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Consultation

Chapter 29 Multidisciplinary team meetings

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

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Chapter 29 Multidisciplinary team meetings

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29 Multidisciplinary team meetings

29.1 Introduction

Multidisciplinary team meetings and a multidisciplinary team care approach have been recommended in several published NICE guidelines about specific diseases and clinical conditions. The review question was posed in this case to find out if there is a more generalisable benefit to such a service to both patients and staff in the management of acute medical emergencies.

Multidisciplinary care can be found in many secondary care settings throughout the UK. There is no national standard for an MDT; indeed some of its success may be in the flexibility to suit each particular clinical area, however, good planning and communication are common themes throughout.

29.2 Review question: Do ward multidisciplinary team meetings (MDTs) improve processes and patient outcomes?

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 in hospital.
Intervention(s)	MDT process; physicians, nurses, allied health professionals and where appropriate, primary care and social work as determined by patient need.
Comparison(s)	No MDT process (best practice).
Outcomes	- Mortality (Dichotomous) CRITICAL - Avoidable adverse events (Dichotomous) CRITICAL - Quality of life (Continuous) CRITICAL - Patient/carer satisfaction (Dichotomous) CRITICAL - Length of stay (Continuous) CRITICAL - Readmission up to 30 days (Dichotomous) IMPORTANT - Staff satisfaction (Dichotomous) IMPORTANT
Study design	Systematic reviews (SRs) of RCTs, RCTs, observational studies only to be included if no relevant SRs or RCTs are identified.

29.3 Clinical evidence

Eleven studies were included in the review[15,16,20,21,30,38,58,59,83,84,101]; these are summarised in Table 2 below. We searched for randomised trials comparing the effectiveness of an MDT process versus no MDT process. We did not identify any studies that compared multidisciplinary team meetings (MDTs) with no multidisciplinary team meetings (MDTs).Nine randomised trials were identified that compared multidisciplinary care with no multidisciplinary care[15,16,21,30,38,58,59,83,84]; this evidence was considered as indirect as the studies did not compare multidisciplinary team meetings with no multidisciplinary team meetings as specified in the protocol. There were 2 studies which compared multidisciplinary ward rounds with no multidisciplinary ward rounds[20,101] which was considered as direct evidence in the evidence review as ward rounds is a type of meeting or gathering to enable MDT working.

In our analysis, we have analysed studies comparing multidisciplinary care with no multidisciplinary care and studies comparing multidisciplinary ward rounds with no multidisciplinary ward rounds

separately. Evidence from these studies are summarised in the GRADE clinical evidence profile (Table 3). See also the study selection flow chart in Appendix B, study evidence tables in Appendix D, forest plots in Appendix C, GRADE tables in Appendix F and excluded studies list in Appendix G.

Summary of included studies

Table 2: Summary of studies included in the review

Study	Intervention and comparison	Population	Outcomes	Comments
Multidisciplinary care/intervention				
Cole 2002[15] RCT Canada	Multidisciplinary care versus usual care. Multidisciplinary care: the intervention consisted of 2 parts; consultation and follow-up by a geriatric internist or psychiatrist, and follow-up in hospital by the study nurse. The intervention team (comprising 2 geriatric psychiatrists, 2 geriatric internists and the study nurse) met after every 8-10 patients were enrolled in the intervention group to discuss delirium management problems. versus Usual care: usual care consisted of standard care services. Referrals for geriatric or psychiatric consultation were honoured consistent with usual practice, but patients in the usual care group did not receive systematic consultation by the geriatric specialists, follow-up the study nurse or the nursing intervention protocol.	All patients aged 65 or more admitted to the 5 general medical units detected with delirium.	Length of hospital stay; mortality (8 weeks).	Setting: university affiliated primary acute care facility. Follow-up: 8 weeks.
Cole 2006[16] RCT Canada	Multidisciplinary care versus usual care. The intervention group received systematic treatment for 24 weeks. The treatment was provided in 3 parts: assessment and treatment by a psychiatrist in the hospitals geriatric service; follow-up by a research nurse and follow-up	All patients aged 65 years and over admitted from the emergency department to medical services. Patients who were found to have major depression (as	Re-admission (all-cause); mortality (6 months); quality of life (not analysable); length of stay (not analysable).	Setting: university-affiliated, primary acute care hospital. Follow-up: 6 months.

Study	Intervention and comparison	Population	Outcomes	Comments
	by the patients' physician. The intervention team comprising 2 psychiatrists from the geriatric service and the research nurse met regularly to assure consistency in the diagnosis and management of depression. versus Control: the patients in the control group received usual care before and after discharge. Subjects in the usual care were informed that they had major depression and advised to discuss treatment with their physician, but they received no systematic intervention or follow-up.	defined by DSM-IV criteria) and who consented to participate were enrolled.		
Davison 2005[21] RCT UK	Multifactorial (medical, physiotherapy and occupational therapy) intervention versus conventional care. Multifactorial intervention including hospital based medical assessment and home based physiotherapy and occupational therapy assessment followed by a prioritised individualised intervention for fall risk factors. versus Control group: usual care provided by A&E and primary care physicians did not undergo medical or therapy assessment.	The study population was recruited from subjects aged over 65 years presenting to A&E with a fall or fall related injury. Subjects were included if they had sustained at least 1 additional fall in the preceding year.	Length of hospital stay; mortality (1 year).	Setting: A&E departments in a university teaching hospital and associated district general hospital. Follow-up: 1 year.
Gwadry 2005[30] RCT Canada	Multidisciplinary educational intervention versus routine care. Patients in the intervention arm received the 2 heart failure information booklets and received education delivered through a	Patients with heart failure.	Quality of life (outcome not analysable, SD not reported).	Setting: acute and surgical units at a teaching hospital. Follow-up: 1 year.

Study	Intervention and comparison	Population	Outcomes	Comments
	multidisciplinary team consisting of a nurse or educator and a hospital pharmacist. versus Control: patients in the control arm received the booklets.			
Jitapunkul 1995[38] RCT Thailand	Multidisciplinary team approach versus no multidisciplinary team approach. Multidisciplinary team consisted of a medical consultant, primary nurses, physiatrists and a rehabilitation team, social workers and medical house officers. Physician nurse coloration was strengthened by regular ward rounds (4 days a week). Versus Control-No multidisciplinary team approach.	Female medical patients admitted two female wards of the Department of medicine. Patients admitted from the admission unit or emergency department. n=416	Length of stay, Mortality	Setting: acute care hospital Follow-up-8 weeks
McDonald 2001[58] RCT Ireland	Multidisciplinary care versus routine care. Intervention group patients underwent investigation for CHF. In addition, patients received specialist nurse led education and dietetic consults on 3 or more occasions. versus Routine group patients underwent investigations for CHF and appropriate medical therapy was administered.	High risk elderly heart failure population.	Length of stay; mortality (90 days); re-admissions for CHF (90 days).	Setting: hospital. Follow-up: 90 days.
McDonald 2002[59] RCT	Multidisciplinary care versus routine care. Multidisciplinary care: in addition to routine care,	Patients with diagnosis of heart failure.	Mortality at 3 months; length of hospital stay at 3 months; quality of life	Setting: university hospital. Follow-up at 3 months.

Study	Intervention and comparison	Population	Outcomes	Comments
Ireland	patients systematically received specialist nurse-led education and specialist dietician consults on 3 or more occasions during index admission; similar advice given to next of kin. versus Routine care: routine care in hospital. All patients reviewed at 3 months at the heart failure clinic. Duration: 12 weeks.		(scale was not specified).	
Rich 1993[84] RCT USA	Multi -disciplinary care versus standard care. The study intervention consisted of 4 components: intensive education about congestive heart failure and its treatment, a detailed analysis of medications with specific recommendations designed to improve compliance and reduce adverse effects, early discharge planning and enhanced follow-up through the home care and telephone contacts. versus Patients in standard care group received all conventional treatment as requested by the patients attending physician.	Patients with documented congestive heart failure.	Re-admissions (all-cause) (90 days); length of stay.	Setting: secondary and tertiary care university teaching hospital. Follow-up: 90 days.
Rich 1995[83] RCT USA	Multidisciplinary intervention versus conventional care. Multidisciplinary intervention: the study treatment consisted of intensive education about CHF and its treatment by an experienced cardiovascular research nurse, a registered dietician; consultation with social-service personnel to facilitate discharge planning and care after discharge; an analysis of medications by a geriatric cardiologist; and	High risk patients 70 years of age or older who were hospitalised with CHF.	Mortality at 90 days; re-admissions (all) at 90 days; re-admission for CHF at 90 days; length of hospital stay (days) at 90 days; quality of life (Chronic Heart Failure Questionnaire).	Setting: hospital Follow-up at 90 days.

Study	Intervention and comparison	Population	Outcomes	Comments
	intensive follow-up after discharge through the hospital's home care services. versus Conventional care: patients assigned to conventional care (the control group) were eligible to receive all standard treatments and services ordered by their primary physicians.			
Ward rounds				
Curley 1998[20] RCT USA	Multidisciplinary rounds versus traditional rounds. Multidisciplinary rounds: MDs, RN (patient care coordinator), pharmacist, nutritionist and social worker. Orders written during rounds with RN and pharmacist present. Chart rack to take patient charts on rounds. Weekly social service, 'multidisciplinary' rounds with social work, nutrition and interns. versus Traditional rounds: MDs only. Orders written throughout the day. Charts left at nursing station. No weekly social service rounds needed as all team members present daily.	In-patients. Patients were admitted to the medical service from a variety of locations: emergency department, clinic, intensive care units and other services such as orthopaedics or surgery.	Length of hospital stay; mortality (in-hospital).	Setting: acute care hospital. Follow-up: 6 months.
Wild 2004[101] RCT USA	Interdisciplinary wards rounds. Daily ward rounds in which resident physicians, nurses, a case manager, pharmacist, dietician and physical therapist met to discuss patients on the team and to identify and address possible discharge problems. Versus Standard care (no interdisciplinary ward rounds).	Patients admitted to the telemetry ward of the community hospital with the most common diagnoses (for example, chest pain, atrial fibrillation/flutter, stroke/TIA, CHF and syncope). n=84.	Length of stay.	Setting: community hospital. Follow-up: 2 months.

