Appendix 5: Detail of included studies

Paramedic/ECP) interventions (n=3)

Author Year Country	Study	Participants	Intervention	Control	Outcomes assessed	Results
Mason **2007** **UK**	**Cluster RCT by service** **56 clusters** **Intervention:** paramedic practitioner service n=1469 **Control:** Inactive paramedic practitioner service n=1549	**Inclusion criteria:** Patients aged ≥60yrs recruited from 1 Sep 2003- 26 Sep 2004. Call originated from a Sheffield postcode between 8am-8pm, with a presenting complaint that fell within the scope of practice of the paramedic practitioners. **Exclusion criteria:** **None given** 'If patients were unable to complete questionnaires e.g. because of cognitive impairment or who were unable to read English—we obtained consent for follow-up by review of clinical records only. **Baseline characteristics of participants** Intervention vs. control **Mean age (SD)** 82.6(8.3) vs. 82.5(8.3) yrs **Women %** 72 vs.73% **Living in on own home %** 78vs.78 % **Presenting complaint %** Fall 88 vs.89% Haemorrhage 6 vs.5% Acute medical condition 6vs.5%	A paramedic practitioner based in the ambulance control room identified eligible calls by the presenting complaint and notified a paramedic practitioner. All identified patients were approached face to face either in the community or in ED for written consent to follow-up. Patients who had more than one eligible episode were recruited only once. The research team independently checked the ambulance service call database at the end of each month for any additional eligible calls not identified These were checked for selection bias but not followed up. Scope of practice of paramedic practitioners: Falls, Lacerations, Epistaxis, Minor burns, Foreign body in ear, nose, or throat, Local anaesthetic techniques, Wound care and suturing techniques, Principles of dressings and splintage, Joint examination, Examination of neurological, cardiovascular, and respiratory system, Examination of ear, nose, and throat, Protocol led dispensing: simple analgesia, antibiotics, tetanus toxoid, Assessment of mobility and social needs, Additional options for referral and requesting investigations, Requests for radiography, Referral processes: emergency department, general practitioner, district nurse, community social services	A paramedic practitioner based in the ambulance control room identified eligible calls by the presenting complaint and notified a paramedic practitioner in the ED Procedure continued as for intervention	**Relevant measures & outcomes** Primary outcomes ***ED attendance*** ***Hospital admissions within 28 days*** ***Time of call to time of discharge*** ***Patient satisfaction survey including the EQ-5D*** Secondary outcomes ***Subsequent unplanned contact with secondary care at 28 days*** ***Mortality at 28 days***	Intervention vs. control Primary outcomes ***ED attendance (28 days)*** **970 (62.6%) vs. 1286 (87.5%)** **p<0.001** ***Hospital admissions (28 days)*** **626 (40.4%) vs. 683 (46.5%)** **p<0.001** ***Mean Time of call (SD) to time of discharge in mins*** **235.1(183.3) vs. 277.8(182.6)** **p<0.001** ***Patient satisfaction survey including the EQ-5D*** **Very satisfied with care 656 (85.5%)vs.528 (73.8%)** **p<0.001** Secondary outcomes ***Subsequent unplanned contact with secondary care*** **330(21.3%) vs. 259 (17.6%)** **p<0.01** ***Mortality at 28days*** 68(4.4%) vs.74(5%) p=0.41

Author Year Country	Study	Participants	Intervention	Control	Outcomes assessed	Results
Gray **2008** **UK**	**COS with historical controls** **Intervention:** Emergency care practitioner **(ECP)** intervention n=233 **Control:** Historical control group from ED n=772	The study included two groups of patients a) those with breathing difficulties & b) elderly patients >65yrs with a fall. The latter only is reported here. **Inclusion criteria:** Elderly patients >65yrs with a fall. **Exclusion criteria:** None given **Baseline characteristics of participants** None given	**Outline of intervention** Jan-April 2006 inclusive, all the patients seen by the ECP service who had rung 999 and were an elderly patient (>65yrs) with a fall were reviewed. Each patient seen by an ECP was searched for in the hospital records for ED attendance or admissions in 72 h and 28 days following attendance by an ECP	**Outline of control** Comparison data taken Jan- April 2005 inclusive for attendances to same ED for patients with the same criteria as above & seen by non-ECP ambulance service personnel. These dates were chosen because, during this time, the ECP service was not tasked to patients with breathing difficulties and Yorkshire Ambulance Service had only 12 operational ECPs during this comparison period compared with 24 whole-time equivalent operational ECPs during the study period	**Relevant measures & outcomes** Outcome on initial contact: ***Treated at and stayed home*** ***ED and or admitted*** At 72hrs & 28 days ***At home*** ***ED attendance*** ***Admission*** **Costs** None	**ECP vs. ED** Outcome on initial contact: ***Stayed at home (PC referral)/went home*** 171 vs. 369 (73% vs. 48% avoidable admission rate) **At 72hr:** 21/171 (intervention grp) attended ED and or were admitted **At 28 days:** A further 19 (intervention grp) attended ED and or were admitted Avoidable admission rate (intervention grp) at 28 days was 56% (17% better) compared to control group $p<0.05$

Author Year Country	Study	Participants	Intervention	Control	Outcomes assessed	Results
Mason **2012** **UK**	**COS** **Intervention:** Five teams of Emergency Care Practitioners (ECP) n= 256 for care home cohort **Control:** Five usual care providers n=201 for care home cohort	**Inclusion criteria:** Informed consent was obtained from all study participants prior to recruitment. Within each pair of services all patients presenting with emergency or urgent complaints that were eligible to be seen by ECPs and presented to either the intervention or the control services between May 2006 and August 2007 were included in the trial. **Exclusion criteria:** No detail **Baseline characteristics of participants** (no stats given) Care home cohort Intervention vs. control **Mean age** 83.5(10.40 vs. 84.5(8.5) yrs **% Female** 68 vs.66% **Clinical complaint %** Adult medical 30 vs.41 % Adult trauma 46 vs.13 % Elderly falls 23vs.46%	**Outline of intervention** No detail	**Outline of control** No detail	**Relevant measures & outcomes** Using paired services Primary outcomes ***% of patients Discharged following consultation with no further follow up by any health professional*** ***Urgently referred to hospital (both ED or direct admission)*** ***Non-urgently referred to GP or community care*** Secondary outcomes (relevant ones only) ***Episode time from first contact to discharge***	***Discharged with no further follow up by any health professional*** 49.2 vs.12.4% MD 36.8% (95% CI 26.7,46.8) ***Urgently referred to hospital (both ED or direct admission)*** 22.7 vs. 87.6% MD -64.9% (95% CI -71.8 ,.-58.0) ***Non-urgently referred to GP or community care*** 28.1vs. 0% 28.1% (22.6,33.7) ***Episode time from first contact to discharge median in mins (IQR)*** 60 (40,80) vs. 39 (29,58) Time ratio 1.36 (1.24,1.49)

ED Interventions (n=3)

