. However the nurse could recommend that the patient consulted his/her physician when the patient's</p>	<p>Patients (n=88) hospitalised for HF; needed to have either admission diagnosis of heart failure or radiological signs of heart failure on admission chest x-ray.</p> <p>Actual age of study subjects: median age 74 years, controls mean age 71.6 (SD 10.3), intervention 75.9 (SD</p>	<p>Mortality, admissions, length of stay</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – Low, selective reporting - Low, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>12 month follow-up</p> <p>Duration of intervention: 1 year</p>

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		<p>condition deteriorated sharply or when the patient had problems, in order to help patients to understand when and how to seek and access care</p> <p>Comparison: usual care. All usual care treatments and services ordered by their physicians</p>	<p>8.7) Males: 57% Ethnicity: '74% Caucasians'</p>		
	<p>Kwok 2008⁸³ RCT China</p>	<p>Community nurse Versus Usual follow-up</p> <p>Intervention: usual follow-up plus home visits by community nurse providing counselling (for example, drug compliance, dietary advice), checking vital signs, medications. Nurse access also via pager. Nurse closely liaised with geriatrician or cardiologist.</p> <p>Control group: usual medical and social care and followed up in hospital outpatient clinics by geriatricians or cardiologists.</p>	<p>Adults (n = 105) >60 years, with chronic heart failure in Hong Kong. Recruited on the day or the day before hospital discharge</p>	<p>Mortality, admissions (after 28 days) Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – Low, selective reporting - Low, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p>
	<p>Mejhert 2004⁹⁶ RCT Sweden</p>	<p>Intervention: "nurse based outpatient management programme"</p> <ul style="list-style-type: none"> regular visits to the outpatient clinic and patient encouraged to keep contact with nurse (not clear how regular); nurse checking symptoms and signs of heart failure, blood pressure, heart rate, and weight at each visit nurses can institute and change medication doses according to standard protocol 	<p>Patients (n=208) 60 years of age or older hospitalised with heart failure.</p> <p>Age: Control: 75.7 (SD 6.6), Intervention: 75.9 (SD 7.7) Percentage male:</p>	<p>Quality of life (6, 12 and 18 months), admissions (18 months), mortality (18 months)</p> <p>Risk of bias (assessed in Cochrane review) Risk of bias: Selection –unclear risk,</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: at least 18 months, mean follow up was 1122</p>

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
		<ul style="list-style-type: none"> patient instructed to check weight regularly and monitor early signs of deterioration. Patients with good compliance instructed to change dosing of diuretics on their own. dietary advice recommends restricted sodium, fluid, and alcohol intake; information repeated in booklets and computerised educational programmes <p>Control group: treated by GPs according to local health care plan for heart failure. All patients had clinical examinations and detailed control of medication at 6, 12, and 18 months at the Cardiovascular Research Lab</p>	Control: 59, Intervention: 56 Ethnicity: Not stated	selective reporting - unclear risk, other-low	(405) days Outcomes reported at 6 and 12 months (QoL) and 18 months for all
	Nucifora 2006 ¹⁰⁶ RCT Italy	<p>Intervention: "HF management programme"</p> <ul style="list-style-type: none"> pre discharge intensive education by an experienced cardiovascular research nurse using a teaching booklet, covering causes of HF, recognition of symptoms of worsening HF, the role of sodium restriction and pharmacological therapy, the importance of fluid and weight control, physical activity and complete abstinence from alcohol and smoking. phone call from nurse 3-5 days post discharge to assess any problems, promote self-management and check compliance, weight and lifestyle issues. Patients had telephone access from 8.00 to 9.00am, Monday to Friday, and out of hour's answering machine. outpatient visits to doctor at 15 days, 1 and 6 months after discharge, to evaluate test 	<p>Elderly patients (n=200) admitted to internal medicine department with a diagnosis of HF during recruitment period</p> <p>Age: Control: 73 (SD 8), Intervention: 73 (SD 9) Percentage male: Control: 62, Intervention: 62 Ethnicity: Not stated</p>	<p>Mortality, readmissions, length of stay, quality of life Risk of bias (assessed in Cochrane review) Risk of bias: Selection – unclear risk, selective reporting - Low, other-unclear risk</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 6 months</p> <p>Outcomes reported at 6 months</p>

