National Institute for Health and Care Excellence

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Chapter 35 Discharge planning

Emergency and acute medical care in over 16s: service delivery and organisation

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Chapter 35 Discharge planning

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35 Discharge planning

35.1 Introduction

Planning for a patient's discharge from hospital is a key aspect of effective care. Many patients who are discharged from hospital will have ongoing care needs that must be met in the community. This ongoing care comes in many forms, including the use of specialised equipment at home such as a hospital-type bed, daily support from carers to complete the activities of daily living, or regular visits from district nurses to administer medication.

There is a wide variety of care available in the community, but it needs to be planned in advance of the patient's return home, to ensure that there is no gap in the provision of care between the discharge from hospital and the initiation of community services. Furthermore, information about the patient must be handed over from the hospital team to the community team so an informed plan of care can be put into place.

Discharge planning is the process by which the hospital team considers what support might be required by the patient in the community, refers the patient to these services, and then liaises with these services to manage the patient's discharge. Poor discharge planning can lead to poor patient outcomes and delayed discharge planning can cause patients to remain in hospital longer than necessary, taking up valuable inpatient beds when they could be more easily and comfortably cared for in the community.

While the guideline committee affirmed the value of discharge planning based on experience, they wanted to review any evidence available about the efficacy and cost implications of discharge planning for patients following an acute medical emergency.

35.2 Review question: Does discharge planning facilitate early hospital discharge?

For full details see review protocol in Appendix A.

Table 1: PICO characteristics of review question

Population	Adults and young people (16 years and over) with a suspected or confirmed AME (discharged from the acute hospital).
Intervention(s)	Discharge planning (or transfer of care) for example, beginning process early, individualised and/or involving MDT (within 48 hours of admission or if not defined in studies, reported as 'early planning'; reporting that a 'plan was in place'). In the UK – delayed transfer of care incorporates the community and social care aspects of the discharge process – must be medically fit (ready) for discharge. Introduction of process on top of usual discharge practice.
Comparison	Standard processes (usual practice).
Outcomes	• Readmission up to 30 days (IMPORTANT) • Mortality (CRITICAL) • Avoidable adverse events (CRITICAL) • Quality of life (CRITICAL) • Patient and carer or family satisfaction (CRITICAL) • Length of stay (CRITICAL) • Delayed transfers of care (IMPORTANT) • Staff satisfaction (IMPORTANT)

Study design	Systematic reviews (SRs) of RCTs, RCTs, observational studies only to be included if no relevant SRs or RCTs are identified.

35.3 Clinical evidence

Ten studies (11 papers) were included in the review;[8,16,23,32,33,36,42,52,53,59,64] these are summarised in Table 2 below. Evidence from these studies is summarised in the clinical evidence summary below (Table 3). See also the study selection flow chart in Appendix B, forest plots in Appendix C, study evidence tables in Appendix D, GRADE tables in Appendix F and excluded studies list in Appendix G.

Table 2: Summary of studies included in the review

Study	Intervention and comparison	Population	Outcomes	Comments
Evans 1993[16] USA RCT	Discharge planning and evaluation protocol initiated on day 3 in hospital including assessment of marital relationship, support systems, living situation, finances and area of need for discharge planning. Versus Standard process – received service only upon referral by medical staff, averaging 9th day in hospital or not at all.	n=835 patients admitted to medical, neurologic or surgical services at Department of Veteran Affairs Medical Center, Seattle, USA; 95% male.	Readmission Mortality Length of stay	Medical, surgical and neurological patients (45% medical in intervention group; 44% in control group).
Goldman 2014[23] Chan 2015[8] USA RCT	Nurse-led in hospital discharge planning - disease-specific patient education on day of enrolment and within 24 hours of discharge. After; hospital care plan booklet given to patients including diagnoses, primary care and pharmacy contact information and upcoming appointments, follow up telephone calls (day 1 to 3 and 6 to 10) providing education, assessing medication/treatment adherence, resolving barriers to follow up appointments and discussing discharge plan, nurses worked with pharmacies, adjusted medications and referred patients to primary care provider and urgent health clinic or ED when necessary. Versus Usual discharge care –	n=700 patients admitted to the internal or family medicine, cardiology or neurology departments at San Francisco General Hospital and Trauma Center. Inclusion criteria: English, Spanish or Chinese speaking and aged 55 or older. Exclusion criteria: transferred from an outside hospital, admitted for a planned hospitalisation, likely to be discharged to an institutional setting, unable to consent due to severe cognitive impairment, mental illness or delirium, metastatic cancer, unable to participate in telephone follow up due to aphasia, and severe hearing impairment or lack of access to a telephone.	Readmission Mortality	Indirect intervention – post discharge components.

Study	Intervention and comparison	Population	Outcomes	Comments
	bedside nurse's review of the discharge instructions, 10 day medication supply and assistance of social worker if required and admitting team responsible for transmitting the discharge summary to the patient's primary care provider.			
Jack 2009[32] USA RCT	Reengineered discharge intervention – patient education, appointments for post-discharge follow-up, discussion of in-hospital tests with patient, organisation of post-discharge services, confirmation of medication plan, reconciliation of discharge plan with national guidelines, review of appropriate steps in an emergency, transmission of discharge summary to physicians and services, assessment of patient understanding, provision of a written discharge plan and telephone call from the pharmacist. Initiated at admission by nurse discharge advocates. Versus Usual care – no further intervention.	n=749 patients admitted to the medical teaching service of Boston Medical Center. Inclusion criteria: English speaking, ≥18 years of age, have a telephone, able to comprehend study details and the consent process and plan for discharge to a U.S community. Exclusion criteria: admitted from a skilled nursing facility/other hospital, transferred to a different hospital before enrolment, planned hospitalisation, hospital precautions/suicide watch or deaf/blind.	Readmission Patient and/or carer satisfaction.	
Jennings 2015[33] USA RCT	Discharge bundle – 60 minute visit by a member of the research team 24 hours prior to anticipated discharge day, during which acute exacerbation of COPD risks were addressed (smoking cessation, gastroesophageal reflux disease assessed by questionnaire and given lifestyle advice, anxiety or depressive symptoms referred to outpatient services, patient education on inhaler use) and contacted by telephone 48 hours after discharge to reinforce items in bundle	n=172 patients with acute exacerbation of COPD from a single hospital. Inclusion criteria: diagnosis of COPD with the presence of an acute exacerbation, >40 years, current ex-smoker with a history equivalent to at least 20 pack years. Exclusion criteria: medical history of asthma, interstitial lung disease, bronchiectasis, presence of airway hardware, lung cancer, other cancer associated with a life	Readmission	Indirect intervention – included post discharge components.

Study	Intervention and comparison	Population	Outcomes	Comments
	Versus Routine discharge process – spirometry 1 to 2 days prior to discharge, systemic steroids, antibiotics and inhaler therapy at the primary team's discretion and education from nursing staff regarding inhaler use.	expectancy of <1 year, any cancer where the patient received active chemotherapy or radiation treatment, active substance abuse, neuromuscular disorders affecting the respiratory system, language barriers, residence in a nursing home, ICU stay during admission or significant delirium or dementia.		
Lainscak 2013[36] Slovenia RCT	Discharge coordinator intervention – assessment of patient situation and homecare needs to identify any problems and specific needs, active involvement of patients and carers in the discharge planning process which was discussed with community/home care nurse, GP, social care worker, physiotherapist and other providers as appropriate, patients contacted by telephone 48 hours post discharge, discharge coordinator activities with care providers continued as appropriate and final patient assessment during a home visit 7 to 10 days after discharge. Versus Usual care – routine patient education with written and verbal information about COPD, supervised inhaler use, respiratory physiotherapy as indicated and disease related communication between medical staff with patients and their caregivers.	n=253 patients with acute exacerbation of COPD from a specialised pulmonary hospital. Inclusion criteria: acute exacerbation of COPD, reduced pulmonary function corresponding to Global Initiative for Chronic Obstructive Lung Disease stage 2 to 4. Exclusion criteria: unstable/terminal stage of disease other than COPD (for example, heart failure, malignant disease), unable to deal with telephone contact when out of hospital, death/withdrawal of consent before discharge.	Mortality. Quality of life.	Indirect intervention – included post discharge components.
Lindpaintner 2013[42] Switzerland RCT	Discharge management intervention – individualised discharge plan formulated by nurse care managers, including teaching about self-management, scheduling of follow-up appointments, standardised discharge fax to	n=60 patients admitted to 2 internal medicine wards at 1 centre. Inclusion criteria (1 or more of the following): oral anticoagulation, newly ordered insulin,	Length of stay. Mortality. Readmission	Indirect intervention – included post discharge components.

Study	Intervention and comparison	Population	Outcomes	Comments
	primary physician and local visiting nurse organisation, structured telephone contact within 24 hours of discharge, NCM availability by pager 24/7 for 5 days post discharge and 1 home visit, following a comprehensive structured assessment (symptom burden, prior adherence to prescribed therapies, family caregiving, functional status, cognition and comorbidity), conference with ward team and joining ward rounds. Versus Best usual care – the same team of physicians and nurses provided inpatient care to both groups, but NCMs avoided contact with control patients.	polypharmacy (>8 regular medicines at admission) and new diagnosis requiring 4 or more long term medicines. In addition, eligible patients met 1 or more inclusion criteria for vulnerability: living alone, receiving home nursing care prior to admission, requiring complex wound care, being the family caregiver of a dependent adult. Exclusion criteria: <18 years of age, death anticipated within 30 days, enrolled in another study, unable to give informed consent because of inability to speak German or cognitive impairment, nursing home admission scheduled for the coming month or primary care physician/local visiting nurse association not participating.	Avoidable adverse events (adverse medicine reaction). Other outcomes not extractable: patient and/or carer satisfaction, primary care physician satisfaction, visiting nurse satisfaction and quality of life.	
Naughton 1994[52] USA RCT	Geriatric evaluation and management team routinely evaluated patients' mental status, psychosocial condition, functional status to determine medical, rehabilitative and social needs, discussed at team conferences, social worker coordinated community resources and insured post-hospital treatment plan was in place at discharge and 2 weeks later, nurse coordinated transfer to home health care. Versus Usual care - services of social workers and discharge planners available upon request.	n=111 patients ≥70 admitted to the medicine service. Inclusion criteria: not regularly receiving care from an attending internist on staff at the time of admission. Exclusion criteria: admitted to an ICU or transferred from the medical service to a surgical service.	Mortality. Length of stay.	Indirect intervention – included post discharge components.
Naylor 1994[53] USA RCT	Comprehensive, individualised discharge planning protocol implemented by gerontologic clinical nurse specialists from hospital admission to 2 weeks	n=142 patients ≥70 from selected medical diagnostic-related groups (congestive heart failure and angina/myocardial infarction).	Readmission Length of stay.	

