**Supplemental materials for:**

Vedel I, Khanassov V. Transitional Care for Patients With Congestive Heart Failure: A Systematic Review and Meta-analysis. *Ann Fam Med*. 2015;13:562-571.

## Supplemental Appendix 1: Eligibility criteria

Inclusion criteria:

Population: CHF patients discharged from inpatient departments to home.

Interventions: interventions designed to provide a structured pro-active follow-up after hospital discharge that may include pre-discharge education and care plan development, post-discharge follow-up of various forms (e.g. home visits), and coordination of primary medical care and community-based services (e.g. home care services).

Duration of intervention: No minimum length of follow-up was required.

Comparison: usual care (non-structured follow-up): regular follow-up is not pre-defined after discharge.

Outcomes: all-cause readmission and all-cause ED visits.

Study design: RCTs.

Exclusion criteria:

Population: CHF patients discharged from inpatient departments to skilled nursing facilities or long term care facilities or extended care facilities; patients transferred between different hospitals; patients transferred from emergency department to hospital wards.

Interventions: Interventions without pro-active follow-up after hospital discharge such as pre-discharge education only, medication reconciliation only.

Outcomes: CHF-related readmission and CHF-related ED visits.

Study design: other types of study design (e.g., non-randomized studies, surveys).

## Appendix 2: Search Strategy

1. exp heart disorders/
2. (heart adj6 failure?).mp.
3. (cardiac adj6 failure?).mp.
4. 1 or 2 or 3
5. exp case management/
6. case management?.ti,ab.
7. exp disease management/
8. (disease? adj2 management?).mp.
9. exp patient care planning/ or exp Treatment Planning/ or exp "Continuum of Care"/
10. continuum.ti,ab.
11. (continuity adj2 care?).ti,ab.
12. (transition* or posthospital* or aftercare).ti,ab.
13. exp integrated services/
14. exp hospital discharge/ or exp client transfer/ or exp discharge planning/ or exp hospital admission/
15. discharg*.ti,ab.
16. exp hospital admission/
17. (transfer* or dishcarg* or admission* or readmission* or relocation?).ti,ab.
18. (integrated adj3 (care? or service?)).ti,ab.
19. 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18
20. interinstitution*.ti,ab.
21. 19 or 20
22. exp hospitals/
23. hospital*.ti,ab.
24. (social work??? adj2 hospital?).ti,ab.
25. ((nurs* or physician? or clinician? or personnel?) adj5 hospital?).ti,ab.
26. hospital-based.mp.
27. 22 or 23 or 24 or 25 or 26
28. exp community services/
29. exp home care/ or exp home care personnel/ or exp home visiting programs/ or exp homebound/ or exp respite care/
30. communit*.ti,ab.
31. exp primary health care/
32. exp family medicine/
33. exp family physicians/
34. home care?.ti,ab.
35. home service?.ti,ab.
36. 30 or 34 or 35
37. exp general practitioner/
38. ((family adj (physician* or practic*)) or primary care physician?).ti,ab.
39. exp public health service nurses/
40. (nurse* adj1 (clinician* or practitioner*)).ti,ab.
41. exp family nursing/
42. (family adj nurs*).ti,ab.
43. exp Social Casework/ or exp Foster Care/

44. exp social workers/
45. (social work??? adj2 (home? or communit*)).ti,ab.
46. 43 or 44
47. 30 and 46
48. 36 and 46
49. 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 37 or 38 or 39 or 40 or 41 or 42 or 45 or 47 or 48
50. 4 and 21 and 27 and 49
51. limit 50 to ((english or french) and yr="2014 -Current")

# Appendix 3: Characteristics of the Included Interventions

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | ***Transitional care interventions – low intensity*** | | | | | | | | |
| | ***Telephone follow-up only*** | | | | | | | | |
| Riegel, 2006/USA[37] | Number of randomized patients[1]: 134 (69 vs. 65)<br>Mean (SD) age: 71.6±10.8 vs. 72.7±11.2<br>Percentage of males: 42 vs. 50.8<br><br>Severity of HF:<br>NYHA[2] Functional Class III<br>44.9% vs. 47.7%;<br>NYHA Functional Class IV<br>37.7% vs. 32.3%.<br>Severity of HF: 42.3±18.3 vs. 44.1±18.1 left ventricular ejection fraction (%). | - Regular phone follow-up: the first phone follow-up within 5 days of discharge with subsequent frequency based on software and nurse's judgment;<br>- Culturally tailored education on disease management (Latino context);<br>- Monthly mailed educational material;<br>- Regular reports mailed to treating physicians. | - Nurse case manager affiliated with the hospital (education, monitoring, guidance, follow-up phone calls);<br>- Bilingual collaborators such as nurse case managers, physician co-investigator, research assistant (refinement of the intervention);<br>- Physicians, dieticians, social workers contacted if needed. | Within one week | 6 months/<br><br>Average 13.5 telephone contacts | 6 months | At 1 month: 15.9% vs. 20% (p=0.65).<br><br>At 3 months: 37.7% vs. 40% (p=0.86).<br><br>At 6 months: 58% vs. 56.9% (p=1.0). | | 21 |
| Domingues, 2011/Brazil[56] | Number of randomized patients: 111 (48 vs. 63)<br>Mean (SD) age: 62±12 vs. 63±13<br>Percentage of males: 67 vs. 51<br>Severity of HF: 29±8 vs. 29±9 left ventricular ejection fraction (%). | - Education during hospitalization about the disease and non-pharmacological treatment;<br>- Phone follow-up after discharge (one per week in the first month then every 15 days for 2 months). | A study nurse (phone follow-up). | Within one week | 3 months/<br><br>8 phone contacts | 3 months | At 3 months: 42% vs. 37% (p=0.72). | At 3 months: 8% vs. 13% (p=0.67). | 16 |
| DeBusk, 2004/USA[38] | Number of randomized patients: 462 (228 vs. 234)<br>Mean (SD) age: 72±11 (both groups)<br>Percentage of males: 48 vs. 54<br><br>Severity of HF:<br>NYHA Functional Class III-IV<br>50% vs. 50%. | - Education about the disease provided in the medical center;<br>- Telephone counseling on the disease;<br>- Phone follow-up (weekly for 6 weeks, biweekly for 8 weeks, monthly for 3 months, bimonthly for 6 months). | - A nurse (education);<br>- Two case managers/ nurses (telephone counseling, phone follow-up, pharmacological treatment according to the protocol, communication with physicians about the patient's status). | Within one week | 12 months/<br><br>16 phone calls | 12 months | At 12 months: 51% vs. 50% (p=NS); | | 20 |
| Laramee, 2003/USA[39] | Number of randomized patients: 287 (141 vs. 146)<br>Mean (SD) age: 70.6±11.4 vs. 70.8±12.2<br>Percentage of males: 58 vs. 50<br><br>Severity of HF:<br>NYHA Functional Class III<br>50±36 vs. 46±35;<br>NYHA Functional Class IV<br>3±2 vs. 4±3. | - Discharge letter sent to the family physician;<br>- Education provided on the disease and its management during hospitalization and after discharge;<br>- Educational material on the disease (CHF booklet), home scales, pillboxes sent to the patient;<br>- Telephone follow-up (1 to 3 days after discharge, at weeks 1,2,3,4,6,8,10,12);<br>- Patient could call the nurse during working hours;<br>- Reminder letter to the treating physician if a patient was not adhering to the treatment plan. | A case manager specialized in critical care and cardiology (education, coordination of services during hospitalization and after discharge, telephone follow-up). | Within one week | 3 months/<br><br>9 scheduled phone calls | 3 months | At 3 months: 37% vs. 37% (p=0.99). | | 17 |
| Wakefield, 2008/USA[40] | Number of randomized patients: 148 (47[3] vs. 52[4] vs. 49)<br>Mean (SD) age: 71.8±10.2 vs. 69.0±9.6 vs. 67.2±8.5<br>Percentage of males: 100 vs. 98 vs. 98<br><br>Severity of HF:<br>NYHA Functional Class III<br>64% vs. 71% vs. 59%;<br>NYHA Functional Class IV | - Telephone follow-up (3 times the first week after discharge, then weekly for 11 weeks)[3];<br>- Video follow-up (3 times the first week after discharge, then weekly for 11 weeks).[4] | Two registered nurses (phone/video follow-up, referral to physicians if required). | Within one week | 3 months/<br><br>14 phone/video calls | 12 months | At 12 months: 41% vs. 59%[3,4] (p=0.04). | | 19 |

