Appendix 1: Detailed search strategy

We developed a comprehensive search strategy that balanced sensitivity and specificity. The search of online databases (Ovid MEDLINE, EMBASE, CINAHL, and the Cochrane Central Register of Controlled Trials) was broken down into three themes: (1) The first Boolean search was done using the term ‘or’ to explode and map keywords and MeSH terms relevant to emergency departments and inpatient admissions. (2) A second search strategy also used ‘or’, to map keywords relevant to older populations. (3) A third search was done to identify interventions of interest. This was intentionally broad to capture pre-hospital and ED-based strategies. Search filters were applied to limit citations to interventional study designs, and then the three themes were combined using the Boolean operator ‘and’.

Example Search Strategy for **Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R)**1946 to Present

|  |  |
| --- | --- |
| # | Searches |
| 1 | exp Emergency Service, Hospital/ or Emergency Medical Services/ or Evidence-Based Emergency Medicine/ |
| 2 | (emergency department\* or ED or A&E or "A & E" or "accident and emergency" or casualty department\*).kf,tw. |
| 3 | or/1-2 |
| 4 | exp Hospitalization/ |
| 5 | Home Care Services, Hospital-Based/ |
| 6 | exp Community Mental Health Services/ |
| 7 | ((admit\* or admission\* or hospitali\*) adj3 (avoid\* or alternative\* or outpatient or prevent\* or reduc\*)).kf,tw. |
| 8 | "hospital at home".kf,tw. |
| 9 | (community management or alternative care or day hospital\*).kf,tw. |
| 10 | (community adj (geriatric or senior\* or elder\* or paramedic\*)).kf,tw. |
| 11 | or/4-10 |
| 12 | Homes for the Aged/ or exp Nursing Homes/ |
| 13 | (long term care or ((old age or nursing) adj home\*)).kf,tw. |
| 14 | exp Geriatric Assessment/ |
| 15 | (geriatric adj (assessment\* or screening\* or evaluat\*)).kf,tw. |
| 16 | Dementia/ or Alzheimer Disease/ or Accidental Falls/ |
| 17 | (alzheimer\* or dement\* or falls).kf,tw. |
| 18 | exp Health Services for the Aged/ |
| 19 | exp Aged/ |
| 20 | (elder\* or frail\* or geriatric\* or old people or older adult\*).kf,tw. |
| 21 | or/12-20 |
| 22 | exp clinical study/ or comparative study/ or evaluation studies/ or multicenter study/ or meta-analysis/ or pilot projects/ |
| 23 | (controlled adj3 before adj3 after).tw. |
| 24 | (controlled adj3 pre adj3 post).tw. |
| 25 | (clinical trial or controlled or random\* or evaluation or multicenter or multicentre or multi center or multi centre or meta analysis or review or time series).kf,tw. |
| 26 | review.pt. |
| 27 | pilot.ti. |
| 28 | or/22-27 |
| 29 | 3 and 11 and 21 and 28 |
| 30 | remove duplicates from 29 |

Appendix 2. Data Extraction Template

|  |  |  |
| --- | --- | --- |
| Study Characteristics |  |  |
| * Author
* Study name
* Year of publication
* Country of intervention
* Publication language
* Study design
 |  |  |
| Population Characteristics |  |  |
| *Demographics* |  |  |
| * + n (total)
	+ Sex (% Female)
	+ Mean age (SD)
 | * n (intervention)
* Sex (% Female)
* Mean age (SD)
 | * n (control)
* Sex (% Female)
* Mean age (SD)
 |
| * Population description (inclusion criteria)
* Socioeconomic status (if specified)
* Exclusion criteria
* Data source used to extract patient information
 |
| Intervention Characteristics |  |  |
| * Description of intervention
* List of providers
* Setting of intervention
* Target of intervention (patients, healthcare providers, systems, etc.)
* Duration/frequency of intervention
* Description of control group
* Co-interventions
 |
| Study Outcomes |  |  |
| * Primary outcome description
* Secondary outcome description
 |  |  |
| *ED visits* |  |  |
| * + n (intervention)
 | * n (control)
 | * Outcome measures
	+ Mean (SD)
	+ Rate (per 1000 patient-years)
	+ RR/OR/HR
	+ Number of visits
	+ p value
 |
| *Hospitalization* |  |  |
| * + n (intervention)
 | * n (control)
 | * Outcome measures
	+ Mean (SD)
	+ Rate (per 1000 patient-years)
	+ RR/OR/HR
	+ Number of visits
	+ p value
 |
| *Re-admission* |  |  |
| * + n (intervention)
 | * n (control)
 | * Outcome measures
	+ Mean (SD)
	+ Rate (per 1000 patient-years)
	+ RR/OR/HR
	+ Number of visits
	+ p value
 |
| *Mortality* |  |  |
| * + n (intervention)
 | * n (control)
 | * Outcome measures
	+ Mean (SD)
	+ Rate (per 1000 patient-years)
	+ RR/OR/HR
	+ Number of visits
	+ p value
 |
| * Other reported outcomes
 |  |  |
| * Other comments
 |  |  |