Table 3: Clinical evidence profile: Multidisciplinary care/interventions versus no multidisciplinary care/interventions

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with No MD care	Risk difference with MD care (95% CI)
Mortality (all-cause)	1524 (7 studies)	⊕⊖⊖⊖ VERY LOW[a,b,c] due to risk of bias,, indirectness, imprecision	RR 1.03 (0.78 to 1.37)	Moderate	
				73 per 1000	3 more per 1000 (from 23 fewer to 39 more)
Length of hospital stay (days)	1048 (7 studies)	⊕⊕⊖⊖ LOW[a,b] due to risk of bias, indirectness			The mean length of hospital stay (days) - multidisciplinary care versus no multidisciplinary care in the intervention groups was 1.22 lower (2.33 to 0.12 lower)
Re-admissions for CHF	444 (3 studies)	⊕⊖⊖⊖ VERY LOW[a,b,d] due to risk of bias, inconsistency, indirectness	RR 0.25 (0.05 to 1.23)	Moderate	
				250 per 1000	188 fewer per 1000 (from 237 fewer to 58 more)
Quality of life (Chronic Heart Failure Questionnaire)	126 (1 study)	⊕⊕⊖⊖ LOW[a,b] due to risk of bias, indirectness			The mean quality of life (chronic heart failure questionnaire) in the intervention groups was 10.8 higher (4.29 to 17.31 higher)
Re-admissions (all-cause) (overall)	444 (3 studies)	⊕⊖⊖⊖ VERY LOW[a,b,c,] due to risk of bias, indirectness, imprecision	RR 0.64 (0.52 to 0.79)	Moderate	
				457 per 1000	165 fewer per 1000 (from 96 fewer to 219 fewer)
Re-admissions (all-cause) (Patients with major depression)	64 (1 study)	⊕⊖⊖⊖ VERY LOW[a,b,c] due to risk of bias, indirectness, imprecision	RR 1.36 (0.68 to 2.72)	Moderate	
				290 per 1000	104 more per 1000 (from 93 fewer to 499 more)
Re-admissions (all-cause) (Patients with HF)	380 (2 studies)	⊕⊕⊖⊖ LOW[a,b] due to risk of bias, indirectness	RR 0.59 (0.47 to 0.73)	Moderate	
				564 per 1000	231 fewer per 1000 (from 152 fewer to 299 fewer)

(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) All studies compare multidisciplinary care/intervention with no multidisciplinary care/intervention, they do not compare multidisciplinary team meetings (MDTs) as specified in the protocol.
(c) Downgraded by 1 increment if the confidence interval crossed 1 MID point, and downgraded by 2 increments if the confidence interval crossed 2 MID points.
(d) Downgraded by 1 or 2 increments because heterogeneity, I^2=63%, unexplained by sub-group analysis.

Table 4: Clinical evidence profile: Multidisciplinary ward rounds versus no multidisciplinary ward rounds

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Traditional ward rounds	Risk difference with Multidisciplinary ward rounds (95% CI)
Mortality (in-hospital)	1102 (1 study)	⊕⊖⊖⊖ VERY LOW[a,b] due to risk of bias, imprecision	RR 0.94 (0.4 to 2.25)	Moderate	
				19 per 1000	1 fewer per 1000 (from 11 fewer to 24 more)
Length of hospital stay (days)	1102 (2 studies)	⊕⊕⊖⊖ LOW [a,c] due to risk of bias, inconsistency			The mean length of hospital stay (days) - multidisciplinary ward rounds versus no multidisciplinary rounds in the intervention groups was 0.10 lower (1.02 lower to 0.82 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 increment if the confidence interval crossed 1 MID point, and downgraded by 2 increments if the confidence interval crossed 2 MID points.
(c) Downgraded by 1 or 2 increments because heterogeneity, I^2=60%, unexplained by sub-group analysis.

Outcomes that could not be analysed in Revman included:

1. Quality of life [difference in mean score from baseline to 6 month follow-up] (No SD) (Cole 2006).
   SF-36, mental component (mean): Intervention group: 9.4; control group: 9.2; SF-36, physical component (mean): Intervention group: -2.9; control group: -2.7.

2. Length of hospital stay (median, days) (No SD or IQR reported) (Cole 2006).
   Intervention group: 12.0; control group: 10.0.

3. Health-related Quality of life (No SD) (Gwadry 2005).
   SF-36, PCS (physical) summary scores (mean): Intervention group: Improved from 30.52 to 37.15; control group: Improved from 29.13 to 37.38. SF-36, MCS (mental) summary scores (mean): Intervention group: Improved from 46.31 to 52.38; control group: Improved from 42.74 to 51.94.

29.4 Economic evidence

29.4.1 Published literature

No relevant economic evaluations 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.

29.4.2 Cost analysis

Table 5: Costs of MDT staff

Staff role	Cost per hour
Medical consultant.	£140
Registrar.	£61
Nurse, day ward. (includes staff nurse, registered nurse, registered practitioner)	£49
Hospital pharmacist	£48
Hospital physiotherapist	£38
Hospital occupational therapist	£36
Social worker (adult services)	£57
All	**£429**

Source: PSSRU Unit Costs of Health and Social Care 2014.

Table 6: Incremental results

	Incremental resource use			Incremental costs	
	MDT board round vs usual care	MDT ward round vs usual care	Unit cost	MDT board round vs usual care	MDT ward rounds vs usual care
Total hours per patient	1.2	1.2	£228	£266	£266
Length of stay	-1.67	-0.6	£296	-£494	-£177
Admissions		-0.165	£588		-£97
Total incremental cost				-£228	-£9

Hourly staffing costs for the core members of the MDT (medical consultant, registrar, staff nurse, pharmacist, physiotherapy, occupational therapy and social worker) comes to £429 (Table 5), or an incremental cost of £228 compared with the medical staff on their own.

MDT board round

We assumed a rather generous 10 minutes per patient per day summing to £266 for a 7.0 day stay (Table 6).

The included evidence on MDT care showed reductions in length of stay of 1.7 days per person. Based on the average excess bed day cost from NHS Reference Costs of £296, this would result in a saving of £494 per person. Overall, this indicated a net saving of £228 per patient.

MDT ward round

The evidence on MDT ward rounds showed a mean reduction of 0.6 bed days and this would save £177 per person (Table 6). The evidence also showed a reduction in readmissions of 165 fewer per 1000 for those with MDT care.

Again, we assumed 10 minutes per day for 7 days. On that basis, the cost of the intervention was £266 per patient. If the stays averted were short stays then the net cost savings would be £8.50. However, with more staff attending or higher grades of staff this could be cost increasing instead. If the readmissions averted were long stays then there would be a net saving of £374.

The cost impact is uncertain but if there are improved patient outcomes then it seems likely that it would be cost effective.

29.5 Evidence statements

Clinical

Multidisciplinary care versus no multidisciplinary care

Nine studies comprising 1424 people compared multidisciplinary care with no multidisciplinary care for improving outcomes in adults and young people at risk of an AME, or with a suspected or confirmed AME. The evidence suggested that multidisciplinary care may provide a benefit in reduced length of hospital stay (7 studies, low quality), readmissions for chronic heart failure (3 studies, very low quality), readmissions all-cause (3 studies, very low quality) and quality of life (1 study, low quality). The evidence suggested that there was no effect on all-cause mortality (7 studies, very low quality).

Multidisciplinary care rounds versus no multidisciplinary ward rounds

Two studies comprising 1186 people compared multidisciplinary care rounds with traditional ward rounds for improving outcomes in adults and young people at risk of an AME, or with a suspected or confirmed AME. The evidence suggested that there was no effect on mortality (in-hospital) (1 study, very low quality) and length of stay (2 studies, low quality).

Economic

No relevant economic evaluations were identified.

29.6 Recommendations and link to evidence

Recommendations	16. Provide coordinated multidisciplinary care for people admitted to hospital with a medical emergency.
Research recommendation	-
Relative values of different outcomes	Mortality, avoidable adverse events (missed or delayed investigations and missed or delayed treatments), quality of life, patient and/or carer satisfaction and length of stay/time to discharge were considered by the committee to be critical outcomes. Readmission and staff satisfaction were considered to be important outcomes.
Trade-off between benefits and harms	No studies were found on multidisciplinary team meetings but evidence was included on interdisciplinary ward rounds and multidisciplinary care. The definitions of these terms as used by the committee are noted in the introduction to this chapter. A total of 11 studies were identified for this review, which was split into interdisciplinary ward rounds and multidisciplinary care. There was evidence from 2 studies that compared interdisciplinary ward rounds with no interdisciplinary ward rounds. This was considered as direct evidence in the evidence review as ward rounds are a form of interdisciplinary meeting. The evidence suggested that there was no difference between the groups for the outcomes of in-hospital mortality and length of stay. No evidence was available for the outcomes of readmissions for congestive heart failure (CHF), readmissions (all-cause), quality of life, avoidable adverse events, patient and/or carer satisfaction and staff satisfaction. There was no evidence available for the comparison of multidisciplinary team meetings (MDTs) with no MDTs. However, there was evidence from 9 randomised trials comparing multidisciplinary care with no multidisciplinary care. This evidence was considered as indirect, as the studies did not specifically compare MDTs with no MDTs as specified in the protocol. However, the committee considered that the concept of team working was inherent in the concept of multidisciplinary care and could be used to inform a recommendation. The evidence for multidisciplinary care suggested there may be a benefit for reduced length of hospital stay, readmissions for congestive heart failure (CHF) at 3 months, readmissions (all-cause) at 3 and 6 months and quality of life compared to no multidisciplinary care. The evidence suggested that there was no effect of multidisciplinary care on all-cause mortality. As there was heterogeneity in the results for the outcome of all-cause re-admissions, a sub-group analysis was conducted. The sub-group results suggested that there was benefit for patients with CHF but none for patients aged over 65 years admitted from the ED with major depression. The data for patients with major depression came from 1 study[16] and the study authors suggested that the lack of benefit could be attributed to high patient attrition rate, low number of contacts between patients and psychiatrists, sub-optimal compliance with anti-depressant medications or possible contamination (or mixing) of the usual care group (patients in both the groups were managed on the same units by the same attending physicians). The committee also felt that patients with depression in this study might not be generalisable to patients with other medical emergencies, while recognising that depression could be a common problem in the latter group. Therefore, it was felt that patients with CHF were more likely to be representative of the population of interest that is, those with acute medical emergencies. No evidence was available for the outcomes avoidable adverse events, readmission within 30 days, patient and/or carer satisfaction and staff satisfaction. There was very little information about the frequency of meetings in the included

Recommendations	16. Provide coordinated multidisciplinary care for people admitted to hospital with a medical emergency.
Research recommendation	-
	studies. Only 1 study[16] described the intervention team (comprising 2 geriatric psychiatrists, 2 geriatric internists and the study nurse) meeting after every 8-10 patients were enrolled in the intervention group to discuss delirium management problems. The committee were of the view that MDT care was predicated on effective communication between the various members, and should be focused on patient outcomes and progressing the patient journey. The frequency and formality of meetings should be tailored to the needs of the patient and would have to take into account the context in which care was being delivered. The committee felt that a strong recommendation was appropriate as the evidence was strong enough to show a consistent and likely generalisable benefit for multidisciplinary care over non-multidisciplinary care, particularly as the principles are well-established in current practice. However, variation in application suggests that standardisation of best practice would bring benefits, particularly for patients with complex conditions, and those with multimorbidity. The committee recommended that the multidisciplinary care should be co-ordinated meaning that it brings the different elements of a complex activity or organisation into a harmonious or efficient relationship. Multidisciplinary team meetings and multidisciplinary team care approach have been recommended in several published NICE guidelines about specific diseases and clinical conditions -Stroke: Diagnosis and initial management of acute stroke and transient ischaemic attack (TIA) NICE guidelines [CG68][69]; Hip fracture: The management of hip fracture in adults NICE guidelines [CG124][68] and Chronic heart failure: Management of chronic heart failure in adults in primary and secondary care NICE guidelines [CG108].[67] The committee noted that team composition and styles of practice could be quite diverse and might need to be adapted to particular situations and diseases. The need for multidisciplinary care should be determined on a case by case basis, where clinically appropriate.
Trade-off between net effects and costs	No economic evidence was identified for this question. Hourly staffing costs for the core members of the MDT (medical consultant, registrar, staff nurse, pharmacist, physiotherapist, occupational theraist and social worker) comes to £429, or an incremental cost of £228 compared with the medical staff on their own. The included evidence on MDT care showed reductions in length of stay of 1.7 days per person. Based on the average excess bed day cost from NHS Reference Costs of £296, this would result in a net saving overall of £228 per patient. The evidence on MDT ward rounds showed a mean reduction of 0.6 bed days and a reduction in readmissions of 165 fewer per 1000. By our calculations this would offset most of the cost of the intervention and most likely be cost saving, although this would depend on the time spent per patient and the number and grade of staff involved. Other considerations were the additional benefits shown from the evidence of reduced mortality and improved quality of life. Therefore the committee concluded that multidisciplinary team meetings would be cost-effective and may be cost saving for the management of acutely ill medical inpatients. Most hospitals will provide multidisciplinary care. For those hospitals that need to