[1] Intervention versus control unless otherwise specified
[2] New York Heart Association (Class III-IV are only presented)
[3] Telephone follow-up
[4] Video-telephone follow-up

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | 6% vs. 8% vs. 6%.<br>Severity of HF: 43.5 vs. 38 vs. 43 left ventricular ejection fraction (%). | | | | | | | | |
| Dunagan, 2005/ USA[41] | Number of randomized patients: 151 (76 vs. 75)<br>Mean (SD) age: 70.5±12.7 vs. 69.4±13.9<br>Percentage of males: 41 vs. 47<br><br>Severity of HF:<br>NYHA Functional Class III<br>71% vs. 72%;<br>NYHA Functional Class IV<br>7% vs. 11%. | - Education provided on disease management before discharge using an educational packet;<br>- Telephone follow-up (within 3 days after discharge, then weekly for 2 weeks). | A study nurse (education and phone follow-up);<br>- Cardiologist (supervision of the study nurse). | Within one week | 12 months/<br><br>3 phone calls | 12 months | At 6 months: 37% vs. 65% (p=0.008);<br><br>At 12 months: 66% vs. 73% (p=0.045). | | 20 |
| Rainville, 1999/USA[42] | Number of randomized patients: 34 (17 vs. 17)<br>Mean (SD) age: 66.9±8.7 vs. 72.8±10.7<br>Percentage of males: 47 vs. 53<br><br>Severity of HF:<br>NYHA Functional Class III<br>71% vs. 65%;<br>NYHA Functional Class IV<br>23% vs. 12%. | - Review of the patient's pharmacotherapy by the pharmacist;<br>- Education provided on disease management using information brochure and videotape;<br>- Telephone follow-up (within 3,7 days, 1,3,12 months after discharge). | A pharmacist (review of the medications, phone follow-up). | Within one week | 12 months/<br><br>5 phone calls | 12 months | At 12 months: 88% vs. 94% (p=NS); | | 14 |
| Tsuyuki, 2004/Canada[53] | Number of randomized patients: 276 (140 vs. 136)<br>Mean (SD) age: 71±12 vs. 72±12<br>Percentage of males: 58 vs. 58<br><br>Severity of HF:<br>NYHA Functional Class III<br>35% vs. 30%;<br>NYHA Functional Class IV<br>5% vs. 3%.<br>Severity of HF: 32±12 vs. 31±11 left ventricular ejection fraction (%). | - Education provided on disease management using the educational package before discharge;<br>- Distribution of a medication organizer, medication administration schedule, daily weight log;<br>- Telephone follow-up (2,4 weeks, then monthly for 6 months). | - A hospital pharmacist or nurse (education, phone follow-up). | Within two weeks | 6 months/<br><br>7 phone calls | 6 months | At 6 months: 42.1% vs. 37.5% (p=0.431). | At 6 months: 29% vs. 51% (p=0.2).<br><br>At 6 months (CHF-related): 14% vs. 36% (p=0.03). | 19 |
| Barth, 2001/USA[43] | Number of randomized patients: 34 (17 vs. 17)<br>Mean (SD) age: 78±6.94 vs. 72.41±9.95<br>Percentage of males: 59 vs. 35<br>Severity of HF: no data provided. | - Education provided on disease management before discharge;<br>- Telephone follow-up (within 72 hours after discharge, 2nd day, then every 2 weeks). | - A nurse (telephone follow-up). | Within one week | 2 months/<br><br>At least 6 phone calls | 2 months | | At 2 months: 0% vs. 6%. | 12 |
| Lopez Cabezas, 2006/Spain[62] | Number of randomized patients: 134 (70 vs. 64)<br>Mean (SD) age: 75.3±8.4 vs. 76.1±9.4<br>Percentage of males: 41.4 vs. 46.9<br><br>Severity of HF:<br>NYHA Functional Class III-IV<br>15.9% vs. 12.9%.<br>54.5±14.4 vs. 47.4±17.3 left ventricular ejection fraction (%). | - Education provided on disease management before discharge using written and video material;<br>- Telephone follow-up (monthly during the first 6 months, then every 2 months);<br>- Patients could contact a pharmacist by the phone if needed. | - A pharmacist (education, telephone follow-up). | Within one month | 12 months/<br><br>9 phone calls | 12 months | At 2 months: 11.4% vs. 25.0% (p=0.041);<br><br>At 6 months: 24.3% vs. 42.2% (p=0.028);<br><br>At 12 months: 32.9% vs. 48.4% (p=NS). | | 19 |
| Chaudhry, 2010/USA[44] | Number of randomized patients: 1653 (826 vs. 827)<br>Median age: 61 vs. 61<br>Percentage of males: 56.5 vs. 59.4<br><br>Severity of HF:<br>NYHA Functional Class III<br>50.4% vs. 51.1%;<br>NYHA Functional Class IV<br>7.4% vs. 5.6%; | - Telephone-based interactive voice-response system: daily toll-free calls to the system for answers on questions about general health, CHF symptoms and weight using the telephone keypad;<br>- Reminder call if the system not used for 2 consecutive days. | A study physician (review of the transmitted data). | Within one week | 6 months/<br><br>Daily transmission of vital signs. | 6 months | At 6 months: 49.3% vs. 47.4% (p=0.45). | | 20 |