Appendix 3. Reference list of studies included in systematic review

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Appendix 4. Detailed Study Characteristics (n=53)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | Intervention Characteristics |  |  |
| Author (Year) (ref) | Country | Design | Study Population | Sample Size | Intervention Description | Home Visits | Telemedicine | Comp. Geriatric Assessment | Education | Case Management/Care Coordination | Primary Care Integration | Interdisciplinary Team | Single-discipline Assessment | Patient/Caregiver Counselling | Setting | Providers |
| Aguado et al. (2010) (E1) | Spain | RCT | Patients admitted to internal medicine and cardiology with HF (Mean age: 78 intervention, 77 control) | 106 | Home visit, educational intervention, care plan, exercise plan | \* |  |  | \* |  |  |  |  |  | Home | RN |
| Arendts et al. (2018) (E2) | Australia | RCT | Adults aged 65+ at very high-risk of readmission to the ED | 164 | Post discharge patient-centred intervention | \* |  |  | \* |  |  |  |  | \* | Home | Multi |
| Arendts et al. (2018) (E3) | Australia | Cluster-RCT | Patients aged 65 + living in a residential aged care facility (with a life expectancy of more than 180 days) | 200 | Nurse practitioners working with general practitioners and using a best practice guide for care |  |  |  | \* | \* | \* |  |  | \* | LTC | RN |
| Bellantonio et al.(2008) (E4) | USA | RCT | Older adults with dementia, moving into assisted living (Mean age: 82) | 100 | Multidisciplinary assessments, bimonthly team and staff nurse meetings, in-person/telephone consultation with facility staff members as needed |  |  |  |  |  |  | \* |  |  | LTC | Multi |
| Berg et al. (2008) (E5) | USA | RCT | Age 65+ (Average age: 77) | 134,791 | Direct mailing interventions; one to promote influenza vaccinations and the other to promote calling a telephonic nurse advice service |  |  |  | \* |  |  |  |  |  | Home | RN |
| Bernabei et al. (1998) (E6) | Italy | RCT | Age 65+, home health services/home assistance recipients | 199 | Integrated social and medical care (CGA) with case management |  |  | \* |  | \* |  |  |  |  | Home | Multi |
| Bondestam et al. (1995) (E7) | Sweden | Cluster-RCT | Age 65+, admitted with MI, no language barrier | 270 | Post discharge nurse counselling, optional low-intensity exercise program  | \* |  |  | \* |  |  |  |  | \* | Home, PC | RN |
| Boult et al. (1994) (E8) | USA | CBA | High risk, age 65+  | 154 | Home visit and assessments, interdisciplinary team, care coordination | \* |  |  |  | \* |  | \* | \* |  | Home, PC | Multi |
| Boult et al. (2011) (E9)  | USA | Cluster-RCT | High risk, age 65+ (Mean age: 78) | 850 | CGA, monitoring, care coordination | \* |  | \* | \* | \* |  |  | \* |  | Home, PC | Multi |
| Boyd et al. (1996) (E10)  | USA | CBA | Medicare, at least 1 chronic illness, ED admission twice in past year (Average age: 79) | 54 | Assessment and case management | \* |  |  |  | \* |  |  | \* | \* | Home | RN |
| Brand et al. (2004) (E11)  | Australia | Cluster-RCT | High risk, age 65+ | 166 | CGA |  |  | \* |  | \* |  |  |  |  |  Inpatient, PC | RN |
| Briggs et al. (2015) (E12)  | Australia | RCT | Age 70+, taking >5 medications daily | 1021 | ED clinical pharmacist med review (EDMR) + patient interview |  |  |  |  |  |  |  | \* |  | ED | Pharm |
| Caplan et al. (2004) (E13) | Australia | RCT | Age 75+, discharged home from ED | 739 | CGA | \* |  | \* |  | \* |  | \* |  |  | ED, Home | Multi |
| Connolly et al. (2018) (E14) | New Zealand | CBA | Elderly people living in residential aged care facilities | 21 facilities | Aged Residential Care Intervention Project (ARCHIP) - a multidisciplinary team intervention supporting LTC facility staff |  |  |  | \* | \* |  | \* |  | \* | LTC | Multi |
| Counsell et al. (2007) (E15) | USA | RCT | Age 65+, low income | 951 | GRACE support team (advanced practice nurse, SW), multidisciplinary assessment, CGA | \* |  | \* |  |  |  | \* |  |  | Home, PC | Multi |
| Courtney et al. (2009) (E16) | Australia | RCT | High risk, age 65+, admitted w/ medical diagnosis, mobile (Mean age: 79) | 107 | CGA, individualized low-intensity home exercise program | \* |  | \* |  | \* | \* | \* |  |  | Inpatient, Home | RN + physiotherapist |
| Diaz-Gegundez et al. (2011) (E17)\* | Spain | CBA | Age 84+, living in geriatric residences | 2057 | CGA, follow-up visits, medication review and adjustment, case management, staff training |  |  | \* | \* | \* |  |  |  |  | LTC | Multi |
| Dorr et al. (2008) (E18) | USA | RCT | Age 65+, any complex patient (multiple comorbidities, frail) and with certain illnesses (dementia, mental health needs, diabetes), Medicare (Average age: 76) | 3432 | Case management |  |  |  | \* | \* |  |  | \* |  | PC | Physician + care managers |
| Fan et al. (2018) (E19) | Australia | CBA | Elderly people living in residential aged care facilities | NR | Hospital in the nursing home program |  |  |  | \* | \* |  | \* |  |  | LTC | Multi |
| Feldman et al. (2004) (E20) | USA | Cluster-RCT | Age 65+, CHF, English/Spanish speaking, Medicare | 371 | Case management | \* |  |  | \* | \* |  |  |  |  | Home | RN |
| Garcia-Gollarte et al. (2014) (E21) | Spain | Cluster-RCT | Age 65+, Nursing Home Resident (NHR), clinically stable (Mean age: 84) | 1018 | Educational intervention |  |  |  | \* |  |  |  |  |  | LTC | MD |
| Gellis et al. (2014) (E22) | USA | RCT | High risk, age 65+, home care, COPD or HF, depression | 115 | Telemonitoring, nurse counselling/education |  | \* |  | \* | \* |  |  |  | \* | Home | RN |
| Graham et al. (2012) (E23) | USA | CBA | Age 65+, >1 hospital admission in past year, Medicare Advantage | 3295 | Telemonitoring, case management |  | \* |  |  | \* |  |  |  |  | Home, PC | RN |
| Gravelle et al. (2006) (E24) | UK | CBA | High risk, age 65+, two or more ED admissions in previous year | NR | CGA, individualized care plan |  |  | \* |  | \* |  |  |  |  | PC | RN |
| Hanna et al. (2016) (E25) | Australia | CBA | ED/hospital admission in past year, at high risk for poor medication management. Stratified by age (65+ cohort) | 516 | Pharmacists evaluation + education as needed (HOMR) | \* |  |  | \* |  |  |  |  |  | Home | Pharm |
| Hullick et al. (2016) (E26) | Australia | CBA | Age 75+ (Mean age: 86) | 1289 | Education and case management/collaboration with primary care organisations, GPs, ambulance and EDs for RACF staff |  |  |  | \* | \* |  |  |  |  | LTC | RN |
| Kane et al. (2017) (E27) | USA | Cluster-RCT | NHs with appropriate medical and technical support, 30% of NHR dual Medicare/Medicaid | 21,852 | INTERACT program (Interventions to Reduce Acute Care Transfers) - training program for NHs for 1) early mx and recognition of acute conditions 2) communication, documentation, decision support tools 3) advance care planning |  |  |  | \* |  |  |  |  |  | LTC | MD |
| King et al. (2018) (E28) | New Zealand | CBA | Older adults (aged 75+) enrolled in a primary healthcare practise in Auckland | 1400 | A specialist gerontology nurse-led intervention involvingcase finding, comprehensive assessment and care coordination. | \* |  | \* | \* | \* | \* |  |  | \* | Home | RN |
| Leung et al. (2015) (E29) | Hong Kong | CBA | High risk or HARRPE score >4, age 65+, major functional disability, in-home caregiver  | 78 | Health assessment, education (to patients and carers) and psychosocial support (to patients and carers) | \* | \* |  | \* |  |  |  |  |  | Home | Multi |
| Mattke et al. (2015) (E30) | USA | CBA | Age 65+; 1) Chronic Special Needs plan with diabetes, HF, or COPD; 2) Medicare Advantage with access to House Calls benefit | 8,318,291 | Care Coordination with primary care provider by program staff, CGA, annual in-home visit, Transitional care service (facilitate transfer to ED/hospital as needed), Referral to health plan resources (mental health, disease management, social services) | \* |  | \* |  |  | \* |  |  |  | Home | Nurses + PCP |
| Mendoza et al. (2009) (E31) | Spain | RCT | Age 65+, CHF | 71 | Hospital at home care | \* |  |  |  |  | \* |  |  |  | Home | Specialist nurse + physician |
| Mion et al. (2003) (E32) | USA | RCT | Age 65+, English-speaking, visited 1 of the ED sites in past year, residing in community, telephone access; if significant cognitive impairment, primary family caregiver was a proxy respondent  | 650 | CGA, multidisciplinary assessment, referral to community services |  |  | \* |  |  | \* | \* |  |  | Inpatient | Multi |
| Mogensen et al. (2018) (E33) | Denmark | RCT | Patients aged 65+ with an acute medical condition thatotherwise would require acute hospital in-patient care | 131 | GP- or specialist-led hospital at home intervention | \* |  |  |  | \* | \* |  |  |  | Home or inpatient | GP or Specialist |
| Montgomery & Fallis (2003) (E34) | Canada | RCT | Age 65+, multiple problems, homecare; referred to Manitoba Home Care Program already, living in catchment area | 152 | Geriatric evaluation and management |  |  | \* |  |  |  | \* |  |  | Home | Multi |
| Morcillo et al. (2005) (E35) | Spain | RCT | Age 65+, admitted acute HF patients living in their own home nearby | 70 | Educational intervention | \* |  |  | \* |  |  |  |  |  | Home | RN |
| Navratil-Strawn et al. (2014) (E36) | USA | CBA | Age 65+, Medigap insured | 14,140 | Nurse counselling/support/care coordination (via telephone), referral to services as needed  |  | \* |  |  |  |  |  |  | \* | PC, T | RN |
| Ong et al. (2018) (E37) | Singapore | RCT | Patients aged 65+, who stay alone during the day and have fallen in the last 6 months | 197 | Medical Alert ProtectionSystem (eAlert! System) |  | \* |  |  |  |  |  |  |  | Home | RN |
| Patel et al. (2009) (E38) | USA | RCT | Age 65+, economically disadvantaged, asthma dx, rescue inhaler use more than 2x/week for the past year, one or more ED/urgent care visits in past year | 52 | Telephone call (asthma-specific questionnaire) |   | \* |   |   |   |   |   |   |   | T | Other |
| Reidt et al. (2016) (E39) | USA | CBA | Older adults transitioning from skilled nursing facility (SNF) to home | 276 | Pharmacist evaluation | \* |  |  |  |  |  | \* |  |  | LTC, Home | Multi |
| Ricauda et al. (2004) (E40) | Italy | RCT | Age 70+, acute uncomplicated first ischemic stroke, available carer (family member or caregiver) | 120 | Hospital at home care (Geriatric Home Hospitalization Service), support/counselling to caregivers as needed | \* |  |  |  |  |  | \* |  | \* | Home | Multi |
| Rosenzweig et al. (2010) (E41) | USA | CBA | Medium-risk, high-risk, comorbid diabetes and CAD, Medicare Advantage, with a caregiver and a history of at least one ED/urgent care visit/hospitalization in the past year | 420 | Disease management, education, assessments, coordination between nurse and patient's physician |  | \* |  | \* | \* |  |  |  |  | Home, T | RN |
| Rosted et al. (2013) (E42) | Denmark | RCT | Age 70+, Danish-speaking, high-risk of readmission or functional decline (2-6 points on ISAR tool), living nearby | 271 | Geriatric evaluation and management | \* |  | \* |  | \* |  |  |  |  | Home | RN |
| Sandberg et al. (2015) (E43) | Sweden | RCT | Age 65+, cognitively stable, living in ordinary home, dependent in 2 or more ADLs, admitted to ED at least twice or at least 4 physician visits in the last year | 153 | Geriatric evaluation and management (case management, CGA, functional status evaluation) | \* |  | \* | \* | \* |  |  | \* |  | Home | Nurse + physiotherapist |
| Schraeder et al. (2008) (E44) | USA | CBA | High-risk, age 65+, living in own home, voluntarily completed initial health screening questionnaire | 677 | Multidisciplinary assessment, education, case management (Managed care) | \* |  |  | \* | \* | \* | \* |  | \* | Home, PC | Nurse + PCP |
| Schwarz et al. (2008) (E45) | USA | RCT | Age 65+, CHF, mild functional impairment requiring caregiver, English-speaking, operating phoneline, eligible for Medicare. Inclusion criteria for caregivers: cognitively intact, familial relationship to patient, providing assistance with at least 1 ADL or 1 IADL.  | 102 | Telemonitoring by advanced practice nurses | \* |  |  | \* |  |  | \* |  |  | Home | RN |
| Shah et al. (2015) (E46) | USA | CBA | Living in intervention senior living communities (SLCs)  | 1537 | High-intensity telemedicine |  | \* |  |  |  |  |  |  |  | LTC, T | Other |
| Sommers et al. (2000) (E47) | USA | RCT | Age 65+, >1 PCP visit in last 3 months, English-speaking, mild functional impairment, at least 2 chronic conditions; if both chronic conditions stable, having > 1 health risk factor (sedentary lifestyle, hyperlipidemia, obesity, smoking, alcoholism, social isolation, depression, anxiety)  | 543 | Interdisciplinary collaborative practice. 1. RN/SW home visits, 2. Patient and family engagement in risk reduction and treatment planning, 3. Health monitoring by RN and/or SW between office visits 4. PCP + RN + SW meet at least monthly  | \* |  |  |  |  |  | \* |  |  | PC, T | Multi |
| Tibaldi et al. (2009) (E49)\* | Italy | RCT | Age 75+, CHF, functionally impaired, appropriate care supervision at home, admitted to ED for acute CHF decompensation with at least one previous admission for acute CHF, in need of intravenous drug infusion, living in catchment area of Hospital at Home intervention with telephone connection | 101 | Geriatric hospital-at-home service | \* |  |  | \* |  |  | \* | \* | \* | Home | Multi |
| Tibaldi et al. (2013) (E48) | Italy | RCT | Age 65+, CHF | 52 | Geriatric hospital-at-home service |  |  | \* |  |  |  |  |  |  | Home | Multi |
| Tinetti et al. (2012) (E50) | USA | CBA | Age 65+, relatively stable and independent, receiving non-hospice Medicare-covered home care  | 682 | Restorative home care model: Multidisciplinary assessment + case management  | \* |  |  | \* | \* |  | \* |  | \* | Home | Multi |
| Westberg et al. (2014) (E51) | USA | CBA | Age 65+, discharged after admission for heart failure, ischemic heart disease, dysrhythmias, genitourinary conditions, or digestive disorders; has primary care provider in local internal medicine/family medicine clinics affiliated with the hospital | 405 | Pharmacist evaluation (medication management) |  |  |  |  |  |  |  | \* | \* | PC | Pharm |
| Yim et al. (2011) (E52) | Hong Kong | RCT | High-risk, age 65+, about to be discharged from the ED | 1279 | ISAR assessment, referral to services in ED upon discharge |  |  |  |  |  |  |  | \* |  | ED | Other |
| Zintchouk et al. (2018) (E53) | Denmark | RCT | Adults aged 65+ (admitted from hospital or home to the rehabilitation unit) | 368 | Comprehensive geriatric care performed by a geriatrician at the rehabilitation unit. |  |  | \* |  | \* |  |  |  | \* | Rehabilitation Unit | Geriatrician |

