

S2: Included Studies

**1. Interventions exclusively delivered in the acute hospital pre discharge**

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/policy/intervention Q.3. Main components of Q2	Q.4. Population group & size Q.5. Health condition/problem Q.6. Healthcare context/setting addressed Q.7. Healthcare professionals/personnel involved	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/intervention associated with <u>improved</u> outcomes	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers Q.13. Barriers	Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.	Quality Score
<p>Abdelaal et al. (2013) Canada</p> <p>Syst. Rev. &amp; Meta-analysis (n= 13) – 5 RCTs, 8 observational</p> <p>doi:10.1016/j.jcin.2012.10.008.</p> <p>Reference 28</p>	<p>To “evaluate outcomes of same-day discharge (SDD) following Jesudason versus overnight hospitalization (ON).” (p. 99)</p>	<p>1 Rehospitalization was defined as “repeat hospital admission within 30 days of intervention for any reason related to the index procedure.” (p. 101)</p> <p>2 Same-day discharge (SDD)</p> <p>3 Patient education</p>	<p>4 Older adults – Mean age 62 (n= 111,830)</p> <p>5 Heart conditions (stable/unstable angina, acute coronary syndrome(ACS))</p> <p>6 Surgical to ward/home</p> <p>7 Multidisciplinary team (MDT) (physician, nurse, administration)</p>	<p><b>8 &amp; 9 Rehospitalisations:</b> RCTs - Slightly higher in SDD (4% vs 3.6%; OR: 1.10)</p> <p>Observational – Lower in SDD (1% vs 1.4%; OR: 0.34)</p> <p><b>Total complications:</b> RCTs - Higher in SDD (6.5% vs 5.5%; OR: 1.20)</p> <p>Observational – Lower in SDD (1% vs 2.4%; OR: 0.4)</p> <p>Results were not statistically significant.</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 Safety concerns; insufficient time for patient education; cost disincentive to change practice (US); patient reluctance to accept SDD</p>	<p>Review reported “many carefully selected and risk-stratified groups of patients undergoing elective or ad hoc PCI for low–intermediate risk ACS have been managed successfully with an SDD strategy.” (p. 108)</p> <p>However, due to the low event rate, data heterogeneity, and wide confidence intervals on pooled data, a statistically significant hazard or benefit of SDD could not be determined.</p> <p>Further studies to include patient satisfaction, quality of life, and cost.</p>	<p>37/40</p>

<p>Sales et al. (2014)</p> <p>USA</p> <p>RCT</p> <p>doi: 10.1016/j.cardfail.2013.10.008.</p> <p>Reference 37</p>	<p>To “evaluate the effectiveness of using trained volunteer staff in reducing 30-day readmissions of congestive heart failure (CHF) patients” (p. e 15).</p>	<p>1 NR</p> <p>2 Intervention – education and follow up.</p> <p>3 dietary and pharmacologic education by a trained volunteer, follow-up telephone calls within 48 hours, and weekly calls for a month, to reinforce instructions and promote compliance e.g. diet, weights, medication.</p>	<p>4 Patients &gt;18 years old admitted to New York Methodist Hospital with a primary diagnosis of CHF</p> <p>5 Coronary heart failure</p> <p>6 Large New York hospital.</p> <p>7 Trained volunteer staff – premedical students (n=6).</p>	<p>8 &amp; 9 Primary outcomes were 30-day readmission rates for CHF and worsening New York Heart Association (NYHA) functional classification; composite and all-cause mortality were secondary outcomes.</p> <p>Decrease in readmissions in the community among intervention group (P&lt; .05).</p> <p>10 NR</p>	<p>11 Utilizing trained volunteer staff to improve patient education and engagement might be a low-cost intervention to reduce CHF readmissions.</p> <p>12 NR</p> <p>13 NR</p>	<p>Recommendations: further research needed regarding improved patient satisfaction and engagement, sustainability of benefits following interventions, and costs.</p>	<p>35/40</p>
<p>Davidson et al. (2010)</p> <p>Australia</p> <p>RCT</p> <p>doi:10.1097/HJR.0b013e328334ea56</p> <p>Reference 40</p>	<p>“To assess the impact of a nurse-coordinated multidisciplinary, cardiac rehabilitation program to decrease hospitalizations, increase functional capacity, and meet the needs of patients with heart failure” (p393).</p>	<p>1 NR</p> <p>2 Multidisciplinary cardiac rehabilitation program.</p> <p>3 12 week individualised multidisciplinary programme included exercise component, determined by individual’s functional ability and social circumstances. Control group received only an information session and follow up care.</p>	<p>4 Adult patients (n=105), divided into intervention and control groups.</p> <p>5 Heart failure, NYHA class I–IV</p> <p>6 Teaching hospital</p> <p>7 Nurse, cardiac rehabilitation coordinator, cardiologist, GP.</p>	<p>8 &amp; 9 Outcome measures: primary endpoints of the study were to decrease admission to hospital, both all-cause and cardiovascular admission. Secondary endpoints included health-related quality of life and 6-min walk distance.</p> <p>Patients who had the intervention less likely to be admitted to hospital, either for any cause (P = 0.01) or for a major acute coronary event (P = 0.001). Lower mortality rate in intervention group at 12 months, (P = 0.03). Quality of life scores improved at 3 months compared with baseline for intervention group (P &lt; 0.0001), and control group (P &lt;0.01). Improvement in 6-min walking times at 3 months in intervention group (P = 0.01).</p>	<p>11 NR</p> <p>12 Subsidised transportation was provided to many participants to enable them to attend the program</p> <p>13 Refusal to participate in the intervention was identified as a barrier.</p>	<p>Study closed before obtained calculated sample size. However, strong effect shown in findings from existing sample.</p> <p>Multidisciplinary HF rehabilitation program, utilising individualised exercise programme, and coordinated by a specialist HF nurse appears to significantly decrease readmission rates, improve functional status at 3 months, and increase exercise tolerance</p> <p>A potential advantage of this approach is the use of a group-based model, which may increase organizational efficiency.</p>	<p>30/40</p>

				10 NR			
De Souza et al. (2013) RCT doi:10.12659/msm.889196 Reference 45	“To evaluate the effect of azathioprine (AZA) compared with mesalazine on incidence of re-hospitalizations” (p 716).	1 NR (2014) pre-discharge package discharge-planning intervention 2 Administration of azathioprine (AZA), compared with mesalazine. 3 AZA (2–3 mg/kg per day) or mesalazine (3.2 g per day) therapy. On admission supportive care with fluid replacement, no oral intake, nasogastric tube, and IV hydrocortisone 100 mg every 8 hours for a period of 72 hours. low-fiber diet and were converted to oral corticosteroid therapy prednisone 40 mg at 8 AM for 10 days. The dose was then tapered by 5 mg per week until its complete discontinuation by about the 8th week. Patient recorsing of informatioOn e.g. timing od medication, abdominal pain, adverse effects, etc.	4 Adults aged 18 to 65 years (n=72) 5 sub-occlusive ileo-cecal CD 6 Inflammatory Bowel Diseases Centre in a University Hospital 7 NR	8 & 9 Primary end point was the re-hospitalization proportion due to all causes, as well as for surgical procedures during this period evaluated between the groups. Treatment with AZA significantly reduced the proportion of all-cause re-hospitalization and hospitalizations for surgical procedures when compared with MSZ treatment 10 Use of AZA associated with reduced readmissions.	11 long-term use of AZA in ileocecal CD patients recovering from a sub-occlusion episode can reduce healthcare costs. 12 a significant factor in improving the results of CD treatment is the optimal outpatient control of patients, 13 NR		26/40
Greening et al. (2014) UK RCT doi:10.1136/bmj.g4315 Reference 41	“To investigate whether an early rehabilitation intervention initiated during acute admission for exacerbations of chronic respiratory disease reduces the risk of readmission over 12 months and ameliorates	1 NR 2 early rehabilitation intervention 3 Early rehabilitation involved six week intervention, started within 48 hours of admission. prescribed, progressive aerobic, resistance, and Neuro-muscular electrical stimulation training. Patients also received post discharge training, and a self-management and education package.	4 Adult patients aged between 45 and 93 (n=389). 5 Exacerbations of chronic respiratory conditions, mostly COPD 6 acute cardiorespiratory unit in a teaching hospital and an acute medical unit in an affiliated teaching district general hospital 7 Physiotherapy team, and pulmonary rehabilitation team comprising physiotherapists and nurses.	8 & 9 primary outcome was readmission rate at 12 months. Secondary outcomes included number of hospital days, mortality, physical performance, and health status. 60% overall were readmitted at least once in the following year (62% in the intervention group and 58%	11 NR 12 NR 13 Reduced uptake may have been a mediating factor explaining the lack of reduction in the rate of admission to hospital and the increased mortality in the intervention group.	Early rehabilitation during hospital admission for chronic respiratory disease did not reduce the risk of subsequent readmission Results suggest that beyond current standard physiotherapy practice, progressive exercise rehabilitation should not be started during the early stages of the acute illness.	29/40

	the negative effects of the episode on physical performance and health status” (p 1).			in the control group) and no significant difference between groups was found  Significant recovery in physical performance and health status was seen after discharge in both groups, with no significant difference between groups at one year Mortality at 12 months was higher in the intervention group  10 NR			
Jennings et al. (2014) USA RCT  doi:10.1378/cheest.14-1123  Reference 38	To examine “whether a pre-discharge screening and educational tool, administered to patients with COPD, reduces readmissions and emergency department (ED) visits” (p3).	1 NR  2 pre-discharge bundle intervention  3 Intervention involved smoking cessation counseling, screening for gastroesophageal reflux disease and depression or anxiety, standardized inhaler teaching, and a 48-hour post-discharge phone call. Control group received usual care.	4 Adult patients (n=172)  5 COPD  6 Acute hospital  7 Primary team.	8 & 9 primary endpoint was the difference in the composite risk of hospitalizations or ED visits for AECOPD between the 2 groups in the 30 days following discharge. A secondary endpoint included 90-day readmission rate The risk of ED visits or hospitalizations within 30 days was not different between the groups (risk difference = -3.43%, 95% confidence interval = -15.68%–8.82%; p= 0.58). Overall, the time to readmission in 30 days and 90 days was similar between groups (log-rank test p= 0.71 and p= 0.88, respectively).  10 NR	11 Intervention reported not to be very resource intensive, but ineffective. Authors suggest successful interventions may need to be more resource intensive.  12 NR  13 NR	Authors suggest a more comprehensive, resource-intensive and costlier approach may be necessary for successful reduction of readmissions.	32/40

<p>Bonnet-Zamponi (2013)</p> <p>France</p> <p>RCT</p> <p>doi:10.1111/jgs.12037</p> <p>Reference 39</p>	<p>“To assess the effect of an intervention on drug-related problem (DRP; adverse drug reactions, adherence problems, underuse)-related readmission rates in older adults” (p. 1)</p>	<p>1 NR</p> <p>2. the OMAGE discharge plan: “Discharge-planning intervention combining chronic drug review, education, and enhanced transition-of-care communication” (p. 1)</p> <p>3. Focus on three risk factors of preventable readmissions: depression, malnutrition, and DRPs. Patient education on disease self-management (safety skills, alert signs, deciding health priorities, patient empowerment). Enhanced transition-of-care communication.</p>	<p>4. Adults <math>\geq 70</math> yrs (n=665)</p> <p>5. Drug-related problems of inpatients with multiple chronic conditions</p> <p>6. Six acute geriatric units</p> <p>7. Four specific intervention-dedicated geriatricians (IDGs), GPs, and “expert committee” of three independent geriatricians to adjudicate whether readmissions were drug related (p. 4)</p>	<p>8 and 9.</p> <p><b>Chronic drug prescriptions at discharge:</b> No significant differences between CG and IG (p. 5)</p> <p><b>Readmission Adjudications</b> No significant differences in drug-related readmissions between IG and CC (p. 5) ADRs contributed to 38.7% CG and 17.3 IG readmissions (but this was not significant).</p> <p><b>Cost of ADR-Related Readmissions:</b> No significant differences (with the cost per CG participant estimated at 953.5 euro, and the cost per IG participant estimated to be 392 Euro per participant (p. 5).</p> <p><b>Subgroup Analysis:</b> “Three subgroups of participants benefited most from the OMAGE intervention, with an effect on ED visits and emergency readmissions persisting at 6 months: participants with four or more multiple chronic conditions...participants taking a diuretic at admission or at discharge...participants who wanted to be involved in medical decision-making at admission” (p.6)</p> <p>10. NR</p>	<p>11. See Q8 and 9 (cost of ADR-Related Readmissions).</p> <p>12. NR</p> <p>13. NR</p>	<p>Only confidence intervals were given for the subgroup analysis, and no p values.</p> <p>Although not significant, “the intervention was associated... with 14.3% fewer DRP-related admissions at 6 months (P =.54) and 39.7% fewer ADR-related admissions (P= .12)” (p. 6)</p> <p>Noted that the small sample size could have contributed to the lack of significant findings (“In total, the sample size of the current study has a power of 33% to demonstrate a significant difference between 40.4% and 34.7%”)(p. 7).</p> <p>Authors highlight that study shows the high rate of DRP-related readmissions</p>	<p>29/40</p>
<p>Bradburn et al. (2012)</p> <p>UK</p> <p>RCT</p> <p>10.1136/emj.2010.108522</p>	<p>“To explore variation in outcome and costs between participating hospitals in RATPAC trial” (p. 1)</p>	<p>1.”successfully discharged”: “the patient had to 1. have either left the hospital or be awaiting transport home with a discharge decision have been made at 4h after initial presentation and 2. Suffer no major adverse event...during the following 3 months.” (p. 2)</p>	<p>4. Adults &gt; 25 yrs (n=2243)</p> <p>5. acute chest pain due to suspected myocardial infarction</p> <p>6. Six hospitals in the UK, varying in size and facilities (Barnsley, Derriford, Edinburgh, Frenchay, Leeds, and Leicester)</p>	<p>8 and 9.</p> <p><b>Proportion of patients successfully discharged:</b> Point-of-care panel assessment was associated with an overall modest increase in successful discharge rates (OR = 3.81, P &lt;.01). Substantial increases</p>	<p>11. Costs per patient varied between hospitals, and authors suggest this” may depend on local protocols, staff practices and available facilities” (p.1)</p>	<p>No P values were given for length of hospital stay comparisons.</p> <p>Authors suggest reasons for variation in both outcomes and cost variation across hospitals: “differences in</p>	<p>33/40</p>

Reference 29		<p>2.RATPAC (Randomised Assessment of Treatment using Panel Assay of Cardiac markers)</p> <p>3.point-of-care panel of CK-MB(as a mass assay), myoglobin and troponin at baseline and 90 min using the Seimens Stratus CS analyser</p>	7. Medical staff and physicians	<p>in rates at Barnsley (OR=6.97(4.18 to 11.63), P&lt;.01) and Edinburgh(OR=11.7(6.23 to 11.68), P&lt;.01). Modest increases at Dartford(OR=2.48(1.37 to 4.49), P&lt;.01) and Frenchay (OR=7.3(3.35 to 14.75), P&lt;.01). No increases at Leeds or Leicester.</p> <p><b>Mean costs per patient between hospitals:</b> Only the difference at Edinburgh was statistically significant (costing £646.57 more in point-of-care group, P&lt;.05). “The difference between the mean costs at each centre are reported with a 95% CI. This difference ranged from £214.49 less.... Davidson o £646.57 more” (p. 3), with weak evidence of heterogeneity between centres... suggests that the effect of point-of-care panel assessment on means cost per patient varied between hospitals” (p. 3)</p> <p><b>Health utility (using EQ-FD):</b></p> <p><b>Length of initial hospital stay and total inpatient days over 3 months:</b> Point-of-care associated with fewer patients being in hospital up to 24 h at Barnsley and Edinburgh. Derrisford: the difference in proportion in hospital was only apparent between 4 and 8 h. Frenchay: diference marked up to 12 h, but after 12h the proportion of patients was</p>	<p>Cost differences ranged from £214.49 less to £646.57 more</p> <p>12. NR</p> <p>13. NR</p>	<p>the facilities available, local protocols, existing guidelines for chest pain, existing troponin assays or staff using the point-of-care tests” (p. 4).</p> <p>Power was determined on all centres (rather than on an individual basis) so the study lacks power in detecting differences in each centre (p. 5).</p>	
--------------	--	---	---------------------------------	---	--	---	--

				greater in point-of-care group. Leeds: difference between 6 and 24h. Leicester: slightly fewer patients from 12 – 36 h.  10. NR			
Miller et al. (2013) USA RCT doi:10.1016/j.cmg.2012.11.022 Reference 9	To “determine the effect of stress cardiac magnetic resonance (CMR) imaging in an observation unit (OU) on revascularization, hospital readmission, and recurrent cardiac testing in intermediate-risk patients with possible acute coronary syndromes (ACS).” (p. 785)	1 Hospital readmission: “an overnight stay or placement into observation or inpatient status for >8 h, for all causes, after the index visit” (p. 788)  Index visit length of stay: “the time elapsed between randomisation and discharge from the facility.” (p. 789)  2 Observation Unit care (OU) with stress cardiac magnetic resonance (CMR)  3 Management; stress CMR exams	4 Adults - range 35-91 yrs; (n= 105)  5 Symptoms of acute coronary syndrome (ACS)/chest pain  6 Observation unit or inpatient setting/ED  7 Emergency physician; care providers	8 & 9 <b>LOS:</b> Significantly reduced in OU CMR group compared to usual care group (21 hr s vs 26 hrs; P< 0.001). <b>Rehospitalisation:</b> Significantly reduced in OU CMR group compared to usual care group (8% vs 23%; P= 0.03)  10 NR	11 NR 12 NR 13 NR	Authors found that the “OU CMR care pathway, in elevated-risk participants, is an efficient alternative to inpatient care and can shorten hospital length of stay and reduce hospital readmissions.” (p. 791)  Another study (Miller et al. 2011) reported that OU CMR care reduced cost over the course of 1 year compared with an inpatient care strategy.  <b>Limitations:</b> Single-centre design  Study needs to be replicated across multiple centres to ensure external validity of the findings.	32/40
Challand et al. (2012) UK RCT doi:10.1093/bja/aer273. Reference 46	To determine whether “intraoperative GDT would reduce the time to surgical readiness for discharge (RfD) of patients having major elective colorectal surgery”, and whether less marked effect would occur in	1 NR  2 standard fluid regimen with or without ODM-guided intraoperative GDT.  3 NR	4 Patients having major open or laparoscopic colorectal surgery (n=179), divided between aerobically fit (n=123) and unfit (n=56), based on exercise test.  5 Colorectal surgery.  6 Operating theatre and colorectal surgery ward.  7 Surgeon and anaesthetist.	8 & 9 primary outcome measure=surgical RfD based on predefined criteria, that is, tolerance of oral diet, mobilization and self-support at an appropriate level, adequate pain control with simple oral analgesics, return of adequate lower gastrointestinal function, and adequate stoma care, where applicable.	11 NR 12 NR 13 NR	Recommendations: Future studies should consider methods of defining the ‘high-risk surgical patient’ with regard to nature of planned surgical procedures, and functional capacity, and evaluation of the effects of GDT with consideration of these factors.	33/40

	aerobically fit patients (p53).			<p>Secondary outcomes included actual length of stay (LOS), critical care admission, 30 and 90 day mortality, and 30 day hospital readmission rates.</p> <p>GDT patients received an average of 1360 ml of additional intraoperative colloid. Times to RfD and LOS were longer in GDT than control patients but did not reach statistical significance (P=0.09). Fit GDT patients had an increased RfD and LOS (P=0.01) compared with controls.</p> <p>10. NR</p>			
<p>Jesudason et al. (2012)</p> <p>Australia</p> <p>RCT</p> <p>doi:10.1136/emermed-2011-200157</p> <p>Reference 42</p>	<p>“To investigate whether a physiotherapy service to an EECU altered the rate of hospital admission, rate of re-presentation to the ED, visits to the community healthcare practitioners, return to usual work/home/leisure activities and patient satisfaction” (p.1).</p>	<p>1 NR</p> <p>2. Physiotherapy intervention service to an EECU</p> <p>3. “Interventions included education, advice, mobility review, provision of mobility aids, exercise prescription and organisation of appropriate community equipment/resources” (p. 2).</p>	<p>4. adults <math>\geq</math> 18 yrs (mean age of 70 yrs) (N=186)</p> <p>5. patients referred for physiotherapy assessment/intervention (most commonly mobility issues)</p> <p>6. EECU (emergency extended care unit) physiotherapy service at Royal Adelaide Hospital (public hospital)</p> <p>7. Physiotherapists, with a range of experience; nursing and medical staff</p>	<p>8 &amp; 9.</p> <p><b>Rate of hospital admission:</b> No significant differences.</p> <p><b>Rate of re-presentation to the ED:</b> No significant differences.</p> <p><b>Use of community healthcare resources:</b> No significant differences</p> <p><b>Return to usual work/home/leisure activities:</b> No significant differences</p> <p><b>Patient satisfaction:</b> No significant differences.</p> <p>10. NR</p>	<p>11. Findings suggest that a physiotherapy service does not reduce healthcare sector costs (p. 4).</p> <p>12. NR</p> <p>13. NR</p>	<p>Authors suggest that the lack of reduction in admission rates could have been due to the fact that hospital admission reasons were “multifactorial and complex. Physiotherapy intervention, which was predominantly aimed at only one factor leading to hospital admission (ie, poor mobility), may therefore have been rendered ineffective... It is possible that a physiotherapy service may reduce the rate of hospital admission if it were provided to EECU patients only after they have been deemed ready for discharge for all medical reasons and mobility is the only</p>	33/40

						factor preventing discharge" (p. 4). Study powered to detect a min. 15% difference rate only	
Sahota et al. (2017)  United Kingdom  RCT  doi:10.1093/ageing/afw149.  Reference 43	To compare the clinical and cost-effectiveness of a Community In-reach Rehabilitation and Care Transition (CIRACT) service with the traditional hospital-based rehabilitation (THB-Rehab) service (Pg 2).	1. NR 2. The Community In-reach Rehabilitation and Care Transition (CIRACT) 3. The CIRACT service consisted of a team working across multiple boundaries with patients and their carers. Following randomisation, the CIRACT service undertook a comprehensive assessment of the participant's ability to perform certain tasks and formed a rehabilitation plan. While in hospital participants were treated daily (7 days a week, if appropriate) and the duration of rehabilitation they received depended on their needs. During the participant's hospital stay, the team liaised with the participant and their carer(s) to visit the participant's home to assess and provide recommendations for equipment and make adaptations and/or modifications as required.	4. Patients aged 70 years and older (n=250) 5. Patients admitted to the elderly care medical wards as an acute medical emergency. 6. General medical elderly care 7. A senior occupational therapist (transition coach), senior physiotherapist, and assistant practitioner, linked directly to a social services practitioner	8. Hospital length of stay, readmission, day 9.-super spell bed days,  functional ability, co-morbidity and health-related quality of life; cost-effectiveness analysis  9. There was no significant difference in length of stay between the  CIRACT and THB-Rehab service. Of the participants who were discharged from hospital, 17% and 13% were readmitted  within 28 days from the CIRACT and THB-Rehab services, respectively.  10.NR	11.NR  12.The nurse discharge advocate engaged patients during their admission to hospital, provided clinical information and an individualised, illustrated plan post-discharge  13. Bottlenecks in providing community personal care services (for example community care support provided by social services) may have led to delays in  both groups and potentially masked any significant benefits of the CIRACT intervention.	Further studies are necessary powered with larger sample sizes, cluster randomisation (to reduce bias), but more importantly including a more integrated community medical model as part of the CIRACT team (Pg 6).	31/40