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | 71% vs. 70% left ventricular ejection fraction 20 to <40%. | | | | | | | | |
| | ***Follow-up in clinic only*** | | | | | | | | |
| Doughty, 2002/ New Zealand[70] (cluster trial) | Number of randomized patients: 197 (100 vs. 97)<br>Mean (SD) age: 72.5±11.6 vs. 73.5±10<br>Percentage of males: 64 vs. 56<br>Severity of HF:<br>NYHA Functional Class III<br>24% vs. 25%;<br>NYHA Functional Class IV<br>76% vs. 75%.<br>30.6±12.7 vs. 33.8±12.7 left ventricular ejection fraction (%). | - Initial in-clinic review two weeks after discharge;<br>- Education of patients (individual and in groups);<br>- 6 in-clinic visits either with family physician or in heart failure clinic (alternating visits). | - A study team (no details) (education, initial assessment);<br>- A study nurse and a cardiologist (educational sessions);<br>- Family physician and the heart failure clinic's specialists (in-clinic follow-up) | Within two weeks | 12 months/<br><br>7 visits to the clinic | 12 months | At 12 months: 64% vs. 62% (p=NS); | | 17 |
| Jaarsma, 2008/ the Netherlands[57] | Number of randomized patients: 1049 (344 vs. 339)<br>Mean (SD) age: 70±12 vs. 72±11<br>Percentage of males: 61 vs. 60<br><br>Severity of HF:<br>NYHA Functional Class III<br>48% vs. 42%;<br>NYHA Functional Class IV<br>4% vs. 4%.<br>33±15 vs. 34±14 left ventricular ejection fraction (%). | - Outpatient visits for follow-up by cardiologist (2 months after discharge and then every 6 months);<br>- One outpatient visit for education and behavioral strategies;<br>- Advice from multidisciplinary team (e.g., diet). | - A CHF nurse (education, phone and home follow-up);<br>- Cardiologist (follow-up in the outpatient clinic);<br>- Other specialist for advice (physiotherapist, dietician, social worker). | Within 2 first months | 18 months/<br><br>10 visits to the clinic | 18 months | At 18 months: 56% vs. 53% (p=NS); | | 20 |
| | ***Transitional care interventions – moderate intensity*** | | | | | | | | |
| | ***Home visit only*** | | | | | | | | |
| Stewart, 1998/ Australia[9, 81] | Number of randomized patients: 97 (49 vs. 48)<br>Mean (SD) age: 76±11 vs. 74±10<br>Percentage of males: 45 vs. 52<br><br>Severity of HF:<br>NYHA Functional Class III<br>47% vs. 42%;<br>NYHA Functional Class IV<br>4% vs. 4%;<br>38±11 vs. 39±11 left ventricular ejection fraction. | - Visit of the nurse before discharge to educate on compliance with the treatment, symptoms;<br>- A home visit by a nurse and pharmacists one week after discharge;<br>- For poor/non-compliant patients – daily reminder, weekly medication container, encouragement of monitoring by caregivers, reminder card, referral to a community pharmacist for regular review;<br>- Update of family physician by a nurse. | - A study nurse (education, home visits);<br>- A pharmacist (assessment of knowledge on prescribed medications and compliance). | Within one week | 6 months/<br><br>No details on the frequency of home visits | 6 months | At 6 months: 49% vs. 65% (p=0.12) | | 14 |
| Barker, 2012/ Australia[71] (cluster trial) | Number of randomized patients: 120 (64 vs. 56)<br>Mean (SD) age: 73.02±10.11 vs. 72.02±10.12<br>Percentage of males: 50 vs. 41<br><br>Severity of HF:<br>NYHA Functional Class III<br>18.75% vs. 17.86%;<br>NYHA Functional Class IV<br>0% vs. 1%.<br>Severity of HF: 32.6±19.7 vs. 47±20.1 left ventricular ejection fraction (%). | - Copy of discharge medications sent to community pharmacist;<br>- Home visits by a pharmacist (within 96 hours of hospital discharge, at 1 and 6 months) to ensure medication adherence. | A pharmacist (education on the medications, home visits, contact with community pharmacists). | Within one week | 6 months/<br><br>2 home visits | 6 months | At 6 months: 87% vs. 74% (p=0.42). | | 11 |
| Naylor, 2004/USA[35] | Number of randomized patients: 239 (118 vs. 121)<br>Mean (SD) age: 76.4±6.9 vs. 75.6±6.5<br>Percentage of males: 40 vs. 44<br><br>Severity of HF:<br>30% vs. 28% left ventricular ejection | - Visits during hospitalization (within 24 hours of admission and then daily);<br>- Home follow-up (within 24 hours of discharge, weekly during the first month, then bimonthly);<br>- Patients could contact professional by phone if needed (7 days per week);<br>- In case of readmission, the patient was visited by the | - A nurse practitioner specialized in CHF (home and in-hospital visits); | Within one week | 3 months/<br><br>At least 8 home visits | 12 months | At 12 months: 44.9% vs. 55.4% (p=0.121). | | 19 |