Recommendations	16. Provide coordinated multidisciplinary care for people admitted to hospital with a medical emergency.
Research recommendation	-
	extend multidisciplinary care, e.g. through multidisciplinary board rounds, there will be an investment of time from those professionals (including doctors, nurses, pharmacists and therapists). However, this cost should be at least partly offset by savings in terms of reductions in length of stay and possibly readmission.
Quality of evidence	The quality of the evidence for studies comparing multidisciplinary care with no multidisciplinary care was graded from low to very low, mainly due to risk of bias, imprecision, inconsistency and indirectness. The evidence was downgraded for indirectness as the studies did not focus on multidisciplinary team meetings, but instead at multidisciplinary care. There was heterogeneity for the outcome of re-admissions (all cause) but the evidence was not downgraded as it was sufficiently explained by the sub-group analysis by disease condition. One study examined patients with major depression and the other 2 studies were patients with chronic heart failure. Patients with depression are suspected to have a longer and more complex pathway than patients with chronic heart failure which could reflect in readmissions. The quality of evidence for studies comparing multidisciplinary ward rounds with traditional ward rounds was graded low to very low quality; this was due to risk of bias, inconsistency and imprecision. There were no economic studies included in the review.
Other considerations	Multidisciplinary care is already common practice, although not uniform, throughout the country. While the principle of multidisciplinary care and therefore the recommendation should be well-accepted, practical implementation requires planning and effective communication. It should be relatively straightforward to implement but regular review of this approach will be important to ensure effective communication between team members to maximise effective use of health professional time and benefits to patients. Regular scheduling of MDTs in the elective setting (for example, oncology and transplantation) may need adaptation for emergency care, with a smaller group conducting daily reviews and incorporating external expertise either on an ad hoc basis or at planned but less frequent intervals. It will be important to ensure there are no unnecessary delays and that the care is value-added. It is often assumed that this form of working is easy and simple to implement. To achieve effective MDT working some training is required to ensure members understand and value the roles of each other and develop an ethos of working as a member of a team, particularly focusing on providing the best possible outcomes for patients. Therefore, logistical difficulties in arranging MDTs should not be resolved at the expense of timely patient care. There was no evidence on the frequency of meetings. In the context of acute medical emergencies the committee noted that staff would meet as required by the current situation (which would probably be at least once daily). Once patients have moved along the pathway and their condition(s) stabilised, management may come under specific NICE guidelines for particular clinical conditions; these should be consulted for information on multidisciplinary care. It is important that the benefits achieved through MDT care should not be restricted to weekdays and office hours. Such care should be provided 7 days per week to ensure equity of care and timely transit of patients along their therapeutic pathway and across the continuum of secondary, community and social care; otherwise, this would cause delays resulting in the inevitable Monday effect when hospital are strained by increased demand and the reduced capacity due to the lack of progress

Recommendations	**16. Provide coordinated multidisciplinary care for people admitted to hospital with a medical emergency.**
Research recommendation	**-**
	in patient management over the weekend.

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Appendices

Appendix A: Review protocol

Table 7: Review protocol: Multidisciplinary team meetings (MDTs)

Review question	MDT
Guideline condition and its definition	Acute Medical Emergencies.
Objectives	Good communication and coordination of care between all health and social care staff involved in patient care during a hospital stay is considered vital to ensure that it is delivered optimally. This should ensure the whole process is performed efficiently with minimal delays and repetition. Multidisciplinary meeting (MDTs) is a mechanism by which this information is shared between various professionals involved in the patient's care. MDTs could ensure that all the relevant information from each professional is captured and shared. This could have a positive effect on patient care.
Review population	Adults and young people (16 years and over) with a suspected or confirmed AME in hospital.
	Adults and young people (16 years and over).
	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)	MDT process; physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. No MDT process; no MDT (best practice).
Outcomes	- Mortality at end of follow-up (Dichotomous) CRITICAL - Avoidable adverse events at end of follow-up (Dichotomous) CRITICAL - Quality of life at end of follow-up (Continuous) CRITICAL - Patient/carer satisfaction at end of follow-up (Dichotomous) CRITICAL - Length of stay at end of follow-up (Continuous) CRITICAL - Readmission up to 30 days (Dichotomous) IMPORTANT - Staff satisfaction at end of follow-up (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 randomization	Patient.
Crossover study	Permitted.
Minimum duration of study	Not defined.
Other exclusions	Elective care (including cancer). Trauma. Community hospital MDTs. Outpatients.
Subgroup analyses if there is heterogeneity	- Frail elderly (frail elderly; not frail elderly); different population. - People with serious mental illness (co-morbidity) plus AME (people with serious mental illness and AME; people without serious mental illness and AME; define); different population.

	- Intensive care (intensive care; other settings); different setting. - Stroke unit (stroke unit); different setting. - Frequency of meeting (weekly; daily; less often); different interventions.
Search criteria	Databases: Medline, Embase, the Cochrane Library. Date limits for search: 1990. Language: English.

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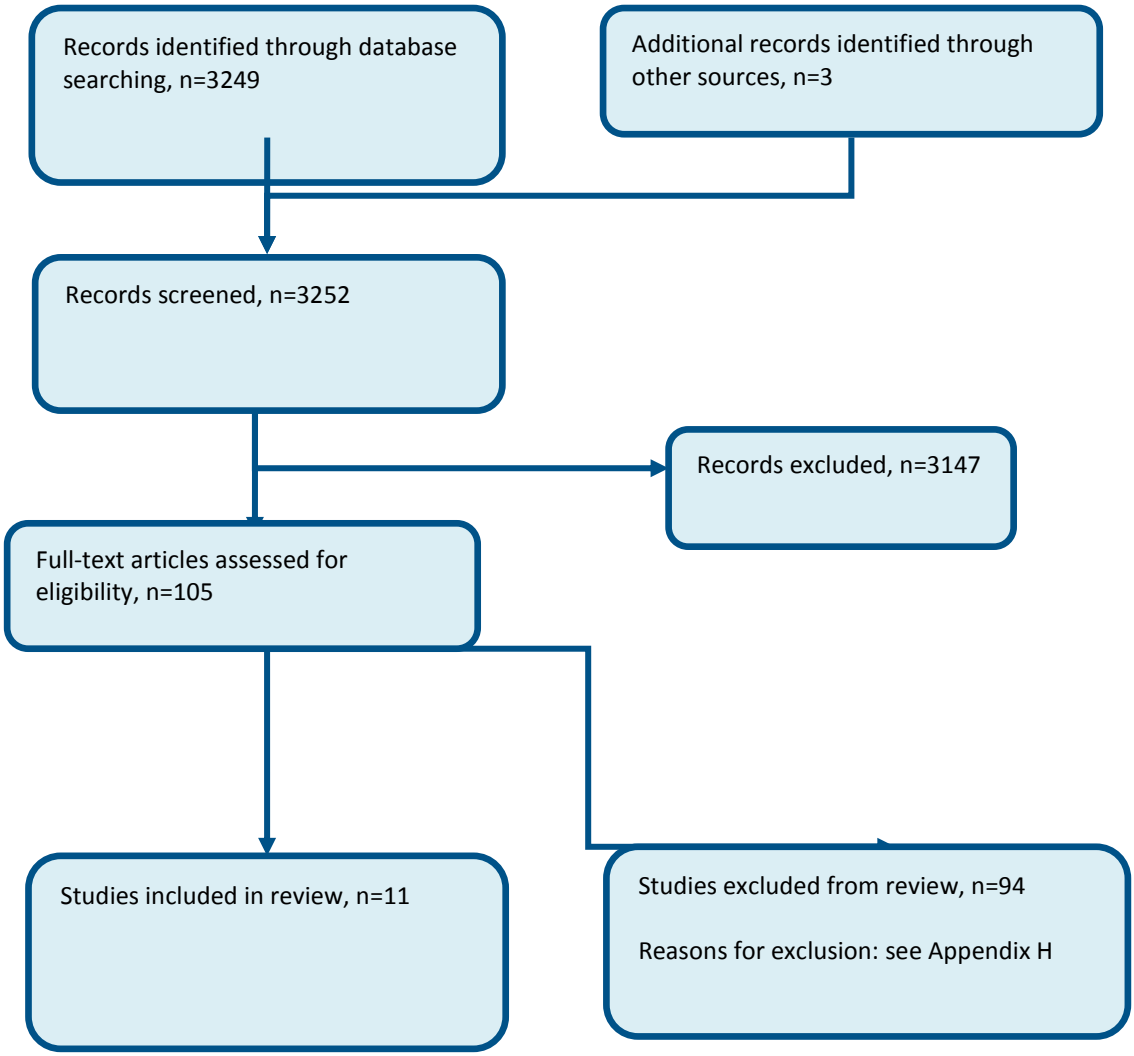
Appendix B: Clinical article selection

Figure 1: Flow chart of clinical article selection for the review of MDT process versus no MDT process



Appendix C: Forest plots

C.1 Multidisciplinary care/intervention versus no multidisciplinary care/intervention

Figure 2: Mortality

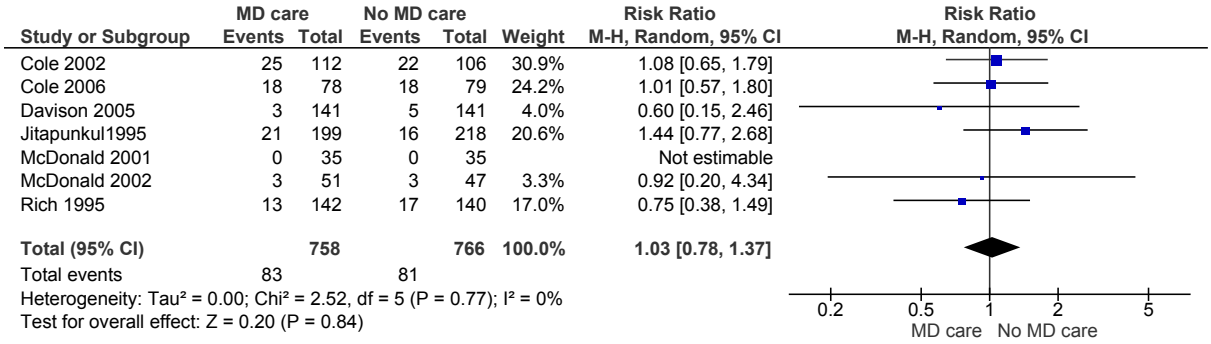


Figure 2: Length of hospital stay (days)