Study	Intervention and comparison	Population	Outcomes	Comments
	after discharge – assessment of discharge planning needs, plan development in collaboration with patient, carer, physician, nurse and other healthcare team members, validation of patient and/or carer education, coordination of plan, interdisciplinary communication and on-going evaluation of effectiveness. Versus Routine discharge plan – uncomplicated discharges managed by the patients' physician and primary nurse, complicated discharges involved social workers and community nursing coordinators and discharge planning services provided in accordance with medical plan of care.			
Pardessus 2002[59] France RCT	Single home visit by a physical medicine and rehabilitation doctor during hospitalisation, hospital social worker contacted to assess problems encountered, environmental hazards identified, modifications made where possible and advice from occupational therapist, persons likely to bring social assistance contacted. Versus Usual care – physical therapy during hospitalisation, patient and family informed on home safety and possible social assistance.	n=60 patients hospitalised for falling, in the acute geriatric department of the geriatric hospital. Inclusion criteria: aged ≥65 years, hospitalised for falling, able to return home after hospitalisation and informed consent to participate. Exclusion criteria: cognitive impairment (mini mental test <24), without a telephone, lived further than 30km from the hospital, falls secondary to cardiac, neurologic, vascular or therapeutic problems.	Mortality. Avoidable adverse events (falls).	
Preen 2005[64] Australia RCT	Discharge care plan – 24-48 hours before anticipated discharge, individually tailored in accordance with that set down by the Australian Enhanced Primary Care Initiative, including problems identified from hospital notes and	n=189 inpatients from 2 Western Australian tertiary hospitals, with a primary diagnosis of chronic cardiorespiratory disease. Inclusion criteria: have a current GP and at least 2	Quality of life. Patient and/or carer satisfaction. Staff	

Study	Intervention and comparison	Population	Outcomes	Comments
	patient/caregiver consultation, patient agreed goals based on personal circumstances, identified appropriate interventions and community service providers, faxed to GP, GP consultation within 7 days of discharge for review, care plan faxed back to the hospital and explained in full to patient/carer and copy given. Versus Standard practice – all patients have a discharge summary completed which is copied to their GP.	community care providers for example, allied health worker or in-home nurse. Exclusion criteria: discharged to residential aged-care facilities.	satisfaction. Length of stay.	

Table 3: Clinical evidence summary: Discharge planning versus standard processes

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with standard processes	Risk difference with Discharge (95% CI)
Readmission number readmitted	700 (1 study) 30 days	⊕⊖⊖⊖ VERY LOW[a,b,c] due to risk of bias, indirectness, imprecision	HR 1.17 (0.79 to 1.73)	Moderate	
				Not calculable	Absolute effect cannot be calculated
Readmission number readmitted	970 (3 studies) 5-30 days	⊕⊕⊖⊖ LOW[a,c] due to risk of bias, imprecision	RR 0.74 (0.56 to 0.98)	Moderate	
				207 per 1000	54 fewer per 1000 (from 4 fewer to 91 fewer)
Mortality number of deaths	1655 (4 studies[d]) 1 day -12 months	⊕⊕⊕⊖ MODERATE[c] due to imprecision	RR 1.13 (0.87 to 1.48)	Moderate	
				100 per 1000	13 more per 1000 (from 13 fewer to 48 more)
Mortality number of deaths	253 (1 study) 6 months	⊕⊖⊖⊖ VERY LOW[b,c] due to indirectness, imprecision	HR 0.54 (0.23 to 1.27)	Moderate	
				Not calculable	Absolute effect cannot be calculated
Mortality (in hospital) number of deaths during admission	111 (1 study) during admission	⊕⊖⊖⊖ VERY LOW[b,c] due to indirectness, imprecision	RR 0.71 (0.18 to 2.81)	Moderate	
				83 per 1000	24 fewer per 1000 (from 68 fewer to 150 more)
Avoidable adverse events adverse medicine reaction	60 (1 study) 1-5 days	⊕⊖⊖⊖ VERY LOW[a,b,c] due to risk of bias, indirectness, imprecision	RR 1.5 (0.27 to 8.34)	Moderate	
				67 per 1000	34 more per 1000 (from 49 fewer to 492 more)
Avoidable adverse events falls	60 (1 study) 12 months	⊕⊖⊖⊖ VERY LOW[a,c] due to risk of bias,	RR 0.87 (0.5 to 1.49)	Moderate	
				500 per 1000	65 fewer per 1000 (from 250 fewer to 245 more)

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with standard processes	Risk difference with Discharge (95% CI)
		imprecision			
Quality of life minimal clinically important difference on St. George's Respiratory Questionnaire	135 (1 study) 180 days	⨁⊖⊖⊖ VERY LOW[a,b,c] due to risk of bias, indirectness, imprecision	RR 0.91 (0.6 to 1.39)	Moderate	
				417 per 1000	38 fewer per 1000 (from 167 fewer to 163 more)
Quality of life medical outcomes study short form 12 - physical ratings	189 (1 study) 7 days	⨁⨁⊖⊖ LOW[a] due to risk of bias	-	-	The mean quality of life in the intervention groups was 0 higher (1.23 lower to 1.23 higher)
Quality of life medical outcomes study short form 12 - mental ratings	189 (1 study) 7 days	⨁⊖⊖⊖ VERY LOW[a,c] due to risk of bias, imprecision	-	-	The mean quality of life in the intervention groups was 1.5 higher (0.11 lower to 3.11 higher)
Patient satisfaction rating of discharge process (scale: 1 to 5; high is better outcome)	189 (1 study) 7 days	⨁⊖⊖⊖ VERY LOW[a,c] due to risk of bias, imprecision	-	-	The mean patient satisfaction in the intervention groups was 0.21 higher (0.05 to 0.37 higher)
Patient satisfaction preparedness to leave hospital (prepared to very prepared)	615 (1 study) 30 days	⨁⨁⊖⊖ LOW[a,c] due to risk of bias, imprecision	RR 1.21 (1.06 to 1.39)	Moderate	
				529 per 1000	111 more per 1000 (from 32 more to 206 more)
Length of stay days in hospital	1337 (5 studies)	⨁⨁⨁⊖ MODERATE[a] due to risk of bias	-	-	The mean length of stay in the intervention groups was 0.58 lower (1.45 lower to 0.28 higher)
Staff satisfaction GP satisfaction (scale: 1 to 5; high is better outcome)	189 (1 study) 7 days	⨁⨁⊖⊖ LOW[a] due to risk of bias	-	-	The mean staff satisfaction in the intervention groups was 0.18 lower (0.37 lower to 0.01 higher)

(a) Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias.
(b) Downgraded by 1 or 2 increments because the majority of the evidence was based on indirect interventions (interventions included post discharge components).
(c) Downgraded by 1 increment if the confidence interval crossed 1 MID or by 2 increments if the confidence interval crossed both MIDs.
(d) This result is from 3 studies (1 study had 0 events in both arms).

35.4 Economic evidence

Published literature

No relevant health economic studies were identified.

The economic article selection protocol and flow chart for the whole guideline can found in the guideline's Appendix 41A and Appendix 41B.

35.5 Evidence statements

Clinical

Ten studies comprising 3,271 people evaluated the role of discharge planning for improving outcomes in secondary care in adults and young people at risk of an AME, or with a suspected or confirmed AME. The evidence suggested that discharge planning may provide a benefit in reduced avoidable adverse events expressed as falls (1 study, very low quality), length of stay (5 studies, moderate quality), quality of life SF-12 mental ratings (1 study, very low quality) patient and/or carer satisfaction defined as preparedness to leave hospital (1 study, low quality). The evidence suggested there was no effect on quality of life (St Georges Respiratory questionnaire and SF-12 physical ratings) (1 study, low to very low quality), staff satisfaction (1 study, low quality) avoidable adverse events defined as adverse medicine reaction (1 study, very low quality) and patient and/or carer satisfaction (1 study, very low quality).

The evidence suggested a benefit for discharge planning in reducing readmissions in 3 studies (low quality) but in 1 study that reported a hazard ratio there was no difference in readmission (very low quality). The evidence suggested a benefit for discharge planning in reducing mortality at 6 months (1 study, very low quality) and during admission (1 study, very low quality). However, evidence from 4 studies suggested an increase in mortality from 5 days-12months (moderate quality).

Economic

No relevant economic evaluations were identified.

35.6 Recommendations and link to evidence

Recommendations	21. Start discharge planning at the time of admission for a medical emergency.
Research recommendation	-
Relative values of different outcomes	Mortality, avoidable adverse events, quality of life, patient and/or carer satisfaction and length of stay were considered by the committee to be critical outcomes to decision making. Readmission, delayed transfers of care and staff satisfaction were considered important outcomes.
Trade-off between benefits and harms	A total of 10 studies were identified that assessed the role of discharge planning for improving outcomes in secondary care in adults and young people at risk of an AME, or with a suspected or confirmed AME. The evidence suggested that discharge planning may provide a benefit in reduced avoidable adverse events (falls), length of stay, quality of life (as measured by SF-12 mental rating in 1 study) and patient and/or carer satisfaction measured by the preparedness to leave hospital. The evidence suggested there was no effect on quality of life (as measured by either the St Georges Respiratory questionnaire or SF-12 physical ratings), staff satisfaction and patient and/or carer satisfaction assessed by patient rating of the discharge process. Discharge planning was beneficial in terms of reducing readmissions in 3 studies but in 1 study that reported a hazard ratio that there was no difference in readmission. The evidence from 1 study reporting results only as hazard rations suggested a benefit for reduced mortality at 6 months and another study suggested reduced in hospital mortality for discharge planning. However, evidence from 3 studies suggested an increase in mortality from 1 day -12 months. It should also be noted that 2 of the studies[23,59] in the meta-analysis suggesting an increase in mortality post discharge; discharge planning were small studies and there is evidence to suggest that the frailty of the patients in the discharge planning groups was more pronounced than in the control group which may explain the excess mortality in the study groups. No evidence was identified for delayed transfers of care. The discharge planning interventions evaluated by the studies varied in terms of their composition and focus. Whereas some were grounded in facilitating the organisation of community, social care and living arrangements, others were more focused on improving post-discharge management of clinical conditions through patient education and management of follow-up appointments and prescriptions. Some interventions also included post-discharge components such as follow-up telephone calls and visits. However, despite these differences, pooled analyses showed no significant heterogeneity. The committee felt that if no plan for discharge is made, it can result in bed blocking if a patient is medically fit for discharge, but is unable to be discharged because the appropriate community and social care measures, if required, are not in place. This plan should be made on admission to enable adequate time to make arrangements for the point where the patient is medically ready for