<p>Wu et al. (2017)</p> <p>Australia</p> <p>RCT</p> <p>doi:10.1177/0269215517694462</p> <p>Reference 44</p>	<p>To investigate the impact of an in-reach rehabilitation team for patients admitted after road Trauma (Pg 2).</p>	<p>1. Instead of waiting for medical and surgical stability, there has been a trend to start rehabilitation “early” as part of acute inpatient treatment with rehabilitation services running in parallel with acute care teams.</p> <p>2. Early rehabilitation after hospital admission using an in-reach multidisciplinary team.</p> <p>3. Rehabilitation teams encouraged timely multidisciplinary assessments of mobility, activities of daily living, swallowing, communication, skin integrity, continence, mood, cognition, nutritional status, home assessment and insurance related issues.</p>	<p>4. Adult patients (aged 18 and over) (n=214)</p> <p>5. Patients with sustained injuries related to road trauma</p> <p>6. Clinical/Medical (acute trauma units and wards)</p> <p>7. Rehabilitation teams at the four sites all had a rehabilitation physician, a nurse coordinator, a physiotherapist and an occupational therapist, all with experience working in rehabilitation.</p>	<p>8. Acute length of stay, percentage</p> <p>requiring inpatient rehabilitation, function, psychological status, pain and quality of life.</p> <p>9. Acute length of stay did not differ between the intervention and control groups. There were no significant differences observed in the secondary outcomes at hospital discharge and follow-up.</p> <p>10. NR</p>	<p>11. Limited ward sources.</p> <p>12. NR</p> <p>13. The goal of providing two sessions of therapy per day may not have been consistently feasible in this setting. Lack of specialised nursing with a rehabilitation focus may be the critical missing ingredient.</p>	<p>Trauma rehabilitation services may be feasible if all trauma patients are housed on the same ward, by using a rehabilitation physician to coordinate an adequately staffed multidisciplinary team and to work collaboratively with the trauma teams (Pg 9)</p>	<p>37/40</p>
<p>Ortiz et al (2014)</p> <p>Brazil</p> <p>Review of randomized trials</p> <p>16 studies (randomized and quasi-randomized trials)</p> <p>doi: 10.1002/14651858.CD009015.pub2.</p> <p>Reference 47</p>	<p>“to evaluate the risk of complications (the risk of postoperative nausea and vomiting (PONV), admission or readmission to hospital, postoperative behavioural disturbances and perioperative respiratory and cardiovascular complications) and recovery times (time to discharge from recovery ward and time to discharge from</p>	<p>1. NR</p> <p>2. Inhalational and intravenous anaesthesia</p> <p>3. These two types of anaesthesia are available for general anaesthesia in children</p>	<p>4. 900 participants were otherwise healthy children (aged under 15 years)</p> <p>5. Children scheduled for say surgery.</p> <p>6. Hospitals</p> <p>7. Nursing staff</p>	<p>8. The risk of PONV and postoperative behavioural Disturbances</p> <p>9. NR</p> <p>10. When compared to inhaled anaesthesia with sevoflurane, intravenous anaesthesia with propofol may reduce the risk of PONV and the risk of behavioural problems with no difference in the time to recovery from anaesthesia and discharge from hospital in children having day surgery.</p>	<p>11. Nursing staff</p> <p>12. NR</p> <p>13. The drugs used, how they were combined and the duration of the anaesthesia varied greatly in the included studies, which made it difficult to provide a meaningful analysis.</p>	<p>Further studies need to compare specific subsets of ambulatory surgery in children, with standardized and validated measurement of outcomes.</p>	<p>37/40</p>

	hospital) comparing the use of intravenous to inhalational anaesthesia for paediatric outpatient surgery” (Pg. 1).						
Ogilvie (2005)  Syst Rev 1 RCT, 23 observational or cross- sectional studies, and 1 qualitative study  Doi: 10.1136/adc.2 003.035543  Reference 36	To synthesise published evidence of the impacts of introducing hospital based alternatives to acute paediatric admission.	1 NR  2 Alternative service provided in hospitals  3 Acute assessment units based in a paediatric department (hereafter referred to as paediatric assessment units: (n=13 Acute assessment units based in an accident and emergency department (A&E assessment units:( n= 9) studies) Acute assessment clinics (n=3).	4 Children (n-NR)  5 acute medical problems  6 Hospital  7 NR	8 & 9  <b>Discharge:</b> 40% of children referred as emergencies to <b>Paed assessment</b> units were discharged without requiring inpatient Admission (n=10) 62% to 99%,were discharged from <b>A&amp;E Assessment Units</b> without admission (n=8).  <b>Unscheduled returns</b> Between 0.4% and 7% of discharged Children from <b>Paeds assessment</b> units returned unexpectedly to hospital (n=five). 0.4% and 1.7%, respectively, of patients discharged from the <b>A&amp;E Assessment Units</b> returned for readmission within 72 hours (n=2)  <b>Parents satisfaction</b>  10 NR	11 One RCT Found no significant difference in indirect costs, but children who were managed initially in the acute assessment unit spent fewer days in hospital, had fewer days of intravenous therapy, and incurred lower room and therapy/ancillary charges.  12 NR  13 Children’s use of emergency hospital services may be affected by socio-spatial factors such as deprivation and proximity to hospital (p141)	Note: In summary of key findings: Many of the studies identified were of uncertain quality or were open to significant potential bias.  The available evidence suggests that about 40% of children attending acute assessment units in paediatric departments, and over 60% of those attending acute assessment units in A&E departments, do not require inpatient admission. (p140)	25/40

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/policy/intervention	Q.4. Population group & size Q.5. Health condition/problem	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers	Additional Comments e.g. explanatory notes; key recommendations/messages reported quality stated by authors.	Quality Score
-----------------------------	-----	---	---	---	--	--	---------------

		Q.3. Main components of Q2	Q.6. Healthcare context/setting addressed  Q.7. Healthcare professionals/personnel involved	intervention associated with <u>improved</u> outcomes	Q.13. Barriers		
<p>Fox et al. (2013) Canada</p> <p>Syst. Rev. &amp; Meta-Analysis (n= 9) - 7 RCTs, 1 Pseudo-RCT, 1 Quasi-experimental study</p> <p>doi: 10.1186/1471-2318-13-70.</p> <p>Reference 27</p>	<p>To compare the effectiveness of early discharge planning to usual care in reducing clinical outcomes (LOS &amp; readmissions)</p>	<p>1 Early discharge planning (EDP): "interventions initiated during the acute phase of an illness or injury to facilitate transition of care back to the community as soon as the acute event is stabilized." (p. 2)</p> <p>2 Early discharge planning (EDP)</p> <p>3 Clinical pathway (early ambulation); pathway documentation (patient &amp; family); patient education; orthopedic consultation; comprehensive physical, cognitive, and psychosocial nursing assessment; family, patient, and healthcare team meeting; transfer to home health care or to interdisciplinary outpatient care program; follow-up visits or telephone calls after discharge.</p>	<p>4 Older adults <math>\geq 65</math> (n= 1736)</p> <p>5 Cardiovascular illness (e.g. congestive heart failure; myocardial infarction) or surgical management of hip fracture.</p> <p>6 Medical unit; orthopaedic unit; intensive care unit</p> <p>7 Multidisciplinary team (MDT) /Gerontological clinical nurse specialists with MDT assistance/geriatrician / advanced practice nurses with physicians, nurses &amp; discharger planners/ geriatrician.</p> <p>Note 5 studies = MDTs</p>	<p>8 &amp; 9</p> <p><b>LOS:</b> No significant difference (n= 7)</p> <p><b>Readmissions:</b> Significantly fewer within one or twelve months of discharge in EDP group (equates to 22% reduction; P= 0.0003, n= 7)</p> <p><b>Readmission LOS:</b> Significantly lower LOS of almost 2.5 days (P= 0.004; n= 3) in EDP group.</p> <p><b>Mortality:</b> No significant difference (n= 5)</p> <p><b>Narrative analysis only:</b> Significantly higher scores in overall <b>quality of life</b> and general health domain at two weeks and at three months after discharge (n= 2) in EDP group.</p> <p>No differences in <b>patient satisfaction</b> (n= 2)</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Limitations noted regarding drawing conclusions about risk of bias because of small number of studies with few details on study methods.</p> <p>Future research: "examine the effectiveness of early discharge planning on caregiver satisfaction and quality of life as well as community healthcare provider satisfaction." (p. 7-8)</p> <p>Concluded that EDP with older adults admitted to hospital improves system level outcomes after index hospital discharge.</p> <p>..</p>	35/40
<p>Goldman et al (2014) USA</p> <p>RCT</p> <p>doi: 10.7326/M14-0094.</p> <p>Reference 30</p>	<p>"To examine whether a peri-discharge, nurse-led intervention decreased emergency department (ED) visits or readmissions among ethnically and linguistically diverse older</p>	<p>1 NR</p> <p>2 Nurse led discharge support intervention</p> <p>3 In-hospital, one-on-one self-management education by nurse, telephone follow up.</p>	<p>4 Adults 55 years + who spoke English, Spanish or Chinese (n=700).</p> <p>5 NR</p> <p>6 Urban acute care public hospital</p> <p>7 Language-concordant nurses, and a nurse practitioner.</p>	<p>8 &amp; 9</p> <p><b>ED visits or readmissions:</b> No significant difference between intervention and usual care groups at 30, 90 or 180 days.</p> <p><b>Mortality:</b> No significant difference between groups</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>34/40</p>	34/40

	patients admitted to a safety-net hospital” (p472).						
Lin et al. (2014) Australia RCT doi: 10.1111/imj.12482. Reference 35	To “determine whether a brief patient-directed discharge letter (PADDLE), delivered during a brief discussion with the treating physician would improve patient understanding at the time of hospital discharge and would be feasible for busy clinicians to administer.” (p. 852)	1 NR 2 Patient-directed discharge letter (PADDLE) 3 Education (brief discussion) at discharge with letter on discharge instructions.	4 Older adults – mean age 63 yrs (n= 67) 5 Patients from cardiology (n= 48), respiratory (n= 14), and endocrinology (n= 4) wards. 6 Acute hospital (medical) to home 7 Clinician (hospital and community physician); research nurse	8 & 9 <b>Patient knowledge/understanding:</b> Increased regarding tests (P < 0.001) and post-discharge recommendations (P < 0.001) but no significant differences between groups at 3 & 6 months post discharge. <b>Patient Satisfaction:</b> No change in patients’ self-ratings of satisfaction or level of knowledge, which remained high in both groups. 10 NR	11 NR 12 Clinicians considered that “completing and administering the PADDLE letter was feasible and acceptable within their daily work load.” (p. 854) Inexpensive to produce. 13 NR	<b>Context:</b> Information for continuity of care is often missing at the time of discharge.  Study demonstrates that a “brief patient-directed discharge letter (PADDLE) discussed with the patient on the day of discharge improved immediate understanding of their hospitalisation and discharge recommendations.” (p. 855) Immediate understanding not sustained at 3 and 6 months (long time to retain information, especially for older patients)  <b>Recommendation:</b> Future versions of the letter “may include less detail on tests and results, and more focus on the post-discharge recommendations as this will most strongly influence readmission rate.” (p. 856).  Integration of this brief intervention into routine discharge practice.	34/40

<p>Webster et al. (2011) Australia RCT doi: 10.1016/j.ijnurstu.2011.02.022 Reference 31</p>	<p>To “assess the effect of a protocol driven, nurse-initiated discharge process on discharge time, patient satisfaction and adverse events in a 23-hr post-surgical ward.” (p. 1173)</p>	<p>1NR  2 Protocol driven, nurse-initiated discharge process  3 Completion of surgery summaries and discharge prescriptions; patient discharged when discharge criteria (i.e. Modified Post Anaesthetic Discharge Scoring System (MPADSS) which includes stable vital signs, ability to ambulate safely, minimal nausea or vomiting, minimal pain and bleeding) met, without review.</p>	<p>4 Adults – mean age 49 yrs (n= 131)  5 Patients undergoing a surgical procedure (e.g. ENT, orthopaedic, maxillofacial)  6 A 23-hr post-surgical unit  7 Surgeon; unit nursing staff; research nurses; doctor</p>	<p><b>8 &amp; 9 Discharge by 0900:</b> 82 patients (62.6%) discharged by 0900h. 78.9% from protocol group discharged on time; 50% from usual care (significant difference; P= 0.001) <b>Length of time to discharge:</b> Average LOS was 16.5 hrs; did not differ by group (P=0.81) <b>Admission to hospital:</b> Majority discharged home (93% vs 95.9%; protocol vs usual care). 4 patients from protocol group and 2 from usual care group admitted to inpatient bed. <b>Readmission:</b> No significant difference (n= 3; P= 0.43) <b>Patient satisfaction:</b> High but no significant difference between groups (96.2 vs 94.6; P= 0.40)  10 NR</p>	<p>11 NR 12 NR 13 NR</p>	<p>Study demonstrates that protocol initiated discharge increases the proportion of patients discharged by 0900 h and that patient and staff satisfaction are not compromised.  Most common reason for delay in discharge was waiting for a medical review (mostly in usual care) followed by patients not meeting the discharge criteria.  <b>Strength:</b> Study adequately powered to show a statistical difference in the primary outcome, the proportion of patients discharged by 0900.  <b>Limitations:</b> Although response rate was high, high quality data for the outcome ‘readmission to hospital’ was not obtained.  Contamination between groups noted (i.e. medical staff wrote in the notes of patients in the usual care group that they may be discharged without an AM review).  <b>Recommendation:</b> Future research to include an economic evaluation and a more detailed follow-up plan, to ensure safety of the process.</p>	<p>35/40</p>
---	---	--	---	--	----------------------------------	--	--------------

<p>Dawes et al. (2007) Scotland</p> <p>Randomised comparison and economic evaluation</p> <p>doi: 10.1016/j.ejogrb.2006.02.002.</p> <p>Reference 32</p>	<p>“To determine the effect on quality of life and cost effectiveness of specialist nurse early supported discharge for women undergoing major abdominal and/or pelvic surgery for benign gynaecological disease compared with routine care.” (p262).</p>	<p>1 NR</p> <p>2 Early supported discharge intervention by specialist nurse.</p> <p>3. Daily assessment of women; Individualised discharge plan .</p>	<p>4 Adult women (n=111)</p> <p>5 Benign gynaecological disease.</p> <p>6 Gynaecology surgery service of university hospital in the NHS Trust.</p> <p>7 Specialist gynaecology nurse.</p>	<p>8 &amp; 9</p> <p><b>Readmission:</b> No significant differences</p> <p><b>Length of hospital stay:</b> significantly reduced post-operatively, in intervention group 4.71 S.D. (1.64) vs 6.06 S.D. (1.41) in routine care (p = 0.001).</p> <p><b>Information on discharge support:</b> Improved following intervention</p> <p><b>Complications:</b> No significant differences.</p> <p><b>Quality of life:</b> Significant improvement in some domains in intervention group.</p> <p><b>Patient Satisfaction:</b> improved following intervention.</p> <p><b>Costs:</b> Discharge group associated with much lower total costs to the NHS due to reduced length of stay. Savings made offset cost of specialist nurse. 10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Recommendations: Discharge at 48 h after major abdominal and pelvic surgery is acceptable, and cost effective compared with routine practice. Study demonstrates effectiveness of specialist nurses in providing health information.</p>	<p>32/40</p>
<p>Wong et al. (2005) China</p> <p>RCT</p> <p>doi: 10.1111/j.1365-2648.2005.03404.x.</p> <p>Reference 33</p>	<p>To compare “the outcomes of diabetic patients undergoing either nurse-led early discharge or routine care.” (p. 391)</p>	<p>1 Transitional care: “goals are to control symptoms, prevent complications and promote a lifestyle that will delay disease progression.” (p. 400)</p> <p>2 Nurse-led early discharge programme</p> <p>3 Education (self-management skills); discharge plan; self-monitoring; follow-up calls by DNS until protocol met (diet, exercise, medication-taking, self-monitoring)</p>	<p>4 Adults ≥ 18yrs (mean age -62yrs; n= 101)</p> <p>5 Patients with diabetes mellitus who needed glycaemic control</p> <p>6 Medical department of acute hospital to home</p> <p>7 Diabetes nurse specialist (DNS), Physician, endocrinologist, dieticians</p>	<p>8 &amp; 9 <b>Readmission:</b> No significant difference between groups at 12 (P= 0.111) or 24 weeks (P=0.610)</p> <p><b>ED attendance:</b> No significant difference between groups at 12 (P= 0.052) or 24 weeks (P=0.233)</p> <p><b>LOS:</b> Significantly reduced in intervention group (2.2 vs 5.9 days; P&lt; 0.001)</p> <p><b>Monitoring adherence:</b> Significantly higher score at 12 (P&lt; 0.001) and 24 weeks (P&lt; 0.001) in intervention group.</p>	<p>11 NR</p> <p>12 Practical and cost-effective</p> <p>13 NR</p>	<p>Early discharge and telephone follow-up by a specialist nurse is a feasible approach to care for appropriately selected patients with diabetes.</p> <p>Early discharge programme integrates treatment with the real life environments of patients with diabetes.</p> <p>No limitations reported.</p> <p>Intervention empowers patients to assume responsibility for their own health. Noted that “telephone-based follow-up</p>	<p>33/40</p>

				<p><b>Exercise adherence:</b> Significantly higher score at 12 (P= 0.001) and 24 weeks (P&lt; 0.001) in intervention group.</p> <p><b>Diet adherence:</b> No significant difference between groups at 12 (P= 0.633) or 24 weeks (P=0.686)</p> <p><b>Medication adherence:</b> No significant difference between groups at 12 (P= 0.448) or 24 weeks (P=0.404)</p> <p><b>Cost:</b> Cost saving of HK\$11,888 for each patient discharged early.</p> <p><b>Patient satisfaction:</b> No significant difference between groups (P= 0.528). Both had high levels of satisfaction.</p> <p>10 NR</p>		forms an essential part of the intervention plan” (p. 400)	
<p>Graabaek et al. (2018) Denmark</p> <p>RCT</p> <p>doi: 10.1111/jep.13013.</p> <p>Reference 34</p>	<p>To “investigate the effect of a pharmacist-led medicines management model among older patients at admission, during inpatient stay, and at discharge on medication-related readmissions” (Pg. 2)</p>	<p>1. NR</p> <p>2. The three groups consisted of a control group named Control (usual care) and two intervention groups named ED (basic intervention) and STAY (extended intervention). 3. All patients received usual care including medication history, medication reconciliation, and medication review by a physician. The Control group was not offered any pharmacist-led intervention. Both the ED group and the STAY group received a pharmacist-led medication review.</p>	<p>4. Patients 65 years of age or above, acutely admitted, medical patients (not surgical), able to give informed consent, able to speak and understand Danish, and holding a Danish personal registration number; (n=600)</p> <p>5. NR</p> <p>6. Acute medical unit</p> <p>7. Nurse, a ward-based pharmacist, physicians</p>	<p>8. The number of patients with a medication-related readmission within 30 days from discharge</p> <p>9. NR</p> <p>10.NR</p>	<p>11. NR</p> <p>12. The pharmacist was able to identify and solve medication related problems for the majority of the intervention patients</p> <p>13. Pharmacists’ limited years of experience and limited time so interventions were not offered during the evening, night or weekends.</p>	<p>Note: But in a research setting, bias could be overcome in future studies by cluster-randomization or other designs such as before-and-after study.</p>	34/40

## **2. Interventions delivered both pre and post discharge from acute care**

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/policy/intervention Q.3. Main components of Q2	Q.4. Population group & size Q.5. Health condition/problem Q.6. Healthcare context/setting addressed Q.7. Healthcare professionals/personnel involved	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/intervention associated with <u>improved</u> outcomes	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers Q.13. Barriers	Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.	Quality Score
Adib-Hajbaghery et al. (2013) Iran.  Syst. Rev. (N= 21) i.e. 15 RCTs, 4 quasi-experimental.  doi: 10.5681/jcs.2013.031.  Reference 79	"to determine the effect of post-discharge follow-up on readmission of patients with heart failure (HF)" (p. 255).	1 NR 2 Patient Education/ Home Visits 3 Pre-discharge education/Home visits/ Follow-ups by telephone/ mailing/Internet.	4 Adults (n = 4419) 5 Heart failure 6 Home follow up for most studies 7 Nurses/Pharmacists (NR for most studies)	8 & 9. <b>Readmission:</b> Significant reduction in 15/20 studies varying from 10% to 33%.  10 <b>Pre-discharge patient education,</b> home visits, & telephone follow up	11 Not in results but noted in Discussion that: "patient education before hospital discharge could be a simple and low cost method for reducing readmissions of patients with HF" (p.260). .  12 NR  13 NR	No reference made on the quality of studies included	27/40
Bahr et al (2014)  Syst. Rev. (n=19) i.e 10 RCTs, 4 quasi-experimental & 5 descriptive/ cohort	To assess "the impact of a postdischarge telephone call on patient outcomes" (p84).	1 NR 2 Post discharge phone calls. 3 Assessment & Advice; Education; Medication counselling.	4 Adults 18 yrs < (n=6090). 5 NR 6 Medical / surgical units 7 Registered Nurses /Students/Pharmacists/ Telephone services.	8 & 9 Noted that "Evidence is inconclusive for use of phone calls to decrease readmission, emergency department use, patient satisfaction, scheduled and unscheduled follow-up, and physical and emotional well-being" p.96). Improvements noted in some studies re: Patient Satisfaction; Medical Compliance; Medication Adverse Events; Follow-Up Attendance.	11 NR 12 NR 13 NR	Noted that RNs were the professionals involved in most studies.  Recommended that persons at high risk need to be targeted in future research	32/40

<p>doi: 10.1177/0193 94591349101 6.</p> <p>Reference 80</p>				<p>10 NR</p>			
<p>Huntley et al. (2013) UK</p> <p>Syst. Rev. &amp; Meta-analysis (n= 11) - All RCTs.</p> <p>doi: 10.1093/famp ra/cms081.</p> <p>Reference 58</p>	<p>To evaluate "the effectiveness of case management in reducing the risk of unplanned hospital admissions in older people." (p. 266)</p>	<p>1 NR on case management</p> <p>Unplanned hospital admission: "admission or readmission with an overnight stay that was not previously planned or scheduled or 'elective'." (p. 267)</p> <p>2 Case management (CM) - (1) Initiated in or after discharge from hospital (n= 6) (2) in the community (n= 5)</p> <p>3 (1) Hospital and home visits; geriatric assessment; follow-up telephone calls; liaison with service providers; treatment plans; 24-hour telephone service (2) Initial and follow-up assessments; care plans; home visits; follow-up telephone calls; frequent monitoring of symptoms; adherence; transitional care; coordination of health care professionals; support for self-management; support for care givers and enhanced access to community services.</p>	<p>4 Older adults (CM in hospital or on discharge) - mean age 78 yrs (n= 2505)</p> <p>Older adults (CM based in the community) - mean age 79 yrs (n= 1706)</p> <p>5 NR (unplanned hospital admission)</p> <p>6 Initiated either in or after discharge from acute care hospitals/ED, or in the community.</p> <p>7 (1) Advanced Practice Nurse (APN); geriatric health professionals; physician; district nurse.</p> <p>(2) Geriatric health professionals; trained "guided care" nurses; primary care physician; nurse community manager; home visitors (intervention municipality employees); GP; caregivers.</p>	<p>8 &amp; 9 <b>Unplanned admissions (CM in hospital or on discharge, n= 6):</b> Two individual trials reported a significant decrease in unplanned admissions (one at 6 months, one at 18 months). Three trials suitable for meta-analysis, two of which reported a reduction in unplanned admissions. Overall, no statistically significant reduction in unplanned admissions reported.</p> <p>Significantly reduced length of stay reported in three trials (33.5 vs 42.7 days, P&lt; 0.05; 3 vs 5.2 days, P&lt; 0.05; 1.53 vs 4.09 days, P&lt; 0.05).</p> <p>Significant difference in number of days until first admission (382 vs 348 days, P&lt; 0.011; n= 1)</p> <p><b>Unplanned admissions (CM based in the community, n= 5):</b> Individual trials reported no reduced admissions. Three trials suitable for meta-analysis. Overall, no statistically significant reduction in unplanned admissions reported.</p> <p>Other outcomes: Significant reduction reported in admissions to ED (6 vs 17, n= 1; P&lt; 0.025))</p> <p>Cost (n= 5): Significantly reduced costs (\$3630 vs \$6661 per patient, P= 0.001, n= 1)</p> <p>Other 4 studies reported favourable cost-outcomes for case management.</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>This systematic review and meta-analysis of RCTs is the first to be conducted to the authors' knowledge which focuses on the effectiveness of case management for reducing unplanned hospital admissions in the general older population.</p> <p><b>Main finding:</b> Review provides evidence that case management does not reduce unplanned hospital admissions in older people compared with usual care (n= 9).</p> <p><b>Limitations:</b> Included a range of case management interventions, which added heterogeneity.</p> <p>One trial, which showed a significant reduction in hospital readmissions, recruited &gt;50% electively admitted patients. This may have affected the rate of readmission.</p> <p><b>Recommendation:</b> Authors suggest that "case management works best as part of a wider programme of care, where multiple</p>	<p>32/40</p>