Abbreviations: ISAR=Identification of Seniors at Risk; HARRPE=Hospital Administration Risk Reduction Programme for the Elderly; PCP=Primary Care Physician; RACF=Residential Aged Care Facilities; SW=Social Worker, T=Telephone

\*Studies translated from original publication language to English

Appendix 5. Graphical representation of the effectiveness of hospital avoidance interventions on hospital admissions by intervention type



Summary:

Interventions that included home visits were proportionally more likely to report a decrease in hospital admissions. Statistically significant decreases in hospital admissions (for interventions versus controls) ranged from -6% to -14%. Reporting varied substantially across the included studies with authors using absolute values, rates (with varying denominators), ratios (OR, HR, RR), beta coefficients, means, and percent differences to quantify the effect of interventions on hospital admissions.

Appendix 6. Detailed Study-Specific Results

|  |  |
| --- | --- |
|  | Results |
| Author (Year) (ref) | Outcome(s) Measured | Time Period (Follow-up) | Data Source | Intervention Group | Control/Comparator Group | Effect |
| Aguado et al. (2010) (E1)  | Mean ED visits for HF | 24 months | Medical records | 0.68 (0.90) | 2.00 (1.97) | p=0.001 |
| Mean unplanned readmissions for HF | 24 months | Medical records | 0.68 (0.94) | 1.71 (1.67) | p=0.003 |
| % mortality | 24 months | Medical records | 46.67% | 55.36% | p=0.448 |
| Mean total cost per patient (in Euros) | 24 months | Medical records | 671.56 | 2154.24 | -1482.68p<0.001 |
| Arendts et al. (2018) (E2) | 28-day reattendance at ED | 28 days | Medical records and discharge summaries | 35 ED reattendances in 25 patients | 45 ED reattendances in 31 patients | 8% absolute reduction (95% CI: -7%-20%), 20% relative risk reduction (p=0.26) |
| 28-Day hospitalization rate  | 28 days | Medical records and discharge summaries | 13 | 20 | 9% absolute reduction, 36% relative reduction, p=NS |
| Hospital bed day usage | 28 days | Medical records and discharge summaries | 1.84 bed days/patient | 1.99 bed days/patient | p=NS |
| ED rate | 1 year | Medical records and discharge summaries | 4.4 ED events/patient year | 4.3 ED events/patient year | p=NS |
| Mortality rate | 1 year | Medical records and discharge summaries | 12 | 11 | p=NS |
| Arendts et al. (2018) (E3) | Unplanned transfer to a hospital (via the ED) | 12 months | Electronic medical records | 98 transfers in 63 patients | 121 transfers in 60 patients | Chi square p=0.10Logistic regression OR: 0.7 (95% CI: 0.3-1.5), p=0.36 |
| Health-related Quality of Life (EQ-5D) | 12 months | Electronic medical records | Mean: 0.44 (95% CI: 0.37-0.50) | Mean: 0.44 (95% CI: 0.37-0.51) | NR |
| Functional status | 12 months | Electronic medical records | Mean: 0.10 (95% CI: 0.04-0.17) | Mean: 0.21 (95% CI: 0.14-0.29) | NR |
| Death | 12 months | Electronic medical records | 32 | 21 | p=0.93 |
| Bellantonio et al.(2008) (E4) | Time to unanticipated transition out of assisted living to permanent nursing facility admission | 9 months | Health care worker and staff observations, assisted living medical records |  |  | -11% (-50% - +59%)p=0.70 |
| Time to unanticipated transition out of assisted living to first ED visit | 9 months | Health care worker and staff observations, assisted living medical records |  |  | -12% (-65% - +126%)p=0.80 |
| Time to unanticipated transition out of assisted living to first hospitalization | 9 months | Health care worker and staff observations, assisted living medical records |  |  | -45% (-74% - +18%)p=0.13 |
| Time to any unanticipated transition out of assisted living to permanent nursing facility admission, first ED visit, or first hospitalization | 9 months | Health care worker and staff observations, assisted living medical records |  |  | -13% (-51% - +59%)p=0.67 |
| Mortality | 9 months | Assisted living medical records |  |  | -63% (-88% - +15%)p=0.08 |
| Berg et al. (2008) (E5) (Influenza int) | Condition-related inpatient bed days (%) | 5 months | Outpatient insurance claims  | 26.3655% | 27.1445% | -2.87%p=0.033 |
| Condition-related ED visits (%) | 5 months | Outpatient insurance claims  | 2.2513% | 2.4272% | -7.25%p=1.01 |
| Berg et al. (2008) (E5) (Nurse advice int) | Condition-related inpatient bed days (%) | 5 months | Outpatient insurance claims  | 25.067% | 27.1445% | -7.65%p=0.001 |
| Condition-related ED visits (%) | 5 months | Outpatient insurance claims  | 2.2633% | 2.4272% | -6.75%p=0.125 |
| Bernabei et al. (1998) (E6) | Admission to nursing home | 12 months | Patient medical records, case manager assessments, national official statistics | 10 | 15 | HR=0.81 (95% CI: 0.57 – 1.16)p=0.3 |
| Admission to hospital | 12 months | Patient medical records, case manager assessments, national official statistics | 36 | 51 | HR=0.74 (95% CI: 0.56 – 0.97)p<0.05 |
| Admission to nursing home or hospital | 12 months | Patient medical records, case manager assessments, national official statistics | 38 | 58 | HR=0.69 (95% CI: 0.53 – 0.91)p<0.01 |
| Admission to ED | 12 months | Patient medical records, case manager assessments, national official statistics | 6 | 17 | HR=0.64 (95%CI: 0.48 – 0.85)p<0.025 |
| Adjusted mean ADL score (SE) | 12 months | Case manager assessments | 2.0 (0.1) | 2.6 (0.1) | p<0.001 |
| Adjusted mean instrumental ADL score (SE) | 12 months | Case manager assessments | 4.1 (0.1) | 4.4 (0.1) | p<0.05 |
| Adjusted mean short portable mental status questionnaire score (SE) | 12 months | Case manager assessments | 2.8 (0.2) | 3.4 (0.2) | p<0.05 |
| Adjusted mean geriatric depression scale score (SE) | 12 months | Case manager assessments | 10.9 (0.5) | 12.8 (0.5) | p<0.05 |
| Bondestam et al. (1995) (E7) | Rehospitalizations (total number) | 12 months | Patient questionnaires and hospital charts | 54 | 94 | p<0.001 |
| Rehospitalizations and ED visits (total number) | 12 months | Patient questionnaires and hospital charts | 70 | 149 | p<0.001 |
| Number of deaths | 12 months | National registry of deaths | 15 | 25 | p>0.001 (NS) |
| Boult et al. (1994) (E8) | Annual rate of mortality (%) | Mean 10 months intervention group, mean 12 months control group | Patient records (Minnesota Department of Health, Minnesota Department of Human Services) | 2.9 | 19.2 | p=0.03 |
| Annual rate of emergency room use (# of visits) | Mean 10 months intervention, mean 12 months control  | Patient records (Minnesota Department of Human Services) | 0.6 | 1.0 | p=0.01 |
| Annual rate of nursing home use (# of days) | Mean 10 months intervention, mean 12 months control  | Patient records (Minnesota Department of Human Services) | 9.0 | 14.2 | p=0.30 |
| Annual rate of hospital use (# of days) | Mean 10 months intervention, mean 12 months control  | Patient records (Minnesota Department of Human Services) | 4.7 | 3.8 | p=0.98 |
| Boult et al. (2011) (E9) | Hospital admissions (mean annual per capita use) | 12 months | Patient insurance claims | 0.70 | 0.72 | Adjusted ratio=1.01 (95% CI: 0.83-1.23) |
| 30-day re-admissions (mean annual per capita use) | 12 months | Patient insurance claims | 0.13 | 0.17 | Adjusted ratio=0.79 (95% CI: 0.53-1.16) |
| Hospital days (mean annual per capita use) | 12 months | Patient insurance claims | 4.26 | 4.49 | Adjusted ratio=1.00 (95% CI: 0.77-1.30) |
| Skilled nursing facility admissions (mean annual per capita use) | 12 months | Patient insurance claims | 0.20 | 0.25 | Adjusted ratio=0.92 (95% CI: 0.60-1.40) |
| Skilled nursing facility days (mean annual per capita use) | 12 months | Patient insurance claims | 2.84 | 4.03 | Adjusted ratio=0.84 (95% CI: 0.48-1.47) |
| Emergency department visits (mean annual per capita use) | 12 months | Patient insurance claims | 0.44 | 0.44 | Adjusted ratio=1.04 (95% CI: 0.81-1.34) |
| Primary care visits (mean annual per capita use) | 12 months | Patient insurance claims | 9.89 | 9.88 | Adjusted ratio=1.02 (95% CI: 0.91-1.14) |
| Specialist visits (mean annual per capita use) | 12 months | Patient insurance claims | 9.04 | 8.49 | Adjusted ratio=1.07 (95% CI: 0.93-1.23) |
| Home health care episodes (mean annual per capita use) | 12 months | Patient insurance claims | 0.99 | 1.30 | Adjusted ratio=0.70 (95% CI: 0.53-0.93) |
| Boyd et al. (1996) (E10) | Hospital admission (total number) | 12 months | Hospital medical records | 12 | 20 | p<0.08 |
| Emergency department visits (total number) | 12 months | Hospital medical records | 8 | 18 | p<0.05 |
| Average hospital length of stay (days) | 12 months | Hospital medical records | 6.4 | 6.1 | p>0.08 (NS) |
| Brand et al. (2004) (E11) | Proportion of patients with readmission to acute care | 3 months | Patient phone call, medical records, and Royal Melbourne Hospital (RMH) administrative data | 36.1% | 36.1% | p=1.00 |
| Proportion of patients with ED visit | 3 months | Patient phone call, medical records, and RMH administrative data | 8.4% | 8.4% | p=1.00 |
| Proportion of patients with readmission to acute care | 6 months | RMH administrative data | 25.3% | 31.3% | p=0.39 |
| Proportion of patients with ED visit | 6 months | RMH administrative data | 18.1% | 21.7% | p=0.70 |
| Briggs et al. (2015) (E12) | Admitted from ED | 4 months | Patient interview, medical records, pharmacy records  | 53% | 62% | p=0.003 |
| Mean length of stay (days) | 4 months | Patient interview, medical records, pharmacy records | 6 (12) | 6 (11) | p=0.87 |
| Mean re-presentations to ED  | 3 months | Patient interview, medical records, pharmacy records | 1 (1) | 1 (1) | p=0.43 |
