Chronic heart failure: management of chronic heart failure in adults in primary and secondary care
A clinical guideline for the NHS in England and Wales

APPENDIX J: EVIDENCE TABLES

Section 9: Referral and approach to care

Contents:
Referral 2
Discharge planning 5
Multi-disciplinary team care 7
Care pathways 15
### Referral

**Paper**  

**Description**  
Randomised Controlled Trial

**N=**  
n=1396, intervention group =695, normal care =701  
Age =63yrs, Male =98.5%, hospital days in 6 months prior to randomisation =4 days Of HF patients NYHA class I =12%, class II =37%, class III =23%, class IV =28%  
USA

**Intervention**  
A pre and post discharge intervention to improve access to primary care including assessment of post discharge needs, assignment of patient to a primary care physician, and provision of bleep number of this physician to patients, with a personal visit 2 days prior to discharge. After discharge a telephone call from a nurse within 2 days to remind of follow-up appointment, with the primary care physician and nurse reviewing treatment plan at follow-up appointment. Vs normal care in HF, diabetic and COPD patients.

**Outcomes**  
The primary endpoints are hospitalisation both frequency and length of admissions for the 6 months post index discharge. Other outcomes include a self reported QOL score using the SF-36 scale and a patient satisfaction questionnaire

**Results**  
- The median time from index discharge to a general medicine clinic was significantly shorter in the intervention group 7 days than in the normal care group 13 days, (p<0.001)  
- Surprisingly the intervention group had a monthly readmission rate higher than the control group 0.19 Vs 0.14 (p=0.005) and had more days of hospitalisation 10.2 Vs 8.8days (p=0.041)  
- After adjustment for the stratification variables of risk of re-hospitalisation the difference between the groups in monthly readmission rates remained significant (0.21 Vs 0.15 p<0.001)  
- There was no significant difference between the groups in QOL scores at one or six months.

**Comments**  
The intervention may have given rise to more self reporting of illness and therefore more frequent admissions, that the difference in number of days re-hospitalised was less significantly different between the groups suggests less severe clinical state when admission occurred  
The primary care intervention did not effect the quality of life of the patients who received it, but they were substantially more satisfied with their care than were the controls  
Having a channel to voice their complaints can lead to more readmissions among severely ill patients  
The generalisability of finding may be limited by the high rate of refusal to participate, although these patients did not differ in readmission rates for 6 months after screening compared to study patients  
The study only included a proportion of HF patients (36%) so applicability of results to the guideline population requires some caution  
The high refusal to enter rate suggests that the study population is made up of patients who are more amenable to change and thus will effects of intervention on outcome

**Reference**  
216
### Description

**Cohort Studies**

### N=

- n=151
- co-managed =54, family practitioner =97
- Age 75yrs, Male =47%, NYHA class I =28%, class II=26%, class III =26%, class IV=9% unknown =11%
- USA

### Intervention

The establishment of a co-management pattern of care between a family practitioner and a cardiologist is compared to management by family practitioner only in the management of HF patients.

### Outcomes

The primary outcomes are Emergency department visits and hospitalisation (both all cause and for HF), and death all within 1 year of study.

### Results

- Two thirds of the patients were managed solely by family physicians.
- Co-managed patients had significantly more reduced systolic volume 70% had a LVEF reduced to <45% compared to 46% of the not co-managed group.
- Co-management was established before diagnosis in 20% and at the time of diagnosis in 54% of the patients who received co-managed care.
- Patients who were co-managed were taking significantly more cardiac medications, except for diuretics and ACEi which were used at the same frequency across the cohort.
- There was no difference in the frequency of non HF related hospitalisation, or mortality between the 2 groups during the year of evaluation.
- Co-management remained a significant negative predictor of HF hospitalisation after adjusting for confounding variables OR 0.25 (95% CI 0.09 – 0.96).