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | fraction 35 to <45%;<br>14% vs. 14% left ventricular ejection fraction ≥45%. | nurse. | | | | | | | |
| Kwok, 2008/China[72] | Number of randomized patients: 105 (49 vs. 56)<br>Mean (SD) age: 79.5±6.6 vs. 76.8±7.0<br>Percentage of males: 45 vs. 45<br>Severity of HF: 18% vs. 30% left ventricular ejection fraction < 40% | - Visit of a nurse before discharge to provide consultation (drug compliance, diet, symptoms, exercise);<br>- Contact with community nurse by phone (hotline during office hours);<br>- Home visit by a nurse (weekly for 4 weeks and monthly after for 5 months);<br>- Close liaison by a nurse with a geriatrician, cardiologist;<br>- Patient visited by a nurse at the hospital in case of re-admission. | - A community nurse (health counseling, drug compliance, dietary advice);<br>- A geriatrician and a cardiologist (consulting with a community nurse if needed). | Within one week | 6 months/<br><br>9 home visits | 6 months | At 6 months: 46% vs. 57% (p=0.233) | | 16 |
| | ***Combination of telephone and in-clinic follow-up*** | | | | | | | | |
| Nucifora, 2006/Italy[59] | Number of randomized patients: 200 (99 vs. 101)<br>Mean (SD) age: 73±9 vs. 73±8<br>Percentage of males: 62 vs. 62<br><br>Severity of HF:<br>NYHA Functional Class III<br>64% vs. 61%;<br>NYHA Functional Class IV<br>3% vs. 1%;<br>43±16 vs. 43±19 left ventricular ejection fraction (%). | - Pre-discharge education on CHF and treatment (causes, symptoms, weight control, exercises, alcohol consumption and smoking cessation);<br>- Telephone follow-up (3-5 days after discharge) and hotline during office hours;<br>- Visits to the clinic (at 15 days, 1 and 6 months after discharge). | - A cardiovascular research nurse (pre-discharge education; phone follow-up);<br>- Internal medicine physician (scheduled visits to the clinic). | Within one week | 6 months/<br><br>1 phone contact and 3 home visits | 6 months | At 6 months: 50% vs. 50% (p=NS) | | 16 |
| Del Sindaco, 2007/Italy[60] | Number of randomized patients: 175 (86 vs. 87)<br>Mean (SD) age: 77.4±5.9 vs. 77.5±5.7<br>Percentage of males: 51.2 vs. 52.8<br><br>Severity of HF:<br>NYHA Functional Class III<br>51.2% vs. 56.3%;<br>NYHA Functional Class IV<br>11.6% vs. 4.6%.<br>33.5±11 vs. 32.5±10 left ventricular ejection fraction (%). | - Patients educated during hospitalization (using an educational booklet), contact number available to answer questions;<br>- Visits to the outpatient heart failure clinic (within 7-14 days of discharge, at 1,3 months and then every 6 months);<br>- Phone follow-up. | - A cardiologist (evaluation, treatment plan);<br>- A nurse (phone follow-up, education, coordination);<br>- Family physician (assessment of adherence to the treatment plan). | Within two weeks | 24 months/<br><br>8 visits to the clinic,<br><br>No data on the frequency of phone contacts | 24 months | At 24 months: 55.8% vs. 74.7% (p=0.014). | | 18 |
| Cleland, 2005/ the Netherlands[58] | Number of randomized patients: 258 (173 vs. 85)<br>Mean (SD) age: 67±11 vs. 68±10<br>Percentage of males: 72 vs. 82<br>Severity of HF: 25±8 vs. 24±8 left ventricular ejection fraction (%). | - Regular visits to the clinic (every 4 months);<br>- Telephone follow-up each month and phone calls by patients if needed. | - A nurse specialized in heart failure (phone follow-up);<br>- A family physician (responsible for the management plan and its adjustment) | Within one months | Over 8 months/<br><br>4 in-clinic visits<br>8 phone calls. | 8 month (240 days) | At 8 months: 49% vs. 54%. | | 18 |
| Ekman, 1998/ Sweden[64] | Number of randomized patients: 158 (79 vs. 79)<br>Mean (SD) age: 80.3±6.8 (both groups)<br>Percentage of males: 58 (both groups)<br><br>Severity of HF:<br>NYHA Functional Class<br>3.2±0.5 vs. 3.2±0.5.<br>0.43±0.18 vs. 0.38±0.15 left ventricular ejection fraction. | - One scheduled visit to the outpatient clinic (one week after discharge) for education, evaluation of condition, development of an individualized plan according to the patient's goals;<br>- Regular phone follow-up (at least once a month);<br>- Patients could contact a nurse by phone during business hours if needed;<br>- Patient's family physician was informed about the patient's situation. | - Three specially trained research nurses (phone follow-up). | Within one week | 6 months/<br><br>At least one visit to the outpatient clinic and 6 phone calls | 6 months | At 6 months: 61% vs. 57% (p=NS). | | 17 |
| Atienza, 2004/Spain[63] | Number of randomized patients: 338 (164 vs. 174)<br>Mean age: 69 vs. 67<br>Percentage of males: 62 vs. 59<br><br>Severity of HF:<br>NYHA Functional Class III<br>40% vs. 40%;<br>NYHA Functional Class IV | - Education and explanation of strategies on self-management using teaching brochure before discharge;<br>- In-clinic visit to family physician (within 2 weeks of discharge);<br>- Follow-up at the outpatient clinic (every 3 months);<br>- Telephone communication with a monitor (24/7). | - A cardiac nurse (education);<br>- Family physician (monitoring of clinical symptoms, modification of treatment if needed);<br>- Cardiologist (clinical assessment and strategies on treatment adherence). | Within two weeks | 12 months/<br><br>5 visits to the clinic, telephone monitoring (24/7) | 12 months | At 12 months: 41% vs. 58%. | | 19 |

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | 10% vs. 10%.<br>36 vs. 40 left ventricular ejection fraction. | | | | | | | | |
| Kasper, 2002/USA[45] | Number of randomized patients: 200 (102 vs. 98)<br>Mean (SD) age: 60.2±13.8 vs. 63.7±15.0<br>Percentage of males: 64.7 vs. 56.1<br><br>Severity of HF:<br>NYHA Functional Class III<br>55.9% vs. 61.2%.<br>27.1±13.8 vs. 27.5±13.9 left ventricular ejection fraction (%). | - Telephone follow-up (within 72 hours of discharge, weekly for one month, twice in the second month, and monthly thereafter);<br>- Monthly visit to the outpatient clinic (some at home if the patient could not come in);<br>- Regular update on the patient's conditions sent to the family physician;<br>- Telephone contact available 24hr./day. | - A telephone nurse coordinator (telephone follow-up);<br>- A CHF nurse (follow-up in the clinic);<br>- Cardiologist (development of treatment plan implemented by a CHF nurse);<br>- Family physician /internist (received an update and treatment of non-CHF related conditions). | Within one week | 6 months/<br><br>10 phone calls, 6 home visits | 6 months | At 6 months: 75% vs. 98%. | | 19 |
| Angermann, 2012/USA[46] | Number of randomized patients: 715 (352 vs. 363)<br>Mean (SD) age: 67.7±12.8 vs. 69.4±11.5<br>Percentage of males: 71 vs. 71<br><br>Severity of HF:<br>NYHA Functional Class III<br>40% vs. 31%;<br>NYHA Functional Class IV<br>3% vs. 5%.<br>Severity of HF: 30±8 vs. 30±8 left ventricular ejection fraction (%). | - Visit to the clinic for the appointment with the family physician or cardiologist (within 7-14 days of discharge);<br>- In-hospital education on the disease management and non-pharmacologic strategies;<br>- Telephone follow-up (weekly during the first month, then according to the patient's condition and needs);<br>- Adjustment of the pharmacological treatment by the family physician. | - A specialized nurse (education and phone follow-up);<br>- Family physician (medication adjustment);<br>- Cardiologist and psychologist (supervision of nurses). | Within one week | 180 days/<br><br>One visit to the clinic and at least 4 phone calls | ~ 6 months | At 6 months: 34% vs. 31% (p=0.28). | | 19 |
| Ducharme, 2005/ Canada[54] | Number of randomized patients: 230 (115 vs. 115)<br>Mean (SD) age: 68±10 vs. 70±10<br>Percentage of males: 73 vs. 71<br><br>Severity of HF:<br>NYHA Functional Class III<br>59% vs. 55%;<br>NYHA Functional Class IV<br>34% vs. 33%.<br>Severity of HF: 34±14 vs. 35±15 left ventricular ejection fraction (%). | - Evaluation by a multidisciplinary heart failure outpatient clinic within 2 weeks of hospital discharge (patient history, physical examination, medication management);<br>- Regular visits to the clinic (monthly);<br>- Phone follow-up (within 72 hours of discharge then monthly);<br>- Patient calls in case symptoms worsen;<br>- Education of patients and family members about the disease and its non-pharmacological management;<br>- Dietary assessment at outpatient clinic;<br>- Referral to other specialists at the clinic if needed. | - A cardiologist (initial evaluation of the patient and periodic assessments);<br>- Other specialists at the clinic (clinician nurses, dieticians, pharmacists, social workers) (referral if needed);<br>- A study nurse (phone follow-up, education). | Within one week | 6 months/<br><br>7 visits to the clinic and 7 phone contacts | 6 months | At 6 months: 39% vs. 57%. | At 6 months: 60% vs. 63%. | 20 |
| | ***Telecare – no scheduled direct contact with patients*** | | | | | | | | |
| Dar, 2009/UK[66] | Number of randomized patients: 182 (91 vs. 91)<br>Mean (SD) age: 70±12.8 vs. 72±10.4<br>Percentage of males: 29 vs. 36<br><br>Severity of HF:<br>39% vs. 40% left ventricular ejection fraction ≥40%. | - Initial home visit by the study nurse to counsel on self-monitoring of CHF;<br>- Installation of telemonitoring equipment: an electronic weight scale, automated blood pressure cuff, pulse oximeter;<br>- Each morning patients recorded their vital signs and answered four questions related to CHF symptoms;<br>- All readings were transmitted and reviewed daily;<br>- Telephone call if an alert suggested clinical deterioration;<br>- Telephone support was available during normal working hours. | - A heart failure nurse (monitoring transmitted signs, phone follow-up);<br>- Cardiologist or internist (regular review of patient's signs, medication and life style management). | Within one week | 6 months/<br><br>Daily transmission of vital signs. | 6 months | At 6 months: 36% vs. 25% (p=NS). | | 20 |
| Goldberg, 2002/USA[47] | Number of randomized patients: 280 (138 vs. 142)<br>Mean (SD) age: 57.9±15.7 vs. 60.2±14.9<br>Percentage of males: 69.6 vs. 65.5<br><br>Severity of HF:<br>NYHA Functional Class III<br>75.8% vs. 75.2%;<br>NYHA Functional Class IV<br>24.2% vs. 24.8%.<br>21.6±6.8 vs. 21.8±6.8 left ventricular | - Installation of the equipment: a weight scale;<br>- An individualized symptom response system monitored by the nurse;<br>- Data transmitted twice daily;<br>- Development of the individualized treatment plan by a physician;<br>- 7 days/week access to the nurse by phone if needed;<br>- Reporting of the changes to the physician (cardiologist). | - A cardiac nurse (monitoring vital signs, reporting to the physician, phone calls);<br>- Cardiologist (development of the treatment plan, support for the nurse). | Within one week | 6 months/<br><br>Daily transmission of vital signs | 6 months | At 6 months: 47% vs. 47% (p=NS). | | 17 |