| Admission to aged-care facility | 4 months | Patient interview, medical records, pharmacy records | 5.9% | 5.0% | p=0.37 |
| Caplan et al. (2004) (E13) | 30-day readmissions to hospital | 3 months | Patient questionnaire and electronic hospital admission data | 16.5% | 22.2% | p=0.048 |
| Connolly et al. (2018) (E14) | Potentially avoidable ED presentations | 9 months | Routinely-collected ED presentation records (hospital data) |  |  | Rate Ratio = 0.73 (95% CI: 0.62-0.86), p<0.001 |
| Counsell et al. (2007) (E15) | Mean change in SF-36 physical functioning score | 24 months | Patient questionnaire | -5.3 (23.0) | -6.8 (22.7) | p=0.32 |
| Mean change in SF-36 role-physical score | 24 months | Patient questionnaire | +1.9 (39.9) | -2.7 (38.0) | p=0.07 |
| Mean change in SF-36 bodily pain score | 24 months | Patient questionnaire | +0.1 (25.7) | +0.8 (24.8) | p=0.67 |
| Mean change in SF-36 general health score | 24 months | Patient questionnaire | +0.2 (19.4) | -2.3 (19.0) | p=0.045 |
| Mean change in SF-36 vitality score | 24 months | Patient questionnaire | +2.6 (21.7) | -2.6 (20.0) | p<0.001 |
| Mean change in SF-36 social functioning score | 24 months | Patient questionnaire | +3.0 (30.4) | -2.3 (30.5) | p=0.008 |
| Mean change in SF-36 role-emotional score | 24 months | Patient questionnaire | -0.5 (41.5) | -2.6 (45.3) | p=0.46 |
| Mean change in SF-36 mental health score | 24 months | Patient questionnaire | +3.6 (18.5) | -0.3 (18.2) | p=0.001 |
| Mean change in SF-36 physical component summary | 24 months | Patient questionnaire | -1.1 (8.9) | -1.6 (8.8) | p=0.38 |
| Mean change in SF-36 mental component summary | 24 months | Patient questionnaire | +2.1 (10.2) | -0.3 (10.8) | p<0.001 |
| Mean change in instrumental ADL score | 24 months | Patient questionnaire | +0.4 (3.3) | +0.6 (3.6) | p=0.77 |
| Mean change in basic ADL score | 24 months | Patient questionnaire | +0.2 (2.7) | +0.4 (2.7) | p=0.37 |
| Mean change in days in bed | 24 months | Patient questionnaire | -1.7 (23.8) | -0.5 (22.5) | p=0.54 |
| ED visit (rate per 1000 patients) | 24 months | Regional health information exchange  | 1445 | 1748 | p=0.03 |
| Hospital admissions (rate per 1000 patients) | 24 months | Regional health information exchange  | 700 | 740 | p=0.66 |
| Courtney et al. (2009) (E16) | Hospital readmissions | 24 weeks | Patient self-reported healthcare utilization data, hospital medical records | 22.0% | 46.7% | p=0.007 |
| Emergency general practitioner (GP) visits | 24 weeks | Patient self-reported healthcare utilization data, hospital medical records | 25.0% | 67.3% | p<0.001 |
| Diaz-Gegundez et al. (2011) (E17) | Emergency room attendance (event rate per 1000 patient beds/residents) | 3 years | Medical records | -491%  | +175% | NR |
| Hospital income rate (number of hospital admissions/total patient beds x 100) | 3 years | Medical records | -16.3% | +12.3% | NR |
| Dorr et al. (2008) (E18) | Mortality | 12 months | Care management tracking database (intervention only), EHR data, billing data | 6.5% | 9.2% | OR=0.68, p<0.05 |
| Hospital admission rate | 12 months | Care management tracking database (intervention only), EHR data, billing data | 22.2% | 23.3% | OR=0.77, p>0.05 |
| Mortality | 24 months | Care management tracking database (intervention only), EHR data, billing data | 13.1% | 16.6% | OR=0.94, p>0.05 |
| Hospital admission rate | 24 months | Care management tracking database (intervention only), EHR data, billing data | 31.8% | 34.7% | OR=0.88, p>0.05 |
| Fan et al. (2018) (E19) | ED presentation rate (per 1000 beds/month) | 3 months | Electronic hospital databases | 63.2 (95% CI: 51.5-77.5) | 52.7 (95% CI: 47.8-58.2) | Mean difference = -10.47 (95% CI: -32.6-11.6), p=0.117 |
| Inpatient admission rate (per 1000 beds/month) | 3 months | Electronic hospital databases | 49.8 (95% CI: 37.6-65.8) | 26.3 (95% CI: 22.9-30.2) | Mean difference =-23.5 (95% CI: -46.4- -0.57), p<0.0001 |
| ED length of stay (hours) | 3 months | Electronic hospital databases | 13.1 (95% CI: 11.2-15.4) | 7.0 (95% CI: 6.3-7.7) | Mean difference = -6.1 (95% CI: -9.2- -3.1), p<0.0001 |
| Inpatient length of stay (hours) | 3 months | Electronic hospital databases | 80.2 (95% CI: 45.4-141.7) | 65.0 (95% CI: 42.0-100.5) | Mean difference = -15.3 (95% CI: -68.5-38.0), p=0.323 |
| Net cost associated with intervention | 12 months | Predictions from statistical modelling |  |  | -8,171,671 AUD |
| Feldman et al. (2004) (E20) | Mean number (SD) of home health nursing visits delivered | 90 days | Agency's administrative files and claims database | 14.91 (9.25) | 16.68 (13.68) | p>0.05 (NS) |
| Readmissions to hospital (%) | 90 days | Medicare claims records | 36% | 35% | p=0.107 (NS) |
| ED visits (%) | 90 days | Medicare claims records | 8% | 11% | p=0.117 (NS) |
| Outpatient physician use (%) | 90 days | Medicare claims records | 69% | 71% | p=NS |
| Mortality (% deceased) | 90 days | National death index | 9% | 11% | p=NS |
| Mean overall improvement in Living with Heart Failure Questionnaire score (points) | 90 days | Patient interviews | 12.3 | 10.6 | p=NS |
| Garcia-Gollarte et al. (2014) (E21) | Visits to physician (mean difference between baseline and final) | 3 months (post 6-month int)  | Patient electronic health records (EHRs) and provider billing records | -0.77 | -0.22 | Intervention: p=0.10Control: p=0.281 |
| Visits to nurse (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | -1.46 | -0.55 | Intervention: p=0.000Control: p=0.427 |
| Visits to ED (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | 0.03 | 0.12 | Intervention: p=0.179Control: p=0.022 |
| Days in hospital (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | 0.01 | 0.38 | Intervention: p=0.822Control: p=0.011 |
| Number of falls (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | -0.08 | 0.09 | Intervention: p=0.251Control: p=0.003 |
| Delirium (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | -0.05 | 0.1 | Intervention: P=0.035Control: p=0.01 |
| Number of drugs (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | -4.61 | -3.41 | Intervention: P=0.000Control: p=0.001 |
| Duplicate medications (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | 0.11 | 0.11 | Intervention: p=0.000Control: p=0.006 |
| STOPP criteria (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | -0.41 | 0.41 | Intervention: p=0.000Control: p=0.000 |
| START criteria (mean difference between baseline and final) | 3 months | Patient electronic health records (EHRs) and provider billing records | -0.78 | 0.09 | Intervention: p=0.000Control: p=0.101 |
| Gellis et al. (2014) (E22) | Mean ED visits | 12 months | Agency’s healthcare use database | 0.6 (1.6) | 1.4 (1.2) | p=0.03 |
| Mean hospital days | 12 months | Agency’s healthcare use database | 7.5 (4.3) | 10.5 (6.5) | p=0.06 |
| Mean episodes of care | 12 months | Agency’s healthcare use database | 1.3 (1.0) | 1.8 (1.5) | p=0.10 |
| Mean Hamilton Depression Rating Scale score | 3 months | Patient questionnaire | 9.8 (5.6) | 18.6 (5.7) | p=0.02 |
| Mean Patient Health Questionnaire 9 score | 3 months | Patient questionnaire | 7.4 (5.7) | 13.6 (5.6) | p=0.01 |
| Mean Medical Outcomes Study 12-item Short-Form Survey Mental Component Subscale score | 3 months | Patient questionnaire | 53.6 (21.7) | 42.8 (20.7) | p=0.01 |
| Mean problem solving skills inventory score | 3 months | Patient questionnaire: Social Problem-Solving Inventory—Revised | 14.6 (1.9) | 8.4 (1.7) | p=0.001 |
| Mean overall satisfaction with care rating  | 3 months | Patient questionnaire | 4.4 (1.4) | 4.5 (1.3) | p=0.28 |
| Mean Hamilton Depression Rating Scale score | 6 months | Patient questionnaire | 10.4 (7.1) | 17.4 (6.3) | p=0.05 |
| Mean Patient Health Questionnaire 9 score | 6 months | Patient questionnaire | 7.9 (5.3) | 14.1 (5.9) | p=0.05 |
| Mean Medical Outcomes Study 12-item Short-Form Survey Mental Component Subscale score | 6 months | Patient questionnaire | 52.1 (24.3) | 40.3 (27.4) | p=0.05 |
| Graham et al. (2012) (E23) | 30-day readmissions (%) | 30 days | Medical claims data | 16.5%  | 20.5% | -4.0% absolute reduction, -19.5% relative reductionp<0.0001 |
| Gravelle et al. (2006) (E24) | ED admissions | 6 months | Evercare patient medical records + NHS administrative data |  |  | +16.5% (-5.7 – 38.7)p=0.14 |
| Hospital bed days | 6 months | Evercare patient medical records + NHS administrative data |  |  | +19.0% (-5.3 – 43.2)p=0.13 |
| Mortality | 1-13 months  | Evercare patient medical records + NHS administrative data |  |  | +34.3% (-1.7 – 70.3)p=0.06 |
| Hanna et al. (2016) (E25) | Difference in unplanned hospital admissions (post-int compared to pre-int) for those 65+ | 12 months | Hospital administrative data | -38.6% | -40.7% | p=0.20 |
| Difference in unplanned ED visits (post-int compared to pre-int) for those 65+ | 12 months | Hospital administrative data | -36.7% | -42.3% | p=0.47 |
| Hullick et al. (2016) (E26) | Hospital admission following ED presentation | 9 months | Hospital administrative data |  |  | OR=0.589 (95% CI: 0.427-0.812), p=0.0012 |
| Difference in ED length of stay (minutes) | 9 months | Hospital administrative data |  |  | -45.4602 (95% CI: -92.3731-1.4527), p=0.0575 |
| Kane et al. (2017) (E27) | Mean all-cause hospital admissions (rate per 1000 resident-days) | 11 months | Medicare Provider Analysis and Review file, outpatient claims  | 3.25 (1.26) | 3.42 (1.44) | −0.13 (95% CI: −0.36 - 0.10), p= 0.25 |
| Mean all-cause hospital admissions within 30 days of NH admission (rate per 1000 resident-days) | 11 months | Medicare Provider Analysis and Review file, outpatient claims  | 8.59 (4.90) | 8.93 (4.58) | -0.37 (95% CI: -0.40 – 0.01), p=0.48 |