Recommendations	21. Start discharge planning at the time of admission for a medical emergency.
Research recommendation	-
	discharge. Therefore, the committee decided to make a recommendation based on the evidence and their wide experience within primary, secondary and community care.
Trade-off between net effects and costs	No economic studies were included. One of the studies included above found substantial cost savings but this has not been included since (as outlined in the review protocol) the US setting is unlikely to make the economic findings generalisable to the UK. Unit costs of ED attendances and hospital admissions were provided to aid the consideration of cost-effectiveness. The review above indicated a reduction in readmissions and length of stay associated with discharge planning, which could result in substantial costs savings. The committee noted that implementing a form of early discharge planning is likely to be low cost and therefore it is likely to be cost saving overall. Safeguards need to be in place to ensure that earlier discharge is safe and the patients have appropriate support in the community.
Quality of evidence	The evidence was graded very low to moderate quality due to risk of bias, imprecision and indirectness. There was no economic evidence included in the review.
Other considerations	The committee considered current practice with regard to discharge planning. Discharge planning of some form occurs throughout all hospitals in the UK but is not standardised across hospitals. Although it is stated that it should begin at the point of admission (and before admission in the case of elective admission), this often does not happen. The Department of Health has guidelines and a tool for discharge planning.[57] Discharges are divided into 'simple' and 'complex'. Simple discharges account for 80% of discharges and should be easily achieved with the appropriate training, planning and resources. The processes to achieve a simple discharge are predictable and reproducible. In these cases, when the discharge process does not occur as planned, it is most likely to be a consequence of a failure in communication. Complex discharges account for the remaining 20%. These are patients with more complex needs such as multimorbidity or frailty, who may need additional input from other professionals such as social workers and therapists. The involvement of additional services, staff and specialties makes prior co-ordination and planning even more critical. This is of particular importance in the frail elderly and those patients with mental health issues. These patient groups are vulnerable to poor communication and co-ordination which have a disproportionate impact on the discharge process. Doctors are not usually specifically trained in discharge planning. It is assumed that they gain knowledge and skills through clinical practice. Training in discharge planning would benefit doctors early in their career and junior nursing staff so that it is embedded in the management plan. The committee decided to make a positive recommendation as they

Recommendations	**21. Start discharge planning at the time of admission for a medical emergency.**
Research recommendation	**-**
	considered it good practice to start planning discharge at the point of admission. This would ensure that discharge gets equal prominence with the ongoing management of the acute illness which should mitigate the risk of delayed discharge once the patient is fit to return to the community.

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Appendices

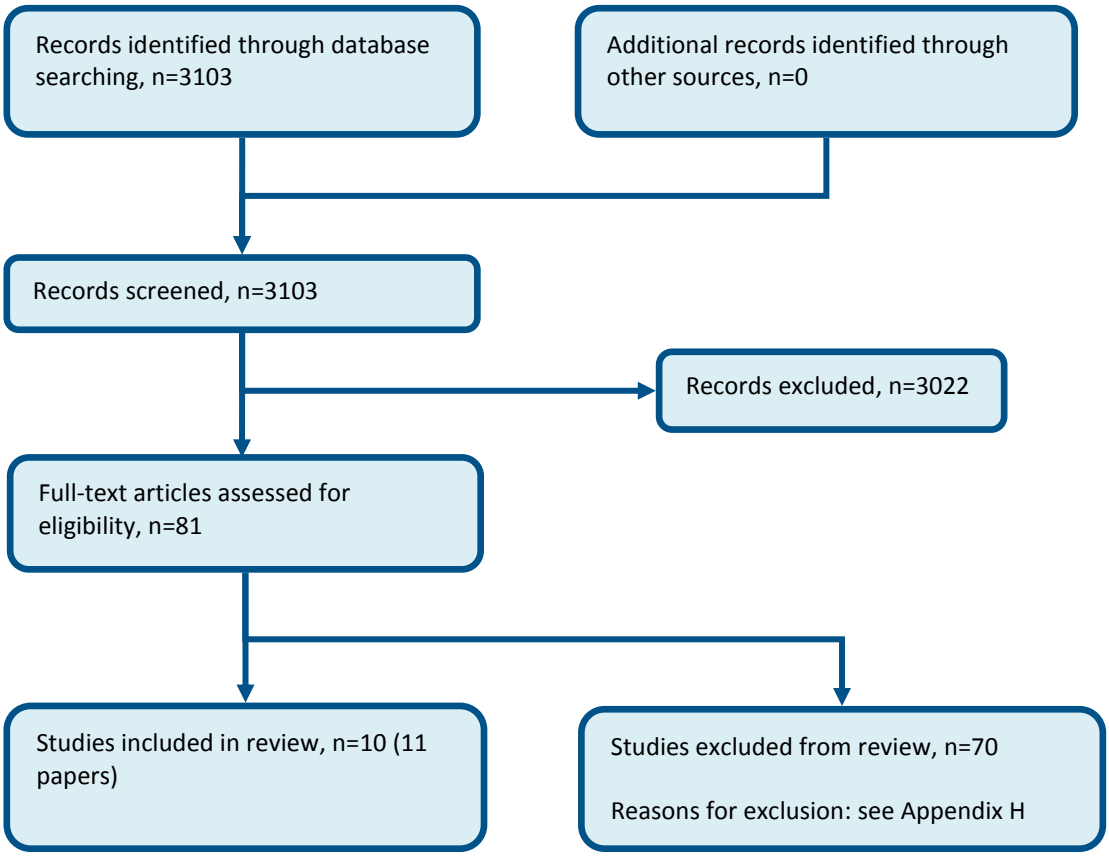
Appendix A: Review protocol

Table 4: Review protocol: Discharge planning

Review question	Discharge planning
Guideline condition	Acute medical emergencies.
Review population	Adults and young people (16 years and over) with a suspected or confirmed AME (discharged from the acute hospital).
	Adults
	Line of therapy not an inclusion criterion.
Interventions and comparators: generic/class; specific/drug (All interventions will be compared with each other, unless otherwise stated)	Discharge planning; discharge planning as defined by study. Usual care; as defined by study. Standard processes; usual practice.
Outcomes	- Quality of life (Continuous) CRITICAL - Mortality (Dichotomous) CRITICAL - Avoidable adverse events (Dichotomous) CRITICAL - Length of stay (Continuous) CRITICAL - Patient/Carer/Family satisfaction (Dichotomous) CRITICAL - Readmission up to 30 days (Dichotomous) IMPORTANT - Staff satisfaction (Dichotomous) IMPORTANT - Delayed Transfers of care (Dichotomous) IMPORTANT
Study design	Systematic reviews (SRs) of RCTs, RCTs, observational studies only to be included if no relevant SRs or RCTs are identified.
Unit of randomisation	Patient. Hospital. Ward.
Crossover study	Not permitted.
Minimum duration of study	Not defined.
Subgroup analyses if there is heterogeneity	- Frail Elderly (Frail; Not Frail); Different outcomes - People with mental illness (Mental illness; No mental illness); Different outcomes - Multimorbidity (Multimorbidity; No multimorbidity); Different outcomes - Early versus late (Early; Late); Different outcomes - MDT versus no MDT (MDT; No MDT); Different outcomes - Discharge co-ordinator (Nurse; Manager); Different outcomes
Search criteria	Databases: Medline, Embase, the Cochrane Library, CINAHL. Date limits for search: none. Language: English only.

Appendix B: Clinical article selection

Figure 1: Flow chart of clinical article selection for the review of discharge planning



Appendix C: Forest plots

C.1 Discharge planning versus standard processes

Figure 2: Readmission (30 days)

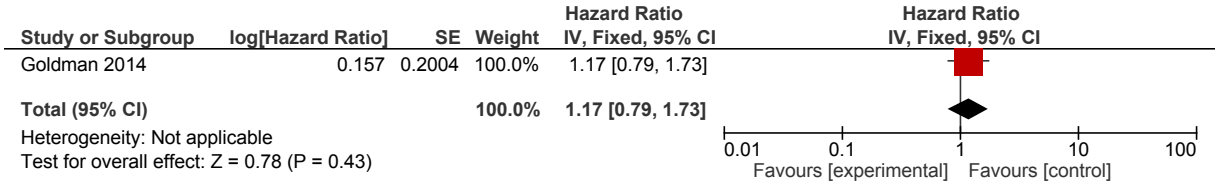


Figure 3: Readmission (5-30 days)