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | ejection fraction (%). | | | | | | | | |
| | ***Transitional care intervention – high intensity*** | | | | | | | | |
| | ***Combination of home visit and telephone follow-up*** | | | | | | | | |
| Harrison, 2002/ Canada[55] | Number of randomized patients: 192 (92 vs. 100)<br>Mean (SD) age: 75.52±10.41 vs. 75.74±9.40<br>Percentage of males: 53 vs. 56<br><br>Severity of HF:<br>NYHA Functional Class III 65% vs. 70%;<br>NYHA Functional Class IV 12% vs. 8%. | - Counseling and education (medications, diet, exercise, stress) for CHF self-management;<br>- Telephone follow-up (1st within 24 hours);<br>- Linkage between home care nurse and hospital primary care nurse for consultation;<br>- Home visit by a community nurse (2 visits within 2 weeks post-discharge). | Hospital and community (home care) nurses. | Within one week | 2 weeks after discharge/<br><br>2 home visits; no details on the frequency of phone contacts | 3 months | At 3 months: 23% vs. 31% (p=0.26). | At 3 months: 29% vs. 46%. | 19 |
| Rich, 1993/USA[48] | Number of randomized patients: 98 (63 vs. 35)<br>Mean (SD) age: 80.0±6.3 vs. 77.3±6.1<br>Percentage of males: 39.7 vs. 42.9<br>Severity of HF: 2.7±1.1 vs. 3.0±1.0 of NYHA Functional Class | - Education on the disease using a booklet (before discharge and during follow-up);<br>- Dietary assessment and development of individualized diet;<br>- Tight weight control;<br>- Medication review before discharge;<br>- Liaison with social support services at discharge;<br>- Home and phone follow-up. | - Cardiovascular research nurse (education, dietary teaching, side effects of medications);<br>- Home care nurse (reinforcement of the activities provided by a research nurse);<br>- Dietician (detailed dietary history and individualized diet development);<br>- Geriatric cardiologist (medication review);<br>- Social worker and home care team (discussion of potential problems after discharge). | Within first month | 3 months/<br><br>At least 3 home visits | 3 months | At 3 months: 33.3% vs. 45.7% (p=NS). | | 18 |
| Rich, 1995/USA[8] | Number of randomized patients: 282 (142 vs. 140)<br>Mean (SD) age: 80.1±5.9 vs. 78.4±6.1<br>Percentage of males: 32 vs. 41<br>Severity of HF: 2.4±1.0 vs. 2.4±1.1 of NYHA Functional Class<br>Severity of HF: 44±14 vs. 41±13 left ventricular ejection fraction (%). | - Education on the disease using a booklet (before discharge and during follow-up);<br>- Dietary assessment and development of an individualized diet;<br>- Tight weight control;<br>- Medication review before discharge;<br>- Liaison with social support services at discharge;<br>- Home and phone follow-up. | - Cardiovascular research nurse (education, dietary teaching, side effects of medications);<br>- Home care nurse (reinforcement of the activities provided by a research nurse);<br>- Dietician (detailed dietary history and individualized diet development);<br>- Geriatric cardiologist (medication review);<br>- Social worker and home care team (discussion of potential problems after discharge). | Within first month | 3 months/<br><br>At least 3 home visits | 3 months | At 3 months: 37% vs. 67% (p=0.02). | | 16 |
| Blue, 2001/UK[67] | Number of randomized patients: 165 (84 vs. 81)<br>Mean (SD) age: 74.4±8.6 vs. 75.6±7.9<br>Percentage of males: 64 vs. 51<br><br>Severity of HF:<br>NYHA Functional Class III 34% vs. 42%;<br>NYHA Functional Class IV 43% vs. 38%. | - Home visits by nurse at decreasing frequency;<br>- Telephone contact if needed;<br>- Education on symptoms, management (medications, diet, exercises, electrolyte monitoring);<br>- Early liaison with health and social services;<br>- Psychological support. | CHF nurse (home and phone follow-up, education, optimization of treatment, psychological support). | Unclear | 12 months/<br><br>No details on the frequency of home visits and phone contacts | 12 months | At 12 months 56% vs. 60% (p=0.27). | | 19 |
| Leventhal, 2011/ Switzerland[68] | Number of randomized patients: 42 (22 vs. 20)<br>Mean (SD) age: 76.7±7.1 vs. 77.6±6.0<br>Percentage of males: 59.1 vs. 65.0 | - Home visit (one week after discharge) by a nurse;<br>- Regular follow-up by phone (17 phone calls over 12 months);<br>- Education on self-management. | A nurse specialized in heart failure (home and phone follow-up, development of a nursing treatment plan). | Within one week | 12 months/<br><br>1 home visit and 17 phone | 12 months | At 12 months: 45% vs. 30% (p=NS). | | 20 |