| Mean all admissions >31 days after NH admission (rate per 1000 resident-days) | 11 months | Medicare Provider Analysis and Review file, outpatient claims  | 1.88 (0.98) | 2.02 (1.27) | -0.09 (95% CI: -0.28 – 0.11), p=0.39 |
| Mean potentially avoidable hospital admissions (rate per 1000 resident-days) | 11 months | Medicare Provider Analysis and Review file, outpatient claims  | 0.94 (0.67) | 0.92 (0.74) | -0.18 (95% CI: -0.30 - -0.04)p=0.01 |
| Mean 30-day readmission rate (per 1000 resident-days) | 11 months | Medicare Provider Analysis and Review file, outpatient claims  | 0.19 (0.16) | 0.21 (0.18) | -0.01 (95% CI: -0.04 – 0.01), p=0.36 |
| Mean ED visits not resulting in admission (rate per 1000 resident-days) | 11 months | Medicare Provider Analysis and Review file, outpatient claims  | 1.93 (1.02) | 2.02 (1.12) | 0.02 (95% CI: -0.17 – 0.22), p=0.83 |
| King et al. (2018) (E28) | Mean hospitalizations | 12 months | Regional electronic records system | 57 (0.06) | 74 (0.14) | Mean difference: 0.08 (95% CI: -0.41 – 0.92), p=0.63 |
| Mean ED presentations | 12 months | Regional electronic records system | 0.11 | 0.13 | Mean difference: 0.02 (95% CI: -1.58 – 5.77) p=0.26 |
| < 3 hospital readmissions in 12 months | 12 months | Regional electronic records system | 3% | 4.6% | Mean difference: 1.6% (95% CI: -0.55 – 4.02) p=0.13 |
| ≥ 3 hospital readmissions in 12 months | 12 months | Regional electronic records system | 2.3% | 1.7% | Mean difference: -0.6% (95% CI: -1.17 – 2.17) p=0.45 |
| Hospital length of stay (days) Mean (SD) | 12 months | Regional electronic records system | 1.1 | 1.8 | Mean difference: 0.7 (95% CI: -0.53 – 1.93) p=0.26 |
| Leung et al. (2015) (E29) | Change from baseline in length of hospital readmission via ED  | 90 days | Patient medical records | -11.62 (17.91) | -4.38 (26.41) | p=0.14 |
| Change from baseline in number of hospital readmissions via ED | 90 days | Patient medical records | -1.41 (1.23) | -0.77 (1.31) | p=0.049 |
| Change from baseline in number of ED visits  | 90 days | Patient medical records | -1.51 (1.25) | -1.08 (1.48) | p=0.29 |
| Change in mean overall modified Quality-of-Life Concerns in the End of Life Questionnaire (mQOLC-E) score | 90 days | Patient questionnaire | +0.60 (0.56) | +0.07 (0.56) | p=0.02 |
| Change in mean physical discomfort score | 90 days | Patient questionnaire | +0.67 (0.92) | +0.20 (0.96) | p=0.17 |
| Change in mean food-related concerns score | 90 days | Patient questionnaire | +0.82 (0.87) | -0.14 (0.95) | p=0.003 |
| Change in mean care and support score | 90 days | Patient questionnaire | +0.43 (0.46) | +0.12 (0.59) | p=0.09 |
| Change in mean negative emotions score | 90 days | Patient questionnaire | +0.73 (0.74) | +0.02 (1.03) | p=0.01 |
| Change in mean emotional distress score | 90 days | Patient questionnaire | +0.72 (1.06) | +0.15 (0.81) | p=0.04 |
| Change in mean value of life score | 90 days | Patient questionnaire | +0.22 (0.85) | -0.01 (0.40) | p=0.23 |
| Mattke et al. (2015) (E30) (Chronic Special Needs Plan int) | Number of hospital admissions  | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Chronic Special Needs Plan | Medicare fee-for-service | -14%p<0.01 |
| Number of hospital admissions  | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Chronic Special Needs Plan | Non-HouseCalls MA  | -1%p>0.10 |
| Number of hospital admissions  | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Chronic Special Needs Plan | Future HouseCalls Chronic Special Needs | -8%p<0.05 |
| Number of ED visits (with and without admission) per 1000 patient-years | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Chronic Special Needs Plan | Medicare fee-for-service | +8p<0.01 |
| Number of ED visits (with and without admission) per 1000 patient-years | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Chronic Special Needs Plan | Non-HouseCalls MA  | +12p<0.01 |
| Number of ED visits (with and without admission) per 1000 patient-years | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Chronic Special Needs Plan | Future HouseCalls Chronic Special Needs | -4p<0.10 |
| Mattke et al. (2015) (E30) (Medicare Advantage (MA) int) | Number of hospital admissions  | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Medicare Advantage | Non-HouseCalls MA | -6%p<0.05 |
| Number of hospital admissions  | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Medicare Advantage | Future HouseCalls MA | +6%p<0.05 |
| Number of ED visits (with or without admission) per 1000 patient-years | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Medicare Advantage | Non-HouseCalls MA | -6p<0.01 |
| Number of ED visits (with or without admission) per 1000 patient-years | 12 months | Medicare Advantage plan administrative data + Medicare fee-for-service claims data | Medicare Advantage | Future HouseCalls MA | +3p>0.10 |
| Mendoza et al. (2009) (E31) | Mortality (%) | 12 months | Patient interview | 5.4% | 8.8% | p=0.67 |
| Re-admission for HF | 12 months | Patient interview | 40.5% | 50% | p=0.42 |
| Combined clinical outcome: mortality, re-admission for heart failure, or another cardiovascular event (stroke, acute coronary syndrome, coronary revascularization) (%) | 12 months | Patient interview | 54.1% | 55.9% | p=0.88 |
| Variation in functional status (Barthel index) | 12 months | Patient interview | 4.0 (-0.9, 8.9) | 4.7 (-2.2, 11.5) | p=0.21 |
| SF-36 physical component  | 12 months | Patient interview | 3.6 (20.5, 7.7) | 2.2 (21.9, 6.4) | p=0.47 |
| SF-36 mental component  | 12 months | Patient interview | 4.0 (20.9; 8.9) | 2.8 (22.4, 8.0) | p=0.38 |
| Mean total cost per patient during follow-up (in Euros) | 12 months | Compensation charged by the Basque Health Service-Osakidetza | 4619 (7679) | 3425 (4948) | p=0.83 |
| Mion et al. (2003) (E32) | Repeat ED visit | 30 days | Patient medical records, patient interview | 20% | 15% | OR=1.2 (95% CI: 0.95 – 2.14) |
| Hospitalization | 30 days | Patient medical records, patient interview | 14% | 14% | OR=0.99 (95% CI: 0.64 – 1.54) |
| Nursing home admission | 30 days | Patient medical records, patient interview | 0.7% | 3% | OR=0.21 (95% CI: 0.05 – 0.99) |
| Mortality | 30 days | Patient medical records | 0.6% | 0.3% | OR=2.00 (95% CI: 0.36 – 11.00) |
| Mean number of days in hospital  | 30 days | Patient medical records, patient interview | 0.36 (1.78) | 0.76 (3.85) | -0.4 (95% CI: 0.1 – 0.9) |
| Mean costs for hospitalizations (USD) | 30 days | Patient medical records | $501 (2349) | %643 (2333) | -$142 (95% CI: -502 – 219)p=NS |
| Repeat ED visit | 120 days | Patient medical records, patient interview | 37% | 40% | OR=0.9 (95% CI: 0.66 – 1.24) |
| Hospitalization | 120 days | Patient medical records, patient interview | 28% | 27% | OR=1.05 (95% CI: 0.75 – 1.49) |
| Nursing home | 120 days | Patient medical records, patient interview | 2% | 4% | OR=0.40 (95% CI: 0.14 – 1.15) |
| Mortality | 120 days | Patient medical records | 1% | 2% | OR=0.89 (95% CI: 0.36 – 2.72) |
| Mean number of days in hospital  | 120 days | Patient medical records, patient interview | 1.37 (5.11) | 1.69 (6.22) | -0.3 (95% CI: -0.6 –1.2) |
| Mean costs for hospitalizations (USD) | 120 days | Patient medical records | $1592 (4809) | $1865 (6831) | -$272 (-1182 – 637)p=NS |
| Mogensen et al. (2018) (E33) | Admission within 7 days | 3 months | Regional electronic records system and patient medical records  | Community model: 24% | Hospital model: 45% | OR=2.7 (95% CI: 1.3-5.8) p=0.01 |
| Admission within 14 days | 3 months | Regional electronic records system and patient medical records | Community model: 25% | Hospital model: 46% | OR=2.7 (95% CI: 1.3-5.7) p=0.01 |
| Admission within 21 days | 3 months | Regional electronic records system and patient medical records | Community model: 28% | Hospital model: 48% | OR=2.4 (95% CI: 1.2-5.1) p=0.02 |
| Admission within 30 days | 3 months | Regional electronic records system and patient medical records | Community model: 31% | Hospital model: 52% | OR=2.1 (95% CI: 1.0-4.3) p=0.04 |
| Admission within 90 days | 3 months | Regional electronic records system and patient medical records | Community model: 49% | Hospital model: 58% | OR=1.4 (95% CI: 0.7-2.9) p=0.30 |
| Death within 30 days | 3 months | Regional electronic records system and patient medical records | Community model: 7% | Hospital model: 11% | OR=1.6 (95% CI: 0.4-5.9) p=0.48 |
| Montgomery & Fallis (2003) (E34) | Days before initial assessment | 3 months | Administrative data (control patients); Home care services files (intervention patients) | 2.2 | 12.1 | p<0.0001 |
| Mean number of over-the-counter medications | 3 months | Administrative data (control patients); Home care services files (intervention patients) | 4.3 | 2.6 | p<0.0001 |
| Mean number of prescribed medications | 3 months | Administrative data (control patients); Home care services files (intervention patients) | 2.3 | 0.7 | p<0.0001 |
| Utilization of geriatric day-hospital | 3 months | Administrative data (control patients); Home care services files (intervention patients) | 50% | 19% | p>0.0001 |
| General hospital services use (days) | 3 months | Administrative data (control patients); Home care services files (intervention patients) | 388 | 927 | NR |
| Proportion designated to LTC  | 6 months | Administrative data (control patients); Home care services files (intervention patients) | 9% | 23% | p=0.032 |
| Morcillo et al. (2005) (E35) | Mean ED visits | 6 months | Telephone interview with patient or patient’s family, medical records | 0.21 (0.41) | 1.33 (1.21) | p<0.001 |