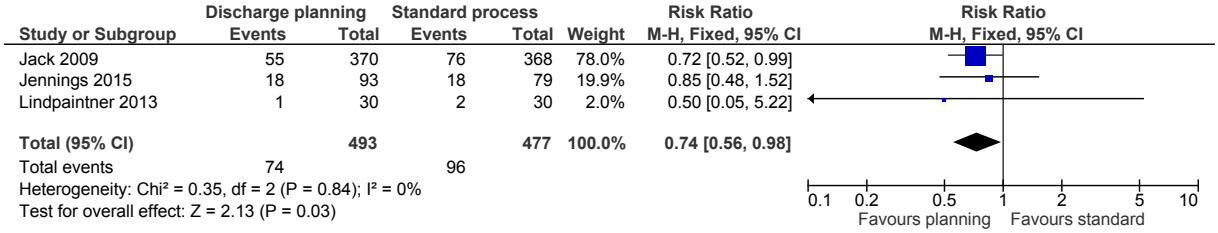


Figure 4: Mortality

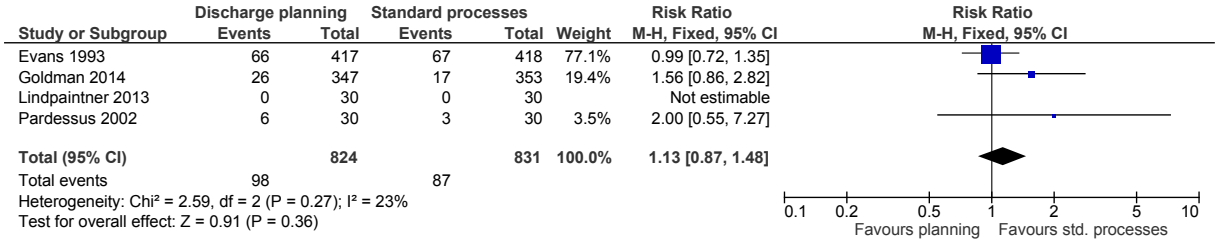


Figure 5: Mortality

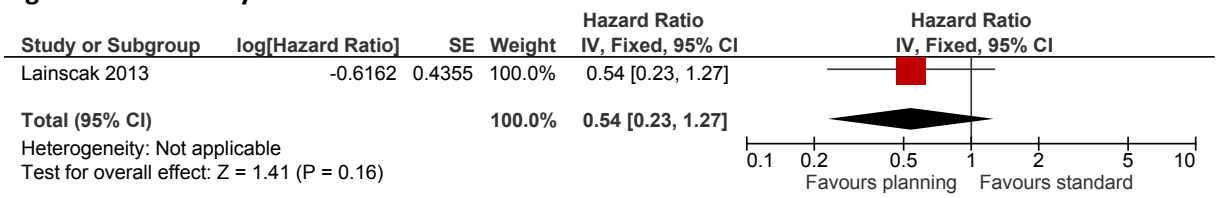


Figure 6: Mortality (in-hospital)

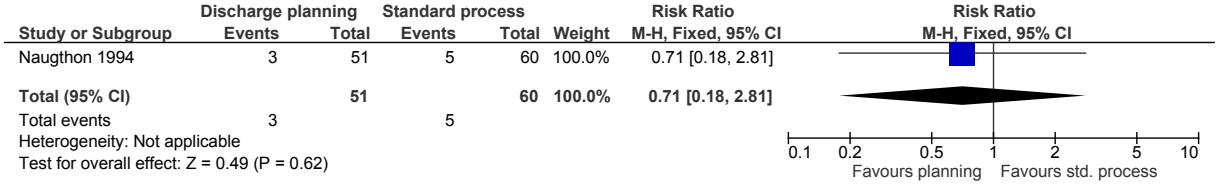


Figure 7: Avoidable adverse events (adverse medicine reaction)

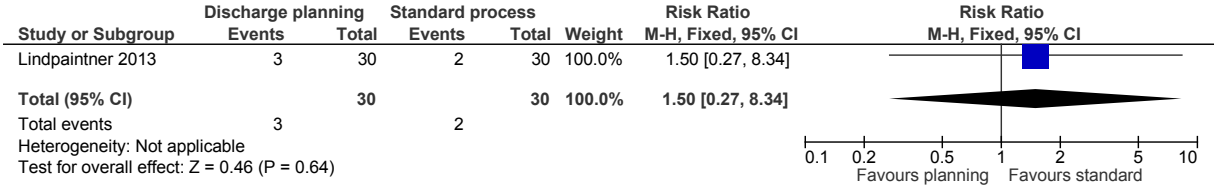


Figure 8: Avoidable adverse events (recurring falls)

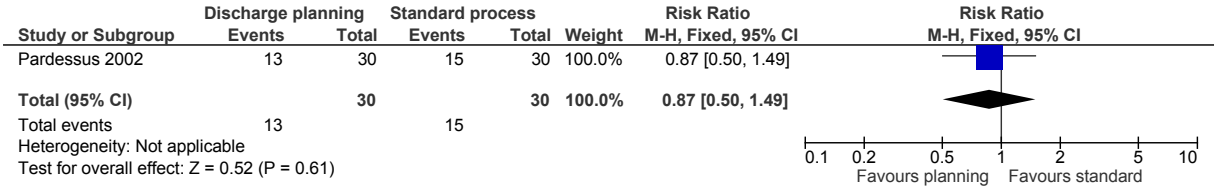


Figure 9: Quality of life (minimal clinically important difference on St. George's Respiratory Questionnaire)

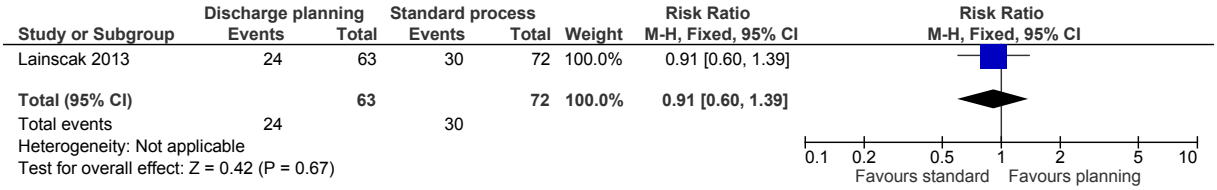


Figure 10: Quality of life (SF12 physical)

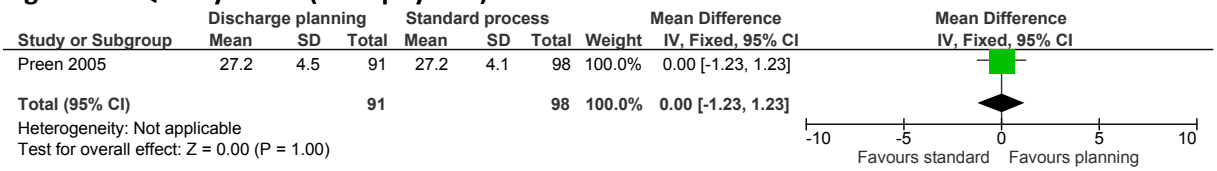


Figure 11: Quality of life (SF12 mental)

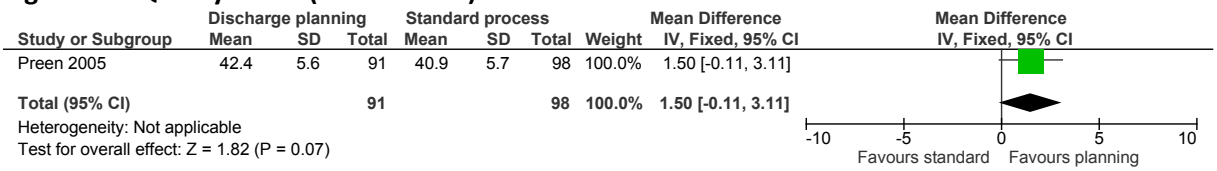


Figure 12: Patient satisfaction (rating of discharge process; 5 point Likert scale)

Study or Subgroup	Discharge planning Mean	SD	Total	Standard process Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Preen 2005	3.23	0.61	91	3.02	0.52	98	100.0%	0.21 [0.05, 0.37]
Total (95% CI)			**91**			**98**	**100.0%**	**0.21 [0.05, 0.37]**

Heterogeneity: Not applicable
Test for overall effect: Z = 2.54 (P = 0.01)

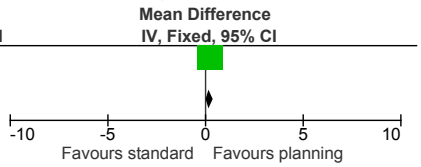


Figure 13: Patient satisfaction (prepared or very prepared to leave hospital)

Study or Subgroup	Discharge planning Events	Total	Standard process Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Jack 2009	197	307	163	308	100.0%	1.21 [1.06, 1.39]
Total (95% CI)		**307**		**308**	**100.0%**	**1.21 [1.06, 1.39]**
Total events	197		163			

Heterogeneity: Not applicable
Test for overall effect: Z = 2.81 (P = 0.005)

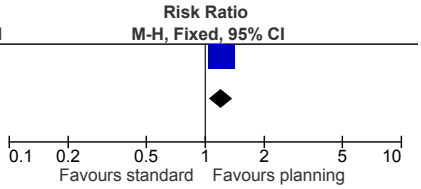


Figure 14: Length of stay

Study or Subgroup	Discharge planning Mean	SD	Total	Standard processes Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Evans 1993	11.9	12.7	417	12.5	13.5	418	23.8%	-0.60 [-2.38, 1.18]
Lindpaintner 2013	12.2	6.7	30	12.4	5.7	30	7.6%	-0.20 [-3.35, 2.95]
Naugthon 1994	5.4	5.5	51	7	7	60	13.9%	-1.60 [-3.93, 0.73]
Naylor 1994	7.4	3.8	72	7.5	5.2	70	33.4%	-0.10 [-1.60, 1.40]
Preen 2005	11.6	5.7	91	12.4	7.4	98	21.4%	-0.80 [-2.68, 1.08]
Total (95% CI)			**661**			**676**	**100.0%**	**-0.58 [-1.45, 0.28]**

Heterogeneity: Chi² = 1.24, df = 4 (P = 0.87); I² = 0%
Test for overall effect: Z = 1.32 (P = 0.19)

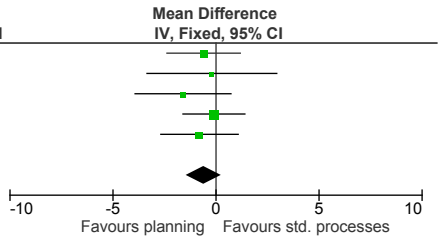
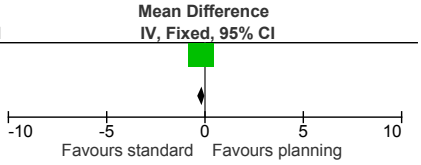


Figure 15: Staff satisfaction (5 point Likert scale)

Study or Subgroup	Discharge planning Mean	SD	Total	Standard process Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Preen 2005	3.24	0.62	91	3.42	0.7	98	100.0%	-0.18 [-0.37, 0.01]
Total (95% CI)			**91**			**98**	**100.0%**	**-0.18 [-0.37, 0.01]**

Heterogeneity: Not applicable
Test for overall effect: Z = 1.87 (P = 0.06)