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
		<p>results, physical condition and medicine adherence and make any required changes to drug therapy</p> <p>Control: pre-existing routine of post-discharge care; that is, usual care by GP. Outpatient visit to doctor at 6 months post discharge</p>			
	<p>Stewart 1999^{126,127}</p> <p>RCT Australia</p>	<p>Intervention Group: Usual care plus 'Multidisciplinary, home-based intervention'</p> <p>After discharge: Comprehensive assessment at home by a cardiac nurse 7-14 days after discharge. After home visit nurse sent report to primary care physician and cardiologist. Cardiac nurse arranged a flexible diuretic regimen for patient's weight and symptoms if required. Phone call by cardiac nurse to patient contact at 3 and 6 months. Home visits repeated if a patient had 2 or more unplanned readmissions within 6 months of index admission Home visit included assessment of clinical status, physical activity, adherence to medication, understanding of disease, psychosocial support and use of community resources. Followed by (as appropriate): 'remedial counselling' to patients and their families, strategies to improve adherence, simple exercise regimen, incremental monitoring by family/carers, urgent referral to 10 care physician.</p> <p>Comparison Group: usual care</p>	<p>Patients (n=200) admitted to tertiary care hospital under cardiologist and who had at least 1 previous admission for acute heart failure</p> <p>Actual age of study subjects: control group mean 76.1 years (SD9.3), intervention group 75.2 years (SD 7.1) years Male sex: 62% Ethnicity: not given</p>	<p>Mortality, admissions, length of stay Risk of bias (assessed in Cochrane review) Risk of bias: Selection – Low, selective reporting - Low, other-unclear risk</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: mainly within 2 weeks of discharge but some phone contact throughout study</p> <p>Outcomes reported at 6 months follow-up</p>

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
		<p>All study patients could be referred to cardiac rehab nurse, dietician, social worker, pharmacist and community nurse as appropriate. All patients had appointment with their primary care physician and/or cardiology outpatient service within 2 weeks of discharge. Regular outpatient review by the cardiologist was undertaken throughout the follow up period</p>			
	<p>Stromberg 2003¹³⁰</p> <p>RCT</p> <p>Sweden</p>	<p>Intervention: nurse led HF clinic</p> <ul style="list-style-type: none"> • 1st visit 2-3 weeks after discharge, nurses evaluated status, assessed treatment and provided education about HF and social support. Individualised education based on guidelines: information on HF, treatment, dietary advice, individually adjusted energy intake advice, lifestyle advice (including exercise), and promoted self-management • nurses contactable by phone during office hours, Monday-Friday, and nurses called patients to provide psychosocial support and evaluate drug changes required • extra appointments to attend HF clinic scheduled for patients unstable with symptoms of worsening heart failure • patients referred back to primary health care once they were stable and well Informed <p>Control: conventional follow-up in primary health care. Some patients got a scheduled visit after discharge, but most were encouraged to phone primary health care if they had problems due to heart failure</p>	<p>Patients (n=106) hospitalised for HF</p> <p>Age: Control: 78 (SD 6), Intervention: 77 (SD 7)</p> <p>Percentage male: Control: 32/54 (59%), Intervention: 33/52 (63%)</p> <p>Ethnicity: Not stated</p>	<p>Mortality, admissions, length of stay</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – Low, selective reporting - Low, other-unclear risk</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Outcomes reported at 12 months</p> <p>Duration of intervention: not clear</p>

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
	Thompson 2005 ¹³⁴ RCT UK	<p>Intervention: “clinic plus home-based intervention”</p> <ul style="list-style-type: none"> • appointment with specialist nurse prior to discharge, to receive info on HF and medications • office-hours contact number for nurse specialist • home visit with 10 days of hospital discharge, for education on symptom • management and lifestyle, and clinical examination • monthly nurse-led outpatient heart failure clinic for 6 months post-discharge, including education, clinical examination and indices monitoring, and starting of new therapeutic drugs where appropriate <p>Control group: standard care (that is, explanation of condition, prescribed medications by the ward nurse and referral to appropriate post-discharge support as required). Patients given an outpatient department appointment 6-8 weeks post discharge</p>	<p>Patients (n=106) with acute admission to hospital with a diagnosis of CHF.</p> <p>Age: Control: 72 (SD 12), Intervention: 73 (SD 14)</p> <p>Percentage male: Control: 73, Intervention: 72</p> <p>Ethnicity: not stated</p>	<p>Mortality, admission</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias: Selection – Low, selective reporting - Low, other-low</p>	<p>In Cochrane review: Clinical service organisation for heart failure</p> <p>Duration of intervention: 6 months</p> <p>6 month follow-up</p>

Study	Wong 2012B ¹⁴²
Study type	Systematic review – Home care by outreach nursing for chronic obstructive pulmonary disease
Number of studies (number of participants)	9 RCTs (n=1498 participants) (5 studies from this Cochrane review included in our review)
Countries and setting	Conducted in the United Kingdom, Canada, USA and Australia
Duration of study	Databases were searched through to November 2011