| Mean hospital admissions | 6 months | Telephone interview with patient or patient’s family, medical records | 0.09 (0.29) | 0.94 (0.98) | p<0.001 |
| Navratil-Strawn et al. (2014) (E36) | Change from baseline in ER visits (per 1000 patients) | 12 months | Medical claims data | -1299 | -1121 | Incremental difference: -178, p=0.033 |
| Change from baseline in physician office visits (per 1000 patients) | 12 months | Medical claims data | -1114 | -2011 | Incremental difference: +897, p<0.001 |
| Change from baseline in hospital admissions (per 1000 patients) | 12 months | Medical claims data | -234 | -181 | Incremental difference: -53, p=0.002 |
| Total costs (per member per month) | 12 months | Medical claims data | -$677 | -$637 | p=0.502 |
| Ong et al. (2018) (E37) | Number of ED visits | 6 months | Electronic medical records | Median 0 (IQR: 0-1) | Median 0 (IQR: 0-1) | p=0.881 |
| Number of hospital admissions | 6 months | Electronic medical records | Median 0 (IQR: 0-1) | Median 0 (IQR: 0-1) | p=0.545 |
| Total length of stay (for admitted patients) | 6 months | Electronic medical records | Median 8 (IQR: 4-14) | Median 15 (IQR: 3-25) | p=0.045 |
| Self-reported confidence | 6 months | Questionnaire  | Confidence scale score: 7 (IQR:6-8) | Confidence scale score: 6 (IQR:5-7) | p=0.126 |
| Quality of life (EQ5D) – Health State | 6 months | Questionnaire | Median 70 (IQR: 60-80) | Median 60 (IQR: 50-70) | p=0.008 |
| Mortality | 6 months | Electronic medical records | 2.8% | 0% | p=0.112 |
| Patel et al. (2009) (E38) | Medication use (inhaled corticosteroid) | 12 months | Medical records/patient questionnaire | +32%(p=0.05) | +8%(p=0.76) | NR |
| Minimum 1 ED visit | 12 months | Medical records/patient questionnaire | -44% (P=0.004) | -8.6% (P=0.76) | NR |
| Use of an asthma action plan | 12 months | Medical records/patient questionnaire | +64%(p<0.0001) | +17%(p=0.23) | NR |
| Reidt et al. (2016) (E39) | Hospitalization rate | 30 days | Hospital electronic health records |  |  | OR=0.47 (95% CI: 0.21–1.0) |
| Rate of ED visits | 30 days | Hospital electronic health records |  |  | OR=0.46 (95% CI: 0.22–0.97) |
| Ricauda et al. (2004) (E40) | Mortality (cumulative proportion of cases surviving) | 6 months | Patient medical charts | 0.65 | 0.60 | Log-rank test p=0.53 Wilcoxon test p=0.49 |
| Rosenzweig et al. (2010) (E41) | Change from baseline in all-cause hospital admissions (per member per year) | 12 months | Medical claims data | -0.255 | -0.055 | p<0.05 |
| Change from baseline in diabetes-related hospital admissions (per member per year) | 12 months | Medical claims data | -0.272 | -0.009 | p<0.05 |
| Change from baseline in all-cause ED visits (per member per year) | 12 months | Medical claims data | -0.085 | +0.148 | p=0.18 |
| Change from baseline in diabetes-related ED visits (per member per year) | 12 months | Medical claims data | -0.002 | +0.076 | p=0.23 |
| Change from baseline in all-cause medical costs (per member per year) | 12 months | Medical claims data | -$984.87 | +$4,547.06 | p<0.05 |
| Rosted et al. (2013) (E42) | Readmitted to hospital | 30 days | Hospital administrative database | 16% | 14% | p=0.57 |
| Admitted to nursing home | 30 days | Hospital administrative database | 1% | 0% | p=0.57 |
| Mortality | 30 days | Hospital administrative database | 2% | 1% | p=0.38 |
| Readmitted to hospital | 180 days | Hospital administrative database | 37% | 39% | p=0.79 |
| Admitted to nursing home | 180 days | Hospital administrative database | 4% | 5% | p=0.66 |
| Mortality | 180 days | Hospital administrative database | 9% | 7% | p=0.49 |
| Sandberg et al. (2015) (E43) | ED visits (not leading to hospitalization) | 6 months | Patient administrative registers | 0.08 (0.27) | 0.37 (1.18) | p=0.041 |
| Outpatient physician visits | 6 months | Patient administrative registers | 4.09 (2.63) | 5.29 (4.45) | p=0.047 |
| Schraeder et al. (2008) (E44) | Any hospital admission | 36 months | Health plan administrative claims data, patient questionnaire |  |  | OR=0.93 (95% CI: 0.67 – 1.30), p=0.683 |
| 2 or more hospital admissions | 36 months | Health plan administrative claims data, patient questionnaire |  |  | OR=0.66 (95% CI: 0.45 – 0.97), p=0.032 |
| Mean hospitalizations (for service users only) | 36 months | Health plan administrative claims data, patient questionnaire |  |  | *B*= -0.54 (95% CI: -0.89 – 0.20), p=0.002 |
| Mean hospital bed days (for service users only) | 36 months | Health plan administrative claims data, patient questionnaire |  |  | *B*= -5.25 (95% CI: -8.23 – 2.27), p=0.001 |
| Any ED visit not resulting in hospitalization | 36 months | Health plan administrative claims data, patient questionnaire |  |  | OR=1.39 (95% CI: 0.87 – 2.25), p=0.173 |
| Mean ED visits (for service users only) | 36 months | Health plan administrative claims data, patient questionnaire |  |  | *B*= -0.32 (95% CI: -0.81 – 0.18), p=0.205 |
| Cost of care (per patient per month, USD) | 36 months | Health plan administrative claims data |  |  | *B*= -$106 (95% CI: -$138 – $75), p=0.253 |
| Schwarz et al. (2008) (E45) | Mean hospital readmission | 90 days | Medical records, computerized chart review | 0.32 (0.6) | 0.33 (0.6) | p=0.90 |
| Mean ED visits | 90 days | Medical records, computerized chart review | 0.34 (0.6) | 0.38 (0.5) | p=0.73 |
| Mean costs of care (USD) | 90 days | Medical records, computerized chart review | $12,017.99 (29,405.65) | $6,673.29 (10,258.28) | p=0.28 |
| Shah et al. (2015) (E46) | Rate of ED visits for ambulatory care sensitive conditions (% change per year) | 12 months | Medical records, practice billing data | -34.0 % (95%CI: -1.8 – -55.4) | +1.2% (95%CI: -10.5 – +14.3) | p=0.0622 |
| Sommers et al. (2000) (E47) | Change in rate of hospital admissions per patient per year | 12 months | Medical records, Health Care Financing Administration's National Claims History Database, Medicare HMOs | -0.02 | +0.18 | OR=0.63 (95% CI: 0.41 – 0.96), p=0.03 |
| Change in rate of patients with >1 60-day readmission | 12 months | Medical records, Health Care Financing Administration's National Claims History Database, Medicare HMOs | -2.0 | +5.4 | OR=0.26 (95% CI:0.08 – 0.84), p=0.03 |
| Change in rate of mean office visits | 12 months | Medical records, Health Care Financing Administration's National Claims History Database, Medicare HMOs | -1.5 | +0.5 | p=0.003 |
| Change in rate of patients with >1 ED visit | 12 months | Medical records, Health Care Financing Administration's National Claims History Database | +1.2 | -0.22 | p=0.77 |
| Change in rate of patients with >1 SNF admission | 12 months | Medical records, Health Care Financing Administration's National Claims History Database | +5.0 | +5.4 | p=0.59 |
| Change in rate of patients with >1 home care visit | 12 months | Medical records, Health Care Financing Administration's National Claims History Database | +1.8 | +2.6 | p=0.81 |
| Tibaldi et al. (2009) (E49) | Mortality | 6 months | Patient medical records | 15% | 15% | p=0.83 |
| Tibaldi et al. (2013) (E48) | Hospital readmission | 1 month | Medical records | NR | NR | No difference (p<0.05) |
| Mortality | 1 month | Medical records | NR | NR | No difference (p<0.05) |
| Caregiver stress | 1 month | Questionnaire | NR | NR | p=0.017 |
| Tinetti et al. (2012) (E50) | Hospital readmissions (matched pairs) | 18 months | Outcome and Assessment Information Set version B | 13.2% | 17.6% | OR=0.68 (95% CI: 0.43 – 1.08), p=0.10  |
| Hospital readmissions (unmatched analysis) | 18 months | Outcome and Assessment Information Set version B | 12.9% | 17.2% | OR=0.71 (95% CI: 0.47 – 1.06), p=0.09 |
| Mean length of home care episode (days) | 18 months | Outcome and Assessment Information Set version B | 20.3 (14.8) | 29.1 (31.7) | p<0.001 |
| Westberg et al. (2014) (E51) | Mean hospital readmissions  | 6 months | Patient electronic health records (EHRs) and provider billing records | 0.34 (0.79) | 0.34 (0.73) | p=0.728 |
| Mean ED visits | 6 months | Patient electronic health records (EHRs) and provider billing records | 0.44 (1.03) | 0.41 (0.94) | p=0.641 |
| Yim et al. (2011) (E52) | Institutionalization  | 6 months | Medical Records | 0.9% | 1.1% | p=0.791 |
| Early return or frequent ED visits | 6 months | Medical Records | 19.5% | 18.7% | p=0.724 |
| Admission to acute general care hospital | 6 months | Medical Records | 31.1% | 27.1% | p=0.771 |
| Number of deaths | 6 months | Medical Records | 12/637 (1.9%) | 12/642 (1.9%) | p=0.985 |
| Zintchouk et al. (2018) (E53) | Number of hospitalizations or ED visits in the 90 days following admission to the rehabilitation unit | 90 days | National administrative data  | 166 | 153 | IRR: 1.2 (95% CI: 0.8-1.8), p=0.5 |
| Mortality rate | 30 days | National administrative data | 5.4% | 7.1% | HR: 0.49 (95% CI: 0.15–1.63), p=0.25 |
| Mortality rate | 90 days | National administrative data | 8.1% | 9.3% | HR: 0.87 (95% CI: 0.43–1.7), p=0.68 |
| Days in hospital | 90 days | National administrative data | Median: 0 (IQR: 0-3) | Median: 0 (IQR: 0-2) | p=0.18 |
| Ambulatory contacts | 90 days | National administrative data | 244 | 255 | IRR: 0.9 (95% CI: 0.7-1.2), p=0.7 |
| GP contacts | 90 days | National administrative data | NR | NR | p=NS |
| Activities of Daily Living (ADL) | 90 days | Questionnaire | 128 of 156 improved | 114 of 147 improved | OR: 1.32 (95% CI: 0.75–2.32), p=0.33 |
| Overall Quality of Life (OQoL) | 90 days | Questionnaire | 78 of 117 improved | 64 of 110 improved | OR: 1.44 (95% CI: 0.84–2.47), p=0.19 |