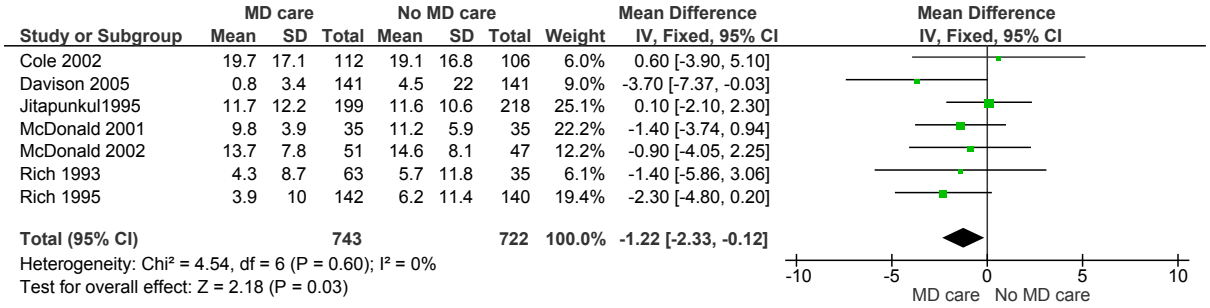


Figure 3: Re-admissions for CHF

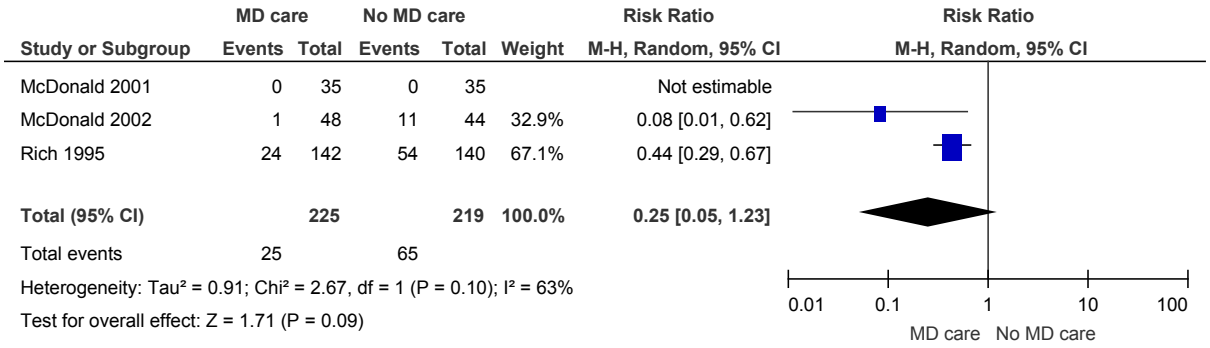


Figure 4: Re-admissions (all-cause)

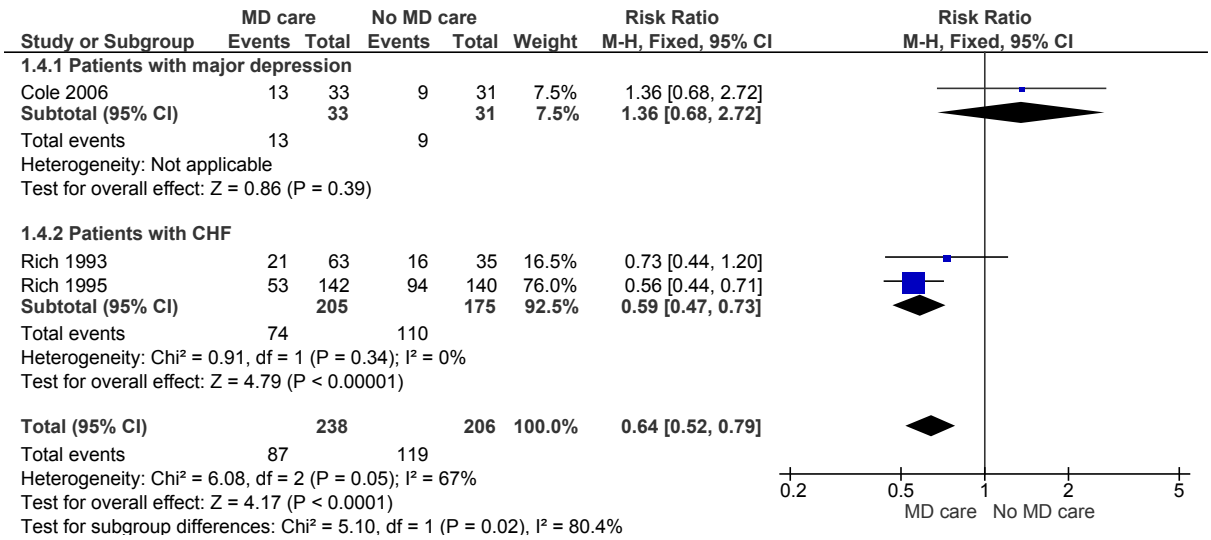


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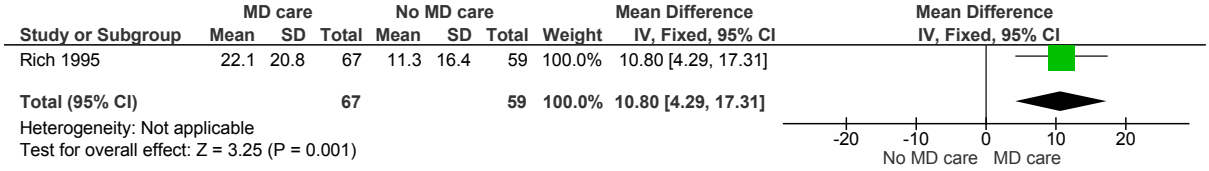
Figure 5: Quality of life (Chronic Heart Failure Questionnaire)



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3 C.2 Multidisciplinary ward rounds versus no multidisciplinary ward 4 rounds

Figure 6: Mortality (in-hospital)

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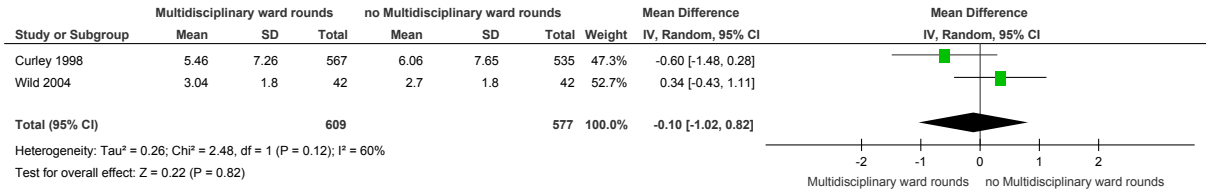
Figure 7: Length of hospital stay (days)



Appendix D: Clinical evidence tables

Study	Cole 2002[15]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=227).
Countries and setting	Conducted in Canada; setting: university affiliated primary acute care facility.
Line of therapy	1st line.
Duration of study	Intervention + follow up: follow-up: 8 weeks.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	All patients aged 65 or more admitted to the 5 general medical units between March 15, 1996, and Jan, 31, 1999, were eligible.
Exclusion criteria	Excluded were patients who met 1 or more of the following exclusion criteria: primary diagnosis of stroke, duration of stay on the intensive care unit or cardiac monitoring unit of more than 48 hours, admission to geriatric or oncology service, inability to speak English or French or residence other than on the island of Montreal.
Recruitment/selection of patients	Not stated.
Age, gender and ethnicity	Age - Mean (SD): Intervention group: 66/47; Usual care group: 57/57. Gender (M: F): Intervention group: 82.7 (7.5); Usual care group: 82 (7.1). Ethnicity: Not stated.
Further population details	1. Frail elderly: Not applicable 2. Intensive care: not applicable 3. People with serious mental illness (comorbidity) plus AME: people with serious mental illness and AME (Delirium). 4. Stroke unit: not applicable.
Extra comments	To detect prevalent cases of delirium, eligible patients were screened within 24 hours after admission by the study nurse using the Sort Portable Mental Status Questionnaire. Those who scored 3 to 9 errors on this instrument or had symptoms of delirium recorded in the nursing notes were assessed by means of the Confusion Assessment method. To detect incident cases of delirium, all patients without prevalent delirium were rescreened during the week following admission. Those who scored 1 point higher on the Short Portable Mental Status Questionnaire than on admission or had symptoms of delirium recorded in the nursing notes were assessed with the Confusion Assessment Method. Patients with prevalent or incident delirium were enrolled in the study.
Indirectness of population	No indirectness.

Study	Cole 2002[15]
Interventions	(n=113) Intervention 1: MDT process - physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. The intervention consisted of 2 parts: consultation and follow-up by a geriatric internist or psychiatrist, and follow-up in hospital by the study nurse. The consultation (within 24 hours after enrolment) determined the probable predisposing, precipitating and perpetuating factors of delirium (focusing on crucial factors associated with delirium, such as medication, infection and sensory deficits) and resulted in management recommendations (for example, changes in medications and investigations to be carried out), which were recorded on a regular hospital consultation form and signalled in the progress notes. The follow-up by the study nurse involved daily visits (mean duration 35.7 minutes (SD 2.8)) to conduct a brief structured mental status exam, monitor the completeness of the consultants reports, ensure that previous recommendations had been implemented, ensure implementation of the nursing intervention protocol by liaising with the primary care nurses and meet with the patients family to involve them in patient care. Duration: 8 weeks. Concurrent medication/care: not stated. (n=114) Intervention 2: No MDT process - no MDT (best practice). Usual care consisted of standard care services. Referrals for geriatric or psychiatric consultation were honoured consistent with usual practice, but patients in the usual care group did not receive systematic consultation by the geriatric specialists, or follow-up the study nurse or the nursing intervention protocol. Duration: 8 weeks. Concurrent medication/care: not stated.
Funding	Academic or government funding.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE). Protocol outcome 1: Mortality at End of follow-up. - Actual outcome: Mortality at 8 weeks; Group 1: 25/112, Group 2: 22/106; Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Length of stay at end of follow-up. - Actual outcome: Length of stay at 8 weeks; Group 1: mean 19.7 (SD 17.1); n=112, Group 2: mean 19.1 (SD 16.8); n=106; Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Avoidable adverse events; Quality of life; Patient and/or carer satisfaction; Readmission; Staff satisfaction.