Appendix D: Clinical evidence tables

Study	Evans 1993[16]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	(n=835).
Countries and setting	Conducted in USA; setting: Department of Veteran Affairs medical centre.
Line of therapy	Not applicable.
Duration of study	Follow up (post intervention): 9 months.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Risk-screening index score ≥ 3, based on a validated screening tool by Evans et al., 1988. The index evaluates the presence of 8 mutually exclusive variables, which were useful in discriminating outcome: 1) 2 or more chronic conditions; 2) poor mental status; 3) psychiatric comorbidity; 4) previous admission; 5) age 70 years or older; 6) lives alone or in a nursing home; 7) dependent ambulation; 8) being unmarried. Scores were in the range of 0-8, with a higher score indicating a higher risk of adverse hospital outcome.
Exclusion criteria	Low risk patients, based on the scale above (score lower than 3).
Recruitment/selection of patients	Patients were randomised after risk- screening.
Age, gender and ethnicity	Age - Other: ≥70 years: early discharge group: 184/417 (44%) male; usual care group: 198/418 (47%). Gender (M:F): early discharge group: 401/417 (96%) male; usual care group: 393/418 (94%) male. Ethnicity: not reported.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear 2. Multimorbidity: multimorbidity (75% had 2 or more chronic medical conditions) 3. People with mental illness: mental illness (psychiatric co-morbidity: early discharge group: 32%, usual care group: 28%).
Extra comments	Patients admitted to medical, neurologic or surgical services at a Department of Veteran Affairs medical centre.
Indirectness of population	Serious indirectness; patients included surgical and neurological as well as medical.
Interventions	(n=417) Intervention 1: Discharge planning - discharge planning as defined by study. Intervention was initiated on day 3 on the hospital. On the second day after admission, the patient's chart was reviewed and informed consent obtained. The patients were immediately referred to a social worker and the discharge planning protocol initiated. The protocol included assessment of the following areas: marital relationship, support systems, living situation, finances and area of need for patient discharge planning. Information was collected by 1) reviewing the chart; 2)

Study	Evans 1993[16]
	consulting the physician and nurse; and 3) interviewing the patient and family. Plans were implemented with measurable goals and results were charted into the medical record. Duration: 9 months. Concurrent medication/care: to examine possible sources of treatment effectiveness, the types of service received by each group were determined. They included referrals to community agencies, nursing home placements, counselling, health education, planning home health care, financial planning, living arrangements, environmental modifications and help with medical follow-up. Patients were considered ready for discharge when orders for such were written by the physician in the medical record. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear 2. Early versus late: early 3. MDT versus no MDT: Not applicable/Not stated/Unclear. (n=418) Intervention 2: Usual care - as defined by study. Discharge planning only if there was a written physician request. This was an average of day 9, or not at all. Duration: 9 months. Concurrent medication/care: to examine possible sources of treatment effectiveness, the types of service received by each group were determined. They included referrals to community agencies, nursing home placements, counselling, health education, planning home health care, financial planning, living arrangements, environmental modifications and help with medical follow-up. Patients were considered ready for discharge when orders for such were written by the physician in the medical record.
Funding	Academic or government funding (Department of Veterans Affairs Health Services Research and Development Program, project IIR#87-132).
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus USUAL CARE. Protocol outcome 1: Mortality. - Actual outcome: Mortality at 9 months; Group 1: 66/417, Group 2: 67/418; Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Length of stay. - Actual outcome: Length of stay at 9 months; Group 1: mean 11.9 (SD 12.7); n=417, Group 2: mean 12.5 (SD 13.5); n=418; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness Protocol outcome 3: Readmission. - Actual outcome: Readmission rate at 9 months; Group 1: 229/417, Group 2: 254/418; Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Quality of life; Avoidable adverse events; Patient and/or carer satisfaction; Delayed Transfers of care; Staff satisfaction.

Study (subsidiary papers)	Goldman 2014[23] (Chan 2015[8])
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=700).
Countries and setting	Conducted in USA; setting: internal or family medicine, cardiology, or neurology departments at San Francisco General Hospital and Trauma Centre.
Line of therapy	Not applicable.
Duration of study	Intervention + follow up.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall: n/a
Subgroup analysis within study	Not applicable.
Inclusion criteria	English, Spanish or Chinese speaking, aged 55 or older.
Exclusion criteria	Transferred from an outside hospital, admitted for a planned hospitalisation, likely to be discharged to an institutional setting, unable to consent due to severe cognitive impairment, mental illness or delirium, metastatic cancer, unable to participate in telephone follow up due to aphasia, severe hearing impairment or lack or access to a telephone.
Recruitment/selection of patients	Study staff received a list from the hospital's electronic health record system of patients admitted in the previous 24 hours, after screening for eligibility, staff reviewed the exclusion criteria with the patient's attending physician, if the physician agreed, patients were approached for consent.
Age, gender and ethnicity	Age - Mean (SD): 66.2 (9). Gender (M:F): 396:304. Ethnicity: 171 black, 137 Hispanic, 133 white, 33 other, 171 Chinese, 41 Filipino, 13 other Asian.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear 2. Multimorbidity: Not applicable/Not stated/Unclear 3. People with mental illness: Not applicable/Not stated/Unclear.
Indirectness of population	No indirectness: n/a.
Interventions	(n=347) Intervention 1: Discharge planning - discharge planning as defined by study. Nurse-led in hospital discharge planning - disease-specific patient education on day of enrolment and within 24 hours of discharge, after hospital care plan booklet given to patients including diagnoses, primary care and pharmacy contact information and upcoming appointments, follow up telephone calls (day 1 to 3 and 6 to 10) providing education, assessing medication/treatment adherence, resolving barriers to follow up appointments and discussing discharge plan. Nurses worked with pharmacies, adjusted medications and referred patients to primary care provider, urgent health clinic or ED when necessary. Duration: during admission and 10 days post discharge. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: nurse 2. Early versus late: early 3. MDT versus no MDT: Not applicable/Not

Study (subsidiary papers)	Goldman 2014[23] (Chan 2015[8])
	stated/Unclear. (n=353) Intervention 2: Usual care - as defined by study. Bedside nurse's review of the discharge instructions, 10 day medication supply and assistance of social worker if required, admitting team responsible for transmitting the discharge summary to the patient's primary care provider. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear 2. Early versus late: Not applicable/Not stated/Unclear 3. MDT versus no MDT: Not applicable/Not stated/Unclear.
Funding	Other (Gordon and Betty Moore Foundation).
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus AS DEFINED BY STUDY. Protocol outcome 1: Mortality. - Actual outcome: mortality at 180 days; Group 1: 26/347, Group 2: 17/353; Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA Protocol outcome 2: Patient and/or carer satisfaction. - Actual outcome: Care transitions measure at 30 days; Group 1: 242/301, Group 2: 247/315; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: Serious indirectness, Comments: NA Protocol outcome 3: Readmission. - Actual outcome: readmissions at 30 days; HR 1.17 (95%CI 0.79 to 1.74); Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA	
Protocol outcomes not reported by the study	Quality of life; Avoidable adverse effects; Length of stay/Time to discharge; Delayed Transfers of care; Staff satisfaction.

Study	Jack 2009[32]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=749).
Countries and setting	Conducted in USA; setting: medical teaching service of Boston Medical Center.
Line of therapy	Not applicable.
Duration of study	Intervention + follow up.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.

Study	**Jack 2009[32]**
Stratum	Overall: n/a.
Subgroup analysis within study	Not applicable.
Inclusion criteria	English speaking, at least 18 years of age, have a telephone, able to comprehend study details and the consent process and plan for discharge to a U.S community.
Exclusion criteria	Admitted from a skilled nursing facility/other hospital, transferred to a different hospital before enrolment, planned hospitalisation, hospital precautions/suicide watch and deaf/blind.
Recruitment/selection of patients	Each morning, a list of admitted patients were reviewed for initial eligibility, last names were ranked by using a random number sequence to determine the order in which to approach patients for enrolment and research assistant approached each patient and further determined eligibility.
Age, gender and ethnicity	Age - Mean (SD): intervention: 50.1 (15.1), control: 49.6 (15.3). Gender (M:F): 371:378. Ethnicity: 209 white non-Hispanic, 388 black non-Hispanic, 74 Hispanic, 74 other race or mixed race.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear 2. Multimorbidity: Not applicable/Not stated/Unclear 3. People with mental illness: Not applicable/Not stated/Unclear/
Indirectness of population	No indirectness: n/a.
Interventions	(n=373) Intervention 1: Discharge planning - discharge planning as defined by study. Reengineered discharge intervention - patient education, appointments for post-discharge follow up, discussion of in-hospital tests with patient, organisation of post-discharge services, confirmation of medication plan, reconciliation of discharge plan with national guidelines, review of appropriate steps in an emergency, transmission of discharge summary to physicians and services, assessment of patient understanding, provision of a written discharge plan, telephone call from the pharmacist, initiated at admission by nurse discharge advocates. Duration: during admission and telephone calls at least 3 times post-discharge. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: nurse (nurse discharge advocate). 2. Early versus late: early (beginning at admission). 3. MDT versus no MDT: Not applicable/Not stated/Unclear. (n=376) Intervention 2: Usual care - as defined by study. No further intervention. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear 2. Early versus late: Not applicable/Not stated/Unclear 3. MDT versus no MDT: Not applicable/Not stated/Unclear.
Funding	Academic or government funding (Agency for Healthcare Research and Quality grants and National Heart, Lung and Blood Institute, National Institutes of Health)
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus AS DEFINED BY STUDY.	

Study	Jack 2009[32]
Protocol outcome 1: Patient and/or carer satisfaction. - Actual outcome: How prepared were you to leave the hospital? (Prepared or very prepared) at 30 days; Group 1: 197/307, Group 2: 163/308; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA; Group 1 Number missing: 66; Group 2 Number missing: 68 Protocol outcome 2: Readmission. - Actual outcome: Readmissions at 30 days; Group 1: 55/370, Group 2: 76/368; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA; Group 1 Number missing: 3, Reason: 2 participant request, 1 died before discharge; Group 2 Number missing: 8, Reason: 5 participant request, 2 died before discharge, 1 previously enrolled	
Protocol outcomes not reported by the study	Quality of life; Mortality; Avoidable adverse effects; Length of stay/Time to discharge; Delayed Transfers of care; Staff satisfaction.