Study	Wong 2012B ¹⁴²
Stratum	Overall
Subgroup analysis within study	-
Inclusion criteria	<p>The authors included only randomised controlled trials in which the home visits were provided by a respiratory nurse or similar respiratory health worker to patients with COPD. Only participants with chronic obstructive pulmonary disease, as defined according to pulmonary function test findings, consistent with British Thoracic Society criteria (BTS 1997) were included.</p> <p>Included were interventions that comprised home visits by a respiratory nurse or similar respiratory health worker, to facilitate health care, provide education, provide social support, identify respiratory deteriorations promptly and reinforce correct technique with inhaler therapy. Eligible control groups were patients who received routine care, without respiratory nurse/health worker input. Studies with co-interventions, with subgroup analysis as necessary, were considered. Only trials with at least 3 months of follow-up were included as this was considered an appropriate minimum duration of follow-up to observe any clinically significant benefits of the intervention.</p>
Exclusion criteria	Forty-eight papers were excluded for the following reasons: predominantly concerned with physical rehabilitation or exercise (n=19), not supervised by a nurse at home (n=15), not a RCT (n=11), data previously reported (n=2) and the intervention was of too short a duration (n=1).
Recruitment/selection of patients	<p>The authors included only randomised controlled trials in which the home visits were provided by a respiratory nurse or similar respiratory health worker to patients with COPD. Only participants with chronic obstructive pulmonary disease, as defined according to pulmonary function test findings, consistent with British Thoracic Society criteria (BTS 1997) were included.</p> <p>Included were interventions that comprised home visits by a respiratory nurse or similar respiratory health worker, to facilitate health care, provide education, provide social support, identify respiratory deteriorations promptly and reinforce correct technique with inhaler therapy. Eligible control groups were patients who received routine care, without respiratory nurse/health worker input. Studies with co-interventions, with subgroup analysis as necessary, were considered. Only trials with at least 3 months of follow-up were included as this was considered an appropriate minimum duration of follow-up to observe any clinically significant benefits of the intervention.</p>
Age, gender and ethnicity	Adult patients with COPD.
Further population details	No specific details provided for sample overall
Extra comments	
Indirectness of population	No indirectness
Interventions	Included were interventions that comprised home visits by a respiratory nurse or similar respiratory health worker, to facilitate health care, provide education, provide social support, identify respiratory deteriorations promptly and reinforce correct technique with inhaler therapy. Eligible control groups were patients who received routine care, without respiratory nurse/health worker input. Studies with co-interventions, with subgroup analysis as necessary, were considered. Only trials with at least 3 months of follow-up were included as this was considered an appropriate minimum duration of follow-up to observe any clinically significant benefits of the intervention.

Study	Wong 2012B¹⁴²
	In brief, all studies investigated the effects of a supervised, home-based intervention in patients with COPD using a parallel group RCT design. The home-based intervention represented a respiratory nurse providing care, education and support in a patient's home. The effects of this was assessed via a variety of outcomes, including patient based outcomes (lung function, exercise testing, HRQL and mortality), health system based outcomes (medical service utilisation), and carer based outcomes (HRQL, satisfaction).
Funding	Not stated

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
	Bergner 1988 ⁹ RCT USA	<p>1. Respiratory home care group (n = 99): Patients in the respiratory home care group received specialised care from trained respiratory nurses at least 1 a month</p> <p>2. Standard home care group (n = 102): Patients in the standard home care group received standard home care from nurses at least once a month</p> <p>3: Control group (n = 100): Patients in the control group continued to receive usual care</p> <p>The duration of the intervention period was 12 months.</p>	<p>Patients with COPD (n=301). Patients had to have a clinical diagnosis of COPD, a FEV1 and FEV1/FVCratio <60% predicted, be homebound (by US Medicare criteria, for use of public transport), be between 40-75 years of age, be able to administer aerosolised metaproterenol, be a local resident, be capable of co-operating with the study.</p>	<p>Mortality</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias : Selection - unclear, Blinding - high, Incomplete outcome data - Low, Outcome reporting - unclear, other-low</p>	<p>In Cochrane review: Home care by outreach nursing for COPD</p> <p>The outcomes of the interventions were assessed at 6 and 12 months after enrolment</p>
	Coultas 2005 ³¹ RCT USA	<p>1. Medical management group (n = 49): Patients in the medical management group received approximately 8 hours of education about the diagnosis of COPD, the assessment of COPD severity, patient self-management, smoking cessation, follow-up and the formation of an action plan for exacerbations</p> <p>2. Medical and collaborative management</p>	<p>Patients (n=217) with COPD who fulfilled 3 criteria: were a current or former smoker with at least a 20-pack-year smoking history, had at least 1 respiratory symptom (for example,.</p>	<p>Health related quality of life (St George Respiratory Questionnaire, SF-36), presentations to ED, presentations to GP, hospitalisations</p> <p>Risk of bias (assessed</p>	<p>In Cochrane review: Home care by outreach nursing for COPD</p> <p>The outcomes of the interventions were assessed at the end</p>