### Comments

The retrospective design of this study precludes any firm conclusions about a causal relationship between co-management and clinical outcomes. Having a second physician monitor a patient between visits to family practitioner may allow more opportunity to detect deterioration in status. Size of study did not allow for sub group analysis of timing of co-management and relation to clinical outcome. Inability to control for many confounding factors may have influenced the protective effect of co-management. Some patients with CHD may have established care solely with a cardiologist before HF developed. The outcomes of the study are widely applicable to most HF patients given the clinical and demographic characteristics of the study, however there may be important institutional differences when applied to a setting other than in private community based practices. It is not possible to tell if exposure status effected outcome assessment, however owing to the nature of the outcomes as mortality or other dichotomous events this is unlikely.

### Reference

215

| Description | Cohort Studies |
| N= | n=257, general physicians =154, cardiologists =103 Age =77yrs, Male =50%, NYHA classes III-IV =98%, Australia |
| Intervention | The treatment of patients admitted to generalist care are compared to specialist cardiology care as per specified admission policy |
| Outcomes | The outcomes studies were LOS, unplanned readmission, disease specific QOL, patient satisfaction, and survival |
| Results | • From admission to follow-up at 12 months cardiologists carried out more echocardiograms than generalists 39% Vs 25%. • The use of cardiac drugs by cardiologists and general physicians was similar (ACEi, Digoxin, Aspirin, B blockers, Antiarrhythmics) • There were no significant differences in QOL score at any time or patient satisfaction as average levels during the study • After adjustment for other study factors Length of stay was only reduced by cardiology care by 5% but this was not statistically significant. • Early mortality remained significantly higher among patients cared for by cardiologists in hospital OR 3.1 (95% CI 1.1 – 8.6) and at 28 days OR 4.3 (1.5 – 12.2) but the difference was no longer significant after 1 year. |
| Comments | There may have been significant differences in care between cardiologists and between generalists within the study The generalists’ patients stayed in hospital longer, had slightly more readmissions, but were less likely to die during mid term follow-up. Most of these findings were probably due to the different baseline characteristics of the patients rather than the quality of care provided. It appears that it is possible for generalists and cardiologists working within a defined admission policy and with equal access to resources, to provide the same quality of care and clinical outcome for HF patients Not clear whether outcome assessments were undertaken blinded to care group Multivariate logistic regression was used to assess univariate effects on outcomes including social, clinical factors, results from lab tests, comorbidity, and drug therapy prior to admission and during hospitalisation. |
### Discharge planning

<table>
<thead>
<tr>
<th>Paper</th>
<th>Parkes, J. &amp; Shepperd, S. 2002, &quot;Discharge planning from hospital to home&quot;, Cochrane Library no. 2</th>
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<tr>
<td>Description</td>
<td>Systematic Review</td>
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| N= | n=8 trials n=4837 patients  
All hospitalised patients included irrespective of age gender of clinical condition  
Trials from USA, Canada, Denmark |
| Intervention | A programme of discharge planning entailing initial assessment, planning, implementation and monitoring in each study compared to usual care |
| Outcomes | Various outcome measures were used in the primary trials reviewed, with follow up from two weeks to 9 months |
| Results |  
- 4 trials including elderly medical patients showed no significant differences in treatment groups in terms of length of stay with a weighted mean difference for the DP group of -1.01 (95% CI -2.06 to 0.05)  
- There were conflicting outcomes of trials reporting on readmission rates with one trial reporting an increased readmission rate at one month follow up with DP 19% Vs control 14% (p=0.005) although this effect was not seen at 6 months. Elsewhere one trial reported a decreased a readmission rate at one week with DP 5% Vs 20% in control patients, although this was not detected at 8 weeks. The remaining trials recruiting medical patients did not detect a difference between the two groups.  
- No studies reported on outcomes of incidence of complications  
- Only one study reported on mortality with identical rates noted in either arm  
- All four trials reporting the effect of discharge planning on patient health outcomes reported no significant differences in endpoints between DP and control groups  
- In terms of improved patient satisfaction with care, two trial of patients with medical conditions reported increased satisfaction when given DP at one to three months, although one of the papers did not report the figures and the other was a subgroup analysis of 40 patients |
| Comments | A very thorough literature review including searches of Medline, embase, Psychlit, Cinahl, the Cochrane library, and others from a variety of dates until 1996. Reference lists of articles selected were hand searched, and contact was made with individual trialists. With searches given. A thorough description of the review process with two reviewers independently selecting studies to be included, assessing methodological quality, and undertaking data extraction. Though no details given on rationale for meta analysis chosen  
No UK based studies makes translation of discharge planning to our care setting difficult  
A key issue regarding the definitions of discharge planning is the difficulty of understanding the relative contribution if each element.  
Two of the trials used an assessment tool to find patients eligible for discharge planning and randomised these patients, providing a selective sample  
All discharge planning programmes will be influenced by the context in which it is implemented, and by the patient group to which it is targeted |
| Reference | 208  
### Paper