Study	Cole 2006[16]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=157).
Countries and setting	Conducted in Canada; setting: university-affiliated primary acute care hospital in Montreal.
Line of therapy	1st line.
Duration of study	Intervention + follow up: intervention: 24 weeks. Follow-up: 6 months.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	All patients aged 65 years and over admitted from the emergency department to medical services. Patients who were found to have major depression (as defined by DSM-IV criteria) and who consented to participate were enrolled.
Exclusion criteria	Patients were excluded if they were admitted to the intensive care unit or cardiac monitoring unit for more than 48 hours, had an immensely terminal illness, did not speak or understand English or French and did not live on the Island of Montreal.
Recruitment/selection of patients	All patients aged 65 years and over admitted from the emergency department to medical services between Oct 19, 1999 and Nov 1, 2002, were screened for eligibility by the research nurse.
Age, gender and ethnicity	Age - Mean (SD): Intervention group: 77.5 (6.7); usual care group: 78.5 (6.6). Gender (M: F): define. Ethnicity: not stated.
Further population details	1. Frail elderly: not applicable 2. Intensive care: not applicable 3. People with serious mental illness (comorbidity) plus AME: People with serious mental illness and AME (patients with major depression). 4. Stroke unit: not applicable.
Indirectness of population	No indirectness.
Interventions	(n=78) Intervention 1: MDT process - physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. The intervention group received systematic treatment for 24 weeks. The treatment was provided in 3 parts: assessment and treatment by a psychiatrist in the hospitals geriatric service; follow-up by a research nurse and follow-up by the patients' physician. The psychiatrist assessed each patient and made management recommendations, all recorded on the regular hospital consultation form and signalled in the progress notes. Treatment involved supportive psychotherapy and drug therapy with an antidepressant, prescribed according to clinical practice guidelines. Patients were seen as often as necessary during their hospital stay and after discharge. When the patients were seen by their family physicians for follow-up, the psychiatrist was informed of their progress by the research nurse. The research nurse visited the patients at least weekly in hospital and visited or telephoned them weekly after discharge for 24 weeks to monitor their condition, provide supportive psychotherapy,

Study	Cole 2006[16]
	ensure maximum compliance with their treatment and liaise with the family, psychiatrist and family physician. The intervention team comprising 2 psychiatrists from the geriatric service and the research nurse met regularly to assure consistency in the diagnosis and management of depression. Duration: 24 weeks. Concurrent medication/care: drug use; psychotropic: 46.2%; anti-depressant: 25.6%. (n=79) Intervention 2: No MDT process - no MDT (best practice). The patients in the control group received usual care before and after discharge. Subjects in the usual care were informed that they had major depression and advised to discuss treatment with their physician, but they received no systematic intervention or follow-up. Duration: 24 weeks. Concurrent medication/care: drug use; psychotropic 53.2%; anti-depressant 27.9%.
Funding	Academic or government funding.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE). Protocol outcome 1: Mortality at end of follow-up - Actual outcome: Mortality at 6 months; Group 1: 18/78, Group 2: 18/79; Risk of bias: All domain - High, Selection - Low, Blinding - Low, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Quality of life at end of follow-up [difference in mean score from baseline to 6 month follow-up] (no SD)]. - Actual outcome: SF-36, mental component at 6 months; SF-36, mental component (mean): Intervention group: 9.4; control group: 9.2; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness - Actual outcome: SF-36, physical component (mean): Intervention group: -2.9; control group: -2.7; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 3: Readmission up to 30 days - Actual outcome: Re-admission (all-cause) at 6 months; Group 1: 13/33, Group 2: 9/31; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 4: Length of stay at end of follow-up - Actual outcome: (median, days) (No SD or IQR reported); Intervention group: 12.0; control group: 10.0; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - High, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness	

Study	Cole 2006[16]
Protocol outcomes not reported by the study	Avoidable adverse events; Patient and/or carer satisfaction; Length of stay; Staff satisfaction.

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Study	Curley 1998[20]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=1,102).
Countries and setting	Conducted in USA; setting: acute care county hospital.
Line of therapy	1st line.
Duration of study	Intervention + follow up: 6 months.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Patients admitted to inpatient medical services.
Exclusion criteria	Patients were excluded from the trial if they were transferred from medicine to another service (for example, surgery) or if less than 50% of their stay occurred on the medical floor (for example, a patient transferred from the critical care unit to the floor, who spent 10 days in the critical care unit and 1 day on floor).
Recruitment/selection of patients	Study patients included all patients admitted to the medical inpatient units between November 8, 1993 and May 31, 1994, who spent at least 50% of their hospital stay on that unit and were discharged from that unit. Patients were admitted to the medical service from a variety of locations: emergency department, clinic, intensive care units and other services such as orthopaedics or surgery.
Age, gender and ethnicity	Age - Mean (SD): Traditional rounds: 53.9 (18.6) years; Multi-disciplinary rounds: 52.7 (18.8) years. Gender (M: F): Females (%): Traditional rounds (51.4%); Interdisciplinary rounds (52%). Ethnicity: black: traditional rounds (27.7%); interdisciplinary rounds (31.4%).
Further population details	1. Frail elderly: not applicable 2. Intensive care: not applicable 3. People with serious mental illness (comorbidity) plus AME: 4. Stroke unit: not applicable.
Indirectness of population	No indirectness.
Interventions	(n=567) Intervention 1: MDT process - physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. Multidisciplinary rounds: MDs, RN (patient care coordinator),

Study	Curley 1998[20]
	pharmacist, nutritionist and social worker. Orders written during rounds with RN and pharmacist present. Chart rack to take patient charts on rounds. Weekly social service, 'multidisciplinary' rounds with social work, nutrition and interns. Duration: 6 months. Concurrent medication/care: not stated. (n=535) Intervention 2: No MDT process - no MDT (best practice). MDs only. Orders written throughout the day. Charts left at nursing station. No weekly social service rounds needed as all team members present daily. Duration: 6 months. Concurrent medication/care: not stated.
Funding	Funding not stated.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE). Protocol outcome 1: Mortality at end of follow-up. - Actual outcome: Mortality (in-hospital) at 6 months; Group 1: 10/567, Group 2: 10/535; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Length of stay at end of follow-up. - Actual outcome: Length of hospital stay at 6 months; Group 1: mean 5.46 (SD 7.26); n=567, Group 2: mean 6.06 (SD 7.65); n=535; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Avoidable adverse events; Quality of life; Patient and/or carer satisfaction; Readmission; Staff satisfaction.

Study	Davison 2005[21]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=313).
Countries and setting	Conducted in United Kingdom; setting: A&E departments in a university teaching hospital and associated district general hospital.
Line of therapy	Unclear.
Duration of study	Intervention + follow up: In-hospital+1 year follow-up.

Study	Davison 2005[21]
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Subjects were included if they had sustained at least 1 additional fall in the preceding year.
Exclusion criteria	If the patients were cognitively impaired, had>1 previous episode of syncope, were immobile, lived >15 miles from A&E, were registered blind, aphasic, had a clear medical explanation for their fall, that is, acute MI, stroke, or epilepsy or were enrolled in another study.
Recruitment/selection of patients	The study population was recruited from subjects aged over 65 years presenting to A&E with a fall or a fall related injury. A&E records were screened daily and eligible subjects contacted by postal questionnaire to determine fall history.
Age, gender and ethnicity	Age - Mean (SD): control: 77 (7) years; Intervention 77 (7) years. Gender (M: F): Females: control 112 (73%); Intervention 114 (72%). Ethnicity: not reported.
Further population details	1. Frail elderly: Frail elderly 2. Intensive care: not applicable 3. People with serious mental illness (comorbidity) plus AME: not applicable 4. Stroke unit: not applicable.
Indirectness of population	No indirectness.
Interventions	(n=159) Intervention 1: MDT process - physicians, nurses, allied health professionals and where, appropriate, primary care and social work as determined by patient need. Multifactorial intervention including hospital based medical assessment and home based physiotherapy and occupational therapy assessment followed by a prioritised individualised intervention for fall risk factors. Medical assessment: an initial fall and medical history was taken, followed by full clinical examination, including vision, neurological examination and cardiovascular assessment. Physiotherapy assessment: gait and balance were assessed using a modified Performance Orientated Mobility Score in conjunction with review of feet, footwear and assistive devices. Occupational Therapy Assessment and Intervention: a room-by-room environmental fall hazard checklist (USER) was used to identify home environmental hazards. Duration: in-hospital and home. Concurrent medication/care: not stated. (n=154) Intervention 2: No MDT process - no MDT (best practice). Patients in the control group did not undergo medical or therapy assessment. Duration: in-hospital and home. Concurrent medication/care: not stated.
Funding	Academic or government funding.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE	

Study	Davison 2005[21]
APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE). Protocol outcome 1: Mortality at end of follow-up. - Actual outcome: Mortality at 1 year; Group 1: 3/141, Group 2: 5/141; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Length of stay at end of follow-up. - Actual outcome: Length of hospital stay (number of days) at 1 year; Group 1: mean 0.8 (SD 3.4); n=141, Group 2: mean 4.5 (SD 22); n=141; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Avoidable adverse events; Quality of life; Patient and/or carer satisfaction; Readmission; Staff satisfaction.

Study	Gwadry-sridhar 2005[30]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=134).
Countries and setting	Conducted in Canada; setting: acute medical and surgical units at a teaching hospital.
Line of therapy	1st line.
Duration of study	Intervention + follow up: follow-up: 1 year.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Patients eligible if they had HF documented with a low left ventricular ejection fraction (LVEF <40%), had indications for long term medical treatment of HF or low LVEF and provided informed consent.
Exclusion criteria	Patients were excluded if they were <18 years old, were receiving dialysis, had dementia or psychiatric illness, suffered from another illness that would result in a life expectancy of <6 months, had a planned discharge to long-term residential care, had a language barrier to teaching for themselves or their caregivers, resided outside South-western Ontario or had extensive travel planned within the following year.
Recruitment/selection of patients	Patients entered the study between November 1998 and April 2000 and were followed up for 1 year after

Study	Gwadry-sridhar 2005[30]
	randomisation.
Age, gender and ethnicity	Age - Mean (SD): Gender (M: F): Men: control 45/66 (69%); intervention 51/68 (76%). Ethnicity: white: 91% in control and 96% in intervention.
Further population details	1. Frail elderly: not applicable 2. Intensive care: not applicable 3. People with serious mental illness (comorbidity) plus AME: not applicable 4. Stroke unit: not applicable.
Indirectness of population	No indirectness.
Interventions	(n=68) Intervention 1: MDT process - physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. Patients received 2 HF information booklets and watched a video entitled 'Congestive Heart Failure' and received education delivered through a multidisciplinary team consisting of a nurse or educator and a hospital pharmacist. A certified pharmacist accredited in patient counselling trained the research team to deliver the intervention. The teaching used personalised feedback to incorporate the patient's own life circumstances, lifestyle knowledge and medical therapy, and was planned to be reinforced by contact over 2 days. Four specific multifaceted components were oral, written, visual props and media videos. The nurse, educator and pharmacist delivered the intervention within 48 to 96 hours while the patient was in hospital for their index admission. This was planned for the last few days before discharge but, where necessary, was occasionally completed shortly after discharge. In total, this intervention involved 2.5 hours of educator interaction with the patient. No further education was given by the research team during long-term follow-up. Duration: in-hospital. Concurrent medication/care: not stated. (n=66) Intervention 2: No MDT process - no MDT (best practice). Patients in the control arm received booklets and videos. The research team had no input in to information presented as part of usual clinical care to patients by their physicians, nurses, pharmacists, or other healthcare professionals and did not provide any advice to the clinical care team about drug therapy in either group. Duration: in-hospital. Concurrent medication/care: not stated.
Funding	Funding not stated.

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: MDT PROCESS versus NO MDT (BEST PRACTICE).