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
		<p>group (n = 51): In addition to medical management, patients in the medical and collaborative management group received approximately 8 additional hours of training in 'collaborative care', intended to facilitate the adoption of healthy behaviours such as lifestyle and self-management skills</p> <p>3. Control group (n = 51): Patients in the control group continued to receive usual care</p> <p>The duration of the intervention period was 6 months.</p>	cough, shortness of breath, wheeze) during the past 12 months, and had demonstrable airflow obstruction (FEV1/FVC ratio < 70% and FEV1 < 80% predicted)	<p>in Cochrane review)</p> <p>Risk of bias : Selection - Low, Blinding - high, Incomplete outcome data - Low, Outcome reporting -low, other-low</p>	of the 6 month intervention period
	Hermiz 2002 ⁶⁰ RCT Australia	<p>Community nurse visits and preventative GP care</p> <p>Versus</p> <p>Usual care</p> <p>Intervention group: 2 home visits by a community nurse: detailed assessment of the patient's health status and respiratory function; education on the disease and advised on stopping smoking (if applicable), management of activities of daily living and energy conservation, exercise, understanding and use of drugs, health maintenance, and early recognition of signs that require medical intervention; referred patients to other services such as home care; care plan posted to the GP; Patients encouraged to continue to refer to the education booklet for guidance and to keep in contact with their GP. For 4 weeks.</p>	Patients aged 30-80 years (n=177) who attended the hospital emergency department or were admitted to the hospitals with chronic obstructive pulmonary disease between September 1999 and July 2000 were identified from their records and invited to participate.	<p>Mortality at 3 months, Quality of life (St George's respiratory questionnaire) at 3 months, length of hospital stay (days) at index admission, presentations to ED at 3 months, admissions to hospital at 3 months, GP presentation at 3 months</p> <p>Risk of bias (assessed in Cochrane review)</p> <p>Risk of bias : Selection - low,</p>	<p>In Cochrane review: Home care by outreach nursing for COPD</p> <p>COPD patients did not present with exacerbation</p>

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
		Usual care: discharge to GP care with or without specialist follow up; did not include routine nurse or other community follow up. Duration: Not stated		Blinding - high, Incomplete outcome data - Low, Outcome reporting - unclear, other-low	
	Kwok 2004 ⁸⁴ RCT China	Community nurse Versus Usual follow-up Intervention: usual follow-up plus home visits by community nurse providing counselling (for example, drug compliance, dietary advice), checking vital signs, medications. Nurse access also via pager. Nurse closely liaised with geriatrician or respiratory physician. Control group: usual medical and social care and followed up in hospital outpatient clinics by geriatricians or respiratory physician.	Older adults (n=157) with a primary diagnosis of chronic lung disease and at least 1 hospital admission in the previous 6 months were recruited during acute hospitalisation in Hong Kong. Recruited on the day or the day before hospital discharge	Mortality, admissions (after 28 days), presentation to ED, length of hospital stay during study period Risk of bias (assessed in Cochrane review) Risk of bias : Selection - high, Blinding - high, Incomplete outcome data - Low, Outcome reporting - unclear, other-low	In Cochrane review: Home care by outreach nursing for COPD
	Smith 1999 ¹²² RCT Australia	1. Intervention group (n = 48): Patients in the intervention group received home-based nursing intervention (HBNI) in addition to usual care from GP and OPD services. Home visits were made at 2-4 week intervals over 12 months 2. Control group (n = 48): Patients in the control group were not visited by a nurse but received care from GP and OPD services	Patients (n=96) with COPD who had to have a principal diagnosis of COPD, greater than 40 years of age, have a FEV1/FVC < 60%, have no other active major comorbidity, be in a stable state, have a carer	Mortality, hospitalisation, length of stay, presentations to ED, quality of life Risk of bias (assessed in Cochrane review) Risk of bias :	In Cochrane review: Home care by outreach nursing for COPD The outcomes of the interventions were assessed at the end of the 12 month

Summary of included studies	Study	Intervention and comparison	Population	Outcomes	Comments
			involved in their management, and be able to speak and read English.	Selection - Low, Blinding - high, Incomplete outcome data - Low, Outcome reporting - high, other-low	intervention