### Description
Randomised Controlled Trials

### N=
- n=192 transitional care (TC) = 92, usual care = 100
- Age = 75 yrs, Male = 55%, NYHA class I = 1%, class II = 22%, class III = 67%, class IV = 10%, mean LOS = 7.63 days

### Intervention
The transitional care arm (TC) received a comprehensive programme with additional supports to improve transfer to home, including an evidence based education programme, a nursing transfer letter, a phone call within 24 hrs of discharge, phone advice, education booklet at home, education map, and consultation between hospital and community nurses compared to standard discharge

### Outcomes
The changes from baseline to MLHFQ and SF-36 scores were the primary outcomes. Hospital readmissions were also recorded, all to 12 weeks

### Results
- There was a significant benefit of TC in changes to scores on MLHFQ with a improvement of 19 points Vs 6 points with control (p<0.001)
- There were no statistically significant differences noted in the general health or physical components if the SF-36 scores between the groups
- There were no significant differences in the number of patients admitted to hospital between study arms within the 12 week trial period (p=0.26)

### Comments
- Emotional symptoms may be one of the most significant factors in understanding and intercepting hospital use by those with HF
- There are difficulties in rating QOL with a high degree of comorbidity in the population
- Contamination may have led to usual care clients receiving extra care than is normally provided.
- It is difficult to assess the magnitude of effect of individual components of the TC programme
- It is not clear whether similar finding would be seen in a younger cohort with less advanced HF
- With the relatively high drop-out rate and potential bias in outcome assessment it id difficult to be certain that the magnitude of the outcomes noted is directly attributable to the study intervention
- The outcomes of the study should be widely applicable to a wide range of HF patients, however the differences between UK and Canadian care settings cannot be discounted

### Reference
206
## Multi-disciplinary Team approach to heart failure management

| Description | Randomised Controlled Trial |
| N= | n=70, multidisciplinary group =35, usual care =35 Age =69yrs, Male =67%, Ischaemic HF origin =61%, LV ejection fraction =39% Ireland |
| Intervention | A multidisciplinary intervention including in-hospital and post discharge care, including nurse led education encompassing weight monitoring, disease and medication understanding, and salt restriction, on at least three occasions during hospitalisation. Telephone contact was made at 3 days following discharge and weekly thereafter for 12 weeks with patients visiting a clinic to check status after 2 and 6 weeks. Patients were asked to contact the centre if they noticed clinical deterioration and out of hospital increase in diuretic therapy was possible |
| Outcomes | The endpoint reported here is death and readmission within 30 days of discharge, with 90 day outcomes reported elsewhere |
| Results | • There were no deaths or unplanned readmissions for HF in either group to 30 days. This contrasts to a 20% readmission rate across the study population in the month previous to the trial |
| Comments | Thorough assessment of clinical stability before discharge, intended to standardise the groups may have led to the lack of outcome events There is no strict control group in which therapy was not maximised It is not possible to evaluate the efficacy of any particular aspect of the MC intervention in isolation There are no details of randomisation, if patients were selected in any way to be included in the MC group effects Not stated whether investigators were blinded to study arm with potential to overestimate outcomes in MC group effects Potential for contamination of intervention with communication between participants or care professionals effects |
| Reference | 207 |