Protocol outcome 1: Quality of life at end of follow-up (mean, No SD).
- Actual outcome: Quality of life (SF-36) at 9 weeks, PCS (physical) summary scores (mean): Intervention group: Improved from 30.52 to 37.15; 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
-Actual outcome: Quality of life (SF-36) at 9 weeks, SF-36, MCS (mental) summary scores (mean): Intervention group: Improved from 29.13 to 37.38; Risk of bias: All domain - High, Selection - Low, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low;

Study	Gwadry-sridhar 2005[30]
Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Mortality; Avoidable adverse events; Patient and/or carer satisfaction; Length of stay; Readmission; Staff satisfaction.

Study	Jitapunkul 1995[38]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=416).
Countries and setting	Conducted in Thailand; setting: female ward in acute care hospital.
Line of therapy	1st line.
Duration of study	Intervention + follow up: 8 weeks.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	All medical patients regardless of age, staying in the female ward.
Exclusion criteria	Not stated.
Recruitment/selection of patients	All patients were randomly admitted from the admission unit or the emergency department depending on the availability of beds at that time.
Age, gender and ethnicity	Age - Mean (SD): Intervention- 48.1 (19.1); control-48.8 (18.5). Gender (M:F): All females. Ethnicity: not stated.
Further population details	1. Frail elderly: 2. Intensive care: 3. People with serious mental illness (comorbidity) plus AME: 4. Stroke unit.
Indirectness of population	No indirectness.
Interventions	(n=199) Intervention 1: MDT process - papers must state MDT. Physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. Multidisciplinary team approach. Multidisciplinary team consisted of a medical consultant, primary nurses, physiatrists and a rehabilitation team, social workers and medical house officers. Multidisciplinary team approach - physician nurse coloration was strengthened by regular ward rounds (4 days a week). Discussion of patient problems including medical problems, critical review of medication, nursing problems, rehabilitation and social issues and plans of management were conducted during the ward rounds. A team meeting was arranged once a week. Duration: 8 weeks. Concurrent medication/care: not stated.

Study	Jitapunkul 1995[38]
	(n=218) Intervention 2: No MDT process - no MDT (best practice). No multidisciplinary team approach. The control group included patients who were staying in other female ward. Duration: 8 weeks. Concurrent medication/care: not stated.
Funding	Funding not stated.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE). Protocol outcome 1: Mortality at define. - Actual outcome: Mortality (all-cause) at 8 weeks; Group 1: 21/199, Group 2: 16/218; Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness ; Protocol outcome 2: Length of stay at define. - Actual outcome: Length of stay at 8 weeks; Group 1: mean 11.7 (SD 12.2); n=199, Group 2: mean 11.6 (SD 10.6); n=218; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Avoidable adverse events at end of follow-up; Quality of life at end of follow-up; Patient and/or carer satisfaction at end of follow-up; Readmission; Staff satisfaction at end of follow-up.

Study	Mcdonald 2001[58]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=70).
Countries and setting	Conducted in Irish Republic; setting: university hospital.
Line of therapy	1st line.
Duration of study	Intervention + follow up: follow-up: 1 month.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.

Study	Mcdonald 2001[58]
Inclusion criteria	All patients over 18 years admitted to the hospital through casualty with an initial diagnosis of CHF. Diagnosis of CHF was confirmed or refuted by a cardiologist based on the presence of all of the following 4 criteria: history and examination compatible with CHF, chest x-ray appearance of congestion, echocardiography evidenced left ventricular dysfunction and response to initial therapy.
Exclusion criteria	Patients presenting with CHF in the setting of myocardial infarction or unstable angina, or where failure was not thought to be the primary problem were excluded. Also not considered were those with illnesses that could compromise survival over the duration of the study or with cognitive impairment.
Age, gender and ethnicity	Age - Mean (SD): Intervention group: 69.9 (11.3); control group: 67.9 (12.0). Gender (M: F): Male: Female: Intervention group: 25:10; control group: 22:13. Ethnicity: Not stated.
Further population details	1. Frail elderly: not applicable 2. Intensive care: not applicable 3. People with serious mental illness (comorbidity) plus AME: not applicable 4. Stroke unit: not applicable.
Extra comments	Once stable and when informed consent was obtained, all eligible patients were randomised to multidisciplinary care or routine care.
Indirectness of population	No indirectness.
Interventions	(n=35) Intervention 1: MDT process - physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. Patients underwent investigations and treatment as for the routine care group. In addition, patients systematically received specialist nurse-led education and dietetic consults on 3 or more occasions. The education programme focused on daily weight monitoring, disease and medication understanding and salt restriction. Similar advice was given to the patients' carer/next of kin where applicable. Patients were discharged from the hospital with a letter to the referring physician explaining the nature of the study and when the management of CHF related issues should be referred to the clinic or the nurse. Telephone contact was made at 3 days following discharge and weekly thereafter until 12 weeks with the exception of week 2 and week 6 where patients attended the clinic to check clinical status. Duration: in-hospital + home (out-patient care). Concurrent medication/care: diuretic and digoxin was prescribed in appropriate doses. Additionally ACE inhibitor therapy was prescribed at maximally tolerated doses. Perindropil was selected because it may be better tolerated on initiation and can be easily titrated to target doses. Beta blockade was not initiated for management at this stage in view of the, as yet, unproven benefit in NYHA class IV CHF. (n=35) Intervention 2: No MDT process - no MDT (best practice). Patients underwent investigations for CHF including echocardiography and right and left catheterisation where indicated. Appropriate medical therapy was administered. Ancillary services such as dietary and social work consultation were provided as requested by the attending cardiologist. Patients were referred back to their primary physician with a letter stating participation in the study and that routine management of their condition can carry on as they see fit, including review by the hospital cardiology

Study	Mcdonald 2001[58]
	service, if required. All the patients were reviewed at 3 months at the cardiology clinic as per protocol. Duration: in-hospital. Concurrent medication/care: diuretic and digoxin was prescribed in appropriate doses. Additionally ACE inhibitor therapy was prescribed at maximally tolerated doses. Perindropil was selected because it may be better tolerated on initiation and can be easily titrated to target doses. Beta blockade was not initiated for management at this stage in view of the as yet unproven benefit in NYHA class IV CHF.
Funding	Academic or government funding.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE). Protocol outcome 1: Mortality at end of follow-up. - Actual outcome: Mortality at 90 days; Group 1: 0/35, Group 2: 0/35; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Length of stay at end of follow-up. - Actual outcome: Length of hospital stay at end of follow-up; Group 1: mean 9.8 (SD 3.9); n=35, Group 2: mean 11.2 (SD 5.9); n=35; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 3: Readmission up to 30 days. - Actual outcome: Readmission for CHF at 90 days; Group 1: 0/35, Group 2: 0/35; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Avoidable adverse events; Quality of life; Patient and/or carer satisfaction; Staff satisfaction.

Study	Mcdonald 2002[59]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=98).
Countries and setting	Conducted in Irish Republic; setting: secondary care.
Line of therapy	Unclear.
Duration of study	Intervention time: 3 months; Follow-up= 3 months.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis: diagnosis of heart failure confirmed by cardiologist on the basis of history, examination, chest x-ray appearance of congestion, echocardiography evidenced left ventricular systolic or diastolic dysfunction and response to initial therapy.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Diagnosis of heart failure confirmed by cardiologist on the basis of history, examination, chest x-ray appearance of congestion, echocardiography evidenced left ventricular systolic or diastolic dysfunction and response to initial therapy.
Exclusion criteria	Heart failure in the context of myocardial infarction or unstable angina or in whom heart failure was not the primary problem; those with illnesses that could compromise survival over the duration of the study, or cognitive impairment.
Recruitment/selection of patients	Diagnosis of heart failure confirmed by cardiologist on the basis of history, examination, chest x-ray appearance of congestion, echocardiography evidenced left ventricular systolic or diastolic dysfunction and response to initial therapy.
Age, gender and ethnicity	Age - Mean (SD): 70.8 (10.5) years. Gender (M: F): 65:33. Ethnicity: not stated.
Further population details	Not stated.
Indirectness of population	No indirectness.
Interventions	(n=51) Intervention 1: MDT process - physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. In addition to routine care, patients systematically received specialist nurse-led education and specialist dietitian consults on 3 or more occasions during index admission; similar advice given to next of kin. After discharge, letter sent to referring physician explaining that the management of HF-related issues should be referred to the clinic or nurse; telephone contact with nurse specialist 3 days after discharge and weekly thereafter for 12 weeks. At weeks 2 and 6, patients and next of kin attended HF clinic; also asked to contact clinic if patients noticed deterioration, leading to full clinical review. Duration: 12 weeks. Concurrent medication/care: optimal medical therapy. Further details: 1. Frequency of meeting: weekly.

	(n=47) Intervention 2: No MDT process - no MDT (best practice). Routine care in hospital; referred back to primary care physician; all patient reviewed at 3 months clinic. Duration: 12 weeks. Concurrent medication/care: optimal medical therapy.
Funding	Study funded by industry (Irish Heart Foundation and Servier Laboratories Ireland).
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE). Protocol outcome 1: Mortality at end of follow-up. - Actual outcome: Mortality at 3 months; Group 1: 3/51, Group 2: 3/47; Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness 0 Protocol outcome 2: Quality of life at end of follow-up (scale not specified in the study so not included in the analysis). - Actual outcome: Quality of life at 3 months; Group 1: mean 28.8 (SD 23); n=51, Group 2: mean 39 (SD 29.5); n=47; Risk of bias: All domain - Very high, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 3: Length of stay at end of follow-up. - Actual outcome: Length of stay at 3 months; Group 1: mean 13.7 Days (SD 7.8); n=51, Group 2: mean 14.6 Days (SD 8.1); n=47; Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 4: Readmission up to 30 days. - Actual outcome: Readmission at 3 months; Group 1: 2/48, Group 2: 12/44; Risk of bias: All domain - High, Selection - High, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	Avoidable adverse events; Patient and/or carer satisfaction; Staff satisfaction.

Study	**Rich 1993[84]**
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=98).
Countries and setting	Conducted in USA; setting: hospital.