Author Year **Country**	**Study**	**Participants**	**Intervention**	**Control**	**Outcomes assessed**	**Results**
Sun **2014** **USA**	**RCT** **Intervention:** ED observation syncope protocol n=62 **Control:** Normal In-patient admission n=62	**Inclusion criteria:** Patients aged≥ 50 years or older diagnosed with intermediate syncope. **Exclusion criteria** Patients with a serious condition: symptomatic arrhythmias, myocardial infarction, pulmonary embolism, acute pulmonary edema, stroke, severe anaemia or blood loss requiring blood transfusion, sepsis, and major traumatic injury. Also: seizure, head trauma, or intoxication as reason for loss of consciousness; new/ baseline cognitive impairment; do-not-resuscitate or do-not-intubate status; active chemotherapy and inability to speak either English/Spanish. Met high risk criteria. **Baseline characteristics of participants** Observation vs. control Mean(SD) or% **Mean age** 65 (11) vs. 64(11) **% Female** 53 vs. 48 **Syncope index complaint (vs near syncope)** 74vs. 61% **Congestive heart failure** 2vs. 3% **Coronary artery disease** 13vs.8% **Arrhythmia** 8vs.6% **Syncope in previous yr** 16vs.21% **Quality of well-being scale** 0.55(0.15) vs. 0.55(0.14) **Syncope functional status** 29((25) vs.25(26) **Syncope risk score** 0.76 (0.840 vs.0.76 (0.67)	**Outline of intervention** Patients received continuous cardiac monitoring ≥ 12hrs. ≤2 serial cardiac troponin tests approx. 6 hours apart to exclude acute MI. Rest echocardiogram for patients with cardiac murmur, if not performed in previous 6mths. Additional testing as required. Maximum stay in observation unit could not be more than 24hrs. Observation protocol patients who received a diagnosis detailed in exclusion list or had pending tests at 24hrs were admitted **High Risk Criteria** Serious condition identified in the ED, History of ventricular arrhythmia, Cardiac device with dysfunction, Exertional syncope, Presentation concerning for acute coronary syndrome, Severe cardiac valve disease (e.g., aortic stenosis <1 cm2), Known cardiac ejection faction <40% Electrocardiogram findings of QTc>500 mS,pre-excitation, non-sustained ventricular tachycardia, Emergency physician judgment **Intermediate Risk Criteria** No high risk features **AND** No low risk features **AND** Clinical judgment by emergency physician that patient requires further diagnostic evaluation **Low Risk** Symptoms consistent with orthostatic or vasovagal syncope**,** Emergency physician judgment that no further diagnostic evaluation is needed.	**Outline of control** The syncope protocol was not used. Contamination between groups was minimized by being managed in distinct physical spaces by different clinical services. **Intervention delivered by:** No detail	**Relevant measures & outcomes** Primary outcomes ***Inpatient admission rates*** ***Hospital LOS at indexed visit*** Secondary outcomes ***30 day and 6mth serious events*** ***Index and 30 day hospital costs*** ***30 days changes in QoL*** ***30 day patient satisfaction***	***Observation vs. s care*** ***Inpatient admission rates*** **9 (15%) vs. 57 (92%)** **Relative rate 0.16 (95%CI 0.09,0.29, p<0.001)** ***Hospital LOS at indexed visit*** **mean SD (hrs) 29 (15) vs. 47hrs (34) (p<0.001)** ***Serious events*** ***During hospital visit*** Death 0 vs. 0 Arrhythmia 2 vs. 2 Pacemaker insertion 1vs.1 Syncope with bone fracture 2 vs.1 30 days recurrent syncope 1 vs 1 30 day serious outcomes after discharge 2 vs. 0 6mth serious outcomes after hospital discharge 4 vs.5 ***Costs $ (SD)*** At index visit 1,400(1,220) vs.2,420(3,930) Within 30 days 1,800(2,150) vs.2,520(3,980) ***Change in quality of life*** mean SD 0 (0.2) vs. 0.03 (0.18) ***Change in syncope functional status*** -7.6(20.1) vs.-2.4(26.3) ***Patient satisfaction*** 8.9(1.40 vs.9.3(0.9)

Author Year Country	Study	Participants	Intervention	Control	Outcomes assessed	Results
Benaiges **2014** **Spain**	**COS** **Intervention:** 'Day hospital' (DH) n=64 **Control:** Conventional hospitalisation (CH) n=36	**Inclusion criteria:** Patients with sustained hyperglycemia (>300 mg/dL) for at least 3 days with or without ketosis **Exclusion criteria** Ketoacidosis (venous pH <7.31 and/or HCO3 <22 mEq), hyperosmolar crisis (glycemia >600 mg/dL and effective plasma osmolarity >320 mOsm/L), unstable hemodynamic status or need for ventilatory support, severe precipitating factors such as acute myocardial infarction, stroke, sepsis, social deprivation, and dependence for four or more activities of daily living (Katz index >D). **Baseline characteristics of participants** **(Stats shown if signif)** DH vs.CH **Age** 80.3(4.8)vs. 80.6(4.6)yrs **Female** 67 vs. 56% **BMI** 26.1(4.9)vs.25.5(5.1) **Katz A&B** 72.2vs.72.2% **Charlson Index** 3.2(2.0)vs. 3.3(1.7) **Family support** 88.1 vs.97.1% **Diabetes duration** 14.4 (8.0) vs. 97.1 yrs Plus other specific diabetes measures	**Outline of intervention** Patients assigned to DH if admitted to hospital within DH opening hours (week days 8 am -4 pm); otherwise they were treated in ED and subsequently hospitalized. After initial treatment of hyperglycemic crisis DH patients were scheduled for follow-up visits at 24, 72 hours, and 7 days to adjust treatment and to complete their diabetes education Patients were treated with same protocol for both DH and CH: this included initial evaluation with a blood test, urinalysis, chest radiograph to rule out underlying infectious disease, and hourly measurement of glycemia and ketonemia. Treatment included hydration as required, an insulin regimen with insulin, and oral carbohydrate intake if glucose levels were less than 250 mg/dL with persistent ketosis. If infection was diagnosed, treatment was initiated. Diabetes education was delivered by specialist diabetes nurse with specific attention paid to dietary advice, physical activity, and recognition of hypoglycemia. Measurement of glycated hemoglobin (HbA1c) and clinical evaluation was scheduled for 3 & 6 mths for patients in both groups	**Outline of control** At hospital discharge, CH patients were scheduled for a one-week follow-up visit in outpatient clinic. **Intervention delivered by:** Unclear but normal outpatient staff	**Relevant measures & outcomes** (no distinguishing between primary and secondary outcomes) At 3 mth follow up ***[No. of mild or severe hypoglycemic episodes]*** ***Readmissions for diabetes or unrelated cause*** ***[Nosocomial complications]*** ***No. of outpatient visits*** ***No. of ER visits*** [outcomes] not detailed as not relevant to our question ***Costs*** ***Initial care*** ***Complementary examinations*** ***Pharmacy*** ***Outpatient visits*** ***Readmissions*** ***Total*** In euros	Mean (SD) DH vs.CH **Readmissions for diabetes (%)** **1(1.6)vs. 5 (13.9)** **P=0.04** Readmission for any cause (%) 4(6.3)vs.7(19.4) p=0.085 **No. of outpatient visits (SE?)** **5.0(2.2)vs. 2.5(2.0)** **p=0.012** No. of ER visits (SE?)? 0.2(0.6)vs.0.2(0.4) P=0.59 **Costs** **Initial care** **580.2(489.1) vs. 2,013.6(790.4) p<0.001** **Complementary examinations** **123.7(276.3) vs. 281.3(188.1) p=0.007** Pharmacy 12.8(95.6)vs. 20.3(24.8) P=0.676 Outpatient visits **116.7(75.3) vs. 56.9(105.7) p=0.003** **Readmissions (total)** **340.8(1190)vs.288.3(916.8)p=0.835** **Total** **1,345.1(793.6) vs. 2,212.4(982.5) p<0.001**

Author Year Country	Study	Participants	Intervention	Control	Outcomes assessed	Results
Salvi **2008** **Italy**	**COS** **(secondary analysis)** **Intervention:** Geriatric ED (GED) n=100 **Control:** Conventional ED (CED) n=100	**Inclusion criteria:** Patients aged ≥ 65yrs were enrolled in June 2006 from the GED and July 2006 from the CED taking care that none presenting to the ED in the course of the study period was recruited again. **Exclusion criteria** Cognitive impairment (a score of ≥5 on the Short Portable Mental Status Questionnaire SPMSQ) and no proxy, Those too ill to respond, Trauma patients **Baseline characteristics of participants** CED vs GED Mean(SD) **Age 78.1(7) vs.82.5(7.20 p<0.001** **Female 47 vs. 68% p<0.001** **Married 70 vs. 40% p<0.001** Living alone 12 vs 14 **Triage code** Urgent/semi-urgent (2/3) 97 vs.90 % Charlson Index 3.3(2.3) vs. 3.4(1.7) **SPMSQ** **2.5(3.3) vs. 5.2(4.2) p<0.001** **ADL4.3(2) vs. 3.2(2.5)** **P=0.001** No differences in profile of diagnosis in ED between groups	**Outline of intervention** No details beyond ED plus observation unit of 6 beds **Intervention delivered by:** No details	**Outline of control** Patients presenting to ED were screened Mon-Fri 9am- 6pm using standard information sheet. Interviews conducted with patients or family member/other for patients with cognitive impairment. Written consent & access to medical records was obtained. patients a underwent a brief geriatric assessment using the Charlson Index, SPMSQ, and ADL before the current event	**Relevant measures & outcomes** ***Mean duration (SD)*** ***No. of initial admissions*** ***LOS in hospital days*** ***Both of above presented as baseline data*** ***No. ED visits at 30 days and 6 mths*** ***Frequent ED return (≥3 visits over 6 mths)*** ***No. hospital admissions at 6mths*** ***ADL at 6mths (defined as functional decline*** ***Mortality at 30 days & 6 mths*** **Costs** None	CED vs. GED ***Mean duration (SD)*** **6.2(4.5) hrs vs. 12.8 (8.5) hrs** **P<0.001** ***No. of initial admissions*** 53 vs.63 p=0.2 ***LOS in days*** 10(6.65) vs. 10.5(7.2) p=0.74 ***No. ED visits*** 30 days 25 vs. 23 visits p=0.88 6months 51 vs. 42 p=0.25 ***Frequent ED return (≥3 visits over 6 mths)*** 11 vs.13 visits p=0.84 ***No. hospital admissions at 6mths*** 36 vs.29 p=0.2 ***ADL*** 20 vs. 20 p=0.34 ***Mortality*** **30 days 8 vs. 5 deaths** **6months 20 vs. 19** Statistically significant at 6mths after adjustment for age, sex, living status, admission at time of recruitment Charlson index, SPMSQ and ADL **p=0.047**