				10 NR		<p>strategies are employed to integrate care.” (p. 274-5)</p> <p>It is important to note that the clinicians in the hospital received extra training and undertook comprehensive geriatric assessment in both intervention and control groups. This may have influenced outcomes by affecting care in the control group, biasing the result towards the null.</p>	
<p>Rousseaux et al. (2009) France</p> <p>Syst. Rev. (n= 11) - All RCTs</p> <p>No DOI available</p> <p>Reference 57</p>	<p>Evaluate effects of Early Supported Discharge (ESD) on "various outcome parameters in stroke patients." (p. 224)</p>	<p>1 NR</p> <p>2 Early Supported Discharge (ESD): Three Types of services; Type 1 - coordination and performance by the ESD team; Type 2 - coordination by the ESD team; Type 3 - no involvement of the ESD team outside the hospital.</p> <p>3 Systematic evaluation, home visit, discharge planning (technical aids, rehabilitation) and discharge meeting with patient/family/carer/mobile team, follow-up visits, education meeting.</p>	<p>4 Older adults <math>\geq 66</math> and <math>\leq 78</math> (n= 1636)</p> <p>5 Stroke patients</p> <p>6 Stroke Unit (SU) to home/rehabilitation unit</p> <p>7 Mobile team: physician, physiotherapist, occupational therapist, and nurse. Also potentially a speech therapist, social worker and a secretary.</p>	<p>8 &amp; 9</p> <p><b>Readmissions:</b> No significant difference (n= 3); One study suggested lower rates in ESD group (data: NR)</p> <p><b>Resource use:</b> ESD reduced duration of initial inpatient hospitalization up tot 8 days. ESD significantly reduced LOS in SU (n= 9; range 3-15 days). Cost of care (n= 4) 9 to 20% lower in ESD groups.</p> <p><b>Patient outcomes:</b> Decrease in risk of death or institutionalisation and risk of death or dependency. Participation in iADL increased in patients having undergone ESD (n= 9) and depended on ESD quality (i.e. Type 1)</p> <p><b>Satisfaction:</b> Mixed. Greater effect of ESD on patient satisfaction with hospital care but not with home rehabilitation (n= 1). Positive effect on overall patient satisfaction (n= 1). No effect on patient satisfaction (n= 1). No effect on carer satisfaction (n= 2).</p> <p><b>Other outcomes reported:</b> stroke recurrence (NS, n= 1), functional parameters (NS, n= 6), motor activities (NS, n= 7), subjective health status (Long lasting effect on subjective health status, n= 2; NS, n= 8), cost (ESD groups had lower initial hospital costs, higher homecare cost). Overall cost decreased by 10-20% (n= 6), or 35% (n= 1).</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Quality of included studies not reported.</p> <p>Noted that "Study does not take account of the differences between the conventional health systems which are being compared with ESD. ...the Norwegian and Swedish systems involve both relatively intense community rehabilitation care (including physiotherapy, occupational therapy and speech therapy) and social care. ...explain why some studies did not show any (or only minor) differences between ESD and standard care. In contrast, systems in the UK, Canada and Australia often provide less support for rehabilitation at home and thus comparative studies could more easily favour ESD". (p. 228)</p>	26/40

				10 Depended on quality of home care (ESD Type 1 - most beneficial)		Variability in the inclusion criteria (some trials excluded patients with severe disorders while others included these patients). Noted that ESD not appropriate solution for severe stroke patients.	
Thomas et al. (2014) UK  Syst. Rev. & Meta-analysis (n= 20) – All RCTs  Doi: 10.1093/agein g/aft169  Reference 56	To “evaluate the effectiveness of interventions led by hospital or community pharmacists in reducing unplanned hospital admissions for older people.” (p. 174)	1 Unplanned, emergency or unscheduled hospital admissions: “admission or readmission that was not previously planned or scheduled or ‘elective’.” (p. 175)  2 Pharmacist-led interventions  3 <b>Hospital setting (n= 10):</b> Patient medication review with recommendations (n= 10); patient education and counselling (n= 8); telephone or home monitoring (n= 6)  4 <b>Communnity setting (n= 10):</b> In pharmacy, compliance and patient review (n= 4); In primary care physician office, medication assessment with recommendations (n= 1); In home, home visits, medication review, compliance, patient education and counselling (n= 5).	4 Older adults > 60 yrs (n= 9858)  5 Older people with various conditions (e.g. COPD, hypertension, pneumonia, diabetes; n= 16); older people with heart failure (n= 4)  6 Hospital (n= 10) or community (pharmacy (n= 4), primary care physician office (n= 1), home (n= 5))  7 All pharmacist-led, with primary care physician (GP)	8 & 9 <b>Unplanned admissions: Older people with various conditions – Hospital setting</b> –No effect on the number of unplanned admissions with inpatient intervention only (n= 4, pooled RR: 0.91), inpatient intervention with follow-up (n= 3, pooled RR: 1.01) or all hospital interventions (n= 7, RR: 0.97). <b>Community setting</b> – No reduction in unplanned hospital admissions (n = 9, pooled RR: 1.07), even when study of high risk bias was removed (n = 8, pooled RR: 1.08). Also, no effect on unplanned admissions at 3 (n= 3), 6 (n= 6) and 12 months (n= 6). <b>Older people with heart failure - Hospital setting</b> – Significant reduction (25%) in unplanned admissions (n= 3, pooled RR: 0.75), and absolute risk reduction of 19 cases per 100. <b>Community setting</b> – No reduction in unplanned admissions (n= 1, RR: 3.16)  10 Education about heart failure prior to hospital discharge with continuing follow-up post discharge (n= 3; NOTE - trials were of different intensities and follow-ups)	11 NR  12 NR  13 NR	Key features of the UK government strategy include the role of the pharmacist in the prevention, identification and reporting of medication errors.  <b>Main finding:</b> No evidence of an effect on unplanned admissions from pharmacist-led interventions for the older population, whether carried out by hospital or community pharmacists, with the possible exception of heart failure.  “25% reduction in unplanned admissions from the three RCTs for older people with heart failure is promising” (p. 186); however, these trials were heterogeneous in intensity and duration of follow-up, and one trial had a high risk of bias. Further high-quality evaluations are therefore recommended  <b>Strengths:</b> Comprehensive search strategy employed without limitations and robust reviewing. Focused on RCTs.  <b>Limitations:</b> All 20 trials were at a high risk of	26/40

						<p>performance bias because the nature of the intervention meant that personnel and participants could not be blinded.</p> <p>Publication bias: the identification of both positive and negative trials made it unlikely that further high-quality trials remained unpublished.</p> <p><b>Important note:</b> “Reducing hospital admissions or readmissions is not usually the main focus of the role of a pharmacist. Previous research shown that the most frequent benefits resulting from pharmacist reviews are the recommendation of monitoring, removing unnecessary drugs from repeat prescriptions and providing advice on compliance and the prevention of potential adverse effects.” (p. 185-6)</p>	
<p>Dhalla et al (2014)</p> <p>Canada</p> <p>RCT</p> <p>Doi: 10.1001/jama.2014.11492</p> <p>Reference 77</p>	<p>“To determine whether a virtual ward—a model of care that uses some of the systems of a hospital ward to provide interprofessional care for community-dwelling patients—can reduce the risk of readmission</p>	<p>1 NR</p> <p>2 Virtual ward model of care</p> <p>3 Intervention group: Care coordination and direct care via a combination of telephone, home visits, or clinic visits for several weeks after hospital discharge. Individualized management plans. Control group: only had typed, structured discharge summary, prescription if necessary, counseling from physician, home care as needed, and recommendation or appointments for follow-up as required.</p>	<p>4 (n=1923), divided between intervention group (n=963) and control group (n=960).</p> <p>5 NR</p> <p>6 general internal medicine ward</p> <p>7 Inter-professional team including care coordinators (similar to case managers), a part-time pharmacist, a part-time nurse or nurse practitioner, a full-time physician, and a clerical assistant.</p>	<p>8 &amp; 9</p> <p>The primary outcome was a composite of hospital readmission or death within 30 days of discharge. Secondary outcomes included nursing home admission and emergency department visits, each of the components of the primary outcome at 30 days, as well as each of the outcomes (including the composite primary outcome) at 90 days, 6 months, and 1 year. No statistically significant between-group differences in the primary or secondary outcomes at any time point.</p> <p>10 NR</p>	<p>11 Due to the per-patient costs of this intervention virtual ward models of care structured as per this study unlikely to be an efficient use of health care resources.</p> <p>12 NR</p> <p>13 NR</p>		29/30

	in patients at high risk of readmission or death when being discharged from hospital” (1305).						
Li et al (2014) China RCT Doi: 10.3747/pdi.2012.00268 Reference 55	“To test the effectiveness of post-discharge nurse led telephone support on patients with peritoneal dialysis” (p278).	1 2 Telephone support and care.  3 Intervention included comprehensive discharge planning assessment of needs (Omaha system), and individualised education programme developed for pre-discharge education, and education over 6 weeks post discharge, via weekly phone calls. Control group received usual care i.e. routine education, printed education materials, access to telephone hotline, and reminder to attend outpatient appointment. Outcomes measured at baseline i.e. discharge, 6 weeks and 12 weeks.	4 Adult patients aged 22 to 76 years (n=135), divided between intervention group (n=69) and controls (n=66).  5 End stage renal failure, on peritoneal dialysis.  6 Renal units of regional hospitals (n=2).  7 Doctor for discharge education of control group. Nurse case manager for intervention group.	8 & 9 Outcome measures: Quality of life (measured by Kidney Disease Quality of Life Short Form), blood chemistry, management of complications, and utilisation of health services i.e. readmissions or clinic visits. <b>Statistically significant difference between groups in 84 day readmissions</b> More significant improvement among intervention group participants than control group in relation to sleep, staff encouragement, patient satisfaction and pain at T2, but no difference between groups at T3, No significant differences between intervention and control groups in relation to blood chemistry, complication management, other aspects of quality of life, number of clinic visits or readmissions. Non- significant reduction in readmission rates in relation to intention to treats results. 10 NR	11 12 13	Nurse led telephone support effective in supporting dialysis patients during transition from hospital to home, and can be beneficial in terms of quality of life.	36/40
Meisinger et al. (2013) Germany RCT Reference 7	“To evaluate the effects of a nurse-based case management for elderly patients discharged after an AMI from a tertiary care hospital” (p. e1).	1 “Readmission was defined as admission to any hospital after discharge from the index hospital” (p4).  2 KORINNA (“Coronary infarction follow-up in the elderly”) is a single-centre randomized two-armed parallel group trial. case-management intervention consisted of a nurse-based follow-up for one year	4 329 patients (intervention group: n=161; control group: n=168).  5 Myocardial infarction 47.1% had either diabetes or chronic heart failure as a major comorbidity  6 Home based secondary prevention following discharge from tertiary hospital.	8 & 9 Primary study endpoint was time to first unplanned readmission or death. nurse-based management among elderly patients with AMI had no significant influence on the rate of first unplanned readmissions or death during a one-year follow-up.  10 NR	11 Cost components included labor costs, travel expenses, telephone costs etc. In order to calculate quality-adjusted life years. Results of same published elsewhere.  12 NR 13 NR	Recommendation: long-term influence should be investigated by further studies	37/40

		3 Follow up included home visits and telephone calls, to detect problems or risks and give advice.	7 Nurses (n= unspecified) trained by the study physician.				
Rice et al. (2010) USA RCT Doi:10.1164/rccm.200910-1579OC Reference 59	To “determine whether a simplified disease management program reduces hospital admissions and emergency department (ED) visits due to chronic obstructive pulmonary disease (COPD).” (p. 890)	1 NR 2 Disease management program 3 Education, optimisation of evidence based medications, information and support from case managers, counselling, institution of self-management principles, follow-up calls.	4 Older adults – mean age 69.9 yrs (n= 743) 5 Chronic obstructive pulmonary disease (COPD) 6 Acute hospital/ED to home 7 Respiratory therapist case manager	8 & 9 <b>Hospitalisations and ED visits:</b> Statistically significant reduction of 41% in intervention group (P< 0.001) After 1 year of follow-up, the average number of COPD-related hospitalisations per patient was 30% lower in disease management than usual care, and the average number of COPD-related ED visits was 50% lower. Percentage of patients who experienced at least one COPD-related hospitalisation was 23.2% in the usual care group and 16.7% in the disease management group (P= 0.03); for COPD-related ED visits, the percentages were 22.9% and 13.7%, respectively (P= 0.001). Intervention group spent 36% less time in hospital for all causes (1.7 vs 2.8 days; P= 0.03) and less time in the ICU (0.1 vs 0.4 days; P= 0.08)  10 Relative contribution of individual components of the intervention could not be determined.	11 NR 12 NR 13 NR	This multicenter, randomised trial showed that a simple disease management program across a variety of health care delivery settings reduced hospitalizations and emergency department visits for chronic obstructive pulmonary disease.  <b>Limitations:</b> Patients were almost exclusively male; study restricted to relatively high-risk patients, and it is uncertain whether the same intervention would be effective in patients with milder disease; because the trial lasted for only 1 year, longer-term risks and benefits remain unknown; study was substantially larger than other trials, but it lacked sufficient power to detect a mortality effect.  No cost benefit analysis was reported. This intervention shows potential for reducing health care costs in addition to improving quality.  <b>Recommendation:</b> Confirmatory studies need to be performed in other settings.	30/40

<p>Alshabanat et al. (2017)</p> <p>Canada</p> <p>Non randomised clinical trial (n=1564)</p> <p>doi:10.2147/copd.S124385</p> <p>Reference 50</p>	<p>To “determine the efficacy of a comprehensive case management program (CCMP) in reducing length of stay (LOS) and risk of hospital admissions and readmissions in patients with COPD” (Pg.961)</p>	<p>1. CCMP: Comprehensive case management program  2. CCMP in reducing length of stay (LOS) and risk of hospital admissions and readmissions in patients with COPD  3. Follow up in the community for up to 90 days.  Home visits within a week of hospital discharge date (or phone follow-up if patient declined a home visit).</p>	<p>4. COPD patients admitted to all five hospitals in Vancouver between 2011-2014 (n= 1,564)  5. COPD patients  6. Five hospital in Vancouver  7. Multidisciplinary case management teams, usually comprising at least one or more respiratory therapist, nurse, and a nurse practitioner.</p>	<p>8.The rate of hospital readmissions for an AECOPD and the LOS during the 2-year period after program implementation compared to the year prior to the program.  9. Median time to readmission for COPD increased from 41.5 days for patients admitted prior to the program to 55 days for patients admitted during year 1 of the program.  10. NR</p>	<p>11. NR  12. The program could improve the quality of life and reduce the high cost of hospitalization and rehospitalisation in patients with advanced COPD.  13. The study was stopped prematurely and did not include comparative scores for body mass index and exercise tolerance between the two groups.</p>	<p>Note:  The number of subjects included in the study and the duration of follow-up exceed that of any previous randomized controlled trial in this area.</p>	<p>31/40</p>
<p>Lopes et al. (2017)</p> <p>Portugal</p> <p>Non randomised clinical trial (n=1,196,834 )</p> <p>Doi:10.1097/mlr.0000000000000704</p> <p>Reference 53</p>	<p>To “assess the impact of vertical integration on hospital readmissions” (Pg. 506)</p>	<p>1. Vertical integration “vertical integration is a means to reduce fragmentation of care and its negative consequences, especially for older patients or those with multiple chronic conditions, whose disease trajectories typically require contact with several types of providers”.  2. Vertical integration  3. Vertically integrated units were developed by the Portuguese Ministry of Health, which merged hospitals and primary care public providers sharing a common location in order to improve efficiency and effectiveness</p>	<p>4. unplanned 30-day readmissions before and after vertical integration in 6 hospitals transitioned to vertically integrated units in a 10-year period (2004–2013) (n=1,597,159)  5. (acute cerebrovascular disease; congestive heart failure, nonhypertensive; diabetes mellitus with complications; pneumonia; and urinary tract infections), and comorbidities (congestive heart failure; coronary atherosclerosis or angina, cerebrovascular disease; diabetes mellitus; iron deficiency or other unspecified anaemias and blood disease; other infectious diseases and pneumonias; specified arrhythmias)  6. 2 vertical integration statuses: hospitals transitioned to vertically integrated units (intervention group)</p>	<p>8.The primary outcome was unplanned 30-day readmissions, acute clinical events requiring urgent hospitalization within 30 days of discharge, identified as defined elsewhere (indicator variable, 1: readmitted).  9. NR  10. The perception of professionals regarding the level of integration achieved.</p>	<p>11. NR  12. NR  13. Patients’ experiences of coordination problems are relevant, and reasons why patients return after discharge are still not clearly understood or addressed. Despite having accounted for the major risk factors for readmission, the risk of unmeasured differences remains a weakness of this research.</p>	<p>Note:  Considering patients’ experiences and emergency department use would provide a complementary perspective on the outcomes of vertical integration (Pg. 511)</p>	<p>29/40</p>

			and hospitals not vertically integrated (control group). 7. NR				
Dizon & Reinking (2017) USA  Pre-post intervention study  Doi: 10.1111/wvn.12260  Reference 49	To “measure the effect of a multi-faceted set of nurse-driven interventions on readmissions in a busy community hospital” (Pg.433)	1.TOC: “transitions of care” (Pg. 432) 2. TOC program 3.evaluating 30-day readmission rates before, during, and after implementation of the TOC program	4. Patients who might benefit from a person centred intervention and patients who were at high risk for readmission 5. NR 6. Non-RN personnel also performed follow-up phone calls to lower risk patients discharged home and a nurse practitioner conducted follow-up phone calls on high-risk patients discharged to a skilled nursing facility (SNF). 7. Clinicians, nurse practitioner, registered nurse outpatient case manager, primary care staff	8. Did hospital-wide 30-day readmission rates changeover the period of the study as compared to a pre-study baseline, what characteristics were associated with 30-dayreadmissions during the planning, implementation and intervention periods, 9. a computer-generated risk score developed specifically for the hospital identified those who might be at high risk at the initial admission 10. NR	11. RN outpatient case manager was hired 12. NR 13. Patient refusal within the program and it was conducted in a busy community hospital.	Future research: Findings from TOC program data collected during the 10months of the intervention period (data collected at this time period only) should serve as hypothesis-generating for future work (Pg. 436)	34/40
Shcherbakova & Tereso (2016)  United States  Retrospective cohort  Doi:10.1111/jep.12495  Reference 48	To evaluate the effectiveness of in-home clinical pharmacist’s transition of care program on  30-day all-cause readmissions, emergency department (ED) visits, outpatient visits, as well  as to assess patient satisfaction with the program (Pg 2).	1.One important aspect of improving the quality of care for both hospitals and public and private payers is prevention of avoidable readmissions  2.Clinical pharmacist home visits.  3.The intervention was performed in coordination with the personnel of the health plan. Once referred, a patient was contacted by the programme vendor within 72 hours.	4.Patients admitted to emergency department (n=245)  5.Post-discharge support  6.Emergency department and outpatient  7.Pharmacists	8.30-day all-cause readmissions, emergency department (ED) visits, and outpatient visits.  9.There was no difference in 30-day readmission rates, percent of patients with ≥ 1 ED visit, ≥ 1 outpatient physician office visit between the groups. 95% of the participants agreed that the program helped to stay healthy at home.  10.NR	11.A not-for-profit health plan serving Medicare Advantage enrollees contracted a third-party company to deliver in-home clinical pharmacist intervention.  12.NR  13.Lack of personal communication with the primary care physicians.	The patients who declined to participate in the programme may  have differed from the participating group on the psychosocial and  other variables not available from claims data (Pg 4).  Multidisciplinary  transition of care interventions that involve primary  care physicians, pharmacists, nurses and social workers may be  most successful in showing a difference in patient outcomes (Pg 5).	30/40

Sculler et al. (2017) United States  Retrospective analysis of the readmissions data  Doi: 10.1097/jhq.000000000000063  Reference 51	To examine the impact of discharge phone calls (DPCs) on percentages of patients reached through the DPCs and hospital readmission rates based on the centralized or noncentralized mode of DPCs (Pg 5).	1.Readmissions were flagged in the patient medical record and were defined as a patient returning to the hospital within 30 days of discharge for a similar condition or complication.  2.The Studer Group Discharge Phone Call program  3.The completed DPCs require some form of action, including: reinforcing discharge instructions, providing advice and education related to the medical problem, clarifying discrepancies in medication dosage, clarifying miscommunications, and provider or pharmacy follow-up.	4.Adult patients (n= 74,754)  5.Patients admitted to an academic medical Centre (hospital)  6.Medical/Clinical  7.Nurses	8. DPCs reaching discharged patients and effects on hospital readmission rates as a result of centralizing the DPC program  9.Patients not reached were 1.32 times more likely to be readmitted than patients reached by centralized DPCs.  10.Phone calls.	11.NR  12.Centralization of the DPC program allows for a greater percentage of patients to be reached.  13.NR	Future research is needed to assess the actual phone conversation for appropriateness and effectiveness, as well as, other community-based practices to ensure continuity of high-quality care post discharge (Pg 11).	31/40
---	--	---	--	---	---	--	-------

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/policy/intervention Q.3. Main components of Q2	Q.4. Population group & size Q.5. Health condition/problem Q.6. Healthcare context/setting addressed Q.7. Healthcare professionals/personnel involved	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/intervention associated with <u>improved</u> outcomes	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers Q.13. Barriers	Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.	Quality Score
Ontario Health Technical	To determine the effectiveness	1. NR	4 adults >65 (n=2692)  5 Heart Failure	8& 9	11 NR  12 NR	The evidence supports that SMCCC is effective when compared to usual care	31/40

<p>Advisory Committee (2009)</p> <p>Canada</p> <p>Evidence-based analysis RCTs (n=8)</p> <p>No DOI available</p> <p>Reference 60</p>	<p>of specialized multidisciplinary Community Based care in the management of heart failure (HF).</p>	<p>2 Specialized, multidisciplinary, community-based care (SMCCC)</p> <p>3 Disease specific education (n=8)</p> <p>Medication education / titration (n=5)</p> <p>Diet counselling (n=7)</p> <p>Physical activity counselling (n=4)</p> <p>Lifestyle counselling (n=4)</p> <p>Self-care behaviours (n=6)</p> <p>Self-care tools (n=4) diary</p> <p>Evidence Based Guidelines (n=2)</p> <p>Regular follow-up (n=5)</p> <p>Decision support component (all)</p> <p>Self-management component (n=7)</p>	<p>6 Community Based</p> <p>7 Nurses specialist in HF Management and Cardiology physicians</p>	<p><b>All-cause mortality</b> statistically significant RRR of 29% with moderate heterogeneity (I2 of 38%) (n=8)</p> <p><b>All cause hospitalization</b> : Statistically <u>insignificant</u></p> <p><b>HF specific mortality</b>: insignificant</p> <p><b>HF specific hospitalization</b> Pooled results <u>insignificant</u> (n=6)</p> <p><b>ER Visits</b> 77% (59/76) of the SMCCC group and 84% (63/75) of the usual care group were either readmitted or had an ER visit within the 1 year of follow-up (P=0.029). (n=1)</p> <p><b>10 NR</b></p>	<p>13 NR</p>	<p>provided by either a primary care practitioner or a cardiologist. It does not, however, suggest an optimal model of care or discern what the effective program components are (P.8).</p>	
<p>Crocker et al. (2012) USA</p> <p>Syst. Rev. (n= 3) - All RCTs</p> <p>Doi: 10.1016/j.amj med.2012.01.035</p> <p>Reference 67</p>	<p>To investigate “the impact of primary care– based telephone follow-up on post-discharge emergency department visits and hospital readmissions.” (p. 915)</p>	<p>1 NR</p> <p>2 Primary care-based telephone follow-up call intervention.</p> <p>3 Needs assessment, discharge diagnosis, education, medication reconciliation, assist in (re)scheduling appointments, assess barriers to keeping appointments.</p>	<p>4 Adults – Average age 52-65 (n= 1765)</p> <p>5 NR</p> <p>6 Primary/ambulatory</p> <p>7 Primary care providers: Nurses or case managers supervised by physicians</p>	<p>8 &amp; 9</p> <p><b>Non-elective readmissions</b>: No significant effect (n= 3)</p> <p><b>ED visit rate</b>: No significant effect (n= 2)</p> <p><b>Patient engagement</b>: Significant increase in office contact (n= 1) (0.53/patient/ vs 0.48; <i>P</i> = .005); and office visits (n= 2) (0.30/patient vs 0.26; <i>P</i> = .02) and (No follow-up within 21 d - 14.9% vs 40.8%; <i>P</i> = <b>.005</b>)</p> <p>10 Early post discharge contact provides opportunities to address informational needs of patients.</p>	<p><b>11 Noted:</b> “Determining who among the primary care team (eg, nurse, physician, medical assistant, health coach, case manager, or pharmacist) is most Effective in administering the post-discharge telephone follow-up could hold significant workflow and financial implications. (p. 919)</p> <p>12 NR</p> <p>13 NR</p>	<p><b>Note:</b> “Understanding the risk profile of patients who benefit most from telephone follow-up may help transitional care teams better allocate resources to the highest risk group.”</p> <p>Comparison of telephone follow-up on outcomes among studies difficult because groups within each study may not hold similar risk profiles for readmission.</p> <p><b>Note:</b> “Each study used unique discharge planning and office follow-up methods in intervention, which may have confounded the effect of the telephone follow-up.” (p. 918)</p> <p>High-quality studies still needed to evaluate the effect</p>	<p>28/40</p>

						of a primary care-based telephone follow-up intervention. Addition to the telephone follow-up	
<p>Ryan et al. (2011) USA</p> <p>Syst. Rev (n=17)</p> <p>13 Observational &amp; 4 Experimental Studies</p> <p><b>NOTE</b> - the 4 Experimental studies only apply to this review.</p> <p>Doi: 10.1016/j.ijso.2010.11.012</p> <p>Reference 61</p>	<p>To summarize interventions aiming to reduce hospitalizations” (p.e1628).</p>	<p>1.Preventable hospitalisations: readmissions or ambulatory care sensitive conditions or investigator criteria.</p> <p>2 Primary care (PC) programmes: Case management CM/ Special Needs SN programme/ Integrated System IS/ Ambulatory care -AC.</p> <p>3 Assigned primary care providers; Early screening, diagnosis &amp; treatment; Unified Integrated coordination across primary &amp; specialist services; Participation &amp; advocacy/shared decision-making; 24/7 home care .g. nurse care managers; Wraparound services (e.g. OT; Psychology; Speech; Physio).</p>	<p>4 Children (n=139,117 )</p> <p>5 Medical complexity e.g. cerebral palsy, spina bifida, neurological disorders</p> <p>6 Primary/ambulatory</p> <p>7 Multiple primary care providers – nurses, physicians, allied HCP (See No. 3)</p>	<p>8 &amp; 8:</p> <p><b>Reduced avoidable hospitalizations:</b> CM (CI: 0.06-1.01); SC median reductions in admission rates x40% hospital days x 17.6&amp; ( P &lt;.003); IS Reduction in annual hospitalization rates from 58% to 43.2% ( P &lt;.01); AC Reduction in annual hospitalizations for from 2796 to 1622 from previous 10 years (R2 = 0.82, P &lt;.001) &amp; decreased LOS (R2 = 0.83, P &lt;.001). No effect on acute admissions (R2 = 0.08, P = .45).</p> <p>10 Noted that interventions not designed to identify effective components.</p>	<p>11 Increased reimbursement for physicians, hospital &amp; long-term care Expansion of funding needed (re AC);</p> <p>12 Practice level redesign emphasising chronic care management; building organizational capacity; population based management; multi-disciplinary team approach.</p> <p>13 Patient &amp; Family e.g. non-adherence to treatments; discharge advice Health Care: lack of parent input to programme designs; lack of home visits; inadequate care planning; lack of practice level capability.</p>	<p>Definitions related to how preventable hospitalisations were defined by researchers in each study, most of which were ‘readmissions’.</p> <p>Enablers (see 12) proposed as a recommendation. .</p> <p>Noted that most studies has design flaws resulting in medium risks of bias at least.</p>	30/40