Study	Jennings 2015[33]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=172).
Countries and setting	Conducted in USA; setting: single hospital, USA.
Line of therapy	Not applicable.
Duration of study	Intervention + follow up.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall: n/a.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Diagnosis of COPD with presence of an acute exacerbation, >40 years of age, current ex-smoker with a history equivalent to at least 20 pack years.
Exclusion criteria	Medical history of asthma, interstitial lung disease, bronchiectasis, presence of airway hardware, lung cancer, other cancer associated with a life expectance of <1 year, any cancer where the patient received active chemotherapy or radiation treatment, active substance abuse, neuromuscular disorders, affecting the respiratory system, language barriers, residence in a nursing home, ICU stay during admission and significant delirium or dementia.
Recruitment/selection of patients	Not reported.

Study	Jennings 2015[33]
Age, gender and ethnicity	Age - Mean (SD): intervention 64.9 (10.9), control 64.4 (10.5). Gender (M:F): 77:95. Ethnicity: 42 White,129 Black, 1 Asian.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear 2. Multimorbidity: Not applicable/Not stated/Unclear 3. People with mental illness: Not applicable/Not stated/Unclear.
Indirectness of population	No indirectness: n/a.
Interventions	(n=93) Intervention 1: Discharge planning - discharge planning as defined by study. Discharge bundle - 60 minute visit by a member of the research team 24 hours prior to anticipated discharge day, during which acute exacerbation of COPD risks were assessed (smoking cessation, gastroesophageal reflux disease assessed by questionnaire and given lifestyle advice, anxiety or depressive symptoms referred to outpatient services, patient education on inhaler use), contacted by telephone 48 hours after discharge to reinforce items in bundle. Duration: 24 hours before discharge to 48 hours post discharge. Concurrent medication/care: same as control group. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear 2. Early versus late: late 3. MDT versus no MDT: Not applicable/Not stated/Unclear. (n=79) Intervention 2: Usual care - as defined by study. Routine discharge process - spirometry 1 to 2 days prior to discharge, systemic steroids, antibiotics and inhaler therapy at the primary team's discretion, education from nursing staff regarding inhaler use. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear 2. Early versus late: Not applicable/Not stated/Unclear 3. MDT versus no MDT: Not applicable/Not stated/Unclear.
Funding	Academic or government funding (Breech Chair for Health Care Quality Improvement).
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus AS DEFINED BY STUDY. Protocol outcome 1: Readmission. - Actual outcome: Readmissions at 30 days; Group 1: 18/93, Group 2: 18/79; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA	
Protocol outcomes not reported by the study	Quality of life; Mortality; Avoidable adverse effects; Length of stay/Time to discharge; Patient and/or carer satisfaction; Delayed Transfers of care; Staff satisfaction.

Study	Lainscak 2013[36]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=253).

Study	Lainscak 2013[36]
Countries and setting	Conducted in Slovenia; setting: specialised pulmonary hospital, Slovenia.
Line of therapy	Not applicable.
Duration of study	Intervention + follow up.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall: n/a.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Acute exacerbation of COPD, reduced pulmonary function corresponding to Global Initiative for Chronic Obstructive Lung Disease stage 2 to 4.
Exclusion criteria	Unstable/terminal stage of disease other than COPD (for example, heart failure malignant disease), unable to deal with telephone contact when out of hospital and death/withdrawal of consent before discharge.
Recruitment/selection of patients	Unclear.
Age, gender and ethnicity	Age - Mean (SD): 71 (9). Gender (M:F): 182:71. Ethnicity: not reported.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear. 2. Multimorbidity: Not applicable/Not stated/Unclear. 3. People with mental illness: Not applicable/Not stated/Unclear.
Indirectness of population	No indirectness: n/a.
Interventions	(n=118) Intervention 1: Discharge planning - discharge planning as defined by study. Discharge coordinator intervention - assessment of patient situation and homecare needs to identify any problems and specific needs, active involvement of patients and carers in the discharge planning process which was discussed with community/home care nurse, GP, social care worker, physiotherapist and other providers as appropriate, patients contacted by telephone 48 hours post discharge, discharge coordinator activities with care provider continued as appropriate, final patient assessment during a home visit 7 to 10 days after discharge. Duration: during admission and 7-10 days post discharge. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear. 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear. (n=135) Intervention 2: Usual care - as defined by study. Routine patient education with written and verbal information about COPD, supervised inhaler use, respiratory, physiotherapy as indicated and disease related communication between medical staff with patients and their caregivers. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator Not applicable/Not stated/Unclear. 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear.

Study	Lainscak 2013[36]
Funding	Funding not stated.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus AS DEFINED BY STUDY. Protocol outcome 1: Quality of life. - Actual outcome: minimal clinically important difference on St. George's Respiratory Questionnaire at 180 days post-discharge; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA; Group 1 Number missing: 55; Group 2 Number missing: 63 Protocol outcome 2: Mortality. - Actual outcome: all-cause mortality at 180 days post-discharge; HR 0.54 (95%CI 0.23 to 1.28); Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA	
Protocol outcomes not reported by the study	Avoidable adverse effects; Length of stay/Time to discharge; Patient and/or carer satisfaction; Readmission; Delayed Transfers of care; Staff satisfaction.

Study	Lindpaintner 2013[42]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=60).
Countries and setting	Conducted in Switzerland; setting: 2 internal medicine wards at 1 centre in Switzerland.
Line of therapy	Not applicable.
Duration of study	Intervention + follow up.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall: n/a.
Subgroup analysis within study	Not applicable: n/a.
Inclusion criteria	One or more of the following: oral anticoagulation, newly ordered insulin, polypharmacy (>8 regular medicines at admission), new diagnosis requiring 4 or more long term medicines. In addition, eligible patients met 1 or more inclusion criteria for vulnerability: living alone, receiving home nursing care prior to admission, requiring complex wound care and being the family caregiver of a dependent adult.
Exclusion criteria	<18 years of age, death anticipated within 30 days, enrolled in another study, unable to give informed consent because of inability to speak German or cognitive impairment, nursing home admission scheduled for the coming

Study	Lindpaintner 2013[42]
	month or primary care physician/local visiting nurse association not participating.
Recruitment/selection of patients	Consecutive patients meeting the inclusion criteria.
Age, gender and ethnicity	Age - Median (range): intervention: 75.1 +/-9.49, control: 75.2 +/-12.36. Gender (M:F): 26:34. Ethnicity: not reported.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear. 2. Multimorbidity: Not applicable/Not stated/Unclear. 3. People with mental illness: Not applicable/Not stated/Unclear.
Indirectness of population	No indirectness: n/a.
Interventions	(n=30) Intervention 1: Discharge planning - discharge planning as defined by study. Discharge management intervention - individualised discharge plan formulated by nurse care managers, including teaching about self-management, scheduling of follow up appointments, standardised discharge fax to primary physician and local visiting nurse organisation, structured telephone contact within 24 hours of discharge, NCM availability by pager 24/7 for 5 days post discharge and 1 home visit, following a comprehensive structured assessment (symptom burden, prior adherence to prescribed therapies, family caregiving functional status, cognition and comorbidity), conference with ward team and joining ward rounds. Duration: during admission and 5 days post-discharge. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Nurse 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear. (n=30) Intervention 2: Usual care - as defined by study. The same team of physicians and nurses provided inpatient care to both groups, but NCMs avoided contact with control patients. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear. 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear.
Funding	Study funded by industry (MediService AG, a provider of home pharmacy services in Switzerland).
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus AS DEFINED BY STUDY. Protocol outcome 1: Mortality. - Actual outcome: deaths at 1-5 days post-discharge; Group 1: 0/30, Group 2: 0/30; Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA Protocol outcome 2: Avoidable adverse effects. - Actual outcome: adverse medicine reaction at 1-5 days post-discharge; Group 1: 3/30, Group 2: 2/30; Risk of bias: All domain - Very high, Selection - High, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA	

Study	Lindpaintner 2013[42]
Protocol outcome 3: Length of stay/Time to discharge. - Actual outcome: length of stay at admission; Group 1: mean 12.2 days (SD 6.7); n=30, Group 2: mean 12.4 days (SD 5.7); n=30; Risk of bias: All domain - Very high, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - High, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA Protocol outcome 4: Readmission. - Actual outcome: rehospitalisation at 1-5 days post-discharge; Group 1: 1/30, Group 2: 2/30; Risk of bias: All domain - Very high, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA	
Protocol outcomes not reported by the study	Quality of life; Patient and/or carer satisfaction; Delayed Transfers of care; Staff satisfaction.

Study	Naughton 1994[52]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=111).
Countries and setting	Conducted in USA; setting: academic medical centre, USA.
Line of therapy	Not applicable.
Duration of study	Intervention time: during admission and 2 weeks post discharge.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall: n/a.
Subgroup analysis within study	Not applicable.
Inclusion criteria	70 years or older, admitted from the ED to the medicine service.
Exclusion criteria	Regularly received care from an attending internist on staff at the hospital at the time of admission, admitted to an ICU or transferred from the medical service to a surgical service.
Recruitment/selection of patients	Not stated.
Age, gender and ethnicity	Age - Mean (SD): intervention 80.1(6.6), control 80.1(6.4). Gender (M:F): intervention 51% male, control 36.6% male. Ethnicity: intervention 60.8% white, control 58.3% white.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear. 2. Multimorbidity: Not applicable/Not stated/Unclear. 3. People with mental illness: Not applicable/Not stated/Unclear.
Indirectness of population	No indirectness: n/a.

Study	Naughton 1994[52]
Interventions	(n=51) Intervention 1: Discharge planning - discharge planning as defined by study. Geriatric evaluation and management team routinely evaluated patients' mental status, psychosocial condition and functional status to determine medical, rehabilitative and social needs, discussed at team conferences, social worker coordinated community resources and ensured post hospital treatment plan was in place at discharge and 2 weeks later, nurse coordinated transfer to home health care. Duration: during admission and 2 weeks post discharge. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: (GEM team). 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: MDT. (n=60) Intervention 2: Usual care - as defined by study. Services of social workers and discharge planners available upon request. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear. 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear.
Funding	Other (North-western Memorial Foundation).
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus AS DEFINED BY STUDY. Protocol outcome 1: Mortality. - Actual outcome: in-hospital mortality during admission; Group 1: 3/51, Group 2: 5/60; Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA Protocol outcome 2: Length of stay/Time to discharge. - Actual outcome: length of stay during admission; Group 1: mean 5.4 days (SD 5.5); n=51, Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA	
Protocol outcomes not reported by the study	Quality of life; Avoidable adverse effects; Patient and/or carer satisfaction; Readmission; Delayed Transfers of care; Staff satisfaction.