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | Severity of HF: 45 vs. 42 left ventricular ejection fraction (%). | | | | contacts | | | | |
| Jaarsma, 1999/ the Netherlands[10] | Number of randomized patients: 179 (84 vs. 95)<br>Mean (SD) age: 73±9 vs. 73±9<br>Percentage of males: 56 vs. 59<br><br>Severity of HF:<br>NYHA Functional Class III<br>14% vs. 20%;<br>NYHA Functional Class III-IV<br>16% vs. 26%;<br>NYHA Functional Class IV<br>70% vs. 54%.<br>34.3±12 vs. 34.5±14 left ventricular ejection fraction (%). | - Education about the consequences of the disease and non-pharmacological management (e.g., sodium restriction) during hospitalization and after discharge;<br>- Telephone (within one week after discharge) and home follow-up;<br>- Toll-free line to call the nurse if needed;<br>- Family physician or cardiologist contacted by a nurse if needed. | - A study nurse (education, telephone and home follow-up);<br>- Family physician and cardiologist (contacted by a nurse only if needed). | Within one week | 10 days/<br><br>One scheduled phone call and one scheduled home visit. | 9 months | At 1 month: 13% vs. 15% (p=NS).<br><br>At 3 months: 26% vs. 31% (p=NS).<br><br>At 9 months: 37% vs. 50% (p=0.06). | | 17 |
| | ***Combination of home visit and follow-up in clinic*** | | | | | | | | |
| Cline, 1998/Sweden[65] | Number of randomized patients: 190 (80 vs. 110)<br>Mean (SD) age: 75.1±5.1 vs. 76.0±5.3<br>Percentage of males: 55 vs. 51.8<br><br>Severity of HF:<br>2.6±0.7 vs. 2.6±0.7 NYHA Functional Class<br>31.6±8.4 vs. 35.7±12.3 left ventricular ejection fraction (%). | - Education on the disease and non-pharmacological management (e.g., sodium restriction, self-management; 2 sessions: during hospitalization and 2 weeks after discharge);<br>- Oral and video presentation in group sessions;<br>- Medication organizer for 7 days if needed to improve adherence to the treatment;<br>- Follow-up in the outpatient clinic;<br>- Home visit (one scheduled visit at 8 months);<br>- Toll-free line to call the nurse if needed. | - A CHF nurse (education, home and phone follow-up);<br>- Cardiologist or family physician (in-clinic follow-up). | Within two weeks | 12 months/<br><br>4 visits to the clinic, one home visit | 12 months | At 12 months: 39% vs. 54% (p=0.08). | | 15 |
| Thompson, 2005/ Hong Kong[73] (cluster trial) | Number of randomized patients: 106 (58 vs. 48)<br>Mean (SD) age: 73±14 vs. 72±12<br>Percentage of males: 72 vs. 73<br><br>Severity of HF: 31±8 vs. 29±11 left ventricular ejection fraction (%). | - Education on the disease and self-management provided by nurses prior to discharge;<br>- Follow-up at home (the first visit within 10 days after discharge);<br>- Access by phone if needed (during working hours);<br>- Visit to the outpatient heart failure clinic (monthly for 6 months);<br>- Referral to other services if needed. | Specialized nurse with postgraduate qualifications (education, home and outpatient visits) | Within two weeks | 6 months/<br><br>1 home visit and 6 visits to the clinic | 6 months | At 6 months: 22% vs. 44% (p<0.01). | | 21 |
| | ***Combination of home visit, telephone follow-up and follow-up in clinic*** | | | | | | | | |
| Adlbrecht, 2011/ Austria[69, 82] | Number of randomized patients: 278 (96[5] vs. 92[6] vs. 90)<br>Mean (SD) age: 73±11 vs. 70±12 vs. 71±13<br>Percentage of males: 70 vs. 63 vs. 69<br><br>Severity of HF:<br>NYHA Functional Class III<br>60% vs. 55.2% vs. 53.2%;<br>NYHA Functional Class IV<br>38.8% vs. 39.7% vs. 46.8%.<br><br>29.1±10.1 vs. 29.2±9.7 vs. 29.6±13 left ventricular ejection fraction (%). | Two intervention groups:<br>(i) Multidisciplinary care (I[5]):<br>- Home visits (1,3,6,12 months) and telephone contacts;<br>- Scheduled (10 days and 2 months after discharge) and on-demand consultations by CHF specialist;<br>- Consultation included a physical examination, blood pressure and body weight measurement, medication management, ECG, blood tests;<br>- Tailored recommendations developed according to identified health problems;<br>- Education and enhancement of self-management.<br>(ii) Pro-B-type natriuretic peptide-guided patient management (I[6]). In addition to multidisciplinary care:<br>- Ambulatory visit to CHF specialist every 2 weeks for patients with N-terminal pro-B-type natriuretic peptide level >2.200 pg/ml. If it fell below 2.200 pg/ml, patients were followed similar to multidisciplinary care. | - Specialized CHF nurse (home visits, phone calls; individualized education plan);<br>- CHF specialist (scheduled and on-demand consultations, a physical examination, medication review, scheduling of laboratory tests). | Within two weeks | 12 months/<br><br>4 home visits and 2 visits to the clinic | 12 months | At 12 months: I[5]: 75% vs. 83% (p=0.095);<br><br>I[6]: 65% vs. 83% (p=0.052). | | 16 |
| Pugh, 2001/USA[49, 83] | Number of randomized patients: 58 (27 vs. 31) | - Enhanced discharge planning (teaching about CHF management using a workbook, patient-specific printed | - A nurse case manager (home and phone follow- | Within two weeks | 6 months/ | 6 months | At 6 months: 33.3% vs. 35% | | 13 |

[5] Multidisciplinary care intervention
[6] TC based on N-terminal pro-B-type natriuretic peptide level
NS – non-significant