<p>Stall et al. (2014) Canada</p> <p>Syst. Rev (n=9) 8 Observational 1 RCT</p> <p>Doi: 10.1111/jgs.13088</p> <p>Reference 62</p>	<p>To describe the effect of home-based primary care for homebound older adults on individual, caregiver, and systems outcomes. (p. 2243)</p>	<p>1. NR</p> <p>2. Interdisciplinary / Inter-professional Care Teams with a Primary Care Provider. / Comprehensive and ongoing primary care in the home.</p> <p>3. Individualised Care Plan (n=9) Comprehensive Geriatric Assessment (n=4); Regular Inter-professional Care Meetings (n=6); After hours Urgent Telephone Service (n=4).</p>	<p>4. Adults &gt; 65 (n=46,154)</p> <p>5. NR</p> <p>6. Home Based / Primary Care</p> <p>7. Primary Care Provider (Medical Doctor/ Nurse Practitioners/ Physician Assistant / Social Worker/ OT, Physiotherapist)</p>	<p>8 &amp; 9</p> <p><b>ED Visits</b> reductions in emergency encounters of 48% (<b>p &lt; .01</b>)</p> <p><b>Hospital Admissions</b> substantial reductions (23% (<b>P &lt; .001</b>), 7% (<b>P = .004</b>), 43.7% (<b>P = .001</b>), 30 and 84% (<b>P &lt; .01</b>). 22% reduction (<b>P = .03</b>) in hospitalizations in a subgroup of severely disabled individuals.</p> <p><b>Bed Days</b> reductions in inpatient days: 37.4% (<b>P = .04</b>), 49.9% (<b>P = .001</b>), 30 69% (no P-value reported), 31 and 62% and 59% (no P-values reported).</p> <p><b>Long term Care Admissions</b> reductions of 10% (no P-value reported), <b>20% (P = .001)</b>, and 25% (no P-value reported)</p> <p><b>10 NR</b></p>	<p>11. Four studies included financial analyses, two reported substantial cost savings but two reported higher costs per patient after enrolment in the program. In discussion : A recent independent financial analysis of an HBPC program demonstrated substantial economic benefits (p.2248).</p> <p>12. Adherence to the core program components ( see 3)</p> <p>13. NR</p>	<p>Overall, the results are significant and highlight that HBPC for homebound older adults can positively affect several important individual, caregiver, and system outcomes (p.2248)</p>	<p>30/40</p>
<p>Holland et al (2005)</p> <p>UK</p> <p>Syst Rev (n=30) All RCT</p> <p>Doi:10.1136/bmj.38338.674583.AE</p>	<p>To determine the impact of multidisciplinary interventions on hospital admission and mortality in heart failure.</p>	<p>1.NR</p> <p>2: Home Based MTD Interventions</p> <p>3. Home visits (n=12) Home physiological monitoring or tele-video link (n=3);</p>	<p>4. Adults (n=8158)</p> <p>5. Heart Failure Diagnosis</p> <p>6. Primary Care</p> <p>7. NR</p>	<p>8 &amp; 9</p> <p><b>Reduction in proportion of patients with one or more hospital admission (all cause):</b> Meta- analysis: significant reduction in all cause admission (RR 0.87, 95% (CI) 0.79 to 0.95, <b>p = 0.002</b>).</p> <p>Home Visit interventions reduced all cause admission to</p>	<p>11 NR</p> <p>12: Multidisciplinary High intensity interventions</p> <p>13 more generic interventions</p>	<p>Note: It should be noted that 11 trials incorporated interventions that appeared to be of high intensity (p905)</p>	<p>32/40</p>

Reference 63		<p>Telephone follow up with no home visits (n=12); Hospital or clinic interventions alone (n=3).</p> <p>3 one to one patient education concerning heart failure, medication, and diet and exercise advice; and symptom monitoring and self management advice.</p>		<p>Hospital (RR 0.80, 95% CI 0.71 to 0.89, <b>p, 0.0001</b>).</p> <p>Telephone-type borderline significance (relative risk 0.86, 95% CI 0.73 to 1.02, p = 0.09).</p> <p>Hospital based interventions had <b><u>no effect</u></b></p> <p><b>Mortality:</b> Meta-analysis showed a significant decrease in all cause mortality (relative risk 0.79, 95% CI 0.69 to 0.92, <b>p = 0.002</b>).</p> <p><b>Heart failure hospital admission:</b> Meta-analysis showed a significant reduction in heart failure admission (RR 0.70 (95% CI 0.61 to 0.81, <b>p ,0.0001</b>).</p> <p>Home and interventions, (RR of 0.62 95% CI 0.51 to 0.74, p , <b>0.001</b>) and</p> <p>Telephone-type interventions ( RR 0.70 (95% CI 0.57 to 0.85, <b>p , 0.001</b>) Other interventions -No significant effect</p> <p><b>In-patient days:</b> significant decrease in overall mean inpatient days of 1.9 days in favour of the intervention (95% C.I. 0.71 to 3.1, <b>p = 0.002</b>)</p> <p><b>10 NR</b></p>			
Carroll et al. (2007) USA RCT Doi: 10.12968/bjon.2007.16.14.24328	“to determine if a community-based collaborative peer advisor/advanced practice nurse intervention increased	1 NR 2 12 week community intervention involving home visit and telephone calls Participation in a cardiac rehabilitation program and re-hospitalisations were collected at 6 weeks and 3, 6, and 12 months by telephone interview	4 Single, widowed or divorced older adults (n=247). 4 groups: standard care for MI, standard care for CABS, standard care and treatment intervention for MI, standard care and treatment intervention for CABS 5 Myocardial infarction (MI, n=91) or coronary artery bypass surgery (CABS, n=154).	8 & 9 Outcomes: Number of participants in cardiac rehabilitation programs. Number of re-hospitalisations in treatment vs standard care groups. No statistical differences, although there were fewer re-hospitalisations between 3 and 6 months after MI and CABS in the treatment group compared with the standard of care group.	11 NR 12 NR 13 NR	Recommendations: Study findings suggest need for early identification of cardiovascular symptoms, healthy eating, and activity progression to prevent cardiovascular re-hospitalisation.	29/40

Reference 68	participation in cardiac rehabilitation programs and reduced hospital readmissions after MI and CABS and determine whether the type of cardiovascular event influenced rehospitalisation" (p 313).	3 Home visit within 72 hours; telephone calls from an advanced practice nurse at 2, 6, and 10 weeks; telephone calls from a peer advisor every 12 weeks. Telephone interviews to examine participation in cardiac rehabilitation program and re-hospitalizations at 6 weeks and 3, 6, and 12 months. Included support and Encouragement, listening, peer advisors reinterpreting symptoms, promoting exercise, managing energy, and education regarding cardiac diseases.	6 Academic medical centres (n=5).  7 Community-based collaborative peer advisor, advanced practice nurse.	Overall, the evidence from this study suggests that a community-based collaborative peer advisor/advanced practice nurse intervention can play a role in promoting active participation in cardiac rehabilitation programs and fewer rehospitalizations in unpartnered older adults after MI and CABS.  10 NR			
Lainscak et al. (2013)  Slovenia  RCT  Doi: 10.1016/j.jamda.2013.03.003  Reference 64	"To test whether coordination of discharge from hospital reduces hospitalizations in patients with chronic obstructive pulmonary disease (COPD)" (p1)	1 NR  2 Discharge coordination intervention  3 Assessment of patients' circumstances and homecare needs. Patient and carers involved in planning.	4 Adults (n=253), divided between intervention (n=118) and control i.e. usual care (n=135).  5 Acute COPD exacerbation  6 Specialist pulmonary hospital.  7 community care/home care nurse, general practitioner, social care worker, physiotherapist and other professionals involved in home care services.	8 & 9 Primary end-point of the study was the number of patients hospitalized because of worsening COPD. Key secondary end-points were time-to-COPD hospitalization, all-cause mortality, all-cause hospitalization, days alive and out of hospital, and health-related quality of life. During a follow-up of 180 days, fewer patients receiving intervention were hospitalized for COPD (14% versus 31%, P ¼ .002) or for any cause (31% versus 44%, P ¼ .033). In time-to-event analysis, intervention was associated with lower rates of COPD hospitalizations (P ¼ .001).  10 NR	11 Authors state that discharge planning and transitional care are necessary for good functioning of health system, with reduced costs.  12 NR  13 NR	discharge coordinator intervention reduced both COPD hospitalizations and all-cause hospitalizations.	36/40

<p>Chow et al. (2008)</p> <p>China</p> <p>RCT – secondary analysis.</p> <p>Doi: 10.1111/j.1365-2702.2007.02231.x</p> <p>Reference 66</p>	<p>“To examine community nursing services for patients with cardiovascular diseases, chronic respiratory diseases and other general medical conditions, making the transition from hospital to home” (p 260).</p>	<p>1 “NR</p> <p>2 Home visits by community nurses</p> <p>3 first home visit within 48 hours of hospital discharge. health assessment</p>	<p>4 Adult patients who had been readmitted and were at risk of further readmissions (n=46), from previous study group.</p> <p>5 cardiovascular diseases, chronic respiratory diseases and other general medical conditions</p> <p>6 Medical unit of three regional hospitals.</p> <p>7 community nurses, nurse coordinator involved coding of records.</p>	<p>8 &amp; 9</p> <p>Outcome measures are self-reported health status and hospital readmission rates. Significant differences in self reported health of respiratory and cardiovascular group following community nursing services compared with before same. Hospital readmission rate- no significant difference.</p> <p>10 NR</p>	<p>11 Community nurses are valuable resources. Advanced practice nurses (APN) improve patient outcomes, while controlling healthcare costs.</p> <p>12 NR</p> <p>13 Some social factors, such as family support and age, are predictors of the likelihood of readmission</p>	<p>Comprehensive home based intervention involving case management and continuous monitoring beneficial for health and well-being of patients. Positive, patient-centred, caring and appropriate client–practitioner relationship needed with nurse to promote wellbeing of patients.</p>	<p>28/40</p>
<p>Delgado-Passler &amp; McCaffrey (2006)</p> <p>USA</p> <p>Lit. Rev. (n=5) – 3 RCTs, 1 prospective randomised trial, 1 retrospective non-randomised trial</p> <p>Doi:10.1111/j.1745-7599.2006.00113.x</p> <p>Reference 65</p>	<p>“To examine Advanced Practice Nurse (APN) directed vs Registered Nurse (RN) directed telemanagement programs on clinical outcomes for heart failure patients” (p. 154)</p>	<p>1 NR</p> <p>2 Advanced Practice Nurse (APN)-directed telemanagement (n= 3) or Registered Nurse (RN)-directed telemanagement (n= 2)</p> <p>3 APN – Patient assessment, patient/carer education, weekly meetings (APN + cardiologist), transtelephonic home monitoring, telephonic case management (initial and follow-up calls), home visits, availability of dietitians and social workers.</p> <p>RN – Telephonic case management (initial and follow-up calls), decision-supported software program (diet, medication, and lifestyle education), patient/carer education, coordination of primary care.</p>	<p>4 Older adults; mean age range of 63-73 yrs (NR for 1 study) (n= 2591)</p> <p>5 Heart failure (n= 5)</p> <p>1 RCT also focused on elders with medical and surgical conditions at high risk of readmission</p> <p>6 Home/Primary care</p> <p>7 Advanced Practice Nurse, cardiologist, physician, dietitian, social worker.</p> <p>Registered Nurse, physician</p>	<p>8 &amp; 9 <b>APN-directed telemanagement (n= 3) - Readmission:</b> All 3 studies reported significant decrease (13 vs 24, P&lt; 0.001; 20.3% vs 37.1%, P&lt; 0.001; No data, P&lt; 0.05)</p> <p><b>LOS:</b> 2 studies reported significant decrease (49.5 vs 105 days, P&lt; 0.001; 1.53 vs 4.09 days, P&lt; 0.001)</p> <p><b>Mortality rate:</b> 1 study reported significant decrease by 36% (P&lt; 0.05)</p> <p><b>Cost:</b> 2 studies reported significant decrease (\$65,023 vs \$177,365, P&lt; 0.02; \$0.6 million vs \$1.2 million (Medicare reimbursements), P&lt; 0.001)</p> <p><b>RN-directed telemanagement (n= 2) – Readmission:</b> Significant decrease by 47.8% (n= 1, P= 0.01). Other study NS.</p> <p><b>LOS:</b> 1 study reported significant decrease (No data, P= 0.03).</p> <p><b>Cost:</b> 1 study reported significant decrease (45.5%, P= 0.04).</p> <p><b>Mortality rate:</b> Reported in 1 study as NS (11%).</p> <p>10 In contrast to RNs, APNs were “able to make decisions about care and better</p>	<p>11 APNs considered more costly than RNs, but could be off-set by cost savings as APNs shown to prevent readmission to acute care facilities.</p> <p>12 NR</p> <p>13 NR</p>	<p>APN-directed telemanagement programs have the potential to improve the quality of care given to heart failure patients while reducing the cost to the institution, the patient, and the healthcare system. (Note: based on a small number of studies; n= 3)</p> <p><b>Noted:</b> One RN-directed telemanagement program reported decrease in readmission rates. However, the study also identified that ED visits increased among the intervention group. Study did not indicate the number of ED visits or if these were included in the final cost analysis, so these results should be viewed with caution.</p> <p><b>Future research</b> to include “using APNs in managing</p>	<p>28/40</p>

				<p>collaborate with physicians to provide individualised program protocols that meet each patient's needs. The APN's specialised assessment skills are advantageous in helping facilitate improved heart failure management." (p. 159)</p> <p>Suggested as reducing readmission was the inclusion of a dietitian and social worker: "helped focus on specific educational needs of the patient." (p. 157)</p> <p>Transtelephonic home monitoring device provided rapid and accurate monitoring of patients with heart failure directly to APN. APN can check monitoring alarms and adjust medication therapy, resulting in increased effectiveness compared to RN care.</p>		<p>other chronic illnesses and their effects" (p. 159)</p> <p>Studies that examine quality of life and functional status of patients with heart failure before and after implementing an APN-directed telemanagement program also recommended.</p>	
--	--	--	--	---	--	--	--

### 3. Interventions delivered at home post discharge from acute care

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/policy/intervention Q.3. Main components of Q2	Q.4. Population group & size Q.5. Health condition/problem Q.6. Healthcare context/setting addressed Q.7. Healthcare professionals/personnel involved	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/intervention associated with <u>improved</u> outcomes	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers Q.13. Barriers	Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.	Quality Score
<p>Jeppesen et al (2012)</p> <p>Australia</p> <p>Cochrane Syst. Rev (n=8)</p> <p>Doi: 10.1002/14651858.CD003573.pub2</p> <p>Reference 69</p>	<p>To evaluate the efficacy of hospital at home compared with standard hospital inpatient care for acute exacerbations of COPD (p.6)</p>	<p>1 Inpatient hospital readmission rate (after discharge from inpatient or home care)</p> <p>2 All patients provided with the treatment as deemed appropriate at the time of initial assessment on presentation to the emergency department.</p> <p>3. All home support patients would have regular scheduled visits by the nurse as well as additional visits as requested by the patient or deemed appropriate by the nurse or the medical team.</p> <p>All home support patients should be visited by the respiratory nurse until discharged from care.</p>	<p>4 Adults n= 870</p> <p>5 Acute Exacerbations of COPD</p> <p>6 At Home</p> <p>7 specialist respiratory nurse (under guidance of the hospital medical team).</p>	<p>8 &amp; 9 Primary: Readmission/ Mortality Secondary: Carer satisfaction/ HRQL.</p> <p><b>Readmission Rate:</b> a significant reduction in readmission rates for hospital at home compared with hospital inpatient care of acute exacerbations of COPD (risk ratio (RR)0.76; 95% confidence interval (CI) from 0.59 to 0.99; P=0.04).</p> <p><b>Mortality:</b> Observed a trend towards lower mortality in the hospital at home group, but the pooled effect estimate did not reach statistical significance (RR 0.65, 95% CI 0.40 to 1.04, P = 0.07).</p> <p>10 NR</p>	<p>11 Three studies report direct costs associated with supplying the care and do not account for possible saving related to prevention of exacerbations, reduction in absence from work.</p> <p>Two studies reported a significant reduction in direct costs for hospital at home</p> <p>One study showed a trend towards lower cost for hospital at home, but the difference did not reach statistical significance (P = 0.38)</p> <p>12 NR</p> <p>13 NR</p>	<p>Treatment of acute exacerbations of COPD in hospital at home may lead to fewer readmissions in comparison with conventional hospital treatment (moderate quality evidence). Moreover, hospital at home schemes for treatment of acute exacerbation of COPD demonstrate a statistically insignificant trend towards reduced mortality over two to six months when compared with conventional treatment in hospital (moderate quality evidence).</p> <p>Available data from individual studies suggest hospital at home schemes may be associated with cost savings in comparison to inpatient care, but current evidence is found to be of very low quality (p12)</p> <p>Due to the world wide variability of healthcare systems, the applicability</p>	34/40

						of the presented results may be context dependent. (P12).	
<p>Parab et al. (2013)</p> <p>Australia</p> <p>Cochrane Syst. Rev (n=7)</p> <p>5 RCT's 1 Quasi RCT 1 Prospective RCT (Pilot)</p> <p>Doi: 10.1002/14651858.CD004383.p ub3</p> <p>Reference 71</p>	<p>To evaluate specialist home-based nursing services for children with acute and chronic illnesses</p>	<p>1 NR</p> <p>2 Home and outpatient care</p> <p>3 Stress point intervention (n=1) Home and outpatient care for education and treatment (n=3) Hospital at Home'(n=1) At home, chemotherapy (n=1) Home oxygen therapy (n=1)</p>	<p>4 Children (0-18yrs) (n= 840)</p> <p>5 Multiple acute &amp; chronic illnesses (e.g Diabetes, cancer, haematological disorders)</p> <p>6 Home / Primary Care</p> <p>7 NR</p>	<p>8 &amp; 9 <b>Utilisation of emergency departments (EDs)</b> (no data)</p> <p><b>Hospital admissions</b> No significant differences readmissions over 90 days</p> <p><b>LOS: Hospital in the home'</b> treatment group spent significantly less time in a hospital bed (55.2 hours) than those in the hospital group (96.9 hours) (P = 0.001) (n=1). However children receiving home care used more diabetes nursing hours during the 24-month period, 58.9 hours per child compared with 17.3 hours for standard care (P value and significance not stated),</p> <p><b>Parental, child and referrer satisfaction:</b> Improved ability to cope with stress point intervention (6.1% versus 6.8% (P &lt; 0.02) (n=1)</p> <p><b>Physical health:</b> improvement with home care intervention for Diabetes 6.1% versus 6.8% (P &lt; 0.02) (n=1)</p> <p><b>QOL: Home care group had greater satisfaction in family functioning (P &lt; 0.001); greater parental ability to cope (P &lt; 0.001); greater family ability to cope (P &lt; 0.001); a greater ability in personal and social care coping (P &lt; 0.01); and a greater perception of helpfulness from healthcare providers and institutional sources</b></p>	<p>11: Cost effectiveness was not comprehensively addressed by any of the included studies (p. 14)</p> <p>2 studies suggested that the financial cost to the hospital of providing the home-based care programme may cost more than the hospital-based care, but suggested that there are substantial cost savings for the family (p. 14)</p> <p>12 Perception that children receiving the 'Hospital at Home' service recovered more quickly in their own environment and that there was less social disruption and financial burden for the family.</p> <p>13 NR</p>	<p><b>Note</b> There is insufficient evidence to support the effectiveness of specialist paediatric nurse home visiting for acute and chronic illnesses in reducing hospital admissions and Emergency Department utilisation.</p> <p>However, there is suggestive evidence that home care programmes may lead to greater parent satisfaction, improved quality of life and a reduction in the length of hospital stay.</p> <p>The cost effectiveness of these programmes is still to be determined (p. 14)</p>	32/40

				<p>(P &lt; 0.001) (n=1). Better parental satisfaction (n=3)</p> <p><b>Mental Health</b> significant improvement in the child's psychological Adjustment at 6 months (P &lt; 0.05) n=1)</p> <p>10 NR</p>			
<p>Utens et al. (2012)</p> <p>Netherlands</p> <p>RCT</p> <p>Doi:10.1136/bmjopen-2012-001684</p> <p>Reference 70</p>	<p>To “determine the effectiveness of early assisted discharge for chronic obstructive pulmonary disease (COPD) exacerbations, with home care provided by generic community nurses, compared with usual hospital care.” (p. 1)</p>	<p>1 NR</p> <p>2 Early assisted discharge hospital-at-home scheme</p> <p>3 Discharge after 3 days; home visits by ‘generic’ community nurse; symptom review; counselling; medication compliance; 24hr telephone access to hospital ward for 4 days.</p>	<p>4 Adults ≥ 40 yrs (n= 139)</p> <p>5 Chronic obstructive pulmonary disease (COPD) exacerbations.</p> <p>6 Acute hospital to home/community based home care organisations</p> <p>7 Hospital respiratory physician; ‘generic’ community nurses; general practitioner</p>	<p>8 &amp; 9 <b>Readmissions:</b> No difference in number of readmissions per patient between the groups, or in the total number of readmissions in each group. No difference in time to first readmission between the two groups (P= 0.461) Readmission rate was 25%.</p> <p><b>Health status:</b> measurements not significant between groups at 4 days (P= 0.078) or 3 months (P= 0.858)</p> <p><b>Quality of life:</b> Mean change in Health Related Quality of Life scores at end of treatment was significantly greater in the usual hospital care group (P= 0.024). This difference disappeared at 3 months.</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p><b>Context:</b> Hospitalisations are the main cost driver in COPD, and put pressure on scarce hospital beds.</p> <p>No significant short-term or long-term differences in outcomes between early discharge and usual hospital care, except for generic health-related quality of life at the end of treatment.</p> <p><b>Limitations:</b> Slight reduction in power due to small sample size. Study would need &gt; 500 patients to be an equivalence trial (determine if both groups were equally effective – not feasible). Patients and healthcare staff could not be blinded to the allocated group.</p> <p><b>Recommendation:</b> Early assisted discharge with home visits by community nurses is a feasible and an alternative to usual hospital care for selected patients with an acute exacerbation of their COPD.</p>	<p>32/40</p>

						<p>Social environment is an important factor when deciding for admission and (early) discharge.</p> <p>Future studies should focus on determining which treatments can be safely provided at home, which treatments require the supervision of generic or specialised nurses, and which criteria should be applied for selecting eligible patients.</p>	
--	--	--	--	--	--	---	--