Study	Naylor 1994[53]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	(n=276 patients, 125 caregivers. Medical patients used for analysis: 142).
Countries and setting	Conducted in USA; setting: university hospital.
Line of therapy	Not applicable.
Duration of study	Follow up (post intervention): 12 weeks.

Study	Naylor 1994[53]
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Eligible patients were 70 years and older, were admitted from their homes to the Hospital of the University of Pennsylvania, and were from selected medical and surgical diagnostic-related groups (DRGs). Patients were randomly assigned to an intervention or control group. The medical DRGs were congestive heart failure and angina/myocardial infarction. Surgical DRGs were coronary artery bypass graft and cardiac valve replacement. In addition, patients had to speak English, be alert and oriented when admitted, and be able to be reached by telephone after discharge. Caregivers, persons identified by patients as those who would assume primary responsibility for their care after discharge, were also enrolled. Patients who did not identify a caregiver were included in the study.
Exclusion criteria	Non-English speaking, not alert or orientated on admission and unable to be reached by telephone after discharge.
Recruitment/selection of patients	Not reported.
Age, gender and ethnicity	Age - Mean (SD): Intervention group: 76 (5.2), control group 76 (4.9). Gender (M:F): Intervention group: 57% male, control group 41% male. Ethnicity: of medical patients used for analysis: White: intervention group: 61%, control group: 69%.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear. 2. Multimorbidity: 3. People with mental illness: Not applicable/Not stated/Unclear.
Extra comments	Only the medical group of patients from this study is analysed. The surgical group was not included.
Indirectness of population	No indirectness.
Interventions	(n=72) Intervention 1: Discharge planning - discharge planning as defined by study. Patients and caregivers in the intervention group received the hospital's routine plan and a comprehensive, individualised discharge planning protocol developed specifically for elderly patients and implemented by gerontologic clinical nurse specialists. The protocol extended from hospital admission to 2 weeks after discharge. Compared with the hospital's routine procedure, the discharge planning protocol included the following unique features: 1) comprehensive initial and on-going assessment of the discharge planning needs of the elderly patient and his or her caregiver; 2) development of a discharge plan in collaboration with the patient, caregiver, physician, primary nurse and other members of the health care team; 3) validation of patient and caregiver education; 4) coordination of the discharge plan throughout the patient's hospitalisation and through 2 weeks after discharge; 5) interdisciplinary communication regarding discharge status; and 6) on-going evaluation of the effectiveness of the discharge plan. Two half-time nurse specialists with master's degrees in gerontologic nursing and a minimum of 1 year of practice as a nurse specialist were hired to implement the comprehensive discharge planning protocol for patients in the intervention group. Within 24 to 48

Study	Naylor 1994[53]
	hours of admission, the nurse specialist visited the patient and contacted the caregiver to complete the initial patient and caregiver assessment and to document the preliminary discharge plan. The nurse specialist visited the patient every 48 hours thereafter to implement the plan through patient and caregiver education, referrals, consultation with health care team members, counselling, and coordination of home services. The final visit was made within 24 hours of discharge to finalise discharge preparations. Summaries of the discharge plan were recorded in the patient's chart and distributed to the patient, primary care physician, and other health care team members who would care for the patient at home. In addition to personal visits, the nurse specialist was available 7 days a week by telephone (8 a.m. to 10 p.m. on weekdays; 8 a.m. to 12 p.m. on weekends) throughout the patient's hospitalisation and for 2 weeks after discharge for any questions or concerns from the patient, caregiver, or health care team member that were relevant to the discharge plan. The nurse specialist also initiated a minimum of 2 telephone calls during the first 2 weeks after discharge to monitor the patient's progress and intervene when necessary. Duration: 2 weeks post discharge. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: nurse 2. Early versus late: early 3. MDT versus no MDT: MDT. (n=70) Intervention 2: Usual care - as defined by study. Patients in the control group received the hospital's routine discharge plan, which is used for patients of all ages and diagnostic classifications. Criteria-based screening of all hospital admissions normally occurred within 48 hours of admission. Uncomplicated discharges were managed by the patient's physician and primary nurse. Complicated discharges, which necessitated coordination of services and external providers, involved social workers and community nursing coordinators employed by the hospital. Discharge planning services were provided in accordance with the medical plan of care. Duration: during admission only. Concurrent medication/care: not reported.
Funding	Academic or government funding (National Institute of Nursing Research (NR02095-05)).
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING versus USUAL CARE. Protocol outcome 1: Length of stay. - Actual outcome: Length of stay During hospital admission; Group 1: mean 7.4 days (SD 3.8); n=72, Group 2: mean 7.5 days (SD 5.2); n=70; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Readmission. - Actual outcome: Readmissions at 12 weeks post discharge; Group 1: 18/72, Group 2: 29/70; Risk of bias: All domain - High, Selection - Low, 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; Quality of life; Avoidable adverse effects; Patient/Carer/Family satisfaction; Delayed Transfers of care; Staff satisfaction.

Study	Pardessus 2002[59]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=60).
Countries and setting	Conducted in France; setting: acute geriatric department of the geriatric hospital.
Line of therapy	Not applicable.
Duration of study	Intervention + follow up.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall: n/a.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Aged 65 years or older, hospitalised for falling, able to return home after hospitalisation, informed consent to participate.
Exclusion criteria	Cognitive impairment (mini mental test <24), without a telephone, lived further than 30km from the hospital, falls secondary to cardiac, neurologic, vascular, or therapeutic problems.
Recruitment/selection of patients	Not reported.
Age, gender and ethnicity	Age - Mean (SD): intervention: 83.51 (9.08), control: 82.9 (6.33). Gender (M:F): 13:47. Ethnicity: not reported.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear. 2. Multimorbidity: Not applicable/Not stated/Unclear. 3. People with mental illness: Not applicable/Not stated/Unclear.
Indirectness of population	No indirectness: n/a.
Interventions	(n=30) Intervention 1: Discharge planning - discharge planning as defined by study. Single home visit by a physical medicine and rehabilitation doctor during hospitalisation, hospital social worker contacted to assess problems encountered, environmental hazards identified, modifications made where possible, advice from occupational therapist, persons likely to bring social assistance contacted. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear. 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear. (n=30) Intervention 2: Usual care - as defined by study. Usual care - physical therapy during hospitalisation, patient and family informed on home safety and possible social assistance. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear. 2. Early versus late: Not applicable/Not

Study	Pardessus 2002[59]
	stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear.
Funding	Funding not stated.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus AS DEFINED BY STUDY. Protocol outcome 1: Mortality. - Actual outcome: death at 12 months; Group 1: 6/30, Group 2: 3/30; Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA Protocol outcome 2: Avoidable adverse effects. - Actual outcome: falls at 12 months; Group 1: 13/30, Group 2: 15/30; Risk of bias: All domain - Very high, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - High, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA	
Protocol outcomes not reported by the study	Quality of life; Length of stay/Time to discharge; Patient and/or carer satisfaction; Readmission; Delayed Transfers of care; Staff satisfaction.

Study	Preen 2005[64]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=189).
Countries and setting	Conducted in Australia; setting: 2 Western Australian tertiary hospitals.
Line of therapy	Not applicable.
Duration of study	Intervention + follow up.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall: n/a.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Have a current GP and at least 2 community care providers for example, allied health worker or in-home nurse.
Exclusion criteria	Discharged to residential aged-care facilitates.
Recruitment/selection of patients	Patients identified via communication with ward staff at each location.
Age, gender and ethnicity	Age - Mean (SD): 75.1 (10.9). Gender (M:F): 74:115. Ethnicity: not reported.
Further population details	1. Frail Elderly: Not applicable/Not stated/Unclear. 2. Multimorbidity: Not applicable/Not stated/Unclear. 3. People with mental illness: Not applicable/Not stated/Unclear.

Study	Preen 2005[64]
Indirectness of population	No indirectness: n/a.
Interventions	(n=91) Intervention 1: Discharge planning - discharge planning as defined by study. Discharge care plan - 24-48 hours before anticipated discharge, individually tailored in accordance with that set down by the Australian Enhanced Primary Care Initiative, including problems identified from hospital notes and patient/caregiver consultation, patient agreed goals based on personal circumstances, identified appropriate interventions and community service providers, faxed to GP, GP consultation within 7 days of discharge for review, care plan faxed back to the hospital, explained in full to patient/carer and copy given. Duration: during admission and 7 days post-discharge. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear. 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear. (n=98) Intervention 2: Usual care - as defined by study. All patients have a discharge summary completed which is copied to their GP. Duration: during admission. Concurrent medication/care: not reported. Further details: 1. Discharge co-ordinator: Not applicable/Not stated/Unclear. 2. Early versus late: Not applicable/Not stated/Unclear. 3. MDT versus no MDT: Not applicable/Not stated/Unclear.
Funding	Academic or government funding (Western Australian Department of Health).

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: DISCHARGE PLANNING AS DEFINED BY STUDY versus AS DEFINED BY STUDY.

Protocol outcome 1: Quality of life.
- Actual outcome: Medical Outcomes Study Short Form 12 - mental ratings at 7 days post-discharge; Risk of bias: All domain - Very high, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA.
- Actual outcome: Medical Outcomes Study Short Form 12 - physical ratings at 7 days post-discharge; Risk of bias: All domain - Very high, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA

Protocol outcome 2: Length of stay/Time to discharge.
- Actual outcome: hospital length of stay at admission; Group 1: mean 11.6 days (SD 5.7); n=91, Group 2: mean 12.4 days (SD 7.4); n=98; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA

Protocol outcome 3: Patient and/or carer satisfaction.
- Actual outcome: patient rating of discharge process at 7 days post-discharge; Risk of bias: All domain - Very high, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA;

Protocol outcome 4: Staff satisfaction
- Actual outcome: GP satisfaction with patient's overall discharge process at 7 days post-discharge; Risk of bias: All domain - Very high, Selection - High, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low; Indirectness of outcome: No indirectness, Comments: NA

Study	Preen 2005[64]
Protocol outcomes not reported by the study	Mortality; Avoidable adverse effects; Readmission; Delayed Transfers of care.

Appendix E: Economic evidence tables

No relevant health economic studies were identified.