Description | Randomised Controlled Trials

N= | n=181, clinical pharmacist intervention (PC) =90, control =91
Age =67yrs, Male =68%, Ischaemic origin of HF =78.5%, NYHA class I =13%, class II =54%, class III =30%, class IV=3%
USA

Intervention | The intervention group received a number of services including a verbal discussion with the clinical pharmacist who verbally provided therapeutic recommendations regarding optimising therapy with the attending physician, with focus on use of ACEi, and avoiding drug toxicity and interactions. The pharmacist then explained the purpose of each drug and gave written directions for each drug on a medication calendar, the patient was also given a telephone number to contact the pharmacist and telephone follow up was conducted at 2, 12 and 24 weeks, if patients identified worsening symptoms they were instructed to contact their primary physician. This was compared to usual care

Outcomes | Primary endpoints was all cause mortality and non-fatal HF event causing hospitalisation, with other analysis undertaken on medication compliance with median follow up of 6 months.

Results | • 4 events of the primary endpoint (mortality or HF event) occurred in the intervention group compared to 16 events in the control arm this demonstrated a significant beneficial effect OR 0.22 (95% CI 0.07 – 0.65) (p=0.005). This was largely due to a reduction in hospitalisation (including emergency visits) for HF.
• Patients in the intervention group were closer to target ACEi dose at 6 months than those in the usual care arm (p<0.001) in terms of median dose and quartile ranges

Comments | A very intensive intervention
Potential for contamination of intervention if primary care physicians have patients in both study arms
The effectiveness in the HF population likely to be particularly evident given that patients with HF, ischaemic disease, and concomitant disease may have 10 or more medications prescribed to them
Patients in the intervention group had closer follow up than the control group, which may have allowed for the early detection of volume overload.
Acceptance rates of pharmacist recommendations was not evaluated owing to the difficulties in obtaining data
Complete blinding was not appropriate owing to the nature of the intervention, but clinical events were adjudicated by a blinded physician clinical events committee using standard adjudication forms
The hospital database was studies for admissions, however for admissions to other hospitals patient reporting was the only method to assess outcomes, and this method was not checked for accuracy or replicability

Reference | 218
### Description
Randomised Controlled Trial

### N=
- n=200, multidisciplinary intervention MDT =102, usual care =98
- Age =62.5 yrs, Male =61%, NYHA class II =35%, class III =59%, LV ejection fraction =27%
- USA

### Intervention
- A Multidisciplinary team intervention at and post discharge including a cardiologist, a HF nurse, a primary physician, and a telephone nurse coordinator. The nurse telephoned patients within 72 hrs of discharge weekly for a month, twice in the second month and monthly thereafter, following a set script. HF nurses visited patients at least monthly to adjust medications including diuretic ACEi and B blocker, recommended a 2g sodium restricted diet and 20min walking exercise 4 times a week. All patients were supplied with a pill sorter, a list of correct medications an information booklet, and a contact number for the HF nurse. This was compared to usual care for 6 months.