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | Mean (SD) age: 70.9±6.8 vs. 77.2±5.9<br>Percentage of males: 44.4 vs. 41.9<br><br>Severity of HF:<br>NYHA Functional Class III<br>48% vs. 44.1%;<br>NYHA Functional Class IV<br>8% vs. 6.9%. | material);<br>- Home follow-up (minimum 5 visits, a first visit within first two weeks) and phone follow-up (minimum 8 calls) after discharge (assessment, medication review, diet, physical activities, self-management);<br>- Outpatient visits to the clinic. | up);<br>- A dietician, a social worker, a physical therapist (contacted if needed);<br>- A family physician (in case the patient's condition worsened and for regular follow-up of patients);<br>- A cardiologist (in case the condition worsened). | | At least 5 home visits and 8 phone contacts | | (p=NS); | | |
| Jaarsma, 2008/ the Netherlands[57] | Number of randomized patients: 679 (340 vs. 339)<br>Mean (SD) age: 71±11 vs. 72±11<br>Percentage of males: 66 vs. 60<br><br>Severity of HF:<br>NYHA Functional Class III<br>47% vs. 42%;<br>NYHA Functional Class IV<br>3% vs. 4%.<br>34±14 vs. 34±14 left ventricular ejection fraction (%). | - Outpatient visits for follow-up by cardiologist (2 months after discharge and then every 6 months);<br>- One outpatient visit for education and behavioral strategies;<br>- Phone and home follow-up (weekly during the first month, then 2 home visits and telephone calls);<br>- Advice from a multidisciplinary team (e.g., diet). | - A CHF nurse (education, phone and home follow-up);<br>- Cardiologist (follow-up in the outpatient clinic);<br>- Other specialist for advice (physiotherapist, dietician, social worker). | Within one week | 18 months/<br><br>10 visits to the clinic, 6 home visits, at least 4 phone calls | 18 months | At 18 months: 57% vs. 53% (p=NS). | | 20 |
| | ***Telecare with scheduled direct contact with patients*** | | | | | | | | |
| Giordano, 2009/Italy[61] | Number of randomized patients: 460 (230 vs. 230)<br>Mean (SD) age: 58±10 vs. 56±10<br>Percentage of males: 84 vs. 86<br><br>Severity of HF:<br>NYHA Functional Class III-IV<br>46% vs. 35%;<br>28±7 vs. 26±8 left ventricular ejection fraction (%). | - Education on disease management before discharge;<br>- Transmission of ECG by fixed or mobile device to the outpatient department;<br>- Nurse/doctor available 24/7;<br>- Scheduled appointments over the phone every 7 or 15 days for patients with severe or moderate CHF;<br>- Unscheduled calls if vital sign suggests clinical deterioration. | - A nurse on duty (ECG monitoring, scheduled phone appointments, medication management);<br>- Cardiologist (ECG monitoring, support for the nurse, decision on hospitalization). | Within two weeks | 12 months/<br>24-48 scheduled phone appointments<br><br>Regular transmission of ECG | 12 months | At 12 months: 29% vs. 42% (p=0.03). | | 20 |
| Bowles, 2011/ USA[50] | Number of randomized patients: 218 (101 vs. 116)<br>Mean (SD) age: 71.3±10.2 vs. 73.5±9.6<br>Percentage of males: 35.6 vs. 33.6<br><br>Severity of HF: No data. | - Installation of telemonitoring equipment: a video phone, electronic weight scale, automated blood pressure cuff (other devices such as glucometer, pulse oximeter if a co-morbidity was present);<br>- All readings were transmitted and reviewed daily (before 11am);<br>- Video (at least 4) and home (about 5) visits. | - A telehomecare nurse (monitoring transmitted signs, video visits);<br>- A home care nurse (home visits). | Within one week | 6 months/<br><br>4 video and 5 home visits;<br><br>Daily transmission of vital signs | 6 months | At 2 months: 20% vs. 22% (p=NS);<br><br>At 6 months: 23% vs. 22% (p=NS). | | 20 |
| Kulshreshtha, 2010/USA[51] | Number of randomized patients: 110 (42 vs. 68)<br>Mean (SD) age: 65.0±2.2 vs. 70.2±1.7<br>Percentage of males: 6..9 vs. 64.7<br><br>Severity of HF:<br>0.39±0.23 vs. 0.37±0.18 left ventricular ejection fraction. | - Two visits to instruct on the use of the equipment;<br>- Installation of telemonitoring equipment: a weight scale, a blood pressure cuff, pulse oximeter;<br>- All readings were transmitted and reviewed daily;<br>- Weekly phone calls to provide additional instructions;<br>- Answers to questions on worsening CHF symptoms. | A CHF nurse (monitoring transmitted signs, phone calls, home visits). | Within one week | 6 months/<br><br>24 phone calls.<br><br>Daily transmission of vital signs | 6 months | At 1 month: 10% vs. 10% (p=NS). | | 17 |
| Pekmezaris, 2012/ USA[52] | Number of randomized patients: 168 (83 vs. 85)<br>Mean (SD) age: 81±7 vs. 83±7<br>Percentage of males: 43.3 vs. 32.9<br><br>Severity of HF: No data. | - Education on CHF management (e.g. diet, lifestyle modifications);<br>- Installation of equipment: a stethoscope, weight scale, blood pressure cuff, pulse oximeter;<br>- Combination of home and video visits (at least 5; one live visit, 2 video visits for the first 2 weeks);<br>- During the video visits, patients measured and transmitted their vital signs; | Home care nurses (home and video visits). | Within one week | 3 months/<br><br>At least 5 home/video visits<br><br>Transmission of vital signs | 3 months | At 1 month: 30% vs. 20%;<br><br>At 3 months: 51% vs. 48% | | 14 |
| Cleland, 2005/ the Netherlands[58] | Number of randomized patients: 253 (168 vs. 85)<br>Mean (SD) age: 67±13 vs. 68±10 | - Telemonitoring equipment connected to the phone line for taking measurements (weight, blood pressure, heart rate, rhythm) every day before breakfast, evening meal, after | - A nurse specialized in heart failure (phone follow-up); | Within one week | Over 8 months/<br>At least two visits to the | 8 month (240 days) | At 8 months: 47% vs. 54%; | | 18 |

| Author, year/region | Characteristics of the patients | Description of the intervention | Healthcare professionals | Beginning of the follow-up contacts post discharge | Duration of the intervention/ frequency of follow-up | Duration of the study | All-cause readmission | ED-admission | Quality score (See Appendix 4 for details)[27] |
|---|---|---|---|---|---|---|---|---|---|
| | Percentage of males: 80 vs. 82<br>Severity of HF: 25±8 vs. 24±8 left ventricular ejection fraction (%). | emptying the bladder, while wearing light clothing, before the next dose of medication;<br>- Regular visits to the clinic (every 4 month). | - A family physician (responsible for the management plan and its adjustment) | | clinic | | | | |