Community hospital (n=2)

Author Year **Country**	**Study**	**Participants**	**Intervention**	**Control**	**Outcomes assessed**	**Results**
Garåsen **2007/8ab** **Norway**	**RCT** **Intervention:** Community hospital (CH) n=72 assigned but 8 went on to GH **Control:** General hospital (GH)admission n=70	**Inclusion criteria:** Patients aged ≥60 years admitted to general hospital due to acute illness or acute exacerbation of known chronic disease Probably in need of in ward care for ≥ 3-4 days Admitted from own homes and expected to return home when care finished. **Exclusion criteria** Severe dementia or a psychiatric disorders needing specialised care 24 hours a day. **Baseline characteristics of participants** **(No stats given)** [including data from n=8 who were assigned CH then went to GH] CH vs.GH **Age** 80.6 (0.8)vs. 81.3(0.8)yrs **Female** 72 vs.61% **Living with spouse** 16 vs. 15 **ADL (SD)** 2.24(0.9) vs. 2.05 (0.7) **Primary diagnosis** **Cardio dis** 31 vs.29% **Infect** 18vs. 23% **Fractures/contusions** 19vs. 17% **Pulmonary disease** 7vs.9% **Neurological** 7 vs.6% **Cancer** 3 vs 6% **Psychiatric** 1vs.0% **Other** 14 vs 11%	**Outline of intervention** On admission to CH the physicians performed a medical examination of the patients and a careful evaluation of available earlier health records from the **admitting general practitioner, the general hospital physicians and the community home care services**. The communication with each patient and his family focusing on physical and mental challenges was also essential to understand the needs and level of care. . Assume from the inclusion criteria that all patients came to the general hospital initially then ' When an eligible patient was identified and accepted for inclusion, a blinded randomisation was performed by the Clinical Research Department at the Faculty of Medicine.' All patients randomised for care at the community hospital were transferred from the general hospital within 24 hours after the time of inclusion to the study and immediately after the time of randomisation.	**Outline of control** The care at different departments at GH and communication with primary health care followed the standard routines through the formal organisation.	**Relevant measures & outcomes** Follow up at 26 weeks & 12 months ***No. of readmission for index disease*** ***Need for community home care*** ***Need for long term nursing home*** ***No. of days in institutions after randomisation [intervention +rehab +readmissions] data is available for separate services*** ***No. of deaths*** ***No. of days before death*** ***No care*** 12 month data in [0273] **Costs** None	CH vs. GH No. (%) At 26 weeks ***No. of readmission for index disease*** **14(19%) vs. 25 (36%) p=0.02** ***Need for community home care*** 38(53%) vs. 44(63%) p=0.37 ***Need for long term nursing home*** 7(10%) vs. 5(7%) p= 0.76 ***No. days in institutions*** 31(95% CI 26.1,34.7) vs.29.8 (95% CI 23.2,36.4) p=0.80 ***No. of deaths*** 9(12.5%) vs14(20%) p=0.15 **No. days before death** 165 (95% CI 154-176) vs. 156 (95% CI 144,165) **No care** **18(25%) vs. 7(10%) p=0.01** 12 month data **No. of deaths** **13(18.1%) vs. 22 (31.4%) p=0.03** **Total observation period** **335.7(95% CI 312.0,359.4) vs. 292.8(95%CI 264.1,321.5) days p=0.01**

Author Year **Country**	**Study**	**Participants**	**Intervention**	**Control**	**Outcomes assessed**	**Results**
Vicente 2014 **Sweden**	**RCT** **Intervention:** Going to a community-based hospital n=410 **Control:** Going to ED n=396 .	**Inclusion criteria:** No specific information **Exclusion criteria:** No specific information older adults were randomized when they called the emergency number **Baseline characteristics of participants** Intervention vs. control **Mean age (SD)** 81 (8) vs. 81(8) yrs **% Female** 56 vs. 59% **Priority level when ambulance sent out (% individuals)** **1. 1.6 vs. 0%** **2. 59 vs. 47 %** **3. 39 vs.53%** **P=0.001** **Priority level when ambulance arrives at hospital (% individuals)** 1. 7.2 vs.3.6% 2. 39 vs.35% 3.54 vs.61%	**Outline of intervention** The study was conducted over 14 months from Oct 2008 to Dec 2009. Two EMS companies were included in the study. Ambulance personnel at Company 1 had training in and access to the system and tool and could triage eligible individuals to a GW or, a CECC at a CH. By following system and tool & after assessment of the individual's medical situation and care needs, the ambulance nurse was able to decide whether the individual required full ED services or would benefit more from being transported to an assessment at the CH instead. **Delivered by:** The ambulance nurse education are required to have a course of 60 credits includes ≥ 30 credits in Caring Science. The criterion for entering this program is a BSc Caring Science and Nursing. Since 2007, a 1-year Master's Degree & postgraduate Diploma in Specialist Nursing, Prehospital Emergency Care Program has been available.	**Outline of control** Ambulance personnel at Company 2 had no training in the system and tool, and transported all individuals to a full-service ED at a tertiary hospital	**Relevant measures & outcomes** Primary outcome: ***No. of individuals sent direct to CH for either to GW or CECC*** *Secondary outcome:* ***No. of subsequent transfers from CH to ED within 24 hrs*** Calculated as Intention to treat (ITT) and per protocol (pp) analysis **Costs** None	Intervention vs. control ***No. of individuals sent direct to CH for either to GW or CECC*** ITT 90/449 20% (16.6,24) PP 56/273 20.5% (16.1,25.7) ***No. of subsequent transfers from CH to ED within 24 hrs*** ITT 6/90 6.7% (3.1,13.8) PP 4/56 7.1 (2.8,17.0)

Hospital at home for community dwelling older people (n=9)