### Outcomes
The primary outcome was a composite of mortality and HF hospitalisation. With secondary endpoints QOL and activity status, global well being and presence of ankle, as well as process of care factors

### Results
- The primary endpoint of mortality or HF hospitalisation was reached in 72 (73%) patients in the intervention group and 50 (49%) of the control group, representing a non-significant difference (p=0.09) on a log-transformed t test.
- The MDT intervention demonstrated an improvement in QOL with Minnesota living with Heart Failure scores improved by 28.3 points compared to 15.7 points with usual care (p=0.001)
- There were improvements in HF symptoms and a reduction in ankle oedema self reported by patients under MDT care in a reduced sample of the study population (p=0.003 for both)

### Comments
Regardless of randomisation the patient’s primary physician received expert recommendations at the time of enrolment
- Trial not designed to analyse the relative contributions of various components
- Some of the secondary outcomes were assessed by HF nurse in unblinded manner
- Intervention targeted at patients thought to be at high risk of readmission, so may work differently in other care settings
- Only MDT intervention reviewed to include exercise training
- Some secondary outcomes (NYHA class) were evaluated by HF nurse aware of allocation with potential to inflate beneficial outcomes in intervention group 71 effect
- Some patients in the intervention group with limited financial resources were provided with low sodium ‘meals on wheels’ and had a telephone installed

### Reference
219
<table>
<thead>
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<tbody>
<tr>
<td>Description</td>
<td>Randomised Controlled Trial</td>
</tr>
<tr>
<td>N=</td>
<td>n=165, specialist nurse led intervention =82, usual care =75 Age =75yrs, Male =58%, NYHA class II =21%, class III =43%, class IV =36%, LV systolic dysfunction mild =17%, moderate =44%, severe =36% UK</td>
</tr>
<tr>
<td>Intervention</td>
<td>A specialist nurse led intervention with the following dimensions:- Home visits of decreasing frequency supplemented by telephone contact, to educate the patients about heart failure and treatment, optimise treatment, monitor electrolyte concentrations, teach self monitoring, lease with other health care and social workers, and provide psychological support. An information booklet was provided for patients, dietary advice was given, and a contact details for the HF nurses were given. This was compared to usual care with a GP follow up visit post discharge</td>
</tr>
<tr>
<td>Outcomes</td>
<td>The primary endpoint was a composite of all cause mortality, or hospitalisation due to worsening HF. Secondary endpoints included death or hospitalisation for any reason, admission for HF, and all cause admissions. All evaluated up to 6 months</td>
</tr>
</tbody>
</table>
| Results | • Death rates were similar in the two groups  
• The primary endpoint of all cause death or HF admission showed a positive benefit for the nurse led intervention with on 31 events being reported Vs 43 in the control arm HR =0.61 (95% CI =0.38 – 0.96) (p=0.033)  
• Death or readmission rates from all causes were not significantly different between the groups  
• There were significantly fewer HF admissions in the intervention group 37% than the control group 53% HR 0.38 (0.19 – 0.76) (p=0.0044)  
• The intervention showed a benefit in a reduction in the number of admissions per patient per month at 0.124 Vs 0.174 in the usual care group rate ratio =0.71 (0.54 – 0.94) (p=0.018) |
| Comments | Benefit solely related to hospital admission and not deaths as would be expected in a small study with relatively short follow up  
Conducted before there was good evidence for use of B blockers  
Difficult to define which elements of the intervention are effective in providing beneficial outcomes  
Blinding of patients not possible owing to nature of intervention, however all hospital admissions were adjudicated by investigators blind to allocation  
Primary endpoints of mortality and hospitalisation are recorded from the hospital record department, the information and statistics division of the Scottish NHS, and the Registrar General’s Office Scotland |
| Reference | 205 |

### Description
Randomised Controlled Trial

### N=
- n=98, multidisciplinary care intervention (MDT) =63, usual care =35
- Age =79yrs, male =41%, Mean NYHA class =2.8
- USA

### Intervention
A multidisciplinary intervention was trailed Vs conventional care, with the intervention consisting of a number of facets: intensive education about HF and treatment with daily in-hospital visits with a 1.5-2.0 g sodium restricted diet recommended and importance of weight monitoring emphasised, medications were reviewed and regimen simplified, and patient seen in hospital by social worker and a member of the home care team, on discharge a summary form was completed and a nurse visited the patient within 48 hrs, and 3 times within the first week, in addition the nurse telephoned all patients to assess progress