Study	Rich 1993[84]
Line of therapy	1st line.
Duration of study	Intervention + follow up: follow-up: 90 days after discharge.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Elderly patients (70 years or older) with CHF.
Exclusion criteria	Patients deemed to be at low risk were excluded because they would be unlikely to benefit significantly from a programme designed to reduce readmission frequency. Additional exclusion criteria were: residence outside catchment area, planned discharge to a nursing home or other chronic care facility, non-cardiac illness likely to result in non-preventable re-admission, severe mental incapacity or psychiatric disturbance, patient or physician refusal and logistic and discretionary reasons.
Recruitment/selection of patients	All patients 70 years or older admitted to the medical ward between April 1988 and March 1999 were prospectively screened for the presence of CHF. The diagnosis was established by the presence of definite radiographic evidence of pulmonary congestion, as determined independently by both a staff radiologist and a staff cardiologist or by the presence of typical historical and physical findings of CHF in conjunction with symptomatic improvement following diuresis.
Age, gender and ethnicity	Age - Mean (SD): Intervention group: 80 (6.3) years; control group: 77.3 (6.1) years. Gender (M: F): Male- Intervention group: n=25 (39.7%); control group: n=15 (42.9%). Ethnicity: white 46% in intervention group and 57% in control group.
Further population details	1. Frail elderly: not applicable 2. Intensive care: not applicable 3. People with serious mental illness (comorbidity) plus AME: not applicable 4. Stroke unit: not applicable.
Indirectness of population	No indirectness.
Interventions	(n=63) Intervention 1: MDT process - physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. The study intervention consisted of 4 components: intensive education about CHF and its treatment, a detailed analysis of medications with specific recommendations designed to improve compliance and reduce adverse effects, early discharge planning and enhanced follow-up through the home care and telephone contacts. Individualised patient education included daily visits during hospitalisation by an experienced cardiovascular research nurse to discuss the diagnosis, symptoms, treatment, follow-up and prognosis of CHF using a 15 page book entitled 'CHF: a patients guide', specifically developed by the investigators for the elderly CHF patient. A detailed dietary history was obtained by a registered dietician, and dietary teaching was performed by and reinforced by the study nurse. All medications were carefully reviewed with the patient. Several days prior to

Study	Rich 1993[84]
	anticipate discharge, a careful medication review was performed by a geriatric cardiologist; and the doses, frequency and total number of dosing intervals for all medications was recorded. The patients were also seen early in the hospital course by a social worker and a member of the home care team to facilitate discharge planning and to ease the transition from the hospital to the home environment. At the time of discharge, a discharge summary form was completed by the study nurse detailing medications, dietary and activity restrictions, and any anticipated problem areas identified by the social worker, hospital home care representative or study personnel. The home care nurse again reinforced the teaching materials, reviewed medications, diet and activity guidelines, assisted with initiating the daily weight chart and performed a general physical assessment and cardiovascular examination. The patients were seen 3 times in the first week, during which time the above functions were repeated, and they were subsequently seen at regular intervals. The study nurse contacted all patients by telephone to assess their progress, answer any questions and keep communication lines open. Duration: in-hospital + at home after discharge. Concurrent medication/care: not stated. (n=35) Intervention 2: No MDT process - no MDT (best practice). Patients in standard care group received all conventional treatment as requested by the patients attending physician. Such measures included social service evaluation, dietary and medication teaching, home care and all other available hospital services. Because these patients were not seen regularly by the study nurse and did not receive the study educational materials or the formal medication analysis, the intensity of teaching was lower for the usual care group. Also, social-service consultations and home-care referrals were markedly reduced among the usual care patients. Duration: hospital + home care. Concurrent medication/care: not stated.
Funding	Academic or government funding.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE). Protocol outcome 1: Length of stay at end of follow-up. - Actual outcome: Length of hospital stay at 90 days; Group 1: mean 4.3 (SD 8.7); n=63, Group 2: mean 5.7 (SD 11.8); n=35; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Readmission up to 30 days. - Actual outcome: Re-admission (all cause) at 90 days; Group 1: 21/63, Group 2: 16/35; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness:	
Protocol outcomes not reported by the study	Mortality; Avoidable adverse events ; Quality of life ; Patient and/ or carer satisfaction; Staff satisfaction.

Study	Rich 1995[83]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=282).
Countries and setting	Conducted in USA; setting: hospital.
Line of therapy	1st line.
Duration of study	Intervention + follow up 90 days.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Patients with confirmed heart failure were eligible to participate in the study if they had at least 1 of the following risk factors for early readmission: prior history of heart failure, 4 or more hospitalisations for any reason in the preceding 5 years, or congestive heart failure precipitated by either an acute myocardial infarction or uncontrolled hypertension (systolic blood pressure 200 mm Hg or diastolic blood pressure 105 mm Hg).
Exclusion criteria	The criteria for exclusion from the study included residence outside the catchment area of Jewish Hospital Home Care, planned discharge to a long-term-care facility, severe dementia or other serious psychiatric illness, anticipated survival of less than 3 months, refusal to participate by either the patient or the physician and logistic or discretionary reasons.
Recruitment/selection of patients	All patients 70 years of age or older who were admitted to the medical wards of Jewish Hospital at Washington University Medical Centre were screened for congestive heart failure. For a diagnosis of heart failure, either definite radiographic evidence of pulmonary congestion or typical symptoms and signs of heart failure in conjunction with definite clinical improvement in response to diuresis were required.
Age, gender and ethnicity	Age - Mean (SD): control: 78.4 (6.1); 80.1 (5.9). Gender (M:F): Female- control n=83 (59%) ; MDT n=96 (68%). Ethnicity: not stated.
Further population details	1. Frail elderly: not applicable 2. Intensive care: not applicable 3. People with serious mental illness (comorbidity) plus AME: not applicable 4. Stroke unit: not applicable.
Extra comments	A total of 1306 patients 70 or more years of age met the criteria for congestive heart failure from July 1990 through June 1994.
Indirectness of population	No indirectness.
Interventions	(n=142) Intervention 1: MDT process - physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. The study treatment consisted of intensive education about

Study	Rich 1995[83]
	congestive heart failure and its treatment by an experienced cardiovascular research nurse, using a teaching booklet developed by the study investigators for geriatric patients with heart failure; individualised dietary assessment and instruction given by a registered dietitian with reinforcement by the study nurse; consultation with social-service personnel to facilitate discharge planning and care after discharge; an analysis of medications by a geriatric cardiologist who made specific recommendations to eliminate unnecessary medications and simplify the overall regimen; and intensive follow-up after discharge through the hospital's home care services, supplemented by individualised home visits and telephone contact with the members of the study team. The principal goals of follow-up were to reinforce the patient's education, ensure compliance with medications and diet and identify recurrent symptoms amenable to treatment on an outpatient basis. Duration: 90 days. Concurrent medication/care: medications taken; Digoxin, Diuretic, ACE inhibitors, Nitrates, Beta-Blocker, Calcium antagonist. (n=140) Intervention 2: No MDT process - no MDT (best practice). Patients assigned to conventional care (the control group) were eligible to receive all standard treatments and services ordered by their primary physicians. Duration: 90 days. Concurrent medication/care: medications taken; Digoxin, Diuretic, ACE inhibitors, Nitrates, Beta-Blocker, Calcium antagonist.
Funding	Academic or government funding.

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE).

Protocol outcome 1: Mortality at end of follow-up.

- Actual outcome: Mortality at 90 days; Group 1: 13/142, Group 2: 17/140; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Quality of life at end of follow-up.
- Actual outcome: Quality of life (Chronic Heart Failure Questionnaire) at 90 days; Group 1: mean 22.1 (SD 20.8); n=142, Group 2: mean 11.3 (SD 16.4); n=140; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness

Protocol outcome 3: Length of stay at end of follow-up.

- Actual outcome: Length of hospital stay at 90 days; Group 1: mean 3.9 (SD 10); n=142, Group 2: mean 6.2 (SD 11.4); n=140; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness

Study	Rich 1995[83]
Protocol outcome 4: Readmission. - Actual outcome: Re-admission (all) at 90 days; Group 1: 53/142, Group 2: 94/140; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness - Actual outcome: Re-admission for CHF at 90 days; Group 1: 24/140, Group 2: 54/140; Risk of bias: All domain - High, Selection - High, Blinding - High, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low; Indirectness of outcome: No indirectness .	
Protocol outcomes not reported by the study	Avoidable adverse events; Patient and/or carer satisfaction; Staff satisfaction.

Study	Wild 2004[101]
Study type	RCT (Patient randomised; Parallel).
Number of studies (number of participants)	1 (n=84).
Countries and setting	Conducted in USA; setting: community hospital.
Line of therapy	1st line.
Duration of study	Intervention + follow up: 2 months.
Method of assessment of guideline condition	Adequate method of assessment/diagnosis.
Stratum	Overall.
Subgroup analysis within study	Not applicable.
Inclusion criteria	Patients admitted to the telemetry ward of the community hospital with the most common diagnoses (for example, chest pain, atrial fibrillation/flutter, stroke/TIA, congestive heart failure and syncope).
Exclusion criteria	Patients who were at any point in the interdisciplinary rounds stay transferred to the intensive care unit or to the general medical ward due to other conditions were excluded, as were patients who died during the interdisciplinary rounds stay. Patients who were re-admitted within the study period and who had already been randomised on a previous visit were also excluded.
Recruitment/selection of patients	Not stated.
Age, gender and ethnicity	Age - Mean (SD): Intervention-71.3 (13.5); control- 69.8 (14.9). Gender (M:F): Define. Ethnicity: not stated.
Further population details	1. Frail elderly: 2. Intensive care: 3. People with serious mental illness (comorbidity) plus AME: 4. Stroke unit.
Indirectness of population	No indirectness.
Interventions	(n=42) Intervention 1: MDT process - papers must state MDT, physicians, nurses, allied health professionals and, where appropriate, primary care and social work as determined by patient need. Interdisciplinary ward rounds. Daily

Study	Wild 2004[101]
	ward rounds, in which resident physicians, nurses, a case manager, pharmacist, dietician and physical therapist met to discuss patients on the team and to identify and address possible discharge problems. Interdisciplinary ward rounds were held for 30-45 mins with 2 to 5 mins per patient. Duration: 2 months. Concurrent medication/care: number of medications; intervention-7.0 (3.4); control- 6.2 (2.8). (n=42) Intervention 2: No MDT process - no MDT (best practice). No interdisciplinary rounds. No further details reported. Duration: 2 months. Concurrent medication/care: number of medications; intervention-7.0 (3.4); control-6.2 (2.8).
Funding	Funding not stated.
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: PAPERS MUST STATE MDT. PHYSICIANS, NURSES, ALLIED HEALTH PROFESSIONALS AND, WHERE APPROPRIATE, PRIMARY CARE AND SOCIAL WORK AS DETERMINED BY PATIENT NEED versus NO MDT (BEST PRACTICE) Protocol outcome 1: Length of stay at define. - Actual outcome: Length of stay at end of hospital stay; Group 1: mean 3.04 (SD 1.8); n=42, Group 2: mean 2.7 (SD 1.8); n=42; 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 at end of follow-up; Avoidable adverse events at end of follow-up; Quality of life at end of follow-up; Patient and/or carer satisfaction at end of follow-up; Readmission; Staff satisfaction end of follow-up.

Appendix E: Economic evidence tables

No relevant economic evidence was identified.