Author Year **Country**	**Study**	**Participants**	**Intervention**	**Control**	**Outcomes assessed**	**Results**
Patel 2008 **Sweden** **Heart Failure**	**pilot RCT** **Intervention:** HC Treated at home after >48hrs treatment in ED (n=13) **Control:** CC Treated in hospital as per hospital treatment guidelines (n=18)	**Inclusion criteria:** *Into study* Earlier diagnosed with CHF with diastolic or systolic LVD Deterioration of HF ≥3 days with symptoms of increasing dyspnoea, orthopnoea, weight gain≥2 kg, debuting peripheral oedema or abdominal swelling Clinical signs, e.g., extended jugular vein, leg oedema, tachypnoea, pulmonary rales, ascites and third heart sound. At least one symptom and one sign should be present New York Heart Association class II–IV *for home treatment* It was considered medically safe to treat patients at home if they had a S-Potassium level 3.4-5.5 mmol/L, systolic blood pressure >95 mm Hg, S Creatinine<250 µmol/L & <50% increase from the baseline value during drug adjustment. **Exclusion criteria** Unwillingness to participate Worsening of CHF<3 days Newly onset HF, Pulmonary or pre-pulmonary oedema, Need for monitoring of arrhythmia Other morbidities indicating need for hospitalisation. Living at an institution. Inability to follow instructionsS-Haemoglobinb100 g/L or a decrease of S Haemoglobin>20 g/L S-Creatinine>250 µmol/L S-Potassium>5.5 mmol/L or b3.4 mmol/L S-Troponin T>0.05 µg/L Creatine kinase-MB>5 µg/L ASAT and ALAT>three times above the normal value. Systolic blood pressure>95 mm Hg Heart rate<45 or >110 beats/min **Baseline characteristics of participants** Male n (%) 6 (46)/7 (54) 15 (83)/3 (17) 0.03 Age (years) mean (SD) 77 (10) 78 (8) ns Marital status n (%) Divorced 2 (15) 3 (17) ns Single 1 (8) 2 (11) ns Widowed 7 (54) 5 (28) ns Education n (%) ≥9 years 1 (8) 8 (44) 0.02 ns Weight kg mean (SD) 71 (13) 79 (15) ns NT-proBNP pg/ml (median and interquartile range) 4420 (1690–14350) 9335 (3375–13350) ns LVEF % mean (SD) 36 (13) 33 (12) Preserved ejection fraction CHF n (%) 3 (23) 2 (11) Systolic CHF n (%) 10 (77) 16 (89) NYHA class n (%)II 1 (5.5)III 13 (100) 16 (89) IV 1 (5.5) truncated	**Outline of intervention** Initially treated in the ED for ≥48 h & then sent home. The specialist HF nurses followed a written physician directed care plan including adjusting medications. A cardiologist could be consulted. All patients followed-up one day after returning home by nurse. The patients were visited daily or every other day for 5–7 days as appropriate. The home visits stopped when: (1) was symptomatically stable or improving, (2) had stable or falling weight, (3) had no signs of pulmonary rales and (4) had no oedema above the ankle. Patients could contact nurse by phone in office hours. Nurses at intensive cardiac care unit could be reached by telephone after office hours. A cardiologist was always available for phone consultation ≤1 month after the last home visit, the nurse was available for phone counselling.	**Outline of control** Treated in hospital as per hospital treatment guidelines	**Relevant measures & outcomes** No distinction between primary and secondary outcomes **Clinical status** was documented at 1,4,8& 12 mths **Direct costs** for control group based on compensation paid to hospital and for home care group based on time & activities of nurses & physicians plus lab tests and i.v diuretic episodes **Readmissions** from hospital data (presumably up to 12mths – not listed in methods)	There was no significant difference in clinical events including readmissions adverse events or in HRQL (measured at baseline too). The total cost related to CHF was lower in the HC group after 12 months (p=0.05) detail of costs Euros HC vs. CC Nurse cost 386 (244-1107) vs. N/A Physician 35(19-74) vs. N/A Transport 96953-127) vs. N/A Total cost for care 586 (334-1125) vs. 3277 (2125-5750) Readmissions 0.5(0.8) vs. 0.6 (0.8) ns

Author Year Country	Study	Participants	Intervention	Control	Outcomes assessed	Results
Mendoza 2009 **Garcia-Soleto 2013** **Spain** **Heart Failure**	**RCT** **Intervention:** Hospital at home (HAH) care (n=37) **Control:** Inpatient hospital care (IHC) in a cardiology unit (n=34)	**Inclusion criteria:** Patient of 65 years and over With diagnosis and prognosis evaluation of HF since at least 12 months prior to the study NYHA functional class II or III before coming to ED due to exacerbation **Exclusion criteria** Admitted in the preceding 2 months for deterioration of HF or acute coronary syndrome Presence of severe symptoms such as sudden worsening of HF Poor prognosis factors (haemodynamic instability, severe arrhythmia, baseline creatinine above 2.5 mg/dL) No response to treatment in the ED Active cancer, severe dementia, or any other disease at an advanced stage indicating life expectancy of less than 6 months Acute psychiatric diseases, active alcoholism Active pulmonary tuberculosis Those living in a psycho-geriatric institution No guarantee of all-day supervision Absence of a telephone at home or living more than 10 km from the hospital **Baseline characteristics of participants IHC vs. HaH** Women, n (%) 10 (29.4) 19 (51.4) 0.06 Age, mean +SD 79.9+6.3 78.1+6.2 0.20 Admissions for HF in previous year 0.41+0.86 0.65+0.86 0.13 O2 saturation in ED 91.4+5.2 93.2+4.6 0.12 Functional Class NYHA II, n (%) 23 (67.6) 19 (51.4) Functional Class NYHA III, n (%) 11 (32.4) 18 (48.6) 0.16 Atrial fibrillation, n (%) 16 (47) 21 (56.8) 0.49 LVEF ≥45%, n (%) 24 (70) 23 (62.1) LVEF , <45%, n (%) 10 (29.4) 14 (37.8) 0.13 NT-proBNP (pg/mL) 4056+5352 3864+3720 0.86 Charlson index 2.1+1.3 2.5+1.5 0.35	**Outline of intervention** Characteristics of the HaH unit explained whilst still in ED. Given information sheet with contact phone numbers. Within 12–24 h of the ED visit, patients received scheduled & if necessary, urgent visits to their homes from an internal medicine specialist & a nurse, (staff of the HaH unit). If deterioration occurred outside the working hours (8am-9 pm every day of yr), patients & family were instructed to call 112 to explain they were HaH patients. Samples were taken for lab tests and ECGs were performed in patient's home X-ray & echocardiography at hospital was as accessible for HaH patients as for in-patients. Generally all patients were visited daily by a specialist nurse. Patients were visited by a physician daily or every other day depending on condition. Treatment in HaH finished with referral to primary care after recovery or, in case of deterioration or no response to treatment, with transfer to the cardiology ward.	**Outline of control** Patients were admitted to hospital, cardiology ward & were managed by the usual staff of cardiology specialists and nurses, in accordance with guidelines.	**Relevant measures & outcomes** No distinction between primary and secondary outcomes ***Effectiveness*** Necessity to transfer the patient from HaH to IHC during the first admission Mortality due to any cause, re-admission due to HF, or another cardiovascular event (stroke, acute coronary syndrome, and coronary revascularization) during 1 year of follow-up. Functional status -Barthel index Health-related quality of life -SF-36 since first admission up to 12 months later ***Costs*** Cost of the stay Medication, diagnostic tests (electrocardiography, echocardiography, laboratory tests, and chest X-ray), consumables, and transport. visits to HF clinic, primary care physician or ED, as well as re-admissions. For re-hospitalizations, the cost of the admission was estimated as the average cost per day incurred during the first admission for each group.	Clinical outcomes were similar after initial admission and also after the 12 months of follow-up. Death or re-admission due to HF or a cardiovascular event occurred in 19 patients in IHC and 20 in HaH (P=0.88). Changes in functional status and health-related quality of life over the follow-up period were not significantly different. Average cost of initial admission 4502±2153E in IHC and 2541±1334E in HaH (P< 0.001). During 12 months of follow-up, the average expenditure was 4619+7679E and 3425+4948E (P= 0.83) respectively.