### Outcomes
The primary endpoints were unplanned readmissions and length of hospital stay (all causes) within the first 90 days post discharge

### Results
- There was no difference in the rate of readmission between the study arms for 90 days post discharge
- A subgroup of high risk patients showed the time to readmission was shorter in the MDT compared to the usual care group (p=0.026)
- An analysis of the number of hospital days showed that there was no significant difference between values for the two study arms
- A multivariate analysis adjusting for age, diabetes, NYHA class, and MI did not significantly effect the overall results of the study

### Comments
The intervention had no apparent effect on high risk patients suggesting an alternative approach may be needed for such patients
- Small sample size
- Analysis can not give data about the relative importance of the various components of the intervention
- Not stated how outcomes were assessed in 90 day follow up, main outcomes are dichotomous variables of hospitalisation both frequency and duration but data sources not recorded
- That the intervention group included a older cohort this may have led to more negative outcomes being reported in this group ☢️ effects.
- It is possible that there was contamination in treatment intervention with some of the additional services offered in the intervention arm being given to conventional care patients also ☢️ effect
**Paper**

**Description**
Randomised controlled trial

**N=**
n=197, integrated care =100, usual care =97
Age =73yrs, Male =60%, LV ejection fraction =32%, NYHA class III =25% class IV =75%, Ischaemic HF aetiology =54%
New Zealand

**Intervention**
A multidisciplinary intervention including an outpatient clinical review within 2 weeks od discharge with review of pharmacological regime. An individual education programme was initiated by the study nurse including a booklet, and patients kept a diary for self monitoring. 6 weekly visits were scheduled alternating between the GP and HF clinic. In addition group education sessions were offered two within 6 weeks of discharge and one after 6 months. The study team were available for consultation for patients or GPs, and if an admission was not required GPs could request an earlier HF clinic visit. Control group patients received usual care

**Outcomes**
The primary endpoints were a combined outcome of death or hospital readmission, and also change in QOL. Secondary endpoints included, all cause hospital readmission, length of stay, and readmission for HF, all followed up to 1 year

**Results**
- For the primary combined end point of death or readmission there were 68 events in the intervention group and 61 events in the control group demonstrating no significant difference.
- In terms of overall admissions there were 120 cases in the intervention group whilst there were 154 events in the control group showing a rate difference of 0.47 per patient year (95% CI 0.16 to 0.78).
- There were no significant differences in the total number of bed days per patients year of follow up between the study arms
- There were significantly fewer subsequent all cause readmissions in the intervention group (56) than in the control group (95) (p=0.015)
- There was no significant difference in changes from baseline in the overall QOL score on the Minnesota Living with heart failure questionnaire between the study groups. However in the physical components there was a greater perceived benefit of the integrated management scheme with a change of score of -11.1 compared to that amongst patients in the control group where there was a -5.8 point change (p=0.015) (lower scores indicate less impairment)
No additional interventions were given to either group, however for the multi-disciplinary team group if a hospital admission was not required an earlier heart failure clinic visit could be arranged.

There were no significant differences in patient demographic or clinical characteristics at baseline.

There is likely to be some contamination of treatment and control groups with patients and health care providers not in complete isolation which would decrease effects.

The trial was terminated early with only about half of the sample size of that defined in power calculation being recruited reduce the possibility of finding significant results.

The ability of doctors of patients in the intervention arm to arrange an earlier heart failure clinic appointment rather than admit a patient will directly lead to less admission in this arm and increase effect in endpoints related to admissions and number of hospital days.

Trial terminated at 6 months due to no significant difference in primary endpoint between study groups.

Not clear which elements of intervention produce which effects.

A slight improvement in the dose of ACE therapy among patients in intervention group but not significant.

Effects more modest than seen in many home-based interventions.