Appendix F: GRADE tables

Table 5: Clinical evidence profile: Discharge planning versus standard processes

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Discharge	standard processes	Relative (95% CI)	Absolute		
Readmission (follow-up 30 days; assessed with: number readmitted)												
1	randomised trials	serious[1]	no serious inconsistency	serious[2]	serious[3]	none	-	0%	HR 1.17 (0.79 to 1.73)	-	⊕OOO VERY LOW	IMPORTANT
Readmission (follow-up 5-30 days; assessed with: number readmitted)												
3	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[3]	none	74/493 (15%)	20.7%	RR 0.74 (0.56 to 0.98)	54 fewer per 1000 (from 4 fewer to 91 fewer)	⊕⊕OO LOW	IMPORTANT
Mortality (follow-up 5 days -12 months; assessed with: number of deaths)												
4	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[3]	none	98/824 (11.9%)	10%	RR 1.13 (0.87 to 1.48)	13 more per 1000 (from 13 fewer to 48 more)	⊕⊕⊕O MODERATE	CRITICAL
Mortality (follow-up 6 months; assessed with: number of deaths)												
1	randomised trials	no serious risk of bias	no serious inconsistency	serious[2]	very serious[3]	none	-	0%	HR 0.54 (0.23 to 1.27)	-	⊕OOO VERY LOW	CRITICAL
Mortality (in-hospital) (follow-up during admission; assessed with: number of deaths during admission)												
1	randomised trials	no serious risk of bias	no serious inconsistency	serious[2]	very serious[3]	none	3/51 (5.9%)	8.3%	RR 0.71 (0.18 to 2.81)	24 fewer per 1000 (from 68 fewer to 150 more)	⊕OOO VERY LOW	CRITICAL

Avoidable adverse events (follow-up 1-5 days; assessed with: adverse medicine reaction)												
1	randomised trials	very serious[1]	no serious inconsistency	serious[2]	very serious[3]	none	3/30 (10%)	6.7%	RR 1.5 (0.27 to 8.34)	34 more per 1000 (from 49 fewer to 492 more)	⊕OOO VERY LOW	CRITICAL
Avoidable adverse events (follow-up 12 months; assessed with: falls)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	very serious[3]	none	13/30 (43.3%)	50%	RR 0.87 (0.5 to 1.49)	65 fewer per 1000 (from 250 fewer to 245 more)	⊕OOO VERY LOW	CRITICAL
Quality of life (follow-up 180 days; assessed with: minimal clinically important difference on St. George's Respiratory Questionnaire)												
1	randomised trials	serious[1]	no serious inconsistency	serious[2]	very serious[3]	none	24/63 (38.1%)	41.7%	RR 0.91 (0.6 to 1.39)	38 fewer per 1000 (from 167 fewer to 163 more)	⊕OOO VERY LOW	CRITICAL
Quality of life (follow-up 7 days; measured with: medical outcomes study short form 12 - physical ratings; Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	91	98	-	MD 0 higher (1.23 lower to 1.23 higher)	⊕⊕OO LOW	CRITICAL
Quality of life (follow-up 7 days; measured with: medical outcomes study short form 12 - mental ratings; Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	serious[3]	none	91	98	-	MD 1.5 higher (0.11 lower to 3.11 higher)	⊕OOO VERY LOW	CRITICAL
Patient satisfaction (follow-up 7 days; measured with: rating of discharge process; Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	serious[3]	none	91	98	-	MD 0.21 higher (0.05 to 0.37 higher)	⊕OOO VERY LOW	CRITICAL
Patient satisfaction (follow-up 30 days; assessed with: preparedness to leave hospital (prepared or very prepared))												
1	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	serious[3]	none	197/307 (64.2%)	52.9%	RR 1.21 (1.06 to 1.39)	111 more per 1000 (from 32 more to 206 more)	⊕⊕OO LOW	CRITICAL
Length of stay (measured with: days in hospital; Better indicated by lower values)												
5	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	661	676	-	MD 0.58 lower (1.45 lower to 0.28 higher)	⊕⊕⊕O MODERAT	CRITICAL

											E	
Staff satisfaction (follow-up 7 days; measured with: GP satisfaction; Better indicated by higher values)												
1	randomised trials	very serious[1]	no serious inconsistency	no serious indirectness	no serious imprecision	none	91	98	-	MD 0.18 lower (0.37 lower to 0.01 higher)	⊕⊕OO LOW	IMPORTANT

[1] Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias.
[2] Downgraded by 1 or 2 increments because the majority of the evidence was based on indirect interventions (interventions included post discharge components).
[3] Downgraded by 1 increment if the confidence interval crossed 1 MID or by 2 increments if the confidence interval crossed both MIDs.

Appendix G: Excluded clinical studies

Table 6: Studies excluded from the clinical review

Study	Exclusion reason
Altfeld 2013[1]	Incorrect interventions (post discharge intervention)
Anderson 2002[2]	Systematic review (not relevant or unclear PICO)
Anon 2000[15]	Systematic review (not relevant or unclear PICO)
Anon 2004	Study summary
Atienza 2004[3]	Incorrect intervention (multicomponent intervention – patient and family education prior to discharge, post discharge visit with primary care physician and regular follow up visits at a heart failure clinic)
Azzalini 2015[4]	Incorrect interventions. early supported discharge
Balaban 2008[5]	Said to be an RCT but patients were not randomised
Beech 1999[6]	Incorrect interventions. early supported discharge
Braet 2012[7]	Systematic review protocol
Clemson 2016[9]	Incorrect comparison (discharge planning with home follow up vs. in-hospital discharge planning)
Cotton 2000[10]	Data not useable (no SDs provided)
Cunliffe 2004[11]	Not guideline condition (fracture)
Davies 2007[12]	Incorrect study design
Domingo 2012[13]	Systematic review protocol
Durvasula 2015[14]	Incorrect study design
Farren 1991[17]	Incorrect study design
Finn 2011[18]	Incorrect interventions (nurse discharge facilitator assigned to patients who were ready for discharge to assist with discharge processes)
Fox 2013[21]	Systematic review (not relevant or unclear PICO)
Fox 2016[20]	Commentary
Fjaertoft 2004[19]	Incorrect interventions. early supported discharge
George 2013[22]	Letter
Goncalves-bradley 2016[24]	Systematic review is not relevant to review question or unclear PICO
Haggmark 1997[25]	Incorrect population (cancer patients)
Harrison 1990[26]	Article
Harrison 2002[27]	Inappropriate comparison - both arms received the same discharge planning
Hesselink 2012[28]	Systematic review (not relevant or unclear PICO)
Hofstad 2014[29]	Incorrect interventions (early supported discharge)
Hyde 2000[30]	Incorrect interventions (post discharge intervention; supported discharge)
Indredavik 2000[31]	Incorrect interventions (early supported discharge)
Kleinpell 2004[34]	Not guideline condition. outcomes not useable (no SDs given)
Kotowycz 2010[35]	Incorrect interventions (early supported discharge)
Langhorne 2005[37]	Systematic review (not relevant or unclear PICO)
Langhorne 2007[38]	Systematic review (not relevant or unclear PICO)
Laramee 2003[39]	Incorrect interventions - congestive heart failure case manager, multicomponent intervention (early discharge planning and coordination

Study	Exclusion reason
	of care, patient education, enhanced telephone follow up and promotion of CHF medications)
Legrain 2011[40]	Inappropriate comparison (discharge planning in both arms)
Linden 2014[41]	Incorrect intervention (multicomponent intervention including several post discharge components)
Lockwood 2015[43]	Systematic review is not relevant to review question or unclear PICO
Mahler 2015[44]	Systematic review (not relevant or unclear PICO)
Mazloum 2016[45]	Non-OECD country
Mcclellan 2013[46]	Incorrect population (soft tissue injury)
Mcinnes 1999[47]	Incorrect interventions. GP input in to discharge planning
Mcnamee 1998[48]	No useable outcomes
Melberg 2015[49]	Incorrect interventions. early discharge for low risk patients
Mistiaen 2007[50]	Systematic review (not relevant or unclear PICO)
Moher 1992[51]	Incorrect interventions - medical team coordinator (27% of the time spent on activities related to discharge planning, rest of the time participating in ward rounds, generating bed census, retrieving missing medical information etc.)
Naylor 1999[54]	Incorrect intervention (discharge planning and home follow up protocol implemented by advanced practice nurses 4 weeks post discharge)
Naylor 1999B[55]	Incorrect intervention (discharge planning and home follow up protocol implemented by advanced practice nurses 4 weeks post discharge)
Nazareth 2001[56]	Incorrect interventions - pharmacy discharge plan at discharge
Palmer 2001[58]	Incorrect study design
Parfrey 1994[60]	Incorrect population
Parkes 2000[61]	Systematic review (not relevant or unclear PICO)
Phillips 2004[62]	Systematic review (not relevant or unclear PICO)
Pray 1992[63]	Narrative article
Puhr 2015[65]	Systematic review is not relevant to review question or unclear PICO
Rich 1993[67]	Incorrect interventions - multicomponent intervention (intensive patient education, analysis of medications, early discharge planning and enhanced follow up through home care and telephone contact
Rich 1995[66]	Incorrect interventions - multicomponent intervention (intensive patient education, dietary assessment, consultation with social services personnel, analysis of medications, intensive post discharge follow up by hospital's home care services
Rousseaux 2009[68]	Systematic review (not relevant or unclear PICO)
Rudd 1998[69]	Correction
Saleh 2012[70]	Incorrect interventions (intervention is post discharge)
Sharif 2014[71]	Non-OECD country
Shepperd 2004[72]	Systematic review (not relevant or unclear PICO)
Shepperd 2009[73]	Systematic review (not relevant or unclear PICO)
Shepperd 2010[75]	Systematic review (not relevant or unclear PICO)
Shepperd 2013[74]	Systematic review (not relevant or unclear PICO)
Sulch 2000[76]	Incorrect interventions - inpatient rehabilitation
Torp 2006[77]	Inappropriate comparison. discharge planning in both arms
Utens 2012[79]	Incorrect intervention (early supported discharge)

Study	Exclusion reason
Ulin 2014[78]	Incorrect study design
Weinberger 1996[80]	Incorrect interventions - increased access to primary care before and after discharge
Zhu 2015[81]	Systematic review (incorrect PICO); references screened

Appendix H: Excluded health economic studies

No health economic studies were excluded from this review.