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/policy/intervention Q.3. Main components of Q2	Q.4. Population group & size Q.5. Health condition/problem Q.6. Healthcare context/setting addressed Q.7. Healthcare professionals/personnel involved	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/intervention associated with <u>improved</u> outcomes	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers Q.13. Barriers	Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.	Quality Score
<p>O'Connor et al. (2014)</p> <p>USA</p> <p>Syst. Rev (n=7) – all descriptive/cohort studies</p> <p>Doi: 10.1080/01621424.2014.931768</p> <p>Reference 72</p>	<p>To “provide a critique and synthesis of published empirical evidence related to frontloading and visit intensity among home health beneficiaries. (p.161)</p>	<p>1 30-day hospital readmissions; unplanned and possibly preventable hospital readmission. Frontloading: providing 60% of planned visits within first 2 weeks of the home health episode (p.169)</p> <p>2 Comprehensive Community Wide Effort Strategy (n=1) Home Health Visits (n=2) Discipline-specific visits (n= 3) Patient- provider agency (n=1).</p>	<p>4. Adults (n=78,233)</p> <p>5.Heart failure/ Diabetes/ Medicare certified, Total Hip Replacement (some NR)</p> <p>6.Primary / Home</p> <p>7. Nurses, physical therapy, occupational therapy, speech-language pathology, medical social worker, home health aide</p>	<p>8. &amp; 9: Frontloading reduced the need for rehospitalisation among skilled / among home health patients &amp; patients with heart failure.</p> <p><b>Satisfaction rates</b> higher with frontloaded nursing visits (4.94 vs. 4.69, <math>p = .02</math>).</p> <p><b>Re-hospitalisations:</b> Fewer within one 60-day home health episode (15.8 vs. 39.4%, <math>p &lt; .001</math>); Fewer visits overall (9.5 vs 15.5 <math>p &lt; .001</math>),</p> <p><b>LOS:</b> shorter (27.5 vs. 49.3 days, <math>p &lt; .001</math>) THR patients were more likely to</p>	<p>11. NR</p> <p>12 Home health agencies participating in the quality improvement organization demonstration</p> <p>13 Visit intensity varied with patient condition and with type of provider.</p>	<p>Only two frontloading Studies Neither employed random selection.</p> <p>Noted that no one intervention identified as being most effective.</p>	27/40

		3 Home health agencies ( e.g. red flag teaching, Medication reconciliation/ assessment/ self-management) / skilled nursing visits/ Discipline-specific home visits		be discharged from home health with goals met than CHF patients (82 vs. 44%, $p < .001$ )  10. Visit intensity rate: number of visits per day	Not effective for some home health populations e.g. diabetes		
Reilly et al. (2015) UK  Cochrane Syst. Rev (n=13) All RCT's  doi: 10.1002/14651858.CD008345.pub2.  Reference 103	To evaluate the effectiveness of <b>case management</b> approaches to home support for people with dementia, from the perspective of the different people involved (patients, carers, and staff )	1 NR  2 Telephone-based care consultation delivered within a partnership between a managed care health system and an Alzheimer's Association (n=1). Collaborative care management delivered by a team led by their primary care physician and a geriatric nurse practitioner (n=1) Education & Support & Advice(n=4). Early Home Support Programme (n=2)/ Flexible, stepped-care model (n=1) /Dementia Family Care Co-ordinator (n=2)/Individualised Care Package (n=1)/Chronic Care Model (n=1)  3 Participant information and education; carer education; provision of	4 Adults (n=9615)  5 Patients with Dementia  6 Variety of settings, including primary care and dementia resource centres.  7 primary care physician/ a Geriatric nurse practitioner/ Specialist / Advanced Nurse/ OT/ psychiatrists	8 & 9 <b>Hospital Admission</b> There was <b>no difference</b> in the number of people admitted to hospital at six (n=4), 12 (n=5) and 18 months (n=5).  The risk of hospitalisation <b>for the carers</b> in the intervention group was significantly lower than in the control group (OR 0.51, 95% CI 0.33 to 0.81, n = 412, $P = 0.005$ ) (n=1)  <b>Institutionalisation:</b> (MD -7.70, 95% CI -9.38 to - 6.02, n = 88, $P < 0.0001$ ). (N=1)  <b>Homecare use at 12 months</b> significantly greater (OR 2.28, 95% CI 2.03 to 2.56, n = 5376, $P = 30\%$ , $P < 0.0001$ ).  <b>Respite Care at 12 mts:</b> significant increase (OR 2.24, 95% CI 1.98 to 2.53, n = 5301, $P < 0.00001$ ).  10 NR	11 Case management reduced the total cost of services at 12 months (SMD -0.07, 95% CI -0.12 to - 0.02, n = 5276, 2 RCTs, $P = 0.01$ ) (n=1)  However the expenditure in the pooled case management groups was significantly lower than in the control group for the total three years in one study in the US (p36)  12 NR  13 NR	Note: No significant effects were present in favour of case management in the following outcomes <b>in the short term:</b> time to institutionalisation; number of people admitted to hospital; mortality; participant quality of life; cognition; depression; behaviour; function; carer quality of life; carer distress; mood; and social support.  Case management was significantly more effective at reducing hospitalisations and emergency department visits for carers during one three-year study ( p.36).  Although use of many of the community-based services was significantly higher in the intervention group, it was not always Clear whether the case manager reviewed the care package and	36/40

		<p>emotional/ therapeutic support.</p> <p><b>Early Home Support</b> Programme: occupational therapy, physical therapy, social work, nursing, respiratory therapy, in-home respite, and out-of-home respite, homemaking, personal care assistance, volunteer service and psychiatric consultation.</p> <p><b>Dementia Family Care :</b> advocacy comprehensive support, continuous and systematic counselling, annual training courses follow-up calls, in-home visits, assistance with arrangements for social and healthcare services and 24-hour-per-day availability by mobile telephone.</p>				<p>whether service packages changed in a timely manner to reflect the changing needs of the person with dementia</p> <p>The core tasks of assessment, care planning and implementation/ management were common to all but one trial, but there was considerable variation in their delivery. ( p.36).</p>	
<p>Levine et al. (2012)</p> <p>USA</p> <p>RCT</p> <p>No DOI available</p> <p>Reference 73</p>	<p>“To assess the efficacy of a home care program designed to improve access to medical care for older adults with multiple chronic conditions who are at risk for hospitalization” (p e1).</p>	<p>1 NR</p> <p>2 Home care intervention (Choices for Healthy Aging [CHA]), based on home-based palliative care program model</p> <p>3 Early identification and treatment / patient-specific health education /self- management or caregiver management of the disease, /advance care planning. Included home care visit for assessment, planning and evaluation. Follow up visits by nurse and doctor/medication reconciliation. Referrals</p>	<p>4 Older adults at risk of hospitalization (n=298).</p> <p>5 NR</p> <p>6 Home care</p> <p>7 interdisciplinary team, with core team members consisting of a physician, nurse practitioner, nurse care manager, and a social worker.</p>	<p>8 &amp; 9 Outcomes measured: satisfaction with care, hospitalisations or service use, and costs of medical care. The intervention group were significantly more satisfied with care than usual care recipients (P = .014). Intervention patients were less likely to be admitted to the hospital than usual care patients (P = .02). There were no differences in costs between the home care and usual care groups.</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Recommendations: Additional research is needed to determine better methods to identify high-risk patients efficiently to improve clinical and service outcomes and reduce the cost of care.</p>	33/40

		by social worker. Visits by physician available 24/7.					
Bouman et al. (2008) Netherlands RCT Doi: 10.1093/gerona/63.3.291 Reference 75	“to describe the effects on health care use and associated cost. of a home visiting program for older people with poor health” (p291).	1 NR 2 Home visiting program 3 Home visits (n=8) from home care nurse over 18-months. Included geriatric assessment and referral to services as needed. Control group had only usual care.	4 Adults, aged 70–84 years (n=330) living in community who were already receiving home care nursing prior to intervention, divided between intervention group (n = 160) and controls (n=170). 5 Health status moderate to good. 6 Home setting 7 Trained home care nurses (n=3) and public health nurse (n=1)	8 & 9 Main outcomes: admission to hospital/ nursing home/home, contacts with medical specialists/GPs/paramedics, hours of home care help. Inpatient and outpatient health care use similar for both groups. Slightly more participant in intervention group admitted to hospital, but slightly shorter length of stay. More use of aids and in-home modifications in intervention group. No differences between groups in health care cost.  10 NR	11 No difference in total cost or health scores between groups. 12 More frequent visits and better coordination of care may promote effectiveness of program. 13 nurses involved were not part of a multidisciplinary team, therefore limited medical input.	Authors conclude that these visits not beneficial for this population of patients.	30/40
Latour et al. (2006) Netherlands RCT Doi: 10.1176/appi.ps.y.47.5.421 Reference 76	“to determine the impact of post-discharge, nurse-led, home-based case management intervention on the number of emergency readmissions, level of care utilization, quality of life, and psychological functioning” (p421).	1 NR 2 Nurse-led, home-based case management intervention in patient’s home. 3 First home visits within 3 to 10 working days of discharge. Questionnaires and INTERMED scales to measure health status and functional ability. Promoted self-management. Interventions varied	4 Adults > 18 years (n=147), divided between intervention or usual care. 5 Problems related to internal medicine, gastroenterology, pulmonology, and cardiology. 6 Patients’ homes. 7 Trained nurse specialist case manager, GP.	8 & 9 Outcomes: number of emergency readmissions, level of care utilization, quality of life, and psychological functioning  No difference between groups in readmission, care utilization, quality of life, or psychological functioning. Controls group participants moved sooner to non-independent living accommodation than patients in, home-based case management group.  10 NR	11 NR 12 NR 13 NR	Disease-management appears insufficient for complex patients. Case-management interventions should be embedded in primary care to promote effectiveness.	33/40

		slightly depending on patients' specific needs.					
Aguado et al. (2010) Spain RCT Doi: 10.1016/j.hrtlng.2010.04.010 Reference 74	To "evaluate the effectiveness of a single home-based educational intervention for patients admitted with heart failure." (p. S14)	1 NR 2 Educational intervention 3 Home visit 1 week after discharge: self-management, education session on habits, preventive activities. Telephone follow-up, medical review at 6 and 12 months.	4 Older adults – mean age 77.6 yrs (n= 106) 5 Heart failure (HF) 6 Home 7 Physician, nurse	8 & 9 Statistically significant reduction in number of visits to the ED (42 vs 64; P= 0.001) and hospitalizations (19 vs 94; P= 0.003) in the intervention group compared with control. Non-significant decrease (14 vs 31; P= 0.448) in mortality. Significant decrease in mean total cost per person for intervention group (€671,56 vs €2,154.24; P< 0.001). Patients perceived health improved at 24 months but no significant difference between groups reported.  10 Applying the intervention during 1 <sup>st</sup> week after discharge: faster assessment lead to admission avoidance.	11 NR 12 NR 13 NR	<b>Recommendation:</b> "a single educational home visit by a nursing staff member 1 week after hospital discharge reduces emergency visits and unplanned readmissions, lowers total healthcare costs, and shows a trend toward improvement in quality of life." (p. S21)  Performing the intervention during the first week after the hospital discharge allowed the detection of early decompensation, which occurs in up to 40% of the patients at 7 to 14 days after hospital discharge. Authors hypothesized that this may have led to a faster medical assessment, and thus avoided readmission.  <b>Limitations:</b> Single-centre study with small sample size. Sources of bias - Completion of health questionnaires by interview and then by phone. 69 patients (65%) were lost to follow-up at 24 months – difficult to obtain significant results. Family members allowed to answer questions on patients behalf. Assumed that the main cost of HF derived from hospitalisation.	33/40

### 3. Interventions at home post discharge

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/ policy/intervention Q.3. Main components of Q2	Q.4. Population group & size Q.5. Health condition/problem Q.6. Healthcare context/setting addressed Q.7. Healthcare professionals/personnel involved	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/ intervention associated with <u>improved</u> outcomes	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers Q.13. Barriers	Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.	Quality Score
<p>Martinez et al. (2006)</p> <p>Spain</p> <p>Syst.Rev. (n= 42) – 13 RCTs, 10 non-RCTs, 19 non-controlled clinical series or descriptive studies</p> <p>Doi: 10.1258/135763306777889109</p> <p>Reference 54</p>	<p>To “assess the value of home monitoring for heart failure patients” (p. 234)</p>	<p>1 NR</p> <p>2 Telehealth: Home monitoring for heart failure (HF)</p> <p>3 Self-monitoring of vital signs: devices for measuring and transmitting electrocardiograms (ECG), blood pressure, heart rate, medication use, bodyweight, and symptoms</p>	<p>4 Older adults: mean age – 67 yrs; NR for 8 studies (n= 2303, NR for 5 studies)</p> <p>5 Heart failure patients at risk of early re-admission</p> <p>6 Home</p> <p>7 Specialised nurses</p>	<p>8 &amp; 9 <b>Readmission (n= 23):</b> Significantly reduced (n= 10), reduced but NS (n= 5), reduced but not statistically tested (n= 8). <b>LOS (n= 16):</b> Significantly reduced (n= 8), reduced but NS (n= 5), reduced but not statistically tested (n= 3). <b>Quality of life (n= 18):</b> Significantly increased (n= 7), increased but NS (n= 7), increased but not statistically tested (n= 4) <b>Mortality (n= 6):</b> Significantly reduced (n= 3), reduced but NS (n= 2), reduced but not statistically tested (n= 1). <b>Cost (n= 9):</b> Significantly reduced (n= 2), reduced but NS (n= 3), reported “important tendencies” (n= 4; details NR). <b>Use:</b> Ease of use of monitoring devices – patients rated ‘very easy to use’ (n= 5). <b>Acceptance:</b> ≥ 80% of patients expressed a good/very good impression of home experience and felt safer about their health (n= 17). Health staff lower (65%, n= 6)</p> <p>Interventions compared against usual care, home nurse visits, or pre-intervention.</p> <p>10 NR</p>	<p>11 NR</p> <p>12 Home monitoring: technically effective and easy to use.</p> <p>13 NR</p>	<p>Quality of studies varied greatly: 6 studies were of very good strength of evidence, 10 studies of good evidence, 7 studies of fair evidence, and 19 studies of poor evidence.</p> <p>Authors report that home monitoring increases quality of life, while reduces hospital readmissions, length of stay, and mortality rates.</p> <p>Noted that there was a lack of data assessing the effect of home monitoring on improvement in diagnosis, and on organisation.</p> <p>Economic studies focused on hospital impact, not on the patients or the health system.</p> <p>Home monitoring seems to produce significant hospital cost reductions, but the results are strongly dependent on the specific national health model. One study noted although the cost per patient was higher in the intervention group, after 8 months there was a 10% saving per patient reported due to 20% lower hospitalisation/medical costs.</p>	<p>23/40</p>

						<p>Recommend that additional trials of the technology for home monitoring are not needed.</p> <p>Authors suggest that “home monitoring could be successfully implemented for HF patients on a national scale...producing a better quality of life for patients, which in turn would bring benefits to the national health system” (p. 240)</p>	
<p>Motamedi et al. (2011)</p> <p>Canada</p> <p>Syst. Rev. (n= 12) – 8 RCTs, 4 Quasi-experimental studies.</p> <p>Doi: 10.1136/bmjqs.2009.034587</p> <p>Reference 86</p>	<p>To evaluate “the efficacy of computer-enabled discharge communication interventions for patients discharged from acute care hospitals.” (p. 403)</p>	<p><b>1 Computer-enabled discharge communication:</b> Contain one or more of: “(1) automatic population of the discharge document by computer database(s); (2) transmission of discharge information via computer technology (eg, text, email, or Internet); or (3) computer technology providing a platform for dynamic bidirectional discharge communication to occur between parties.” (p. 404)</p> <p>2 Computer technology interventions</p> <p>3 Web-based communication system (e.g. ED notes, consultant notes, imaging reports) and daily advisory emails (n= 2); IT platform including web-based call center (n= 2); computer database(s) for electronic discharge summaries (n= 7).</p>	<p>4 Adults (n= 3579) &amp; neonates (n=30)</p> <p>5 Chronic obstructive pulmonary disease patients, medical patients, diabetic/endocrinology patients/rehabilitation/neonatal critically ill. .</p> <p>6 ED/medical wards/neonatal ICU/rehabilitation</p> <p>7 Primary care physician/Nurse care manager</p>	<p>8 &amp; 9</p> <p><b>Readmissions/ED visits (n= 3):</b> No significant difference (n= 2); significantly lower in intervention group at 12 months (p = 0.033; n= 1)</p> <p><b>Mortality (n= 3):</b> No significant difference (n= 3)</p> <p><b>Adverse events/near misses:</b> No significant difference (n= 1)</p> <p><b>Timeliness:</b> Discharge summaries were significantly generated more efficiently than traditional summaries &amp; transmitted to the PCP more quickly (n= 5).</p> <p><b>Accuracy/Quality:</b> Intervention summaries were more accurate or contained a similar number of errors (n= 2); Significant improvements in intervention completeness (e.g. legibility, medications, planned follow-up; n= 3); No significant difference (n= 1); Intervention summaries contained significantly more errors/omissions (n= 1)</p> <p><b>Satisfaction:</b> PCP satisfaction similar to or greater with intervention summaries than traditional summaries. (n= 8); Patients - significantly improved knowledge of disease and self-management techniques and satisfied with overall quality of care and the care environment. (n= 8)</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Based on Jadad score, each included RCT scored 3 or 4/5 with appropriate descriptions of randomization procedures, allocation concealment. Main weakness related to the absence of double blinding.</p> <p>Future research: “Given the rapid uptake and continuing evolution of electronic patient information systems in acute and primary care settings, it is important to continue to scientifically study the extent to which such systems affect patient outcomes.” (p.414)</p>	<p>30/40</p>

<p>Blum et al. (2014)</p> <p>USA</p> <p>RCT</p> <p>Doi: 10.1016/j.cardfail. 2014.04.016</p> <p>Reference 84</p>	<p>“To analyse Medicare claims data to identify effects of home tele-monitoring on medical costs, 30-day re-hospitalization, mortality, and health-related quality of life” (p 513).</p>	<p>1 NR</p> <p>2 Home tele-monitoring over a range of 33 to 1,614 days i.e. the Medicare Coordinated Care Demonstration Project for Home Tele-monitoring of Heart Failure (MCCD)</p> <p>3 Randomisation visit involving in-depth history, medication review, chart review, brief physical examination, and the Mini-Mental Status Examination (MMSE). Medical Outcomes Survey Short Form (SF-36) and the Minnesota Living With Heart Failure Questionnaire (MLHF) administered by face to face interview.</p>	<p>4 Adults (n=204)</p> <p>5 Heart failure</p> <p>6 Recruited from heart failure services at medical centres (n=2), and several private cardiology practices in the Baltimore/Washington DC area. Patients</p> <p>7 Heart failure research nurse coordinator</p>	<p>8&amp; 9</p> <p>No difference between groups in relation to length of stay, 30 day readmissions. Tele-monitoring associated with lower percentage of 30 day readmissions in first year or intervention, but effect did not persist.</p> <p>10 NR</p>	<p>11 Intervention did not lead to reduced healthcare costs.</p> <p>12 NR</p> <p>13 NR</p>		<p>35/40</p>
<p>Gellis et al. (2014)</p> <p>USA</p> <p>RCT</p> <p>Doi: 10.1111/jgs.12776</p> <p>Reference 82</p>	<p>“To evaluate an integrated tele-health intervention to improve chronic illness and comorbid depression in the home healthcare setting” (p889)</p>	<p>1 NR</p> <p>2 Integrated Tele-health Education and Activation of Mood (I-TEAM)</p> <p>3 Tele-monitoring, chronic illness and depression care management, and PST for comorbid depression.</p>	<p>4 older adults receiving home care</p> <p>5 chronic illness (congestive heart failure, chronic obstructive pulmonary disease) and comorbid depression</p> <p>6 home healthcare setting</p> <p>7 Assigned home care nurses, nurses who had received tele-health training (n=3), primary care physician.</p>	<p>8 &amp; 9</p> <p>Groups compared at baseline, 3 months and 6 months on clinical measures (depression, health, problem-solving) and at 12 months on health utilization (readmission, episodes of care, and ED visits). Individuals in intervention group developed significantly better problem-solving skills and self-efficacy in managing their medical condition. The I-TEAM group had significantly fewer ED visits (P = .01) but did not have significantly fewer days in the hospital at 12 months post-baseline. Depression lower among intervention group than control at 3 and 6 months.</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Findings demonstrate that integrated tele-health care can reduce symptoms and post-discharge ED use in older adults with chronic illness and comorbid depression in home health settings.</p>	<p>34/40</p>

<p>Steventon et al. (2013)</p> <p>UK</p> <p>RCT</p> <p>Doi: 10.1093/ageing/afz008</p> <p>Reference 83</p>	<p>“to assess the impact of telecare on the use of social and health care. Part of the evaluation of the Whole Systems Demonstrator trial” (p501).</p>	<p>1 NR</p> <p>2 Tele-care compared with usual care.</p> <p>3 Functional monitoring: bed and chair occupancy sensors, enuresis sensors, epilepsy sensors, fall detectors, medication dispensers. Security monitoring: bogus caller buttons, infrared movement sensors, property exit sensors. Environmental monitoring: gas/ monoxide/ smoke detectors, heat sensors, extreme temperature sensors, flood detectors. Additional devices e.g. big button phones, key safes for carers. Data from the peripheral devices were sent to a monitoring centre via a telephone line and alerts monitored continuously.</p>	<p>4 People with social care needs (n=2,600).</p> <p>5 Mobility difficulties, history of falls, cognitive impairment or confusion</p> <p>6 Home, recruited from 217 general practices</p> <p>7 Contacts with general practitioners and practice nurses.</p>	<p>8 &amp; 9</p> <p>Our primary endpoint was the proportion with inpatient admission within 12 months Secondary endpoints: mortality; proportion admitted to permanent residential/nursing care; weeks of domiciliary social care paid for by local authority; inpatient hospital bed days, emergency or elective admissions, outpatient attendances, ED visits; length of inpatient hospital stays; number of contacts with GPs and practice nurses, and costs.</p> <p>No significant differences in admissions, service use, mortality.</p> <p>10 NR</p>	<p>11 Intervention’s lack of effect may have implications for use of resources.</p> <p>12 NR</p> <p>13 NR</p>	<p>32/40</p>
<p>Gurwitz et al. (2014)</p> <p>USA</p> <p>RCT</p> <p>Doi: 10.1111/jgs.12798</p> <p>Reference 85</p>	<p>“To assess the effect of an electronic health record–based transitional care intervention involving automated alerts to primary care providers and staff when older adults were discharged from the hospital” (p865).</p>	<p>1 NR</p> <p>2 electronic health record–based transitional care intervention</p> <p>3 System notified primary care providers about recent discharge, information about new drugs added while in hospital, warnings about drug interactions, recommended dose changes and laboratory monitoring regarding high-risk medications, and alerted to</p>	<p>4 Individuals aged 65 and older discharged from hospital to home (n=2645)</p> <p>5 Medical/ surgical patients, including diabetes mellitus, myocardial infarction, heart failure, chronic lung disease, cancer, stroke and cerebrovascular disease, and renal disease</p> <p>6 Large multispecialty group practice</p>	<p>8 &amp; 9</p> <p>Outcomes - office visits with primary care physician within 7, 14, or 30 days post discharge; whether re-hospitalized within 30 days. Intervention did not have a significant effect on the timeliness of office visits to primary care providers after hospitalization or risk of re-hospitalization.</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>36/40</p>

		staff to schedule a post-hospitalization visit.	7 Primary care physicians and their support staff (n=unspecified).				
--	--	---	--	--	--	--	--

#### 4. Interventions only delivered in a post-acute facility.

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/policy/intervention Q.3. Main components of Q2	Q.4. Population group & size Q.5. Health condition/problem Q.6. Healthcare context/setting addressed Q.7. Healthcare professionals/personnel involved	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/intervention associated with <u>improved</u> outcomes	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers Q.13. Barriers	Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.	Quality Score
<p>Connolly et al. (2015) New Zealand Cluster RCT Doi: 10.1016/j.jamda.2014.07.008 Reference 92</p>	<p>“To assess effect of a complex, multidisciplinary intervention aimed at reducing avoidable acute hospitalisation of residents of residential aged care (RAC) facilities” (p49).</p>	<p>1 NR 2 Facility-based complex intervention, lasting 9 months. 3 Staff education led by Gerontology Nurse Specialist (GNS), review of residents by GNS, facility bench-marking, and multidisciplinary discussions using standard criteria</p>	<p>4 Residents (n=1998). 5 NR 6 Residential aged care facilities (n=36), divided into intervention facilities (n=18) and control facilities (n=18). 7 Geriatrician, primary-care physician, pharmacist, Geriatric Nurse Specialist, and facility nurse.</p>	<p>8 &amp; 9 Primary outcome: avoidable hospitalizations. Secondary outcome: all acute admissions, mortality, and acute bed-days. No overall impact study outcomes. 10 NR</p>	<p>11 If confirmed by others that it is not possible to reduce hospitalizations from RAC, must increase acute provision, which has resource implications for acute care. If difficult or not possible to reduce ASH from RAC using outreach model, need for more RAC facility resources e.g. staff, Or, interventions may need to be more intensive which has resource implications for RAC. 12 NR 13 NR</p>		<p>32/40</p>