Every patient has distinct educational and medical needs so flexible approaches are needed to tailor treatment to individual needs.

Reference 217
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<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Randomised controlled trial</td>
</tr>
</tbody>
</table>
| N= | n=297, HBI =149, control =148  
Age =75yrs, Male =56%, LV ejection fraction =38%, NYHA class II =45%, class III =45%, class IV=10%  
Australia |
| **Intervention** | A home based multidisciplinary intervention was studies including a structured home visit with 7 to 14 days of discharge with initial assessment including a physical examination, a review of medication adherence and understanding of prescribed treatment, as well as assessment of the social support system. A study nurse was available to act as a link to the appropriate health care if problems arose. Patient education was given in the first study the intervention lasted for 6 months. Control was usual care |
| **Outcomes** | The primary endpoint was a composite of readmission or all cause out of hospital death. Secondary endpoints included event-free survival and all cause mortality. Minimum period of follow up was 3 years with a median of 4.2 years |
| **Results** | • A total of 87% of the patients in the HBI arm reached the primary end point of readmission or out of hospital death compared to 91% of the control group when adjusted for duration of follow up this related to a mean of 0.21 events per month and 0.37 events a month respectively, a statistically significant difference (p<0.01)  
• HBI treatment was associated with significantly prolonged event free survival relative to usual care (p<0.01). In multivariate regression treatment with HBI was an independent variable associated with a reduced rate of death or readmission RR 0.70 (95% CI 0.49 to 0.91)  
• In terms of all cause mortality treatment under the HBI intervention showed to significantly prolong survival (p=0.056) with only 56% of the patients dying to end of follow up compared to 65% in the usual care group. Assignment to HBI was an independently associated with a reduction in the risk of all cause death RR 0.72 (0.54 to 0.97)  
• There were no significant differences in the number of unplanned readmissions (75% VS 80% for the HBI and control group respectively).  
• Similarly there was no significant difference in the length of stay when involved in the HBI 8.2 days compared with the control 8.8 days |
| **Comments** | Long term outcomes from 2 trials with data amalgamated  
Patients in the two study arms were well matched or most characteristics at baseline except for a higher incidence of prior MI, left bundle branch block, and higher blood urea concentration among patients in the home based intervention than the control group  
A home based integrated intervention can provide prolonged event free survival, reduce hospital use over the medium to long term  
Study endpoints did not take into account the important confounder of pharmacological therapy.  
It is difficult to identify which of the elements of the intervention provided the beneficial effects reported  
The likelihood of contamination of intervention and control through communication between patients would any treatment effect seen in outcomes  
There was in effect a break in recruitment of two years as two trials are combined, with potentially better ‘usual care’ in the control group at later stages which might tend to effect size |
| **Reference** | 7 |
## Care pathways