Author Year Country	Study	Participants	Intervention	Control	Outcomes assessed	Results
Tibaldi 2009 Italy **Heart Failure**	**single blind RCT** **Intervention:** Physician led - Geriatric Home Hospitalization Service (GHHS; n=48) **Control:** Patients were randomly assigned to the general medical ward (GMW; n=53)	**Inclusion criteria:** ≥75 years with a pre-existing diagnosis of CHF (stage C AHA) & persistent functional impairment indicative of NYHA class III or IV status presenting at hospital ED for acute decompensation (defined)& in need of hospital care. Additional inclusion criteria were appropriate care supervision at home, telephone connection, living in the hospital at- home catchment area, informed consent, at least 1 previous admission for acute CHF, and need for intravenous drug infusion. **Exclusion criteria** New-onset heart failure; absence of family and social support; need for mechanical ventilation, hemodialysis, or intensive monitoring; severe dementia ; terminal malignant neoplasm; severe renal impairment; hepatic failure; serum hemoglobin level less than 9 g/dL; and planned cardiac surgery(eg, valve replacement). **Baseline characteristics of participants** Long list of demographic & clinical baseline – truncated GHHS vs. GMV Mean age 82.2 (5.2) vs. 80.1(4.9) p=0.04 Male (%) 22(46) vs. 30 (57) Married (%) 22 (46) vs. 24 (45) Family support at home (%) 48(100) vs. 53(100) Length of disease (yr) 5.4 (4.7) vs. 5.2 (4.7) plus clinical symptoms both cardiovascular & general including functional status (Barthel index) depression (GDS) MMSE, MNA, comorbidity measured by CIRS 3.6 (1) vs. 3.4 (2) All ns except age	**Outline of intervention** The team has 7 cars, is multidisciplinary and consists: 4 geriatricians, 13 nurses, 3 physio-therapists, 1 social worker &1 counselor working together as a team, with daily meetings 7 days a week. In ED all necessary diagnostic tests are provided and then the patient moves home by ambulance, usually within a few hours. Medical consultation with other hospital specialists is possible in the hospital or at the home of the patient. Treatments included physician and nurse visits, standard blood tests, pulse oximetry, spirometry, electrocardiography, echocardiography etc (as per hospital) Patients treated at home and family members obtained adequate Education e.g. early recognition of symptoms. Protocols for prevention of nosocomial infections, bed sores, and immobilization are routinely adopted for frail elderly inpatients. In the first days after admission to GHHS patient was visited at home on a daily basis by physicians and nurses. In the following days this care is tapered off as appropriate Consultation with cardiologists or other hospital specialists was possible. Physicians and nurses were available at all times for urgent home visits.	**Outline of control** The inpatient control group (GMW) received routine hospital care. Protocols for prevention of nosocomial infections, bed sores, and immobilization are routinely adopted for frail elderly inpatients.	**Relevant measures & outcomes** ***Primary outcome*** Mortality at 6 months. ***Secondary outcomes*** morbidity (infections, delirium, bed sores, deep vein thrombosis, and falls) during hospitalization, admissions to a nursing home, and subsequent hospital admissions related to any cause	***Primary outcomes*** Patient mortality at 6 months was 15% in the total sample, without significant differences between the 2 settings of care. (7 vs. 8 deaths) ***Secondary outcomes*** The number of subsequent hospital admissions was not statistically different in the 2 groups 8 (17%) vs. 18 (34%) mean (SD) time to first additional admission was longer for the GHHS patients (84.3 [22.2] days vs 69.8[36.2] days, *P*=.02). Only the GHHS patients experienced improvements in Depression (GDS) +1.48 (1.860 vs. +0.12 (3.36) p=0.02) nutritional status (MNA) -0.86(1.12) vs. -0.27 (1.78) p=0.05 Quality-of-life(NHP) +1.09 (2.57 vs. +0.18 (1.94) p=0.046

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Ricauda 2008 Italy COPD	**Single blind RCT** **Intervention:** Geriatric home hospitalization service (GHHS, n=52) **Control:** General medical ward (GMW, n=52)	**Inclusion criteria:** Patients ≥75 yrs with a diagnosis of acute exacerbation of COPD, defined on Anthonisen criteria as an increase in breathlessness, sputum volume, or purulence for at least 24 hours, admitted to the ED & requiring hospitalization. Additional inclusion criteria were appropriate care supervision in the home, telephone connection, living in the HaH & informed consent. **Exclusion criteria** Absence of family and social support; severe hypoxemia (partial pressure of oxygen <50 mmHg); severe acidosis or alkalosis (pH <7.35 or >7.55); suspected pulmonary embolism; suspected myocardial infarction; severe comorbid illness as defined by presence of need for hemodialysis, severe renal impairment (glomerular filtration rate <20 mL/min), cancer (except skin cancer), hepatic failure, or severe dementia (Mini-Mental State Examination score <14). **Baseline characteristics of participants** Intervention vs. control Age, mean ±SD 80.1 ±3.2 79.2 ± 3.1p=0 .20 Male, n (%) 29 (56) 39 (75) p=0.06 Married, n (%) 27 (52) 29 (56) .84 Family support n (%) 52 (100) 52 (100) p=0.89 Current smoker, n (%)7(13)6(11) p=0.97Ex-smoker, n (%) 34 (65) 35 (67) p=0.95 FEV1, mean ±SD 0.92 ±0.4 1.04 ± 0.5 p=0.18 % of predicted FEV1 38, 47 Home oxygen use, n(%)18 (35)12 (23) p=0.45 Arterial blood gas, mean ±SD pH 7.40 ± 0.04 7.41 ± 0.03 .19 PP of O_2 69 ± 19 65 ±±14 .p= 0.23 PP of CO_2 44 ± 12 46 ± 12 .47 ADL score, mean ± SD± 2.3 ± 2.2 1.9 ± 2.2 p=0.36 IADL score, mean ± SD 7.1 ± 4.9 8.1 ± 4.2 .27 GDS score, mean ± SD 16.1 ± 6.1 17.2 ± 6.8 .45 Comorbidity index 2.6 ± 1.5 3.0 ± 1.8 p=0.24	**Outline of intervention** **Intervention delivered by;** **"**a physician-led substitutive hospital-at-home model of care" Patients assigned to HaH were immediately transferred home by ambulance. At home, a multi-dimensional geriatric assessment was conducted & patients received hospital-level treatment& services, as their condition dictated. (Physician and nursing visits, standard blood tests, pulse oximetry, electrocardiogram, spirometry,echocardiogram, echographs and Doppler ultrasonographs,oral & intravenous medication administration, including antimicrobials & cytotoxic drugs, oxygen therapy, blood products transfusion, central venous access, surgical treatment of pressure sores, physical therapy & occupational therapy The HaH program emphasized patient & caregiver education about the knowledge of the disease, giving advice about smoking cessation, nutrition,management of activities of daily living & energy conservation, understanding & use of drugs, health maintenance, & early recognition of triggers of exacerbation that required medical intervention.	**Outline of control** **Intervention delivered by:** The inpatient control group received routine hospital care	**Relevant measures & outcomes** ***Primary outcomes*** Hospital readmission & mortality rates at 6 months. ***Secondary outcomes*** Depression status -Geriatric Depression Scale, functional status- Katz activities of daily living & Lawton instrumental activities of daily living Cognitive status -Mini-Mental State Examination, Quality of life -the Nottingham Health Profile Nutritional status -Mini Nutritional Assessment, Caregiver characteristics - Relatives' Stress Scale, & satisfaction using ad hoc questionnaire for Scale. Costs of care were compared for the acute episode.	***Primary outcomes*** GHHS vs. GMW Hospital readmissions at6mths 42% vs 87%, P= 0.001 Cumulative mortality at 6 mths was 20.2% in the total sample, No significant differences between grps. ***Secondary outcomes*** Mean length of stay 15.5 ±9.5 vs 11.0 ± 7.9 days, P= 0.010 Only GHHS patients experienced improvements in depression and QoL scores but ns between grps There were no differences in functional, cognitive, nutritional, or caregiver burden outcomes. Satisfaction at discharge was very good or excellent for 94% vs. 88% (P=0.83) (On a cost per patient per day basis, ($101.4 ± 61.3 vs $151.7 ± 96.4, P=0.002).

Author Year Country	Study	Participants	Intervention	Control	Outcomes assessed	Results
Rodriguez-Cerillo 2009 Spain non-massive Pulmonary embolism	**COS** **Intervention:** Home hospitalization (HH) (n=30) **Control:** Conventional Hospitalization (CH) (n=31)	**Inclusion criteria:** *For trial* Non-massive pulmonary embolism • No contraindications for treatment with low MW heparin • Absence of moderate to severe renal failure • Haemodynamic stability • O2 saturation higher than 92% breathing room air • No signs of heart failure • No arrhythmia • No haemoptysis *For HH* • Agreement to admission to our HH unit • A valid caregiver at home • Residence in our health area • A condition amenable to home management **Exclusion criteria** massive PE, haemodynamic instability, oxygen saturation lower than 92% on room air, heart failure, haemoptysis, arrhythmia & contraindication for treatment with low MW heparin **Baseline characteristics of participants** Age 66.8 (27–91) 66.7 (31–90) n.s Sex (males) 30% 54.8% n.s Diagnosed neoplasm 13.3% 9.7% n.s Associated DVT 40% 29% n.s Prior TED 0% 19.3% 0.05 Dementia 23.3% 6.4% n.s. Hypertension 30% 45.1% n.s. Ischaemic heart disease 6.6% 9.6% n.s. Thrombophilia 3.3% 0% n.s Recent surgery 3.3% 6.4% n.s Unilateral involvement 70% 61.3% n.s Bilateral involvement 30% 38.7% n.s Diagnosed by helical CT 26.6% 38.7% n.s	**Outline of intervention** **No detail**	**Outline of control** **No detail**	**Relevant measures & outcomes** No distinction between Primary and secondary outcomes Major and minor bleeding Re-thrombosis, Clinical course Unexpected returns to hospital Need for hospital re-admission in the following 3 months.	All comparisons ns Mean stay length HH vs. CH 8.9 days (7–14 days), vs. 10.6 days (6–20 days). All patients in study had a favourable clinical course. No major bleeding, re-thrombosis, or death occurred. One patient on HH experienced an abdominal wall haematoma in the area of administration of the low MW heparin. One patient admitted to hospital experienced a haematoma in the right arm related to blood sampling for laboratory tests. No patient with HH had infectious complications. Three patients admitted to hospital were diagnosed of urinary tract infection. No HH patients required unexpected return to hospital during admission. During follow-up, two patients required hospital admission, one in each group. The cause was not related to the thromboembolic disease.