## Appendix 4: Methodological Quality of the Included Studies

| Study ID | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27# | Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thompson, 2005[73] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | **21** |
| Cabezas, 2006[62] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | **19** |
| Ducharme, 2005[54] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **20** |
| Rich, 1995[8] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | **16** |
| Giordano, 2009[61] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **20** |
| Wakefield, 2008[40] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **19** |
| Atienza, 2004[63] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **19** |
| Cline, 1998[65] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | **15** |
| Rich, 1993[48] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | **18** |
| Harrison, 2002[55] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | **19** |
| Jaarsma, 1999[10] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | **17** |
| Del Sindaco, 2007[60] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | **18** |
| Stewart, 1998[9] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | **14** |
| Adlbrecht, 2011[69] | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | **16** |
| Naylor, 2004[35] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **19** |
| Kasper, 2002[45] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **19** |
| Kwok, 2008[72] | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | **16** |
| Dunagan, 2005[41] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **20** |
| Cleland, 2005[58] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **18** |
| Blue, 2001[67] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | **19** |
| Kulshreshtha, 2010[51] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | **17** |
| Rainville, 1999[42] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | **14** |
| Pugh, 2001[49] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | **13** |
| Goldberg, 2003[47] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | **17** |
| Bowles, 2011[50] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **20** |
| Laramee, 2003[39] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | **17** |
| DeBusk, 2004[38] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **20** |
| Chaudhry, 2010[44] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | **20** |
| Doughty, 2002[70] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | **17** |
| Pekmezaris, 2012[52] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | **14** |
| Jaarsma, 2008[57] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **20** |

| Study ID | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27[#] | Total[*] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ekman, 1998[64] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | **17** |
| Angermann, 2012[46] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **19** |
| Tsuyuki, 2004[53] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **19** |
| Domingues, 2011[56] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | **16** |
| Barker, 2012[71] | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | **11** |
| Nucifora, 2006[59] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | **16** |
| Dar, 2009[66] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | **20** |
| Leventhal, 2011[68] | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **20** |
| Riegel, 2006[37] | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | **21** |
| Barth, 2001[43] | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | **12** |

[*] - Qualitative assessment scale: ≥ 20 – very good, 15-19 – good, 11-14 – fair, < 10 – poor.

[#] - Item 27 has been modified to account for the sample size calculation.

**Appendix 5: Additional Analyses: Exploratory Sub-group Analyses**

As there was some heterogeneity between the TCIs implemented and the study populations in the included RCTs ($I^2$=50%), we conducted exploratory subgroup analyses to explore the effect on risk of readmission due to intensity of TCI (low, moderate, high), severity of CHF based on LVEF), and mean age of participants (<70, 70-75, ≥75 years). The selected cut-off for LVEF was 40%, as the majority of studies on TCIs used this cut-off. It was not possible to split the older group (≥75 years) into sub-categories due to the lack of studies.

As indicated in the following table, there does seem to be a difference in the mean effect of TCI due to differing intervention intensities and mean included patient age, with the tests for these subgroup differences resulting in p-values of 0.04 and 0.03, respectively. While not accounting for other variables, these results suggest that high intensity interventions are effective at reducing the risk of readmission (RR, 0.86; 95%CI:0.78-0.94), and that TCIs are most effective on a population with mean age of 75 and above (RR, 0.83; 95%CI:0.76-0.92).

**Table 5.1.** Additional analysis: exploratory sub-group analysis

| Analysis | All-cause readmission* | | | Test for subgroup differences |
|---|---|---|---|---|
| | No of patients (No of trials)** | RR (95% CI) | $I^{2***}$ | p-value |
| **Intensity** | | | | |
| - Low[37-42, 44, 53, 56, 57, 62, 70] | 4,238 (12) | 1.00 (0.92-1.09) | 42% | |
| - Moderate[9, 35, 45-47, 54, 58-60, 63, 64, 66, 71, 72] | 3,286 (14) | 0.92 (0.82-1.03) | 61% | |
| - High[8, 10, 48-52, 55, 57, 58, 61, 65, 67-69, 73] | 3,339 (16) | 0.86 (0.78-0.94) | 31% | 0.04 |
| **Severity of CHF#** | | | | |
| < 40%[9, 10, 45-47, 53, 54, 56-58, 60, 61, 63, 65, 69-71, 73] | 5,712 (18) | 0.89 (0.82-0.97) | 60% | |
| ≥ 40%[8, 37, 59, 62, 68] | 792 (5) | 1.06 (0.70-1.61) | 78% | 0.44 |
| **Mean age, years** | | | | |
| < 70[42, 44-47, 51, 54, 56, 58, 61, 63] | 4,634 (11) | 0.89 (0.81-0.99) | 55% | |
| ≥ 70 and < 75[10, 37-41, 49, 50, 53, 57, 59, 66, 69-71, 73] | 4,278 (16) | 0.99 (0.91-1.08) | 53% | |
| ≥ 75[8, 9, 35, 48, 52, 55, 60, 62, 64, 65, 67, 68, 72] | 1,951 (13) | 0.83 (0.76-0.92) | 7% | 0.03 |

* - Random effects; ** - Arms in RCTs were considered as independent interventions when considered for subgroup analysis; *** - Heterogeneity: mild (0-50%), moderate (50-75%), and considerable (75-100%); # - Only for RCTs reporting the data on ejection fraction.

## Appendix 6: Additional Analyses: Sensitivity Analyses

To assess the robustness of our intervention effect estimates, we analyzed the data excluding possible outlier studies, cluster randomized studies that did not adjust for clustering of the data, RCTs with additional components and studies with lower methodological quality.

The results of the sensitivity analyses are presented in the Table below. No differences in the estimated mean effects were detected when omitting outlier studies, cluster trials, trials with additional components, and lower methodological quality studies.

**Table 6.1.** Sensitivity Analysis

| **Analysis*** | **All-cause readmission** | | |
|---|---|---|---|
| | **No of patients (No of trials)** | **RR (95% CI)** | **$I^{2**}$** |
| **All studies** | 10,863 (40) | 0.92 (0.87-0.98) | 50% |
| **Removing outliers**[71] | 10,749 (39) | 0.91 (0.86-0.97) | 48% |
| **Removing cluster trials**[70, 71, 73] | 10,447 (37) | 0.91 (0.86-0.97) | 47% |
| **Removing RCTs with additional components**[35, 72 59, 64 45, 63] | 9,623 (34) | 0.93 (0.87-0.99) | 50% |
| **Removing RCTs with lower quality (score 11-14)*** [9, 42, 49, 52, 71] | 10,392 (35) | 0.91 (0.86-0.97) | 52% |

* - Random effects;
** - Heterogeneity: mild (0-50%), moderate (50-75%), and considerable (75-100%).

Lastly, according to Fisher's exact test, the quality of a study and TCI intensity were found to be independent of one another (p-value=0.66). The contingency table with the data to perform this test is presented below.

**Table 6.2.** Test of independence of study quality and intervention intensity

| Intervention Intensity | Study quality | | |
|---|---|---|---|
| | Very Good | Good | Fair |
| Low | 5 | 6 | 2 |
| Medium | 2 | 10 | 2 |
| High | 5 | 9 | 2 |

Fisher's exact test: p-value=0.6619.

## Appendix 7: Funnel Plot for Assessing Publication Bias