Appendix F: GRADE tables

Table 8: Clinical evidence profile: Multidisciplinary care/intervention versus no multidisciplinary care/intervention

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	MDT process	No MDT process	Relative (95% CI)	Absolute		
Mortality (all-cause)												
7	randomised trials	serious[1]	serious inconsistency	serious[2]	very serious[3]	None	83/758 (12.6%)	7.3%	RR 1.03 (0.78 to 1.37)	3 more per 1000 (from 23 fewer to 39 more)	⊕OOO VERY LOW	CRITICAL
Length of hospital stay (days) - (Better indicated by lower values)												
7	randomised trials	serious[1]	no serious inconsistency	serious[2]	no serious imprecision	None	743	722	-	MD 1.22 lower (2.33 to 0.12 lower)	⊕⊕OO LOW	CRITICAL
Re-admissions for CHF												
3	randomised trials	serious[1]	serious[4]	serious[2]	no serious imprecision	None	25/225 (11.1%)	25%	RR 0.25 (0.05 to 1.23)	188 fewer per 1000 (from 237 fewer to 58 more)	⊕OOO VERY LOW	IMPORTANT
Quality of life (Chronic Heart Failure Questionnaire) (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	serious[2]	no serious imprecision	None	67	59	-	MD 10.8 higher (4.29 to 17.31 higher)	⊕⊕OO LOW	CRITICAL
Re-admissions (all-cause)												

3	randomised trials	serious[1]	no serious inconsistency	serious[2]	serious[3]	None	87/238 (36.6%)	45.7%	RR 0.64 (0.52 to 0.79)	165 fewer per 1000 (from 96 fewer to 219 fewer)	⊕OOO VERY LOW	IMPORTANT
Re-admissions (all-cause) (Patients with major depression)												
1	randomised trials	serious[1]	no serious inconsistency	serious[2]	very serious[3]	None	13/33 (39.4%)	29%	RR 1.36 (0.68 to 2.72)	104 more per 1000 (from 93 fewer to 499 more)	⊕OOO VERY LOW	IMPORTANT
Re-admissions (all-cause) (Patients with HF)												
2	randomised trials	serious[1]	no serious inconsistency	serious[2]	no serious imprecision	None	74/205 (36.1%)	56.4%	RR 0.59 (0.47 to 0.73)	231 fewer per 1000 (from 152 fewer to 299 fewer)	⊕⊕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] All studies compare multidisciplinary care/intervention with no multidisciplinary care/intervention, they do not compare multidisciplinary team meetings (MDTs) as specified in the protocol.

[3] Downgraded by 1 increment if the confidence interval crossed 1 MID point, and downgraded by 2 increments if the confidence interval crossed 2 MID points.

[4] Downgraded by 1 or 2 increments because heterogeneity, I^2=63%, unexplained by sub-group analysis.

Table 9: Clinical evidence profile: Multidisciplinary ward rounds versus no multidisciplinary ward rounds

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Multidisciplinary ward rounds**	**Traditional ward rounds**	**Relative (95% CI)**	**Absolute**		
Mortality - Multidisciplinary ward rounds versus no multidisciplinary ward rounds												
1	randomised trials	serious[1]	no serious inconsistency	no serious indirectness	very serious[2]	None	10/567 (1.8%)	1.9%	RR 0.94 (0.4 to 2.25)	1 fewer per 1000 (from 11 fewer to 24 more)	⊕OOO VERY LOW	CRITICAL

Length of hospital stay (days) - Multidisciplinary ward rounds versus no multidisciplinary ward rounds (Better indicated by lower values)												
2	randomised trials	serious[1]	serious inconsistency[3]	no serious indirectness	no serious imprecision	None	609	577	-	MD 0.10 lower (1.02 lower to 0.82higher)	⊕⊕OO LOW	CRITICAL

[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 increment if the confidence interval crossed 1 MID point, and downgraded by 2 increments if the confidence interval crossed 2 MID points.
[3]Downgraded by 1 or 2 increments because heterogeneity, I^2=60%, unexplained by sub-group analysis.

Appendix G: Excluded clinical studies

Table 10: Studies excluded from the clinical review

Study	Exclusion reason
Ahmed 2002[2]	This is a review/commentary on a systematic review (McAlister 2001). Patients not in hospital. MDT not in title of McAlister 2001
Anon 2013[1]	Not MDT in title
Austin 2009[3]	Not ward/in-hospital MDT
Bearne2016 [4]	Systematic review. Two references ordered
Britton 2000[5]	Cochrane review withdrawn. This review is replaced by 2 separate protocols: "Interventions for preventing delirium in hospitalised patients" and "Multidisciplinary Team Interventions for the management of delirium in hospitalized patients"
Callens 2006[6]	Article
Cameron 2013[7]	Incorrect setting. Older people who were frail in the community.
CAO2016[8]	Abstract only
Caplan 2004[9]	Incorrect interventions. The study compared comprehensive geriatric assessment and multidisciplinary intervention after discharge of elderly from the elderly from the emergency department to usual care
Capomolla 2002[10]	Outpatients -patients discharged by a HF unit were randomised to usual care and HF management programme
Carey 2010[11]	Review. Checked references.
Chan 2011[12]	Not AME patients. Multi-disciplinary primary care for mothers living in areas of socio-economic deprivation.
Chock 2013[13]	Incorrect population. Advanced cancer patients scheduled to receive radiation therapy. (elective care excluded in protocol)
Clark 2013[14]	Not AME. Patients undergoing radiation therapy for advanced cancer
Collard 1985[17]	Not MDT
Connolly 2014[18]	Abstract
Copperman 1997[19]	Incorrect population and setting. Adolescents with cardiovascular risk factors in home/community.
Der 2009[22]	Article
Ellrodt 2007[23]	Report of the performance of a community teaching hospital in 'Get with the guidelines' programme using multi-disciplinary rounds.
Fakih 2008[24]	Incorrect study design. Quasi experimental study.
Flikweert 2014[25]	Incorrect study design. Clinical trial in which the data of the intervention group was collected prospectively and compared with a historical control group.
Gade 2008[26]	Not guideline condition. Not review population. Palliative care not AME
Garrubba 2009[27]	Systematic review- checked for relevant references.
Gray 2010[28]	Incorrect population. Patients with chronic diseases.
Gums 1999[29]	Incorrect setting- community hospital.
Hays 2006[31]	Inappropriate comparison. Multidisciplinary ward rounds every day versus multidisciplinary ward rounds once a week
Hendriks 2005[32]	Study protocol

Hendry 2013[33]	Not AME patients. Children and adolescents with juvenile idiopathic arthritis and inflammatory joint disease affecting the foot/ankle
Hickman 2015 [34]	Systematic review. One reference ordered.
Holland 2005[35]	Systematic review. Checked references
HUNLEY2016[36]	Abstract only
Jaarsma 1999[37]	Letter to the editor
Johansson 2010[39]	Systematic review but no actual outcome data; included RCTs assessed individually
Johnson 2009[40]	Incorrect study design. Before-After study
Kasper 2002	Not correct population, outpatients.
Ke 2013[41]	SR does not give enough information on the studies and their quality to be taken as a whole; individual RCTs assessed
Kim 2016A[42]	Not in English
Kominski 2001[43]	Incorrect setting. Setting is home/community. Intervention begins after patient has been discharged from the hospital.
Koshman 2007[44]	Design of an RCT.
Lamb 2011[45]	Systematic review. References checked
Langhorne 2011[46]	Systematic review: literature search not sufficiently rigorous. SR; included studies checked
Lapid 2007[48]	Incorrect population. Advanced cancer patients who required radiation therapy. (elective care excluded in protocol)
Lapid 2013[47]	Incorrect population. Advanced cancer patients scheduled to receive radiation therapy (elective care excluded in protocol)
Lemstra 2002[49]	Incorrect population and setting. Migraine patients in a non-clinical setting.
Leventhal 2011[50]	Not ward/in-hospital MDT; only home visits after discharge
Licata 2013[51]	Incorrect study design. Before-after study
Lincoln 2004[52]	Intervention in community, not ward/in-hospital MDT
Lu 2014[53]	Incorrect interventions. Not MDT versus no MDT
McCorkle 2015 [57]	Inappropriate population- patients with late stage cancer
Markle-reid 2010[54]	Not review population. Not AME in hospital. Interdisciplinary team approach to falls prevention for older home care patients 'at risk' for falling.
Marra 2012[55]	Incorrect population and setting. Patients with knee pain recruited from local community pharmacies.
Mattila 2003[56]	Incorrect population and setting. Middle aged hypertensives in rehabilitation centres.
Mcmurray 1996[60]	Only title with grant offered. No abstract or full text of the trial available.
Melin 1995[61]	Incorrect setting- elderly patients in home care
Metzelthin 2013[62]	Incorrect population and setting. Frail older people in the community.
Mitchell 2008[63]	Systematic review. Multidisciplinary care of stroke patients in a primary care setting.
Momsen 2012[64]	Systematic review is not relevant to review question or unclear PICO. Most included studies not AME; potential studies assessed separately. Not guideline condition
Mudge 2013[65]	Not RCT. This is a concurrent controlled trial (not randomised).
Naglie 2002[66]	Not AME. Elderly people with hip fracture.

Nazir 2013[70]	Systematic review. Incorrect settings- nursing homes/or residential care settings.
Ng 2009[71]	Cochrane review- No RCTs identified. Not AME- Patients with motor neuron disease (MND)
Nikolaus 1999[73]	Incorrect setting- older patients homes
Nikolaus 2003[72]	Incorrect setting- older people homes
O'leary 2011[74]	Not RCT. Retrospective medical review of 2similar teaching service units which were randomly selected for the intervention (Interdisciplinary rounds) and control units.
Pannick 2015 [75]	Systematic review- checked for relevant references
Peeters 2007[76]	Incorrect population and setting. Older people with a high risk of falling in residential homes or in the community
Pieper 2016 [77]	Incorrect setting- outpatients. Study assessed the effectiveness of multicomponent intervention in nursing home residents with advanced dementia.
Pillay 2016[78]	Systematic review. Incorrect setting- oncology setting
Pitkala 2006 [79]	Incorrect intervention. Multicomponent geriatric intervention (including comprehensive assessment, physiotherapy, additional supplements/treatments, comprehensive discharge planning) for delirium patients.
Pope 2011[80]	Community hospital MDTs
Rabow 2004[81]	Not guideline condition. Palliative care not AME
Reuben 1995[82]	No MDT. Incorrect interventions
Rummans 2006[85]	Incorrect population. Advanced cancer patients scheduled to receive radiation therapy. (elective care excluded in protocol)
Santschi 2011[86]	Not AME. Management of hypertension in patients with chronic kidney disease. Incorrect setting-out-patients.
Schofield 1999[87]	Systematic review. SR but no eligible studies
Shyu 2010[88]	Not AME patients. Older patients with hip fracture.
Shyu 2010[89]	Not AME patients. Older patients with hip fracture.
Stenvall 2007[90]	Not AME patients. Older patients with femoral neck fracture.
Tan 2014[91]	Systematic review. Incorrect population and setting- People with Parkinson's Disease in the community
Trochu 2003[92]	Conference abstract only.
Tseng 2012[93]	Not AME patients. Older patients with hip fracture.
Van den hout 2003[94]	Not guideline condition. Outpatients, not AME in hospital
Van der marck 2013[95]	Not AME patients. Patients with Parkinson's Disease.
Vlietvlieland 1996 [97]	Not AME. Patients with active rheumatoid arthritis.
Vlietvlieland 1997[96]	Not AME. Patients with active rheumatoid arthritis.
Wang 2015 [98]	Systematic review. Multidisciplinary care in patients with chronic kidney disease. Checked for relevant references.
White 2011[99]	Systematic review: study designs inappropriate. Included studies are not RCTs
Wierzchowiecki 2006[100]	Community hospital MDT
Wild 2004[101]	Interdisciplinary rounds in a community hospital
Williams 1987[102]	Not guideline condition. Community hospital MDTs
Wolfs 2009[103]	Incorrect setting as ambulatory

Yagura 2005[104]	Incorrect study design. Patients allocated based on bed availability.
Yoo 2013[105]	Incorrect study design. Not RCT.
Zwijsen 2014[106]	Incorrect population and setting. Patients with dementia in nursing homes.

1
2

Appendix H: Excluded economic studies

No relevant economic studies were identified.