<p>Harvey et al. (2014)</p> <p>Australia</p> <p>RCT</p> <p>Doi: 10.1186/1471-2318-14-48</p> <p>Reference 109</p>	<p>“to evaluate (1) the feasibility and consumer satisfaction with a geriatrician-led supported discharge service for older adults living in residential care facilities (RCF) and (2) its impact on the uptake of Advanced Care Planning (ACP) and acute health care service utilisation” (p. e1).</p>	<p>1 NR</p> <p>2 Residential Care Intervention Program in the Elderly (RECIPE).</p> <p>3 Geriatrician-led outreach service: home visit within 96 hours post discharge, included comprehensive geriatric assessment development of care plan developed. Additional meetings available to patients and family to discuss Advanced Care Plans and Advanced Directives (AD).</p>	<p>4 Patients (n=116 participants) recruited during while in acute care, followed up at the RCF for six months. Divided between intervention (n=57) and controls (n=59).</p> <p>5 NR</p> <p>6 Residential care facilities (RCF).</p> <p>7 RCF staff and the patients’ primary care physician</p>	<p>8 &amp; 9</p> <p>Higher satisfaction with care in intervention group (p = 0.006). More ADs in intervention group.</p> <p>Fewer outpatient visits in intervention group at 6 months (37% versus controls 76%, i.e. p &lt; 0.001). No difference in readmission rates</p> <p>Trend towards reduced hospital bed-day utilisation (intervention group 271 days versus controls 372 days). Factors predictive of readmission were: length of stay at index admission and number of medications at baseline (p = 0.03).</p> <p>10 Rapid access to geriatrician review in RCF impacted on the number of hospital ambulatory care visits i.e. intervention group patients were less likely to need to attend medical outpatient clinics than controls (37% vs 76%, p &lt; 0.001).</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Findings indicate that a multi-faceted approach is required to significantly reduce acute care readmissions rates.</p> <p>Recommendations: up-skilling of RCF staff in management of acute deterioration in health; tele-health consultations in favour of emergency department in situations where primary care physicians unavailable for consultation; increased use of ‘Hospital at Home’ services.</p>	<p>37/40</p>
<p>Boyd et al. (2014)</p> <p>New Zealand</p> <p>RCT</p> <p>Doi: 10.1111/jgs.13022</p> <p>Reference 108</p>	<p>To evaluate a quality improvement outreach programme designed to support residential aged care staff, and compare hospitalisation rates with facilities receiving usual care.</p>	<p>1 NR</p> <p>2 Residential Aged Care Integration Program (RACIP)</p> <p>3 Quality improvement scheme involving on-site support, care coordination, clinical coaching, and education.</p>	<p>4 Older adults (n=2553), i.e. intervention group (n=142) (and comparison group (n=1128).</p> <p>5 Mostly NR, but several facilities provided dementia care, and one facility specialised exclusively in dementia care.</p> <p>6 Residential aged care facilities, divided between intervention facilities (n=29 facilities; 1,425 residents), and comparison facilities (n=25; 1,128 residents).</p> <p>7 Coordinated by Gerontology Nurse specialists</p>	<p>8 &amp; 9</p> <p>Outcome measures included all resident hospitalizations and subgroups classified as medical or surgical admissions. Acute hospitalization rate unexpectedly increased for both groups after program implementation, although the rate of increase was significantly less for the intervention facilities (59% increase in comparison settings, vs 16% in intervention settings; P &lt; .001), although no difference in rates of admission for surgical reasons.</p>	<p>11 Intervention’s ability to minimise increases in admissions, compared with non -intervention facilities, may save costs.</p> <p>12 NR</p> <p>13 NR</p>	<p>Integrating the expertise of Gerontology Nurse Specialists into residential aged care settings may help to support staff in providing optimal care and potentially improving resident health and well-being.</p>	<p>30/40</p>

				10 NR		<p>RACIP program has received a positive response from facility staff and was helpful in integrating services for frail older people across the secondary and primary healthcare divide. Although admissions increased for both groups, findings indicate that intervention may have caused less significant increase in intervention group, compared with non-intervention group.</p>	
--	--	--	--	-------	--	--	--

#### 4. Interventions only delivered in a post-acute facility

Source and Type of Evidence	Aim	<b>Q.1. Definitions</b> <b>Q.2. Model/system/policy/intervention</b> <b>Q.3. Main components of Q2</b>	<b>Q.4. Population group &amp; size</b> <b>Q.5. Health condition/problem</b> <b>Q.6. Healthcare context/setting addressed</b> <b>Q.7. Healthcare professionals/personnel involved</b>	<b>Q.8 &amp; 9 Outcomes assessed &amp; Effects on outcomes</b> <b>Q.10. Components of model/system/policy/intervention associated with <u>improved</u> outcomes</b>	<b>Q.11. Resource implications (e.g. cost, personnel)</b> <b>Q.12. Enablers</b> <b>Q.13. Barriers</b>	<b>Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.</b>	Quality Score
-----------------------------	-----	--	--	--	---	---	---------------

<p>Verhaegh et al. (2014)</p> <p>Netherlands</p> <p>Syst. Rev. &amp; Meta-analysis (n= 26) – All RCTs</p> <p>Doi: 10.1377/hlthaf.2014.0160</p> <p>Reference 100</p>	<p>To “identify and summarize the effectiveness of transitional care interventions on the rates of readmission for patients discharged from a hospital to their home.” (p. 1532)</p>	<p>1 Transitional care: “the main goal of transitional care interventions is to prevent repeated and avoidable readmissions and negative health outcomes after a hospital discharge.” (p. 1532)</p> <p>2 Transitional care interventions</p> <p>3 In-hospital (assessment at admission, self-management education); provider continuity (care coordination by nurse); postdischarge follow-up (communication between hospital and primary care provider); home visits; telephone follow-up calls.</p>	<p>4 Adults ≥18 (n= 7932)</p> <p>5 Chronically ill (e.g. heart failure, COPD, asthma or conditions treated by general internal or surgical medicine)</p> <p>6 Hospital (medical/surgical) to home</p> <p>7 Nurse (Registered Nurse (RN) or Advance Practice Nurse (APN)), primary care provider</p>	<p>8 &amp; 9</p> <p><b>Overall readmission rates:</b></p> <p>Short-term (30 days or less) – Not effective</p> <p>Intermediate-term (31-180 days) – 5% absolute risk reduction</p> <p>Long-term (181-365 days) - 13% absolute risk reduction</p> <p><b>Subgroup readmission rates:</b></p> <p><b>High-intensity:</b> Short-term – 5% absolute risk reduction</p> <p>Intermediate-term - 7% absolute risk reduction</p> <p>Long-term - 13% absolute risk reduction</p> <p><b>Low-intensity:</b> Significantly associated only with reduced long-term readmission.</p> <p><b>Patients &gt; 60 yrs:</b></p> <p>Intermediate-term - 5% lower rate of readmission</p> <p>Long-term - 8% lower rate of readmission</p> <p>10 Care coordination by nurse (P= 0.04), communication between hospital and primary care provider (P= 0.03), and a home visit within three days of discharge (P&lt; 0.001) were significantly associated with reduced rates of short-term readmission.</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>This study suggests that to reduce short-term readmissions, transitional care interventions should be of high intensity and should consist of at least care coordination by a nurse. Future studies need to consider “the early effects of transitional care by examining the rates of readmission in the short-term and including more information on the cost-effectiveness of these interventions.” (p. 1537)</p> <p>Stronger primary care structure needed to improve health system performance. programs still remains unclear.</p> <p><b>Quality:</b> Risk of bias in studies assessed guided by Cochrane collaboration Tool. 78% reported on allocation procedures; 62% undertook intention to treat analysis; 28% conducted power analysis. Found no evidence of publication bias</p>	<p>29/40</p>
---	--	---	---	---	--	--	--------------

<p>Allen et al. (2014)</p> <p>Australia</p> <p>Syst Rev (n=12) – all RCTs</p> <p>Doi: 10.1186/1472-6963-14-346</p> <p>Reference 98</p>	<p>To assess transitional care compared with standard hospital discharge for older people with chronic illnesses.</p>	<p>1 Transitional Care: “interventions that promote safe &amp; timely transfer between levels of care and across care settings... includes pre hospital discharge activities and immediate post hospital discharge follow-up at the next location of care ...considered a part of integrated care, which occurs over longer duration of care episodes”... (p.2 sourced from previous literature) .</p> <p>2 Discharge planning protocol - hospital based (n=5);/primary care involvement with GP &amp; nurses (n=3) /discharge case management (n=1) / self-management &amp; transitional coaching (n=1) / in-patient geriatric evaluation, co-management &amp; transitional care (n=2).</p> <p>3 “Discharge assessment &amp; care planning, communication between providers, preparation of the person &amp; carer for the care transition, reconciliation of medications at transition, community-based follow-up, and patient education about self-management (p. 4)</p>	<p>4 Older Adults aged 60y &gt; (n =5,269).</p> <p>5 Chronic illness (types NR).</p> <p>6 Acute hospital (medical/surgical) to home inclusive of follow-up in the community.</p> <p>7 ANPs for hospital based intervention (ANP GP &amp; Primary Care nurses for primary care involvement.</p> <p>Ward staff (geriatrician, nurse &amp; physical therapist) for patient geriatric evaluation, co-management &amp; transitional.</p> <p>Older adult &amp; family involvement in Self-management intervention</p> <p>NR for discharge case management/ / self-management &amp; transitional coaching.</p>	<p>8 &amp; 9</p> <p><b>Re-hospitalisations:</b> reduced in ANP hospital based discharge planning 6-52 wks follow up (n=4/5) &amp; Self-management 4-24 wks follow-up &amp; geriatric evaluation 12-26 wks follow up.</p> <p>No significant effects from primary care involvement with GP &amp; nurses &amp; discharge case management.</p> <p><b>LOS:</b> lower in ANP hospital based discharge planning &amp; discharge care management.</p> <p><b>Healthcare Costs:</b> lower in ANP hospital based discharge planning (hospital &amp; community costs) &amp; Self-management (hospital costs) &amp; Discharge Case Management (hospital but not community costs).</p> <p><b>Functional Status:</b> no change in ANP hospital based discharge planning</p> <p><b>Quality of Life:</b> Improved in ANP hospital based discharge planning</p> <p><b>Patient Satisfaction:</b> Improved satisfaction with discharge planning from primary care involvement with GP .</p> <p>10 NR</p>	<p>11 See No. 8 &amp; 9 on costs</p> <p>12 NR</p> <p>13 NR</p>	<p>Gaps in the evidence on transitional care noted regarding “timeliness, equity, efficiencies for community providers, effectiveness/symptom management, and domains of person and family centred care ( p. 1).</p> <p><b>Quality:</b> Assessment for bias yielded mixed results with 40% of studies having insufficient information to judge risk of bias.</p>	<p>34/40</p>
<p>Lehnbom et al. (2014)</p> <p>Australia</p> <p>Syst. Rev. (n= 83) – 30 RCTs, 25 prospective observational, 8 prospective</p>	<p>“To evaluate how effective medication reconciliation and review are in improving clinical outcomes in hospitals, the community,</p>	<p>1 NR</p> <p>2 Medication reconciliation and medication review.</p> <p>3 <b>Medication reconciliation:</b> Discharge counselling and education, interview, patient visits, follow-up phone call, process of documentation of current patient medications for</p>	<p>4 Age range NR (n= 65769)</p> <p>5 Unintentional medication discrepancies /Adverse drug events (ADE)</p> <p>6 <b>Medication reconciliation:</b> Hospital (n= 33); community (n= 4); RACF (n = 3)</p>	<p>8 &amp; 9 <b>Medication reconciliation:</b></p> <p><b>Readmission/LOS:</b> No significant difference (<b>Hospital</b>); Significantly decreased at 7 (P= 0.01) and 14 days (P= 0.04; <b>Community</b>, n= 1); significantly shorter LOS (P= 0.026) and fewer ED visits/readmissions (P = 0.035; <b>RACF</b>, n= 2)</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Limited evidence of the potential of unintentional medication discrepancies to cause harm. Hence, actual impact of interventions on health outcomes is not clear. Also, impact of interventions on clinical outcomes not clear. “Future studies should focus on utilizing more effective measures to determine the</p>	<p>28/40</p>

<p>controlled, 3 retrospective cohort, 3 cross-sectional analysis, 2 prospective cohort, 2 prospective randomised comparative, 2 retrospective observational , 2 non-randomised cohort, 2 quasi-experimental, 1 retrospective electronic record review, 1 chart review, 1 longitudinal, 1 before-and-after</p> <p>Doi: 10.1177/1060028014543485</p> <p>Reference 105</p>	<p>and residential aged care facilities (RACF).” (p. 1299)</p>	<p>comparison with medication orders at each point of care transition. <b>Medication review:</b> medication counselling, medication therapy management, ward rounds by pharmacist, interview, questionnaire, community pharmacist visits, follow-up phone call, case management, process of evaluation of current medication treatment (e.g. dosage adjustments, drug addition and discontinuation)</p>	<p><b>Medication review:</b> Hospital (n= 14); community (n= 20); RACF (n= 9)</p> <p>7 Health care provider: Pharmacist (n= 78), nurse (n= 2), consultant (n= 1), general practitioner assistant (n= 1), and multidisciplinary team (geriatrician, social worker, and nurse; n= 1)</p>	<p><b>Medication review:</b> <b>Readmission/LOS:</b> Significantly lower at 12 months (50.7% vs 59.2%; P= 0.027) and lower drug-related readmissions (n= 2), patients with ADE had 1.4 day longer LOS (n= 1), No significant difference (<b>Hospital</b>, n= 7); Significantly lower (n= 5), increase by 30% (n= 1), No significant difference (<b>Community</b>, n= 6) <b>Medication reconciliation</b> identified unintentional medication discrepancies in 3.4% to 98.2% of patients. <b>Medication reviews</b> identified medication-related problems or possible adverse drug reactions in 17.2% to 94% of patients.</p> <p>10 NR</p>		<p>impact of medication reconciliation on health outcomes by considering hospital readmissions, number of visits to primary care physicians or general practitioners, and morbidity.” (p. 1304)</p> <p><b>Limitations:</b> Many studies included in this review were observational studies without control groups. This absence of robust study designs limited the ability of these studies to draw clear conclusions. No quality assessment performed.</p>	
<p>Tabanejad et al. (2014) Iran.</p> <p>Syst. Rev. (n=6) – ALL Quasi-experimental /clinical trials.</p> <p>No DOI available</p> <p>Reference 107</p>	<p>To assess "the impact of liaison nurse in nursing care of patient after ICU discharge on patient's outcomes, compared with patients that are not taken care of by liaison nurses" (p.202).</p>	<p>1 NR</p> <p>2 Liaison Nursing Service</p> <p>3 Patient assessment; Patient &amp; family emotional support; discharge planning; Maintaining relationships between ICU &amp; wards; Critical care transfer to wards; Training and clinical support of the ward staff.</p>	<p>4 Adults (5 studies) &amp; children/youths (1 study) (n = 3421)</p> <p>5 NR</p> <p>6 Intensive care unit transfer to medical/surgical wards</p> <p>7. Nurses</p>	<p>8 &amp; 9 <b>Timing of Discharge:</b> 3 time less probability of 2 hr delay from ICU &amp; 2.5 times less probability of 4 hr of more delay (n=1). <b>Readmission to ICU:</b> Reduced from 5.4% to 4.7% (n=1) <b>LOS (Hospital):</b> No effect (n=1) <b>Transfer to Higher Level Care:</b> Reduced (n =1, P =0.028) <b>Self-care abilities:</b> Increased by 13% (n=1) <b>Prevention of Complicators:</b> Positive effect (n=1, P =0.028).</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR although noted that Liaison Nurses did not work night shifts or weekends.</p>	<p>Outcomes varied across studies. Noted that none of the studies made a single conclusion about the impact of the liaison on one type of outcome. However, overall, 4 of the 6 studies were found to have significantly positive effects on outcomes measured.</p> <p><b>Quality:</b> Studies assessed using Critical Appraisal Skills Programme (CASP) specific to RCTs. Randomization applied to all groups (procedures not reported). Power calculation adequate (n=3) or not available (n=3).</p>	<p>30/40</p>

<p>Prieto-Centurion et al (2013)</p> <p>USA</p> <p>Syst. Rev (n=5 RCT)</p> <p>Doi: 10.1513/Annals.ATS.201308-254OC</p> <p>Reference 96</p>	<p>To identify interventions that could reduce the risk of rehospitalisation in patients initially hospitalized with COPD exacerbations (p. 418)</p>	<p>1 NR</p> <p>2 Discharge Planning pre discharge (n1) / Disease Education (n=3)/ Health Counselling (n=4)/ Inhaler use Training ( n=5) / Action plan (n=5)/ Medication (n=3)/ Smoking Cessation counselling (n=3)/ Assessment of co-morbidities(n=1)/ Referral to rehab (n=1)/ Exercise Programme (n=3)/ Referral to social services (n=2)/ Communication with patients Primary Care Provider (PCP) ( n=4)/ Transition Navigator (n=2)</p> <p>Home Visits (n=4)/ Follow up Telephone (n=4)/ Patient Hotline ( n=5).</p> <p>3 pre-discharge interventions, post-discharge interventions, or bridging interventions (spanning the pre- and post-discharge periods)</p>	<p>4. Adults &gt;65 (n=1393)</p> <p>5. Chronic obstructive pulmonary disease (COPD)</p> <p>6. Primary and Acute</p> <p>7. NR</p>	<p>8 &amp; 9</p> <p><b>Rehospitalisation's</b> decrease in all-cause rehospitalisation over 12 months in the intervention group versus comparator group (mean number of hospitalizations per patient, 1.0 vs. 1.8; <b>P = 0.01</b> (n=2))</p> <p><b>Mortality:</b> higher risk of mortality in the intervention group (17 vs. 7%, <b>P = 0.003</b>) (n=1).</p> <p>10.NR</p> <p>.</p>	<p>11. NR</p> <p>12. NR</p> <p>13 Most of focused on post discharge interventions</p>	<p>No specific intervention or bundle of interventions could be identified as effective in reducing the rate of re-hospitalizations in this population</p> <p><b>Quality:</b> Risk of bias assessed using the Cochrane Effective Practice and Organization of Care (EPOC) Group's criteria<sup>1</sup>. Sufficient information for assessment in 4 studies with risk of bias found to be low in all 4 except blinding of participants and personnel.</p>	31/40
<p>Feltner et al. (2014)</p> <p>USA</p> <p>Syst. Rev. &amp; Meta-analysis (n= 47) - All RCTs.</p>	<p>"To assess the efficacy, comparative effectiveness, and harms of transitional care interventions to reduce readmission</p>	<p>1 Transitional care interventions: "Interventions designed to prevent readmissions among populations transitioning from one care setting to another" (p. 774)</p> <p>2 Transitional Care Interventions: Home-visiting programs (n= 14); structured telephone support STS (n= 13, described in 15 papers);</p>	<p>4 Adults (n= 8675) - Mean age: 70 yrs (range 59-82)</p> <p>5 Heart failure</p> <p>6 From hospital/academic medical centre to home</p> <p>7 Home-visiting programs: Clinician (nurse or pharmacist) Structured telephone support: NR</p>	<p>8 &amp; 9 <b>All-cause readmissions (30 days):</b> Only 1 home-visiting trial (high intensity) reported a lower risk of readmission. 5 other trials reported no reduction in 30 day readmission rates (1 medium intensity home-visiting trial, 1 STS, 2 telemonitoring, and 1 "other" (cognitive training))</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p><b>Main finding:</b> Home-visiting programs and MDS-HF clinic interventions currently have the best evidence for reducing all-cause readmissions and mortality up to 6 months.</p> <p><b>Clarifications:</b> Interventions in "primarily educational" category "do not feature telemonitoring, home visits, or STS and are not delivered</p>	29/40

<sup>1</sup> **AOPC Criteria are:** 1) random sequence allocation, (2) concealed allocation, (3) masking of participants and personnel, (4) masking of outcome assessment, (5) incomplete outcome data, (6) selective reporting, and (7) other bias. Each of these domains was graded for bias as as high, low, or unclear.

<p><b>Note:</b> 1 trial compared home-visiting program with telemonitoring Doi: 10.7326/m14-0083</p> <p>Reference 102</p>	<p>and mortality rates for adults hospitalised with heart failure (HF)" (p. 774)</p>	<p>telemonitoring (n= 8); outpatient clinic-based (n= 7); primarily educational (n= 4); "Other" (n= 2).</p> <p><b>3 Shared features:</b> Patient or caregiver education; self-management; medication reconciliation; coordination among health professionals involved in transition.</p> <p><b>Specific features:</b> Home-visiting programs: physical therapy. Structured telephone support STS: telephone technology (e.g. decision-support software). Telemonitoring: Remote monitoring of physiologic data (e.g. ECG, blood pressure) via technology to monitoring center. Outpatient clinic-based: 3 types (multidisciplinary HF (MDS-HF), nurse-led HF, or primary care), may offer telephone support (e.g. patient hotline) outside clinic hours. Primarily educational: delivered either in person, by interactive CD-ROM, or by video. "Other": individual peer support; cognitive training.</p>	<p>Telemonitoring: NR Outpatient clinic-based: MDT (physician, cardiologist, dietician, pharmacist), or Nurse Primarily educational: Various personnel (only nurse-led reported)</p>	<p><b>All-cause readmissions (3-6 months):</b> Home-visiting programs (n= 9) and MDS-HF clinics (n= 2) reduced all-cause readmissions over 3 to 6 months (high strength of evidence (SOE)). STS, telemonitoring (moderate SOE for both), and nurse-led clinics (low SOE) not effective in reducing risk. Insufficient evidence for primarily educational interventions</p> <p><b>HF-specific readmissions:</b> Home-visiting programs and STS interventions both reduced the risk (moderate and high SOE, respectively). Telemonitoring did not reduce the risk for HF-specific readmissions (moderate SOE). Insufficient evidence for MDS-HF and nurse-led HF clinic, or primarily educational interventions.</p> <p><b>Composite outcome (all-cause readmission or death):</b> Home-visiting programs reduced composite outcome over 3 to 6 months (moderate SOE). STS, MDS-HF clinics, and primarily educational interventions not effective in reducing risk. Insufficient evidence for nurse-led clinic interventions.</p> <p><b>Mortality:</b> Home-visiting programs, MDS-HF clinics and STS interventions reduced mortality (moderate SOE). Telemonitoring, nurse-led clinics, and primarily educational interventions</p>	<p>primarily through a clinic-based intervention. Follow-up telephone calls may occur to ascertain outcomes (e.g., readmission rates) but not to monitor patients' physiologic data." (p. 775) "other" interventions defined as "unique interventions or interventions that do not fit into any of the other categories (e.g., individual peer support for patients with HF)." (p. 775)</p> <p><b>Limitations:</b> Few trials reported 30-day readmission rates. Usual care was heterogeneous and sometimes not adequately described. Included trials commonly excluded persons with end-stage renal or severe cardiovascular disease; thus, results may not be applicable to persons with high levels of coexisting illness.</p> <p><b>Recommendation:</b> The interventions that reduced all-cause readmission and mortality (Home-visiting programs and MDS-HF clinics), and interventions that reduced HF-specific readmission and mortality (STS) should receive the greatest consideration by systems or providers seeking to implement transitional care interventions for persons with HF.</p> <p><b>Quality:</b> Studies rated as having low, medium, high, or unclear risk of bias using AHRQ Methods Guide for Comparative Effectiveness Reviews to rate. Many included</p>
---	--	---	--	--	--