Note: When outcome indicated as mean, results written as ‘Mean (SD)’ unless otherwise indicated.

Appendix 7a. Detailed Assessment of Study Quality – RCTs and Cluster-RCTs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Allocation concealment | Adequate follow-up/outcome ascertainment | Blinding of outcome assessment | Group similarity at baseline | Intention-to-treat analysis |
| RCT |  |  |  |  |  |
| Aguado et al., 2010 (E1) | Unclear | No | Yes | Unclear | Unclear |
| Arendts et al., 2018 (E2) | Yes | Yes | Yes | Yes | Yes |
| Bellantonio et al., 2008 (E4) | Unclear | Unclear | Yes | Yes | Unclear |
| Berg et al., 2008 (E5) | Yes | Unclear | Yes | Yes | Unclear |
| Bernabei et al., 1998 (E6) | Yes | Yes | Yes | Yes | Yes |
| Briggs et al., 2015 (E12) | Yes | Yes | Yes | Yes | Unclear |
| Caplan et al., 2004 (E13) | Yes | No | Yes | Yes | Unclear |
| Counsell et al., 2007 (E15) | Yes | Yes | Yes | Yes | Yes |
| Courtney et al., 2009 (E16) | Yes | Yes | Yes | Yes | Unclear |
| Dorr et al., 2008 (E18) | No | Yes | Yes | Unclear | Yes |
| Gellis et al., 2014 (E22) | Yes | Yes | Yes | Yes | Unclear |
| Mendoza et al., 2009 (E31) | Yes | Yes | Yes | Yes | Unclear |
| Mion et al., 2003 (E32) | Yes | Yes | Yes | Yes | Unclear |
| Mogensen et al., 2018 (E33) | Yes | Yes | Yes | Yes | Yes |
| Montgomery & Fallis, 2003 (E34) | Unclear | No | Yes | Yes | Unclear |
| Morcillo et al., 2005 (E35) | Yes | No | Yes | Yes | Unclear |
| Ong et al., 2018 (E37) | Yes | Yes | Yes | Yes | Unclear |
| Patel et al., 2009 (E38) | Unclear | Yes | Yes | Yes | Unclear |
| Ricauda et al., 2004 (E40) | Yes | No | Yes | Yes | Unclear |
| Rosted et al., 2013 (E42) | Yes | No | Yes | Yes | Unclear |
| Sandberg et al., 2015 (E43) | Yes | Yes | Yes | Yes | Unclear |
| Schwarz et al., 2008 (E45) | Unclear | Yes | Yes | Unclear | Unclear |
| Sommers et al., 2000 (E47) | Yes | Yes | Yes | Unclear | Yes |
| Tibaldi et al., 2009 (E49) | Yes | Yes | Yes | Yes | Yes |
| Tibaldi et al., 2013 (E48) | Yes | Yes | No | Yes | Yes |
| Yim et al., 2011 (E52) | Unclear | Yes | Yes | No | Yes |
| Zintchouk et al., 2018 (E53) | No | Yes | Yes | Yes | Yes |
| Cluster-RCT |  |  |  |  |  |
| Arendts et al., 2018 (E3) | Yes | Yes | No | No | Unclear |
| Bondestam et al., 1995 (E7)  | No | No | Yes | Unclear | Yes |
| Boult et al., 2011 (E9) | Yes | Unclear | Yes | Yes | Yes |
| Brand et al., 2004 (E11) | No | Yes | Yes | Unclear | Unclear |
| Feldman et al., 2004 (E20) | Unclear | No | Yes | Yes | Yes |
| Garcia-Gollarte et al., 2014 (E21) | Yes | No | Yes | Yes | Yes |
| Kane et al., 2017 (E27) | Yes | Yes | Yes | Yes | Yes |