Author Year **Country**	**Study**	**Participants**	**Intervention**	**Control**	**Outcomes assessed**	**Results**
Carratala 2005 Spain Pneumonia	**Open RCT** **Intervention:** Outpatient care with oral levofloxacin therapy or hospitalization with sequential intravenous and oral levofloxacin therapy. (n=110) **Control:** Hospitalisation (n=114)	**Inclusion criteria:** All immunocompetent patients who were at least 18 years of age and had received a diagnosis of community acquired pneumonia in the emergency department (24 hrs per day, 7 days per week) Community acquired pneumonia was defined as the presence of a new infiltrate on chest radiography plus at least 1 of the following: fever (temperature ≥38.0 °C) or hypothermia (temperature <35.0 °C), new cough with or without sputum production, pleuritic chest pain, dyspnea, or altered breath sounds on auscultation. **Exclusion criteria** Neutropenia, HIV infection, transplantation, or splenectomy or who were taking immunosuppressive drugs **Baseline characteristics of participants** Male 69 (62.7) 66 (57.9) Female 41 (37.3) 48 (42.1) Mean age ± SD, *y* 67.5 ± 11.8 64.9 ± 13.4 Alcohol consumption ±80 g/d, *n (%)* 13 (12.4) 7 (6.4) Current tobacco smoking, *n (%)*‡ 21 (19.8) 24 (21.8) Influenza vaccine in current season, *n (%)*§ 44 (42.7) 49 (46.2) Pneumococcal vaccine in the previous 5 yrs, *n (%)*± 15 (15.6) 13 (13.1) Comorbid conditions, *n (%)* 71 (64.5) 78 (68.4) Mean oxygen saturation ± SD, *%* 94.5 ± 2.0 94.5 ± 1.8 Multilobar pneumonia, *n (%)* 8 (7.3) 9 (7.9) Risk class, *n (%)* II 55 (50.0) 63 (55.3) III 55 (50.0) 51 (44.7) Mean PSI score ± SD 70.0 ± 11.6 66.9 ± 12.5	**Outline of intervention** Outpatients were given oral levofloxacin (500 mg/d), and received detailed written information about their pneumonia diagnosis and their treatment plan, as well as emergency contact telephone numbers for a nurse or investigator physician. Patients were visited at home by a nurse 48 hours after emergency department discharge. The visit included assessment of vital signs and measurement of oxygen saturation by pulse oximetry. If the nurse thought that a patient's condition was not improving (worsening of baseline vital signs, oxygen saturation, or both), one of the investigators made an additional visit. The nurse was involved only in outcome assessment. Patients were seen at the outpatient clinic at days 7 and 30 after pneumonia diagnosis.	**Outline of control** Hospitalized patients received sequential intravenous and oral levofloxacin (500 m and received detailed written information about their pneumonia diagnosis and their treatment plan, as well as emergency contact telephone numbers for a nurse or investigator physician g/d) Patients assigned to hospitalization were seen daily during their hospital stay by attending physicians and by at least 1 of the investigators. Criteria for early switching from intravenous to oral levofloxacin were a respiratory rate of 24 breaths/min or less, a pulse rate of 100 beats/min or less, a temp of 37.8 °C or lower on 2 occasions at least 8 hours apart, and maintenance of adequate oral intake. Physicians were advised to discharge patients after their clinical condition stabilized, in accordance with previously recommended criteria. Patients were seen at the outpatient clinic at days 7 and 30 after pneumonia diagnosis.	**Relevant measures & outcomes** ***Primary outcomes*** % of patients with an overall successful outcome at the end of treatment, according to 7 predefined criteria: cure of pneumonia (as defined later), absence of adverse drug reactions, absence of medical complications during treatment, no need for additional visits, no changes in initial treatment with levofloxacin, **absence of subsequent hospital admission in the 30 days after randomization**, and absence of death from any cause in the 30 days after randomization. ***Secondary outcomes*** Patients' quality of life & satisfaction	Intervention vs. control ***Primary outcome*** Successful outcome was achieved in 83.6 vs. 80.7% (absolute difference, 2.9 % points [95% CI, ±7.1 to 12.9 % points]). % patients with adverse drug reactions (9.1% vs. 9.6%), Subsequent hospital admissions (6.3% vs. 7.0%), Overall mortality (0.9% vs. 0%) Medical complications (0.9% vs. 2.6%), ***Secondary outcomes*** All ns Quality of life (9.1% vs. 9.6%) Satisfied with overall care (91.2% vs. 79.1%; absolute difference, 12.1% [CI, 1.8 to 22.5 % points]).

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Kalra 2005 UK Stroke	**RCT** **Intervention:** **1)ST (n=152)** The stroke team involved management on general wards with specialist team support. The team undertook stroke assessments and advised ward-based nursing and therapy staff on acute care, secondary prevention and rehabilitation aspects. **2) DC (n=153)** **Domiciliary care provided management at home under the supervision of a GP and stroke specialist with support from specialist team and community services. Support was provided for a maximum of 3 months**. **Control:** Usual care **SU (n=152)** The stroke unit provided 24-hour care provided by a specialist multidisciplinary team based on clear guidelines for acute care, prevention of complications, rehabilitation and secondary prevention.	Patients were included within 72 hours of stroke onset. The research team was notified by telephone or fax by GPs for patients at home, and by accident and emergency (A&E) services for suspected stroke patients presenting to the casualty department. **Inclusion criteria:** Patients with disabling stroke who could be supported at home with nursing, therapy and social services input on initial assessment were included in the study. **Exclusion criteria** Patients with mild stroke, severe strokes, already admitted to hospitals, and those with unusual or atypical neurological features who required specialised assessments or investigation to establish a diagnosis of stroke. Patients who were institutionalised or had severe disability (Rankin 4 or 5) before stroke **Baseline characteristics of participants SU vs. ST vs.HC** Median age (years) (IQR) 75 (72–84) 77.3 (71–83) 77.7 (67–83) No. of females (%) 69 (46.6) 76 (50.6) 68 (45.6) Living alone (%) 50 (33.7) 55 (36.6) 50 (33.5)	**Outline of intervention** **ST** Patients were managed on general wards & under care of admitting physicians. All patients were seen by specialist team: doctor (specialist registrar grade), a nurse (grade G), a physiotherapist (senior I) and an occupational therapist (senior I) with expertise in stroke management. Patients were assessed by the specialist team, which undertook a diagnostic evaluation and assessment for needs. Ward provided the day-to-day treatment, the team advised on specialist aspects of stroke care. It reviewed progress and treatment of individual patients with ward team & helped in discharge planning and setting up of post discharge services. The team provided counselling, education and support to the family, identified expectations and advised about realistic outcomes in the context of previous morbidity and present deficits. **DC** Patients were managed in own home by a specialist team consisting of a doctor (specialist registrar), a nurse (G grade) & therapists (senior I grades), with support from district nursing and social services for nursing and personal care needs. Patients were under the joint care of the stroke physician and GP. Investigations, including CT scanning, were performed in outpatient s. Therapy was provided by members of the specialist stroke team. Each patient had an individualised integrated care pathway outlining activities and the objectives of treatment, which was reviewed at weekly multi-disciplinary meetings.	**Outline of control** **SU** Care was provided by a stroke physician supported by a multidisciplinary team with specialist experience in stroke management. There were clear guidelines for acute care, prevention of complications, rehabilitation and secondary prevention, and a culture of joint assessments, goal setting, coordinated treatment and discharge planning. A coordinated multidisciplinary approach was adopted towards rehabilitation, with emphasis on early mobilisation. All patients had an individualised rehabilitation plan with clearly defined goals based on joint assessments. Patient participation was encouraged, with focus on motivation and providing an enriched environment.	**Relevant measures & outcomes** ***Primary outcomes*** Death or institutionalisation at 1 year. Dependence - modified Rankin Scale (mRS), ***Secondary outcomes included*** Orgogozo scale, BI and FAI for disability, the mRS for handicap EuroQol-quality of life of patients and their carers.	Mortality and institutionalisation at 1yr were lower on SU vs.ST or DC Significantly fewer patients on SU died compared with ST The proportion of patients alive without severe disability at 1 year was also significantly higher on SU vs. ST or DC. These differences were present at 3 & 6 mths after stroke. Stroke survivors on SU showed greater improvement on basic activities of daily living compared the other two grps. Achievement of higher levels of function was not influenced by strategy of care. QoL at 3mths was significantly better in SU & DC patients. There was greater dissatisfaction with care with ST vs. SU or DC. Poor outcomewith DC and ST was associated with Barthel Index <5, incontinence and with ST, age >75 years. The total costs of stroke per patient over 12mths were £11,450 for SU, £9527 for ST & £6840 for DC The mean costs per day alive for the SU were significantly less than those for the ST , but no different from DC patients. Costs for DC were significantly less than for those managed by the SU or ST.