				<p>did not reduce mortality (low SOE). Insufficient evidence for primary care interventions and cognitive training programs.</p> <p>10 NR, but home-visiting and MDS-HF clinic interventions reported best evidence in reducing all-cause readmissions and mortality up to 6 months</p>		<p>trials reported to have methodological weaknesses thereby introducing bias.</p>	
<p>Guerin et al. (2013)</p> <p>Australia</p> <p>Syst. Rev. (n=12) i.e. 5 RCTs, 4 before and after studies, &amp; 3 controlled trials.</p> <p>Doi: 10.5334/ijic.917</p> <p>Reference 93</p>	<p>“To identify and critically appraise the relevant literature detailing methods of community services’ involvement in the discharge of older adults across the hospital-community interface, ...to identify the most effective methods of community service involvement in the discharge process of older adults” (p. e2).</p>	<p>1 NR</p> <p>2 Four models of discharge: Virtual Interface Model (n=6); In-reach Interface Model (n=2); Out-reach Interface Model (n=2); Independent Interface Model (n=2).</p> <p>3 Interventions/ components of models included: liaison of nurses with community services; coordination of care by specialist hospital teams; liaison of hospital pharmacist with community pharmacist; involvement of community services in assessing and supporting patients prior to and during discharge; and home visits by hospital staff following discharge.</p>	<p>4 Adults &gt; 65 yrs (n=8440).</p> <p>5 Complex chronic conditions or frailty</p> <p>6 Transitioning from acute - medical/surgical/ED hospital to community setting</p> <p>7 Multi-disciplinary hospital team/ nurses/ pharmacists/ doctors/ community health care staff/ social services staff / allied health professionals / general practitioners</p>	<p>8 &amp; 9 Mixed results.</p> <p><b>Readmission rates:</b> No significant differences (n=3)</p> <p><b>Length of stay:</b> reduced (n=4) or no difference (n=3).</p> <p><b>Service costs:</b> reduced (n=4) or no difference (n=2).</p> <p><b>Length of hospital stay:</b> no difference (n=1), or fewer days utilisation of hospital beds on readmission(n=1)</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Some details inconsistently reported.</p> <p>Noted that “further research is required to identify appropriate population groups for various discharge models and to select suitable outcome measures to determine the effectiveness of these models” (p. e1).</p> <p><b>Quality:</b> Assessed using the The design-generic McMaster qualitative and quantitative critical appraisal tools with a scoring system devised. Quality of included studies varied.</p> <p>Problems related to inadequate description of subjects (n=4), sample sizes not justifies (n=5), insufficient detail on psychometric properties of outcome measures (n=5) and on avoiding contamination and cointervention (n=6).</p>	33/40
<p>Rennke et al. (2013)</p> <p>USA</p>	<p>Evaluate the “effectiveness of hospital-initiated care</p>	<p>1 Transitional care strategy: “1 or a group of interventions initiated before hospital discharge with the aim of ensuring the safe and</p>	<p>4 Majority - Older adults (Age NR) (n= 29133)</p>	<p>8 &amp; 9</p> <p><b>Readmission:</b> Statistically significant reductions in 30-day readmission rates/ED visits (n=</p>	<p>11 Cost (implied)</p> <p>12 NR</p>	<p>Among these, only the CTI has been implemented in multiple settings and patient populations. Few studies</p>	27/40

<p>Syst. Rev. (n= 47) - 28 RCTs, 19 Controlled Clinical Trials (non-randomised)</p> <p>Doi: 10.7326/0003-4819-158-5-201303051-00011</p> <p>Reference 101</p>	<p>transition strategies aimed at preventing clinical adverse events (AEs), emergency department (ED) visits, and readmissions after discharge in general medical patients.” (p. 433)</p>	<p>effective transition of patients from the acute inpatient setting to home.” (p. 433)</p> <p>2 Three categories of transitional care strategies: 1) Pre-discharge 2) Postdischarge and 3) Bridging (including both pre- and postdischarge components.</p> <p>3 Pre-discharge: Risk assessment for adverse events (AE); patient/caregiver education; individualised patient record; Outpatient provider facilitation; dedicated transition provider; medication reconciliation. Postdischarge: Patient outreach (follow-up telephone calls, home visits); Clinical follow-up facilitation (ambulatory provider follow-up); medication reconciliation. Bridging: Inclusion of at least 1 pre- and 1 postdischarge component.</p>	<p>5 Clinical adverse events (AE) (adverse drug events; falls; post-discharge infection; post-discharge adverse events)</p> <p>6 Acute hospital (medical/surgical/ED) to home/community setting</p> <p>7 Clinical pharmacist/nurse</p>	<p>8; 4 RCTs, 4 CCTs). Six of the 8 studies used a bridging intervention with dedicated provider. No statistically significant reductions in 30-day readmission rates/ED visits (n= 14; 8 RCTs, 6 CCTs). Four of the 14 studies used a bridging intervention with dedicated provider. Statistically significant reduction in readmission rates/ED visits from 45 days to 1 year after index discharge (n= 7). Four of the 7 studies used a bridging intervention with dedicated provider. No significant reduction in readmission rates/ED visits from 45 days to 1 year after index discharge (n= 19)</p> <p><b>Adverse events (AE):</b> Statistically significant reduction in postdischarge AE rates (n= 3). No significant reduction in postdischarge AE rates (n= 6).</p> <p>10 Bridging intervention with a dedicated transition provider (strength of evidence low)</p>	<p>13 Cost (implied)</p>	<p>specifically targeted AEs after discharge, and the studies identified provided little information about implementation factors, intervention context, or cost. No conclusions could be reached on methods to prevent postdischarge AEs due to scant evidence. The strategies hospitals should implement to improve patient safety at hospital discharge remain unclear. Clinical pharmacist led medication safety seemed to be a promising approach, indicating a need for larger trials with an explicit plan to measure clinically significant AEs."</p> <p><b>Quality:</b> Assessed using Cochrane collaboration's EPOC criteria. Strength of evidence assessed using AHRQ criteria. Most of the studies were rated as having fair methodological quality and low strength of evidence</p>	
<p>Prvu Bettger et al. (2012)</p> <p>USA</p> <p>Syst. Rev. (n= 44)</p> <p>36 RCTs, 6 prospective trials, 1 retrospective, 1 time series</p>	<p>To “describe transitional care interventions and evidence of benefit or harm in patients hospitalised for acute stroke or myocardial</p>	<p>1 Transitional care: “time-limited service to prevent discontinuous care and adverse outcomes, including re-hospitalisations” (p. 407)</p> <p>2 Transitional care: 4 types – 1) hospital-initiated support (n= 14), 2) patient &amp; family education (n= 7), 3) community-based support (n= 20), 4) chronic disease management (n= 3)</p>	<p>4 Adults ≥ 18yrs (n= 15454)</p> <p>5 Acute stroke (n= 27) or Myocardial infarction (n= 17)</p> <p>6 Acute hospital/inpatient rehabilitation to home</p> <p>7 Registered nurse, advanced practice nurse, social worker, physical therapist, occupational therapist, physician, or multidisciplinary team (MDT).</p>	<p>8 &amp; 9</p> <p><b>System level:</b> Only hospital-initiated support in relation to stroke reported significantly fewer hospital days (n= 8; moderate strength of evidence (SOE)). No reduction in rehospitalisation, cost-neutral. <b>Patient level:</b> No important differences reported in stroke studies for mortality and basic activities of daily living. Hospital-initiated support in</p>	<p>11 NR</p> <p>12 Financial incentive</p> <p>13 Applicability (specifically for US health system reported from this review)</p>	<p>Applicability to U.S. clinical practice was limited.</p> <p>Recommended that a consensus needed on a unified taxonomy that defines the constituent components for transitional care services and their evaluation. Authors did not identify any interventions that followed patients across several settings. Research proposed in this area.</p>	<p>34/40</p>

<p>Doi: 10.7326/0003-4819-157-6-201209180-00004</p> <p>Reference 52</p>	<p>infarction (MI).” (p. 407)</p>	<p>3 Education; counselling; monitoring (home or telephone follow-up); goal setting; care coordination; and risk-factor management.</p>		<p>relation to MI reported reduced mortality in patients (n= 6; low SOE).</p> <p>10 NR</p>		<p><b>Quality:</b> Assessed individual studies using AHRQ criteria with summary ratings of good, fair or poor. Few studies had good quality designs due to inadequate sample sizes, heterogeneity of outcome measures, lack of definition for the usual care group, and fair (68%) or poor study quality. Few studies were designed with a single primary end point (several outcome measures that were reported simultaneously). Strength of evidence was : low-to moderate for the effectiveness of hospital-initiated transitional care.</p>	
<p>Naylor et al (2011)</p> <p>USA</p> <p>Syst. Rev (n=21)</p> <p>All Randomised Clinical Trials (conducted in the USA)</p> <p><u>Particular focus on 9 intervention studies</u></p> <p>Doi: 10.1377/hlthaff.2011.0041</p> <p>Reference 97</p>	<p>To identify and synthesize available evidence regarding Transitional Care for Adult, Chronically ill populations.</p>	<p>1 Transitional care : a broad range of time-limited services designed to ensure health care continuity, avoid preventable poor outcomes among at-risk populations, and promote the safe and timely transfer of patients from one level of care to another or from one type of setting to another (p.747)</p> <p>2. Discharge Planning / Follow-up / Home Visits Case management.</p> <p>3 Comprehensive Discharge Planning &amp; Follow-up with Home Visits (n=4) &amp; without home visits (n=3). Case management (n=4) Coaching (n=2); Education (n=2);</p>	<p>4 Adults &gt;32 yrs. (range: n=88-1396). Total NR</p> <p>5 With the exception of one study all studies targeted High Risk Older Patients ;Chronically ill with conditions (congestive heart failure, asthma, diabetes, or depression)</p> <p>6 Hospital and Primary Care</p> <p>7. Designated Nurse (most frequently), Advanced-Practice registered Nurse as clinical manager or leader or Social Worker, Peer Mentor or Personnel with experience in conducting clinical drug trials.</p>	<p>8 &amp; 9</p> <p>Six of the nine studies that demonstrated a positive effect on at least one measure of readmissions included in-person home visits (p752)</p> <p><b>All cause Readmissions:</b> Reductions in all 9 studies (<b>p ≤ 0:05</b>).</p> <p><b>Time to first readmission:</b> Reductions in 3 studies (<b>p ≤ 0:05</b>).</p> <p><b>Length of readmission stay</b> Reductions in 4 studies (<b>p ≤ 0:05</b>).</p> <p>10: In-person home visits.</p>	<p>11</p> <p>Two studies estimated a mean total cost savings of nearly \$3,000 per Medicare beneficiary at six months and \$5,000 at twelve months, respectively.</p> <p>12 A focus on patient self-management.</p> <p>Proactive connection of acute care providers with primary care. Nurses as the clinical leader or manager of care. (p.752)</p> <p>13 NR</p>	<p>The review sought to inform implementation of the Affordable Care Act in USA. A key aim of the Affordable Care Act is to reduce avoidable hospital readmissions Therefore the reviewers focused with particular interest on nine interventions that reported a statistically significant positive effect on at least one measure of readmissions (p750) Details about the degree to which these interventions incorporated self- management support, medication management, and use of health information technology may have been underreported in the articles and therefore, in this synthesis (p749)</p>	<p>25/40</p>

		Peer support (n=2); Tele-health facilitation (n=1); Mobile Crisis (n=1); Post Discharge Geriatric Assessment (n=1); Intensive Primary Care (n=1). Interaction with post -acute outpatient providers (n=7) Referrals for support/ resources ( n=5) Use of Health IT (n=1)  Initiated in advance of hospital discharge (n=14)		Multi-component interventions i.e. (comprehensive discharge planning with follow-up interventions that incorporate patient and caregiver goal setting, individualized care planning, educational and behavioural strategies, and clinical management)  Daily home videophone or telephone monitoring and transmission of physiologic measurements, self-care instruction, and symptom management		Costs not included in economic analyses were medications, supplies, and out-of-pocket patient expenses.  <b>Quality:</b> Methods of quality appraisal or related results were not reported.	
Linertová et al. (2011)  Spain  Syst. Rev (n=32) 25 RCTs 7 non-RCTs.  Doi: 10.1111/j.1365-2753.2010.01493.x  Reference 8	To identify interventions that effectively reduce the risk of hospital readmission for elderly people (at least 75 years old) and to assess the role of home Follow-up.	1 The index hospital admission is defined as the first stay of the patient, regardless of its length and whether it is planned or unplanned. Readmission is the next subsequent admission, urgent or unplanned, of a patient to any hospital within the same area and within a defined reference period  2 In-hospital geriatric evaluation and discharge management (n=17) Geriatric assessment with home follow-up (n=15). 3. <b>In Hospital:</b> Geriatric / multidisciplinary care teams – assessment, communication, discharge planning during the hospital stay and comprehensive discharge planning (All). Included Geriatric Team care plan (n=10) Geriatric-based wards – early rehabilitation (n=4), Included pharmaceutical care review (n=3).	4. Adults > 65 yrs (n=4454)  5. NR  6. Hospital and Primary Care  7. Multidisciplinary Geriatric Team (physicians, nurses, social workers, case managers, physical Therapy; GP)	8 & 9 <b>Reduces Readmission</b>  Pharmaceutical counselling and medication discharge summaries with home visits of a pharmacist (In 3 months after discharge: 3 vs. 15; $P < 0.05$ ).  Geriatric assessment followed by home care provided by a hospital-based multidisciplinary outreach team (In 1 month after discharge: 61 (16.5) vs. 82 (22.2); $P < 0.05$ )  Nurse-conducted home visit and telephone follow-up for 6 months after discharge (In 6 months after discharge: 22 vs. 46.7; $P < 0.01$ )  Home intervention team (In 6 weeks: 4 (14) vs. 9 (38); $P < 0.01$ † In 12 weeks: 9 (31) vs. 14 (40); $P < 0.05$ )	11 NR  12 High degree of collaboration and communication between patients, caregivers, geriatricians, general practitioners, social community services and other agents (p.1174)  Patient education on specific issues, close follow-up, home monitoring, adjustment of medication and regular communication with clinical experts(p.1174)  Effective patient targeting Intensity & duration of the intervention	Focused exclusively on readmission outcomes ‘usual care’ (almost never described in Detail - variable).  Intermediate care at a community hospital as an alternative to prolonged general hospital care, the intervention produced important differences in the number of patients readmitted in the 6 months after discharge. However, the outcome variable was the number of readmissions for the same disease, which makes it difficult to compare these data with other studies (p. 1170).  <b>Quality:</b> Assessed using the SIGN tool. 14 studies met all/most criteria, 13 met some of the criteria & 3 met few/no criteria.	28/40

		<p>In-hospital daily visits by care coordinators and pharmacists, post-discharge phone call (n=1) GP's re-discharge visit (n=1)</p> <p>Special medical unit designed to help older persons maintain independence in self-care activities (n=1)</p> <p>Joint health/social care rehabilitation unit (n=1)</p> <p><b>Post Discharge</b> Follow – up in collaboration with the patient's GP or the intermediate care services (n=11)</p> <p>Transitional care service – chronic disease management model (n=1) Intermediate care at a community hospital (n=1)</p> <p>Care plan after discharge (n=7), Home rehabilitation (n=6) Cooperation with patients' general practitioners (n=7) Phone calls (n=3) Coordination of post discharge care services (n=5) Patient education (n=6).</p>		<p>In-hospital visits, home visits and telephone follow-up by a transition coach 1 month after discharge: 8.3 vs. 11.9; <math>P &lt; 0.05</math>; In 3 months: 16.7 vs. 22.5; <math>P &lt; 0.05</math>).</p> <p>Comprehensive discharge planning and home follow-up (In 6 months after discharge: 49 vs. 107; <math>P &lt; 0.001</math>)</p> <p>10 Interventions that incorporate geriatric management supported with home care post discharge are more likely to reduce or prevent hospital readmissions (p.1174)</p>	13 NR		
<p>Englander et al. (2014)</p> <p>USA</p> <p>Cluster RCT</p> <p>Doi: 10.1007/s11606-014-2903-0</p> <p>Reference 104</p>	<p>“To evaluate the impact of a multicomponent transitional care improvement program on 30-day readmissions, emergency department</p>	<p>1 NR</p> <p>2 multicomponent transitional care improvement program “C-train”</p> <p>3 (1) transitional nurse coaching and education, including home visits for highest risk patients; (2) pharmacy care, including provision of 30 days of</p>	<p>4 Hospitalized low- income adults admitted to general medicine or cardiology who were uninsured or had public insurance (n=382)</p> <p>5 Medical or cardiac problems</p> <p>6 Urban academic medical centre in Portland, Oregon</p>	<p>8 &amp; 9</p> <p><b>Readmission:</b> No significant difference in 30- day readmission or ED visits between groups.</p> <p><b>Transitional care quality:</b> Intervention was associated with significant improvements</p> <p><b>Mortality:</b> Reduced within 30 day discharge period.</p> <p>10 NR</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p>Noted that a different or more intensive intervention may be needed to reduce readmissions</p> <p>Generalizability of findings limited due to being a single centre study and socially disadvantaged group. Sampled possibly underpowered to detect small but clinically significant reductions in re-admissions.</p>	35/40

	(ED) use, transitional care quality, and mortality” (p1460).	medications after discharge for those without prescription drug coverage; (3) post-hospital primary care linkages; (4) systems integration and continuous quality improvement	7 inpatient nurses, treating physicians, patient care managers, social workers,			<b>.Quality/Limitations:</b> Acknowledged that sample may have been underpowered to detect smaller yet clinically relevant reductions in readmission rates.	
Herfjord et al. (2014) Norway RCT Doi: 10.1186/1756-0500-7-889 Reference 106	“to evaluate efficacy and safety of this model of intermediate care with early transfer, compared to usual hospital treatment” (p2).	1 “Intermediate care is a broad term describing health care services designed to provide adequate care closer to home, while preventing hospital admissions, facilitating early discharge and supporting patients with long-term condition” (p2).  2 rapid transfer to intermediate care unit  3. Comprehensive geriatric Assessment; Early mobilisation. Nutrition status evaluated.	4 Adults over 70 years, living at home before admission to hospital (n=376).  5 NR  6 Nursing home and 2 hospitals  7 physician (consultant in geriatrics or junior doctor), nurse, physiotherapist and health care worker	<b>8 &amp; 9 Functional outcome</b>  <b>Quality of life.</b> At the same time, investigators attempted to evaluate costs for the two alternative treatment options. There was no significant differences between groups in number of days living at home (p = 0.80) or days in hospital (p = 0.748). Intervention group patients spent less time in nursing home (p = 0.046), and more lived at home without home care services (p = 0.007)  10 NR	11 NR  12 NR  13 NR	Intermediate care did not significantly improve proportion of living at home but reduced demand for nursing home care and home care services.  <b>Limitations:</b> Calculation of sample size was not based on the re-defined primary outcomes of days living home but rather the original primary outcomes of functional outcome, quality of life and costs,	37/40
Wong et al. (2014) China RCT Doi: 10.1093/ageing/af123 Reference 99	“to examine the overall effects of a transitional care programme for discharged medical patients and the differential effects of telephone calls only” (p91).	1 NR  2 Four week post discharge intervention- telephone calls with or without home visits.  3 Based on Wong’s 4 Cs model (comprehensiveness, continuity, collaboration, coordination). Included pre-discharge assessment and 4-week post-discharge follow-up Home group received two home visits and two phone calls, on alternate weeks, while call only group received only calls.	4 Discharged pts (N=610), divided into home visits with call (n=196), calls only group (n=204), or control group (n=210).  5 primary diagnosis related to respiratory, diabetic, cardiac and renal conditions,  6 Medical units in regional hospital in Hong Kong  7 Nurse case manager (n=1), nursing students (n= unspecified)	8 & 9 Readmission rates. Secondary outcomes: quality of life, self-efficacy and satisfaction. Home visit group and the call group had lower readmission rates than the control group. Bundled interventions involving both home visits and calls appear to be more effective in reducing readmissions. Significant improvement in quality of life, self-efficacy and satisfaction in intention to treat, and per protocol analysis for study groups.	11 Use of skill mix including support workers may be beneficial due to demands for resources.  12 NR  13 NR	Recommendations: Bundled interventions and use of skill mix to deliver interventions is advised. <b>Limitations:</b> Noted that findings not generalizable, missing values were replaced by group means and was reported as an unsophisticated approach. Outcomes only assessed and not processed.	31/40

		Control group received two placebo calls.		A mixed skills model involving different types of professionals appears to have a positive impact.  10 Noted that it was easy to establish which component made the most impact.			
Farris et al (2014) USA RCT Doi: 10.1186/1472-6963-14-406 Reference 110	“to determine if a pharmacist case manager (PCM) providing a faxed discharge medication care plan from a tertiary care institution to primary care could improve medication appropriateness and reduce adverse events, rehospitalization and emergency department visits” (p e1).	1 NR 2 Iowa Continuity of Care Study 3 Admission history, medication reconciliation, patient education, discharge medication list and medication recommendations for both groups. Intervention group also given faxed medication care plan to their usual physician and pharmacy, and telephone call made 3–5 days post-discharge.	4 Adults patients (n=945). 5 Cardiovascular conditions, asthma, COPD. 6 general medicine, family medicine, cardiology or orthopaedics settings in a university hospital and clinics. 7 Pharmacist	8 & 9 <b>Medication appropriateness index (MAI):</b> no statistically significant differences. <b>Adverse events:</b> no statistically significant differences. <b>Adverse drug events:</b> no statistically significant differences <b>Post-discharge healthcare utilization:</b> Almost one-third of all participants had any type of healthcare utilization within 30 days post-discharge, and 15% of all participants had a 30-day readmission. No statistically significant differences between study groups.  10 NR	11 NR 12 NR 13 barriers to adherence with intervention recommendations included cost and patient concerns	<b>Quality/Limitations:</b> The extent to which community physicians used discharge medication care plan information was not determined which creates a missing link in the process of care in the study.	36/40

<p>Gould (2011) USA RCT Doi: 10.1097/DCC.0 b013e31820523 24 Reference 81</p>	<p>Examine a DNI aimed at promoting self-regulation of care at home: "To compare patients with CVD undergoing interventional revascularization procedures who receive usual care and those who receive DNI on medication adherence, patient satisfaction, use of urgent care, and illness perception" (p. 4)</p>	<p>1. Discharge nursing intervention (DNI): "provides nursing consultation to help patients interpret discharge instructions and guidelines for self-regulation of their illness." (p. 3)</p> <p>Common Sense Model of illness perception: "incorporates elements of traditional health belief models and expands to include cognitive and emotional responses involved in the coordination of complex behaviors" (p. 3)</p> <p>2. DNI based on the Common Sense Model of illness</p> <p>3. Written discharge materials (including medication review materials, a medication pocket card, and suggested Internet sites), telephone follow-up by an expert cardio-vascular nurse. Intervention offered at discharge and continued within 24 hours of discharge. (p. 4)</p>	<p>4. Adults 30yrs – 80 yrs (n= 129)</p> <p>5. Cardiovascular disease: Specifically, patients undergoing interventional revascularization procedures</p> <p>6. Academic medical centre that serves as both a city and community care centre</p> <p>7. Nursing personnel and expert cardio-vascular nurses</p>	<p>8 and 9. <b>Medication adherence:</b> A) Medications currently prescribed: No significant differences B) What percentage of aspirin and/or clopidogren they took as prescribed: No significant differences C) Morisky Adherence (forgetting or omitting medication): no significant differences (High in both groups)</p> <p><b>Patient satisfaction:</b> A) Would they return: no significant differences B) Would they refer fam/friends: no significant differences (High in both groups)</p> <p><b>Utilization of urgent care:</b> A) Call to physician: No significant differences B) Call to hospital: No significant differences C) Visits to ER: No significant differences (Low in both groups)</p> <p><b>Illness perception: *</b> A) Timeline (acute/chronic) component: experimental group scored significantly higher (P &lt; .01) B) No other significant differences found</p>	<p>11. "Redesign of discharge processes may be accomplished by reengineering existing resources rather than adding new or costly interventions" (p. 8)</p> <p>12. NR</p> <p>13. NR</p>	<p>Implications of accepting conditions as long-term: "Studies also report that perceiving cardiac disease as chronic may be instrumental in engaging individuals in making lifestyle changes", better diet, exercise self-efficacy, and long-term adherence to medication (p. 7)</p> <p>Limitations: short duration of study (1-3 days post-procedure), self-report, lack of diversity of study sample</p> <p>Suggested study replication in different settings and populations, as well as in "settings without advanced practice nurses and/or Magnet Hospital status, streamlined discharge instructions, electronic medical records and prescription services" (p. 8)</p>	<p>32/40</p>
--	--	---	---	--	--	--	--------------

				(other measures were: personal control, cure control, illness coherence, time cyclical, consequence, emotional representation)			
				10.NR			