Appendix 7b. Detailed Assessment of Study Quality – CBAs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Allocation concealment | Adequate follow-up/outcome ascertainment | Blinding of outcome assessment | Group similarity at baseline | Characteristics of study and control providers are reported and similar |
| CBA |  |  |  |  |  |
| Boult et al., 1994 (E8) | No | Yes | No | Yes | No |
| Boyd et al., 1996 (E10) | Yes | Unclear | Yes | Yes | Yes |
| Connolly et al., 2018 (E14) | No | Yes | No | No | No |
| Diaz-Gegundez et al., 2011 (E17) | Unclear | Unclear | Unclear | Unclear | Yes |
| Fan et al., 2018 (E19) | No | Yes | No | Yes | Yes |
| Graham et al., 2012 (E23) | Yes | Yes | Yes | Unclear | Yes |
| Gravelle et al., 2006 (E24) | Yes | Unclear | Yes | No | Unclear |
| Hanna et al., 2016 (E25) | Unclear | Unclear | Yes | Yes | Unclear |
| Hullick et al., 2016 (E26) | Yes | Unclear | Yes | Yes | Yes |
| King et al., 2018 (E28) | No | Yes | No | Yes | Yes |
| Leung et al., 2015 (E29) | Yes | No | Yes | Yes | Yes |
| Mattke et al., 2015 (E30) | Unclear | Unclear | Yes | Yes | No |
| Navratil-Strawn et al., 2014 (E36) | Unclear | Yes | Yes | Unclear | No |
| Reidt et al., 2016 (E39) | Yes | Unclear | Yes | Yes | Yes |
| Rosenzweig et al., 2010 (E41) | Unclear | Unclear | Yes | Yes | No |
| Schraeder et al., 2008 (E44) | Yes | Unclear | Yes | Unclear | Unclear |
| Shah et al., 2015 (E46) | Yes | Unclear | Yes | Unclear | Yes |
| Tinetti et al., 2012 (E50) | Yes | Unclear | Yes | Yes | Yes |
| Westberg et al., 2014 (E51) | Yes | Unclear | Yes | Unclear | Yes |

Appendix 8. Description of Multidisciplinary Teams

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of professions within a multidisciplinary team** | **Number of Studies** | **Specific Professions** | **Study** |
| 5 professions | 5 | Geriatrician, APN, Physiotherapist, SW, Dietician | Bellantonio et al., 2008 (E4) |
| PCP, Case Manager, Community Geriatric Evaluation Unit [Geriatrician, RNs, SW] | Bernabei et al., 1998 (E6) |
| Gerontology Nurse Specialist, RN, Resident’s GP, Geriatrician, Pharmacist | Connolly et al., 2018 (E14) |
| Geriatrician, APN, Physiotherapist, SW, Counsellor | Tibaldi et al., 2013 (E48)Tibaldi et al., 2009 (E49) |
| 4 professions | 5 | Geriatrician, RNs, Physiotherapists, Occupational Therapists | Caplan et al., 2004 (E13) |
| Geriatrician, PCP, APN, SW | Counsell et al., 2007 (E15) |
| RNs, Residential aged care facility staff, MD, other health professionals (e.g. Geriatrician) | Fan et al., 2018 (E19) |
| ED MD, APN/NP, RN, ED SW | Mion et al., 2003 (E32) |
| RNs, Physiotherapists, Occupational Therapists, Home Health Aide staff | Tinetti et al., 2012 (E50) |
| 3 professions | 8 | RNs, PCPs, PC staff | Boult et al., 2011 (E9)Diaz-Gegundez et al., 2011 (E17) |
| Geriatrician, Home Care Coordinator, hospital team members | Montgomery & Fallis, 2003 (E34) |
| Geriatrician, NP, Pharmacist | Reidt et al., 2016 (E39) |
| PCP, RN, PT | Ricauda et al., 2004 (E40) |
| PCP, RN, SW | Sommers et al., 2000 (E47) |
| RNs, MDs, caregiver | Leung et al., 2015 (E29) |
| MD (geriatric fellow), RN, SW | Boult et al., 1994 (E8) |
| Not Specified | 1 | RN, allied health professionals | Arendts et al., 2018 (E2) |

Abbreviations:

APN: Advanced Practice Nurse; ED: Emergency Department; MD: Medical Doctor (Doctor of Medicine); NP: Nurse Practitioner; PC: Primary Care; PCP: Primary Care Physician; PT: Physical Therapist; RN: Registered Nurse; SW: Social Worker