Author Year **Country**	**Study**	**Participants**	**Intervention**	**Control**	**Outcomes assessed**	**Results**
Rodriguez-Cerrillo 2013 Spain uncomplicated diverticulitis	**Prospective controlled study** **Intervention:** Patients stayed 24 h in the Observation Ward within ED prior to discharge and treatment at home. (n=34) **Control:** Traditional hospitalization (n=18)	**Inclusion criteria:** ≥70 years diagnosed with uncomplicated diverticulitis (The existence of abscess, fistula, bowel obstruction and peritonitis) Patients who were willing to be treated at home and had a caregiver 24 h a day were transferred to HaH. The rest of the patients were admitted to conventional hospitalization. **Exclusion criteria** Patients with complicated diverticulitis, β-lactam allergy or who required admission to hospital for other pathology **Baseline characteristics of participants** intervention vs. control Age 77 (71–90) 79 (71–98) Sex (female) 28 (82.4%) 16 (84.2%) Cardiopathy 9 (26.5%) 6 (31.6%) Diabetes mellitus 4 (11.7%) 2 (10.5%) Chronic renal failure 4 (11.7%) 1 (5.2%) Neoplasm 1 (2.9%) 1 (5.2%) COPD 1 (2.9%) 1 (5.2%) Corticosteroids 4 (11.7%) 2 (10.5%) Previous diverticulitis 7 (20.5%) 3 (15.8%) Abdominal pain 34 (100%) 19 (100%) Fever 9 (26.5%) 6 (31.6%) Diarrhea 6 (17.6%) 3 (15.8%) Leucocytosis 7 (20.5%) 3 (15.8%)	**Outline of intervention** **Intervention delivered by;** All patients were given Ertapenem after diagnosis. Patients in HaH grp stayed 24 h in the observation ward within ED prior to discharge. At home, nurses administrated Ertapenem every day. The physician conducted 2–3 home visits per week, depending on the patient's clinical course. On admission patients were provided with a phone number to contact the unit if any problem arose. Intravenous antibiotic was changed to oral therapy (amoxicillin–clavulanate) after 4–6 days of treatment until complete 10 days of treatment.	**Outline of control** **Intervention delivered by:** All patients were given ertapenem after diagnosis & experienced traditional hospitalisation	**Relevant measures & outcomes** No primary nor secondary outcomes were defined	A small amount of free fluid was present in 38% of patients treated with HaH and 42% of patients in hospital. All patients had a good clinical evolution. None of the patients treated with HaH needed be transferred to hospital. Mean stay was 9 days in HaH vs. 10 days in Hospital. The cost of each patient with diverticulitis treated at home was 1368 euros cheaper than the cost of a patient treated in the hospital (fewer staff and important reduction of maintenance costs).

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Leff **[3066]** **2005** **USA** **Plus** Leff 2009 [2545] Frick 2009 [0158]	**Prospective quasi experimental** 2 consecutive 11 month phases **Intervention:** Treatment in a hospital-at-home model of care that substitutes for treatment in an acute care hospital. Offered In the 2nd phase of study n=169 **Control:** Described as 'observation group' in the first phase of study. Eligible patients were identified and followed through usual hospital care. n=286 **Aim:** 'to evaluate the safety, efficacy, clinical and functional outcomes, patient and caregiver satisfaction, and costs of providing acute hospital level care in a hospital at home that substituted entirely for admission to an acute care hospital for older persons.' **Setting:** **Intervention** (if received): At home **Control** **Secondary hospital care** ***Power calculation****:* No	**Inclusion criteria:** Community-dwelling persons ≥65 yrs old, Lived in catchment area In the opinion of a physician not involved in study, required admission to an acute care hospital for these illnesses: community-acquired pneumonia, exacerbation of chronic heart failure or chronic obstructive pulmonary disease, or cellulitis. Required to meet validated criteria of medical eligibility for hospital-at-home care. **Exclusion criteria** Most common reasons for medical ineligibility were uncorrectable hypoxemia, suspected myocardial ischemia, and presence of an acute illness, other than the target illness, for which the patient was required to be hospitalized. **Baseline characteristics of participants at all sites (Stats shown if signif)** Observation vs. intervention Age (SD) 77.3 (6.6) vs.77.2(7.0) % female 34 vs. 42% % white 90 vs.86% **% in poverty 11 vs.19% p=0.027** **% live alone 43 vs.33% p=0.022** Mean mini mental state (SD)25.5 (4.2) vs. 25.2(4.4) Mean Charlson score (SD) 3.1 (2.0) vs.3.0 (1.8) **Mean medications (SD) 6.8 (3.9) vs. 8.1(4.5) p=0.002** %Primary admission diagnosis Pneumonia 31vs. 32% COPD 32 vs.28% Cellulitis 12 vs 18% CHF 25vs.22%	The study was conducted in 3 Medicare managed care (Medicare +Choice) plans at 2 sites and at a Veterans Administration medical centre. Univera Health and Independent Health, in Buffalo, New York, are Medicare + Choice plans These 2 plans collaborated to provide hospital- at-home care and made up 1 study site (site 1). The Fallon Health Care System (site 2), in Worcester, Massachusetts, operates a not-for-profit Medicare +Choice plan, and the Fallon Clinic, a for-profit multispecialty physician group, provides care on a capitated basis to Medicare + Choice beneficiaries. The Portland, Oregon, Veterans Administration Medical Center (site 3) is a quaternary care and teaching facility. A patient requiring admission to the acute care hospital for a target illness was identified in an ED or ambulatory site and his or her eligibility status was determined. Non-study medical personnel, usually ED physicians, made the decision to hospitalize the patient. All patients who were offered but who declined hospital-at-home care were admitted to the acute care hospital. Study coordinators verified the patient's eligibility for HaH using a standard protocol at enrolment. Most patients were identified the morning after admission.	**Outline of intervention &who delivered** 1 Nov 2001-30 Sep 2002 Patients evaluated by HaH physician either in ED or after ambulance transfer to home. HaH nurse met ambulance at patient's home and provided direct one-on-one nursing for an initial period of ≤ 8hrs at site 3 and ≤24 hrs at sites 1 & 2. followed by intermittent nursing visits and HaH physician at least daily. HaH physician was available 24 hours a day for visits. Nursing and other care components, e.g. durable medical equipment, oxygen therapy were provided and some services e.g. home radiology, support provided by independent contractors. Lifeline devices were provided for patients living alone. Diagnostic tests , IV fluids, IV antimicrobial agents, etc. and oxygen/respiratory therapies were provided at home. Patient was followed by same physician until discharged to primary care	**Outline of control** 1 Nov 1990-30 Sep 2001) Eligible patients identified & followed through usual hospital care.	**Relevant measures & outcomes** **No distinction between primary and secondary outcomes** Intervention group comprised all patients eligible for hospital-at-home care, irrespective of where they were treated. [thus some outcomes are NOT useful to us but some measures are HaH specific] **Mean LoS (SD) days [Leff 2005]** ***Mean time in ED (SD) in hrs*** …… Sub-analysis of HaH vs. Non-HaH (i.e. different to main report [Leff 2009] ***Changes in ADL and IADL from 1mth before admission -2 weeks after intervention*** **Costs** ***Within each health system and per condition*** [Frick 2009] **Overall summary** 'The HaH care model is feasible, safe, and efficacious for certain older patients with selected acute medical illnesses who require acute hospital-level care.' Leff 2005 HaH care is associated with modestly better improvements in IADL status and trends toward more improvement in ADL status than traditional acute hospital care. Leff 2009 Total costs seem to be lower when substitutive HaH care is available for patients with CHF or COPD disease.Frick2009	Intervention vs. control **Mean LoS (SD) days** **4.9 (9.9) 3.2 (2.5) p =0.004** ***Mean time in ED (SD) in hrs*** **6.4(1.8,11.6)SD 1.9 vs. 5.5(1.0,21.3) SD3.2** **P=0.001** [Leff 2005] ---------- ***Changes in ADL and IADL from 1mth before admission -2 weeks after intervention*** ADL 0.39(3.13) vs. -0.6(3.09) p=0.1 **IADL 0.74(2.86) vs. -0.70(2.68) p=0.007** [Leff 2009] --- **Costs** ***Within each health system and per condition*** **Mean (SD)** Overall **$5081(4427)vs.$7480(8113) p<0.001** Pneumonia $5272(6036) vs. $6761(6451) NS Congestive heart failure **$3310(2118) vs. $6399(6643) p≤0.001** COPD **$4293(3806) vs. $6500(7305) p≤0.05** Cellulitis $4262(2309) vs. $7287(11471) NS [Frick 2009]