#### 4. Interventions only delivered in a post-acute facility

Source and Type of Evidence	Aim	Q.1. Definitions Q.2. Model/system/policy/intervention Q.3. Main components of Q2	Q.4. Population group & size Q.5. Health condition/problem Q.6. Healthcare context/setting addressed Q.7. Healthcare professionals/personnel involved	Q.8 & 9 Outcomes assessed & Effects on outcomes Q.10. Components of model/system/policy/intervention associated with <u>improved</u> outcomes	Q.11. Resource implications (e.g. cost, personnel) Q.12. Enablers Q.13. Barriers	Additional Comments e.g. explanatory notes; key recommendations/messages Reported quality stated by authors.	Quality Score
<p>Fox et al. (2012)</p> <p>Canada</p> <p>Syst. Rev. &amp; Meta-analysis (n= 13) – 9 RCTs, 4 Quasi-experimental trials</p> <p>Doi: 10.1111/jgs.12028</p> <p>Reference 91</p>	<p>“To compare the effectiveness of acute geriatric unit care, based on all or part of the Acute Care for Elders (ACE) model and introduced in the acute phase of illness or injury, with that of usual care.” (p. 2237)</p>	<p>1 Early discharge planning: “activities to facilitate return to the community”</p> <p>2 Acute geriatric unit care using one or more ACE components.</p> <p>3 Patient-centered care, frequent medical review, early rehabilitation, early discharge planning, prepared environment.</p>	<p>4 Older adults ≥ 65 (Average age of 81; n= 6839)</p> <p>5 Acutely ill (e.g. neurological, cardiovascular) or injured (e.g. fracture)</p> <p>6 Acute care geriatric and non-geriatric hospital units (medical/surgical) to home/nursing home</p> <p>7 Inter-disciplinary team: Physicians, nurses, physical therapists, social workers, geriatricians, occupational therapists.</p>	<p>8 &amp; 9 <b>Eleven meta-analyses performed:</b></p> <p><b>Readmissions:</b> No significant difference between groups (n= 5)</p> <p><b>LOS:</b> Significantly shorter in intervention group (P= 0.03; n= 4)</p> <p><b>Discharge destination:</b> Patients 1.05 times more likely to be discharged home (P= 0.01; n= 9) and significantly less likely to be discharged to a nursing home (P= 0.04; n= 3) in intervention group</p> <p><b>Iatrogenic complications:</b> Significantly fewer falls (P= 0.02; n= 2) and non-significantly fewer pressure ulcers (P= 0.06; n= 2) in intervention group. Significantly less occurrence of delirium in intervention group (P= 0.001; n= 3)</p> <p><b>Functional decline:</b> Significantly less likely (13%) to experience functional decline between baseline 2-week prehospital admission and discharge (P=</p>	<p>11 “By changing reimbursement or charge rates and by establishing targets for cost and resource efficiency for older people’s care, funders can create the external and substantive structural incentives needed to move ACE into the ‘mainstream of hospital care’.” (p. 2243)</p> <p>12 NR</p> <p>13 Anticipated cost savings of approx.</p>	<p>Review had little missing data (six study authors provided unpublished data), minimizing publication bias.</p> <p>Although randomization was used in most studies, six had postrandomization exclusions or did not report related information, which may have contributed to an overestimation of effect sizes.</p> <p>Heterogeneity was low in the majority of meta-analyses, supporting validity of the results.</p> <p>No subgroup meta-analyses (medical vs surgical) performed due to results</p>	35/40

				<p>0.01; n= 6) in intervention group. No significant difference in functional decline between baseline hospital admission and discharge (P= 0.16; n= 4)</p> <p><b>Mortality:</b> No significant difference (n= 11)</p> <p><b>Costs:</b> Significantly less in intervention group (P= 0.02; n= 4) following sensitivity analysis.</p> <p>10 "Patient-centered care, frequent medical review, early rehabilitation, and early discharge planning were provided in more than half the studies and may represent the optimal ACE components for positive outcome achievement." (p. 2243)</p> <p>Interdisciplinary team work.</p>	<p>\$246 (US dollars) per hospital stay, and more than a half-day shorter hospital stay could address the "cost-ineffectiveness and cost-prohibitiveness barriers to adopting the ACE model." (p. 2243)</p>	<p>compilation and potential bias with small and uneven distribution of groups.</p> <p>Study highlighted the limited number of studies examining the effectiveness of acute geriatric unit care.</p> <p>Future research suggested to compare ACE components between surgical and medical patients; include admission through avenues other than ED; accurately determine the effectiveness of the full ACE model in subgroup meta-analysis.</p>	
<p>Thomas et al. (2013)</p> <p>UK</p> <p>Syst. Rev. &amp; Meta-analysis (n= 20) – All RCTs</p> <p>Doi: 10.1093/agein/g/aft169</p> <p>Reference 56</p>	<p>To "evaluate the effectiveness of specialist clinics in reducing unplanned hospital admissions in people with heart failure." (p. 233)</p>	<p>1 NR</p> <p>Unplanned, emergency or unscheduled hospital admission: "admission or readmission with an overnight stay that was not previously planned or scheduled or 'elective'." (p. 233)</p> <p>2 Specialist clinics</p> <p>3 Education (e.g signs &amp; symptoms, self-monitoring, diet and exercise); clinical monitoring; optimisation of treatment and referrals for diagnostic tests and treatments; tele-monitoring; telephone call follow-up.</p>	<p>4 Older adults - mean age range 56 to 80.3 yrs (n= 2780)</p> <p>5 Heart failure/chronic heart failure</p> <p>6 Hospital outpatient department/day hospital</p> <p>7 Specialist nurse-led or multidisciplinary team (MDT) always consisting of specialist nurses and cardiologists with some studies using additional specialists such as a general practitioner (GP), physician, dietician, physiotherapists, psychologist or social workers.</p>	<p>8 &amp; 9 <b>Unplanned admissions:</b> Studies assessed according to duration of follow-up.</p> <p><b>3 month follow-up (n= 1):</b> No unplanned readmissions within 30 days of discharge. Significant reduction in the number of unplanned admissions after 3 months (RR 0.10).</p> <p><b>6 month follow-up (n= 3):</b> non-significant reduction in the number of unplanned admissions (pooled RR 0.83)</p> <p><b>12 month follow-up (n= 5):</b> Significant reduction in the risk (49%) and in the rate (65%) of unplanned admissions (pooled RR 0.51).</p> <p><b>18 month follow-up (n= 1):</b> No evidence of an effect of either the basic (RR 1.01) or intensive interventions (RR 1.10) vs the control or for the two intervention groups combined (RR 1.04).</p> <p><b>Intensity of follow-up visits:</b> Studies reporting a decreasing intensity of follow-up (n= 3; see comments for definition) showed a significant 58% reduction in unplanned admissions (pooled RR 0.42). No significant reduction reported for trials with intensive (n= 3), tailored (n= 2) or</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p> <p><b>Main finding:</b> Management conducted over a period of 12 months or which provided more intensive monitoring of patients within the first 2 months with one visit every 3 months thereafter (i.e. decreasing intensity of follow-up) had a significant reduction in the number of unplanned admissions. There may be a potential benefit from beginning this type of intervention</p>	<p><b>Strengths:</b> Comprehensive search strategy employed without limitations and robust reviewing. Focused on RCTs.</p> <p><b>Limitations:</b> Narrow focus of the research question and, therefore, studies of specialist clinics focusing on other important outcomes (e.g. quality of life, self-care behaviour) which did not include unplanned admissions were excluded. The quality of the studies had an overall moderate risk of bias (e.g. studies that did not include all eligible patients (i.e. selection bias), and studies where there was possible contamination of the usual care group).</p> <p><b>Cost saving potential:</b> Potential savings in readmission costs could be £11 million (does not take into account the cost of delivering any new services) based on the reported RR at</p>	30/40

				<p>regular (n= 2) follow-up of patients throughout the follow-up periods.</p> <p><b>Intervention began before patient discharge (n= 3):</b> Significant reduction in unplanned admissions (n= 2; pooled RR 0.26) when remaining contamination bias study was removed.</p> <p><b>Other outcomes:</b> Mortality – Significantly lower (n= 2); non-significantly lower (n= 2); no difference (n= 6). Reported benefits on longer time to first readmission or death, a reduction in all cause admissions and improved survival (n= 1) and quality of life (n= 2). No improvement in quality of life or survival rates (n= 1).</p> <p>10 Management conducted over a period of 12 months or utilising decreasing intensity of follow-up (Intensive monitoring first 2 months, reduced to one visit every 3 months)</p>	<p>before hospital discharge, although this was limited by the number of studies and sample size.</p>	<p>12 months from this review and the average cost of a non-elective inpatient admission for HF (NHS in England),</p> <p><b>Level of Contact definition:</b> Level of contact grouped into the following categories: “(1) intensive follow-up where appointments were scheduled every 4–6 weeks, (2) decreasing intensity where appointments were scheduled every 1–2 weeks for the first 2 months and then reduced to once every 3 months, (3) regular follow-up where appointments were scheduled once every 3–4 months, and (4) tailored follow-up where appointments were scheduled depending on patient need without any further detail provided.” (p. 235)</p> <p><b>Recommendation:</b> “Specialist clinics for patients with heart failure can reduce the risk of unplanned admissions; these were most effective when there was a high intensity of clinic appointments close to the time of discharge which then reduced over the follow-up period.” (p. 233)</p>	
<p>Ahmed &amp; Pearce (2010)</p> <p>USA</p> <p>Syst. Rev. (n= 20) – 5 RCTs, 3 Lit. reviews, 5 descriptive, 1 nonrandomize</p>	<p>“To determine whether ACE units contribute to positive patient care outcomes for acutely hospitalized older adults</p>	<p>1 NR</p> <p>2 Acute Care for the Elderly (ACE) paradigm of care.</p> <p>3 Specialized environment, patient-centered care, medical review, and interdisciplinary team plans of care.</p>	<p>4 Older adults <math>\geq</math> 65 (n= only reported for 1 study (n= 1531))</p> <p>5 Acutely ill (types NR)</p> <p>6 Acute hospital to community care units/home</p> <p>7 Inter-disciplinary team: Geriatricians, nurse case managers, nurses, nutritionist,</p>	<p>8 &amp; 9 <b>Hospital readmission:</b> Significantly reduced for ACE units (n= 5); Neutral findings (n= 2). <b>LOS/Hospital Costs:</b> Reduced LOS on average by 1 day (n= 5); Neutral findings (n= 1). Costs, despite higher initial costs, statistically significant and demonstrably less when compared to usual care (n= 2). <b>Nursing home placement:</b> Statistically</p>	<p>11 NR</p> <p>12 NR</p> <p>13 NR</p>	<p><b>Important:</b> Scarcity in duplicated results and lack of heterogeneity in outcome variables and operational definitions within these studies.</p> <p>Although there is a need for replication in future research to confirm or dismiss significant findings, the</p>	27/40

<p>d case-control design, 1 cohort study, 2 interventional studies, 2 surveys, 1 case study. Doi: 10.1089/pop.2009.0058</p> <p>Reference 88</p>	<p>compared to traditional medical care.” (p. 219)</p>		<p>social workers, physical therapists, occupational therapist, and pharmacist.</p>	<p>significant reduction (14% vs 22%) in discharge to long-term care placement for ACE units (n= 3) <b>Functional decline:</b> Significantly less functional decline in activities of daily living for intervention (n= 4); Neutral findings (n= 1). <b>Delirium:</b> Statistically significant reductions in delirium for intervention (n= 2); Inconclusive (n= 1) <b>Polypharmacy:</b> Intervention had lower mean number of drugs when compared to patients on medical wards (n= 1; 4.8 vs 5.2); Neutral findings (n= 2). <b>Patient/provider satisfaction:</b> Superior overall satisfaction with care compared to prior hospitalization experiences (RCT, n= 1; 40% vs 26%, P &lt;0.001). Additionally, all included studies that specified satisfaction scores for patients, caregivers, and families identified ACE as superior compared to usual care.</p> <p>10 NR</p>		<p>literature presents “compelling evidence that warrants further investigation of ACE as a valuable alternative paradigm of acute geriatric care.” (p. 219)</p>	
<p>Conroy et al. (2011) UK Syst. Rev. (n= 5) – 4 RCTs, 1 Pseudo-RCT. Doi: 10.1093/agein/g/afr060 Reference 78</p>	<p>”To examine the evidence for services for older patients who developed a crisis and attended hospital, but who were assessed, treated and discharged, either immediately, or within a short-time period (up to 72 h) from an AMU or ED” (p. 437)</p>	<p>1 NR specific to Discharge 2 Comprehensive geriatric assessment (CGA): geriatrician-led in OPD (n= 2) nurse-led, geriatrician-supported (n= 2) 3 Geriatrician-led: home-based physio &amp; occupational therapy assessment; Nurse-led: weekly MDT supported by geriatricians, liaison with emergency staff, referral to community services, and short-term case management.</p>	<p>4 Older adults ≥ 65 (n= 1899) 5 Care of frail older patients discharged rapidly (&lt;72 h) 6 Acute hospital (ED) to home. 7 Geriatrician and/or nurse.</p>	<p>8 &amp; 9 <b>Readmissions:</b> No significant difference (n= 4). <b>Functional Status:</b> Improved, although doubtful clinical importance (n= 1). <b>Quality of Life:</b> Improvement in physical component &amp; mental component but not clinically meaningful (n=1) <b>Cognition:</b> No improvement (n= 1). <b>Institutionalisation:</b> Nurse led (n=2) or Geriatrician led (n=1) - no significant effect <b>Mortality:</b> No difference (n= 4)</p> <p>10 NR</p>	<p>11 NR 12 NR 13 NR</p>	<p>Quality of Studies compromised due to small number of trials evaluated and high Heterogeneity.  Geriatrician-led service was focused on a single clinical syndrome (falls), while nurse-led service was not condition specific.</p>	<p>27/40</p>

	Concept coined - 'interface geriatrics'						
Doran et al (2013) USA Syst Rev (n=13) 3 from same RCT; 3 Retrospective cohort design & 7 pre- post comparisons  Doi: 10.1353/hpu.2013.0053 Reference 87	To search for studies of medical respite programs' effectiveness in improving outcomes for homeless patients	1 NR  2 Care for Homeless Program / Project/ Respite Care/ Ambulatory.  3 24- hour Nursing Supervision / Care on Site (n=8)/ Meals & Medication Assistance (n=5) Multidisciplinary Care (n=4) Case Management (n=2)/ Social Services / Housing (n=2) Psychiatric services (n=1).	4 Adults > 18 yrs. (n= 12,122).  5 Multiple Chronic Conditions, Mental illness, Substance abuse.  6 Primary / Ambulatory Care (e.g. Special Unit, Chronic Nursing Beds/ Homeless Infirmary)  7 Community Providers Multidisciplinary Health Team (physicians, nurses, social workers, case managers, physical therapy).	8 & 9  <b>Hospitalizations:</b> Reduction 29% (95% CI 10%–44%, <b>p=.005</b> )  <b>Hospital days:</b> Reduction 29% (95% CI 8%–45%, <b>p=.01</b> ); (3.4 vs. 8.1, <b>p=.002</b> )  <b>ED visits:</b> reduction 24% (95% CI 3%–40%, <b>p=.03</b> )  <b>Housing</b> Fewer future days of homelessness e.g. 27% housed at intake vs. 82% housed at discharge  44% discharged to "improved Accommodation."  10 Intensive Case management and Assistance with Housing.	11. Intervention group had average annual cost savings of \$6,307. One study estimated that respite care cost lightly less than half the cost of one hospital day.(p. 519)  Reduced ED visits, Nursing Home stays, and Jail stays also Contributed.  12 NR  13 Respite Care Centres are small and run by community organizations such as homeless shelters /  Clients at risk of leaving against medical advice (p. 521)	27/40	
Scott et al. (2009) Australia Syst. Rev. (n= 9); 7	"To assess the effectiveness of acute medical units (AMUs) in hospitals" (p. 397)	1 NR  2 Acute Medical Unit (AMU)  3 Rapid assessment, diagnosis and treatment; standardized admission and discharge	4 Age group (NR) (n= 248016)  5 Acute medical illness (type - NR)  6 Acute medical unit to inpatient bed/critical care unit	8 & 9 <b>Readmission rates:</b> Decreased from 13.3 to 6% following AMU (n= 1) <b>LOS:</b> Significant reduction (range 1-2.5 days; n= 4, P<0.001) <b>Waiting times in ED:</b> Decreased by 30% following AMU (n= 1; P<0.001)	11 NR  12 NR  13 Difficulties recruiting nurses and allied health staff	"AMUs staffed by multidisciplinary teams led by acute medicine physicians have the potential to improve the quality and the safety of care of a significant proportion of acutely ill	27/40

<p>retrospective and 2 prospective before-after analyses.</p> <p>Doi: 10.1093/intqhc/mzp045</p> <p>Reference 89</p>		<p>processes; optimisation of bed management using care pathways; smoother patient flows; improved rostering and use of shifts.</p>	<p>7 Units supervised by consultants; also generalist physicians and multidisciplinary team (nurses, junior medical staff, allied health, pharmacists, clerical staff, wardsmen) that assess and manage medical illness and functional disability.</p>	<p>number of patients decreased from 14 to 2 over 4 years (n= 1; P&lt; 0.001)</p> <p><b>Discharge disposition:</b> Patients discharged directly home at 24 h increased from 21 to 29% (n= 1; P&lt; 0.005), 4% to between 15 and 29% (n= 1; P&lt; 0.001) and at 48 h increased from 31 to 40% (n= 1; P= 0.04)</p> <p>Increase from 27 to 56% in the proportion of patients being cared for by the appropriate speciality.</p> <p><b>Mortality:</b> Reduction in all-cause hospital mortality over (1) 5 years from 12.6% to 7.0% (n= 1; P&lt; 0.001); and (2) 4 years from 7.2 to 5.9% (n= 1; P= 0.04).</p> <p><b>Bed cost and resource utilization:</b> Saving of 4039 bed-days over 12 month period yielding estimated benefit of €1 714 152, after excluding patients with length of stay of &gt;30 days (n= 1)</p> <p><b>Patient/staff satisfaction:</b> 52% of patients, 91% of nurses and 93% of medical staff perceived the AMU as better than the traditional care model (n= 1); nursing staff (response rate = 64%) reported more time for health promotion (P&lt; 0.01), but felt more stress in dealing with a concentration of acutely ill patients (P&lt; 0.05)</p> <p>10 More appropriate and rapid assessment, diagnosis and treatment (reduced LOS); improved rostering (staff satisfaction)</p>	<p>with appropriate levels of acute assessment skills.</p>	<p>medical patients presenting to hospital." (p. 406)</p> <p>Differences between AMUs both at the local level and between national jurisdictions, and thus the current analysis of a relatively small number of units does not allow identification of differences in operational methods that impact on outcomes.</p> <p>Because of study heterogeneity with respect to periods of observation and outcome measure, no formal meta-analysis performed.</p>	
<p>Crotty et al. (2008)</p> <p>Australia</p> <p>RCT</p> <p>Doi: 10.1093/agein/g/afn141</p> <p>Reference 90</p>	<p>"to assess the effect of home versus day rehabilitation on patient outcomes" (p628).</p>	<p>1 NR</p> <p>2 Rehabilitation programmes – one hospital day unit, one home-based.</p> <p>3 Day hospital intervention: Interdisciplinary programme, three to five times per week for 4–6 weeks of high intensity rehabilitation in individual or group sessions. Each visit lasted 3 hours.</p>	<p>4 Adults &gt; 60 years</p> <p>5 Stroke</p> <p>6 Public hospitals (n=3) in southern Adelaide, Australia.</p> <p>7 Interdisciplinary team, including occupational therapist.</p>	<p>8 &amp; 9</p> <p>Outcomes:</p> <p>Primary outcome: functional ability in ADLs, measured by change in the Assessment of Motor and Process Skills (AMPS) score at 3 months.</p> <p>Other outcomes: hospital readmission, transfer to residential care, quality of life, carer stress /quality of life, at 3 months. Place of residence, hospital re-admissions and mortality at 6 months. Carers of patients in day hospital had more stress than those for patients in home</p>	<p>11 Did not include information on costs but the day hospital programme utilised more resources due to length of stay and number of therapy sessions, while resulting in more readmissions and no difference in other patient outcomes.</p>	<p>Recommendations: based on findings in relation to increased readmissions following hospital day rehabilitation programmes, health services should prioritise access to home rehabilitation in favour of day hospital programmes.</p>	<p>32/40</p>

		Education session available for carers. Home based rehabilitation; one-on-one programme by interdisciplinary team, 3 to 5 sessions per week.		rehabilitation, as per Caregiver Strain Index (CSI) scores (P = 0.047). Patients in day hospital had twice the risk of readmission compared to those in home rehabilitation, at 3 and 6 months.  10 NR	12 NR  13 Access to on-site medical professionals and proximity to ED (as in day hospital programme) promoted readmissions.		
Edmans et al. (2013) UK RCT Doi: 10.1136/bmj.f5874 Reference 95	“To evaluate the effect of specialist geriatric medical management on the outcomes of at risk older people discharged from acute medical assessment units” (p e1).	1 hospital presentations, defined as the total number of inpatient admissions, attendances to accident and emergency/ acute medical unit without admission, and day cases  2 Specialist geriatric assessment at discharge from acute assessment units  3. Assessment by geriatricians prior to discharge. Care coordinated by geriatricians e.g. review of medication, further assessment, intermediate care, advanced care planning, liaison with other services e.g. community services.	4 Older adults (70 years +)  5 At risk of deterioration?  6 Acute medical assessment unit.  7 Medical consultant and team, multidisciplinary team – nurse, physiotherapist, occupational therapist. GPs	8 &9 primary outcome: days spent at home or other normal place of residence in the 90 day follow up period. Secondary outcomes: mortality, institutionalisation, dependency, mental wellbeing, quality of life, and health and social care resource use, at 90 days.  No significant difference in time at home within 90 day follow-up period, or for any secondary outcome. More than half of participants spent all of 90 day follow-up period at home, i.e. 57% of controls and 52% of intervention group. Overall 54% of participants had at least one hospital presentation during the study, with a slightly increased number among intervention group (P=0.05).  10 NR	11 NR  12 NR  13 NR	Specialist geriatric input between acute and community settings, alone, insufficient and unlikely to cause measurable benefits to patient outcomes. More effective methods needed to identify patients most likely to benefit from such interventions.	34/40
Dahl et al. (2015) Norway Non randomised controlled observational study (n=328) Doi: 10.1186/s12913-015-1022-x Reference 21	To “investigate the effectiveness of hospital discharges of patients aged 60 years and older to a municipality with an ICH compared to discharges to a municipality	1.an intermediate care hospital (ICH) “It is an umbrella term for a rehabilitation type arrangement between primary and secondary care that is intended to reduce unnecessary hospital use and optimize functional independence “(Pg. 2) 2. The intermediate care hospital municipal and (ICHM) and the comparative municipality (CM). 3.	4. Patients living in the ICHM or the CM, aged 60 years and older, admitted from their own homes to the medical or surgical department at the general hospital, assessed to be in need of in-patient care for at least 3 days after completion of the hospital diagnostics and the initial treatment and expected to return home after in-patient care. 5. Multiple chronic conditions 6. Patients resided in one of the municipalities;	8. The outcomes were measured 3 months and 1 year from index hospital admission except for the proportion of patients with readmissions within 30 days. The functional status was measured at 3 and 6 months from the index hospital admission. Hospitalization and rehabilitation stays were taken from a national data register. 9. NR 10. The ICH facilitated early hospital discharge for patients who were in need of further institutional care, reduced	11. NR 12. the inclusion of participants from two municipalities that were comparable on most baseline characteristics, the adjustment of the analyses for the differences in the groups, the collection of data from reliable electronic registers and the linkage of	Future research: “cost analysis of alternative care models should be considered” (Pg.9)	36/40

	without an ICH on readmissions, mortality, activities of daily living (ADL) and health care use during 1 year follow-up” (Pg. 2)		the Intermediate care hospital municipality (ICHM) or the Comparative municipality (CM). 7. Hospital nurses and nurses in primary healthcare services	the pressure on hospital inpatient services and prevented prolonged hospital stays.	data on an individual level. 13. Study design; the ICH model may be different in other settings which limits the generalizability		
Malik et al. (2018) Ireland and Belgium  Systematic review (n=9) seven RCTs and two prospective pre/post-intervention designed studies.  Doi: 10.1016/j.ienj.2018.01.008  Reference 94	To systematically review the impact of geriatric focused nurse assessment and intervention in the emergency department (ED) on hospital utilisation in terms of admission rate, ED revisits and length of hospital stay (LOHS) (Pg 2).	1.A critical aspect of healthcare is that hospitalisation of the elderly patient can adversely affect them from iatrogenic complications and other medically related events.  2.ED based geriatric case model  3.The ED based geriatric case model may comprise of eight components: an evidenced-based practice model, leadership, high risk screening, intensive geriatric assessment, initiation of care and disposition planning, inter-professional work practices, discharge follow up, monitoring and evaluating.	4. Patients aged 65 and over  5. Patients underwent a geriatric focused nurse assessment/intervention  6. Emergency unit  7. Nurse and/or multidisciplinary team	8&9. Geriatric focused nursing assessment and interventions did not have a statistical impact on hospitalization, readmissions, LOHS and ED revisits. Risk screening and comprehensive geriatric assessment extending into primary care may reduce readmission rates but not affect hospitalization. An increase in ED visits in the intervention group at 30 days post-intervention was noted.  10.NR.	11.NR  12. A sizable population and use of valid screening tool, randomisation, blinding and control group impact reliability of evidence.  13. A threat of attrition bias was evident in the studies which may question validity and reliability as there were significant attrition rates in intervention and control groups respectively due to death, withdrawal and lost to follow-up (Pg 7).	Heterogeneity of studies with different types of assessment tools used and varied interventions across studies may limit ability to generalise results (Pg 8).	27/40