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<tr>
<td>Description</td>
<td>Systematic Reviews and Meta-analyses</td>
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</table>
| N= | n=10 trials, n≥2000 patients  
acute stroke care and rehabilitation or both were considered  
Nationality of included studies or reviewers not stated |
| Intervention | Criteria for inclusion included a definition of an integrated care pathway encompassing  
1) The inclusion of two or more of the following aspects of care: assessment, investigation, diagnosis or treatment.  
AND  
2) Involved two or more medical disciplines Vs standard care |
| Outcomes | Outcome measures varied between individual studies, but encompassed endpoints of complications, readmission, patient and careers  
satisfaction, QOL and length of stay. Length of follow up also varied between studies |
| Results |  
- Two studies reported on mortality with a randomised study showing a non-significant trend toward harm in the CP group, a non-randomised study showed a trend toward fewer deaths in the care pathway group. The aggregate result (n=432) demonstrated no significant difference OR 0.94 (95% CI0.34 – 2.57) (p=0.9).  
- Two non-randomised trials (n=491) showed no significant difference in death in hospital OR 0.98 (0.59 – 1.64) (p=0.9)  
- An alternative outcomes if death or dependency al end of follow up in one randomised study (n=152) showed no significant differences between patients in either study group  
- The outcome of discharge to home showed no significant benefit of CP in one randomised and four non-randomised trials (n=716) overall OR 1.33 (0.82 – 2.15) (p=0.3)  
- One randomised trial (n=110) reporting on readmission rates demonstrated significantly fewer readmissions in the CP group Vs usual care OR 0.15 (0.04 – 0.59) (p<0.0001) and this was mirrored by one non randomised trial  
- Overall two randomised and two randomised studies (n=1028) showed a non significant trend towards a shorter hospital stay under ICP treatment WMD = -1.19 (-2.76 – -0.39) (p=0.14)  
- In terms of patient and carer satisfaction with care one randomised study (n=121) showed those with CP care significantly less satisfied with their care than those under usual treatment WMD = -1.1 (-1.91 to – 0.29) (p=0.008). Similarly another randomised study (n=152) demonstrated ICP to produce a reduction in QOL with a score of 63 compared to that of 72 in the usual care arm (p=0.005) |
| Comments | Many studies simply reported 'no difference" for some results without the (no) effect size being given making pooling of data impossible  
A through description of the methodology including types of studies, participants and interventions considered and what outcomes measured were to be included. Pooling was undertaken assessing randomised and non randomised studies separately and also in combination using a fixed effect model  
Selection for ICP care in non randomised studies may have led to patients with a worse prognosis being recruited for ICP  
The poorer satisfaction and QOL scores of patients under CP may be due to pressure on staff to discharge as quickly as possible. Further research is needed before widespread implementation of stroke care pathways is recommended |
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</table>

Description | Randomised Controlled Trials

N= | n=152, ICP =76, MDT usual care =76, Age =74.5 yrs, Male =51%, Orgogozo score =55, Barthel index =5, UK

Intervention | An integrated care pathway (ICP) in which therapeutic activities were grouped according to stage and predicted patient needs, covering all aspects of rehabilitation from admission assessment to discharge referrals but not extending to post discharge phase Vs conventional MDT care during hospital admission

Outcomes | QOL outcomes were measured at 6 months using the EuroQol Visual Analogue scale (EQ-VAS), also the Barthel index and modified Rankin scale were assessed for handicap, and a validated questionnaire for patients and caregiver satisfaction with care was employed, all at 6 months

Results | • The EQ-VAS score was significantly better in the MDT group (median 72) than the ICP group (median 53) at 6 months (p<0.005) with a clear benefit in the domain of social functioning, a disadvantage in terms of self care, and no differences in the other 3 domains.  
• Sensitivity analysis assuming the best and worst possible outcomes for patients that were not available for assessment at the end of the study did not show any differences in the overall QOL outcome.  
• From multiple regression analysis MDT care (p=0.044), Rankin disability score (p=0.011), and the psychological domain of the EuroQol score (p=0.0001) remained significant independent predictors of overall EQ-VAS score.  
• There were no significant differences in patient or caregiver satisfaction with care between the groups

Comments | Difficult to generalise findings owing to the individualities of ICPs.  
Not HF population, but requiring extensive management of a chronic condition.  
ICP led management may lack the flexibility to adjust for complexities of stroke rehabilitation beyond the goal of basic functional abilities.  
Contamination bias was difficult to avoid using 2 halves of the same ward for study setting and the potential for information sharing between therapists.  
Differences in post discharge management may have contributed to differences in QOL at 6 months.  
The lack of blinding in the trial is likely to have led to overestimation of outcomes in the intervention arm owing to the self reporting nature of the endpoints & effect.  
The potential contamination between the groups as one ward was used to investigate the two management methods ∨ effect.  
In the main analysis only the patients who completed the protocol for whom data was available were analysed. However a sensitivity analysis was undertaken with and without patients who had not completed the protocol.