Hospital in Nursing/Care Home (HNCH) (n=2)

Author Year Country	**Study**	**Participants**	**Intervention**	**Control**	**Outcomes assessed**	**Results**
Crilly 2010 Australia	**'quasi experimental'** **[Controlled (his) study]** **Intervention:** Hospital in the nursing home (HINH) n=62 **Control:** Usual in-hospital care n=115	**Inclusion criteria:** Reside in an ACF. Have a signed GP request for HINH review from the ACF. Be of any age (usually≥ 65 yrs). Present with an illness that required hospital services but not necessarily admission e.g. UTI & could have treatment e.g. antibiotics continued by ACF staff. Prior to start of HINH, patients who would have fit inclusion criteria for hospital admission **Exclusion criteria:** ACF residents who required extensive treatment that could not be managed in ACF or who required specific services that could only be received in hospital e.g. surgery **Baseline characteristics of participants** **HINH vs. Control** Age (SD) 85(7.1) vs.84.6(6.6)years Triage category 3.2 (0.7) vs.3.2(0.7) Female 76vs. 75% Diagnostic category: Respiratory 24 vs.26% Cellulitis 18 vs.17% Kidney/urinary tract 18vs.16% Cardiac 10 vs. 10 % Abdominal/GI 8vs.8% Viral/sepsis 7 vs.6% All other 16 vs.17%	In the ED. Enrolments were made by HINH programme manager (registered nurse) with programme director (ED director), GPs and ACF nursing staff, as appropriate. After hours and on weekends, if patient was suitable for HINH , they stayed in ED short stay unit and were reviewed by HINH nurse on next weekday. **Outline of intervention** The HINH nurse checks with the ACF registered nurse and patient on the patients' progress initially on a daily basis and then every couple of days. Discharge occurs when required treatment has ceased. This completes the patients' hospital-affiliated episode. **Intervention delivered by:** HINH programme delivers acute care nursing support services, medication and equipment to the ACF registered nurse and/or enrolled nurse. These services may include initial training and education regarding antibiotic or IV fluid administration; specific wound treatment and dressing procedure (with dressing materials); suprapubic catheter care, behaviour management and palliative care.	**Outline of control** The comparison group was selected from patients who presented to ED and were subsequently admitted during the same time period. To be included in this group, the patients had to reside in an ACF and be aged ≥65yrs. ACF residents who presented to the ED were in some cases not enrolled in HINH because they had a medical problem that was judged as possibly requiring in-hospital admission services beyond those offered by the HINH. **Intervention delivered by:** No details but presumably usual hospital staff	**Relevant measures & outcomes** ***Hospital LOS (days)*** ***ED LOS (hours)*** ***Episode of care (total time) LOS (days)*** ***Long (≥6days) vs. short hospital LOS*** ***Long (≥8 days) ED LOS vs. short*** ***Long episode of care (≥6 days)*** ***Hospital readmissions within 28 days*** ***Costs*** None	HINH vs. Control Mean (SD) ***Hospital LOS*** **2.19 (0.82) vs.6.2(0.59) days p<0.001** ***ED LOS*** **9.94(0.66) vs. 7.01(0.47) hrs p=0.005** ***Episode of Care LOS*** 9.56(1.26)vs. 6.20(0.59) days p=0.14 Percentages ***Hospital LOS 6+days*** **9.6 vs. 40 p<0.001** Episode of care 6+days 46.8 vs.40.0 p=0.35 ***LOS in ED 8+ hours*** **50.0vs.33.9 p=0.05** ***Readmission in 28 days*** 11.3 vs. 11.3 p=0.99

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Lau **2013** **Australia**	**Controlled (his) Case series** **Intervention** Treatment in residential care facilities (TRC) grp **n=95** **Control** Hospital-based aged care unit (ACU) **n=167**	**Inclusion criteria:** Patient and/or family consent Capacity within HITH to accept the patient Facility able to manage the care needs of the patient in the residential aged care facility (RACF) **Exclusion criteria:** Lack of consent from patient and/or family. Behavioural disturbances, which may prevent the delivery of care e.g. aggressive behaviour and frequent removal of IV, access device. History of recent falls, which may impact on the delivery of care in the RACF. If there was conflict regarding management, further input and discussion were carried out in ACU. **Baseline characteristics of participants** TRC vs. ACU **Age** 83.5 vs.82.8yrs **Female** 53 vs.59% **Non-English speaking** 42 vs.48% **High level of nursing homecare** 72 vs.76% **Dementia 77.9vs.45.5% p<0.001** **Charlson score** 7.1 SD 1.9 vs. 7.2 SD 2.3	In the ED the acuity of presenting complaint was triaged to maximize service capacity. Overnight referrals were assessed next morning, (those who presented after hours were put in Short Stay Unit adjacent to ED for assessment. TRC generally provided once daily visits for patient. The geriatrician & team members would use clinical judgement to determine if a patient was suitable for TRC **Outline of intervention** Treatment in Residential Care facilities (TRC) delivered by the Residential Care Intervention Program into the Elderly (RECIPE) service between July-Oct 2008. **Appropriate Clinical Diagnosis** Dehydration, Pneumonia, Urinary Tract Infection, Gastroenteritis, Deep Venous Thrombosis, Terminal care support. **Treatment can therefore include any of the following:** IV antibiotics & IV fluids Anticoagulation Oxygen therapy (low flow) Appropriate Allied Health intervention Palliative support* Referral to other appropriate support programs * [TRC also offered palliative care as appropriate. If patient's condition changed and management could not be continued, transfer into acute hospital was organized. If patients had uncertain prognosis, treatment was given, followed by palliative care if no response despite optimal treatment.] **Intervention delivered by:** Geriatrician, registrar and nursing staff with access to allied health staff such as physiotherapy, OT, speech pathology and social work.	**Outline of control** Aged care unit (ACU) Inpatients treated in ACU in preceding year July-October 2007, before existence of TRC. ACU is a service for inpatients who have been admitted from residential care facilities for the management of general medical conditions. **Intervention delivered by:** No details but presumably usual hospital staff	**Relevant measures & outcomes** ***Palliative care*** ***Mortality on discharge*** ***6-month mortality*** ***Rehospitalisation within 1-month*** ***Total hospitalisation at 6 months*** **Length of hospital care/stay** All measured as 'present or not' **Costs** None	TRC vs. ACU ***Palliative care*** **34 (35.8%) 13 (7.8%) <0.001** ***Mortality on discharge*** 11 (11.6%) 20 (12.0%) p=0.924 ***6-month mortality*** 29 (30.5%) 51 (30.5%) p=0.184 ***Re-hospitalization within 1 month*** 20 (21.1%) 35 (21.0%) p=0.986 ***Total re-hospitalization at 6 months*** 39 (41.1%) 68 (40.7%) p=0.963 ***Length of stay*** **Mean (no SD given) 2vs.11 days** **P<0.001** Equivalent of 270 vs. 1840 bed days