

Comparing the cost and clinical effectiveness of a new community in-reach rehabilitation service to an established hospital based rehabilitation service for older people: a pragmatic randomised trial with micro cost and qualitative analysis-The Community In-reach Rehabilitation and Care Transition (CIRACT) Study

CIRACT

Key words :

Care Transition, Transition Coach, Community Rehabilitation, In-Reach, Physiotherapy, Micro-costing

Authors: Sahota O^a, Pulikottil-Jacob R^b, Marshall F^c, Montgomery A^c, Tan, W^c, Sach T^d, Logan P^c, Kendrick D^c, Watson A^a, Walker M^e, Waring J^c.

- a. Nottingham University Hospitals NHS Trust**
- b. University of Warwick**
- c. University of Nottingham**
- d. University of East Anglia**
- e. Nottingham City PCT**

Corresponding Author:

**Professor Opinder Sahota
Depart HCOP, B Floor South Block, QMC
Nottingham University Hospitals NHS Trust
NG7 2UH
opinder.sahota@nuh.nhs.uk**

Competing interests: None declared

Important

A 'first look' scientific summary is created from the original author-supplied summary once the normal NIHR Journals Library peer and editorial review processes are complete. The summary has undergone full peer and editorial review as documented at NIHR Journals Library website and may undergo rewrite during the publication process. The order of authors was correct at editorial sign-off stage.

A final version (which has undergone a rigorous copy-edit and proofreading) will publish as part of a fuller account of the research in a forthcoming issue of the *Health Services and Delivery Research* journal.

Any queries about this 'first look' version of the scientific summary should be addressed to the NIHR Journals Library Editorial Office – nihredit@soton.ac.uk

The research reported in this 'first look' scientific summary was funded by the HS&DR programme or one of its predecessor programmes (NIHR Service Delivery and Organisation programme, or Health Services Research programme) as project number 11/1023/10.

For more information visit <http://www.nets.nihr.ac.uk/projects/hsdr/11102310>

The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors have tried to ensure the accuracy of the authors' work and would like to thank the reviewers for their constructive comments however; they do not accept liability for damages or losses arising from material published in this scientific summary.

This 'first look' scientific summary presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HS&DR programme or the Department of Health.

Scientific Summary

Background

Older people represent a significant proportion of patients admitted to hospital as an acute medical emergency. Their care, compared to younger patients is more challenging, their stay in hospital much longer, the risk of hospital acquired problems much higher, and the risk of being re-admitted within 28 days much greater.

Aims and Objectives

The main aim of this study was to compare the clinical, micro-cost and cost effectiveness of a Community In-reach Rehabilitation and Care Transition (CIRACT) service (intervention) with the Traditional Hospital Based rehabilitation (THB-Rehab) service (standard care) in older people (aged 70 years and over) admitted to hospital as an acute medical emergency.

The primary objective was to assess hospital length of stay between the two groups.

The secondary objectives were to evaluate the effects of the CIRACT service compared to the THB-Rehab service on:

- i) re-admission rate within 28 and 91 days post discharge;
- ii) super spell bed day (total time in NHS care)
- iii) functional ability at day 91
- iv) co-morbidity at day 91
- v) health related quality of life at day 91
- vi) micro-costs and cost-effectiveness

A qualitative appraisal provided an explanatory understanding of the organisation, delivery and experience of the CIRACT service from the perspective of key stakeholders and patients

Methods

Pragmatic randomised controlled trial (RCT) with an integral health economic study and parallel qualitative appraisal undertaken in medical wards within a large teaching hospital with community follow up, in the UK. Participants were individually randomised to either the intervention-the CIRACT service or standard care-the THB-Rehab service. The distinguishing features of the CIRACT service from the THB-Rehab service was that the team was employed by the community rather than the hospital, able to provide more intensive hospital rehabilitation, able to continue with rehabilitation following discharge and facilitate directly ongoing community care. The CIRACT team worked closely with the patient and their carers whilst in hospital, allowing a more seamless, integrated discharge home, working alongside community providers.

The qualitative appraisal involved an ethnographic study of the organisation, delivery and experience of the two services from the perspective of key stakeholders and patients. The

economic evaluation compared the micro-costs (through a three phase Time and Motion Study) and cost-effectiveness (with quality adjusted life years) of the CIRACT service to the THB-Rehab service.

Findings

250 participants were randomised, 125 to the CIRACT service and 125 to THB-Rehab service. 212 participants were followed up and included in the primary analysis. There was no significant difference in length of stay between the CIRACT and THB-Rehab service (median 8 v 9 days; geometric mean 7.8 v 8.7 days, mean ratio 0.90, 95% CI 0.74, 1.10). Median super spell bed days were 17 and 15 days for CIRACT and THB-Rehab services respectively (geometric mean ratio 0.96, 95% CI 0.76, 1.21). Of the participants who were discharged from hospital, 17% and 13% were readmitted within 28 days post discharge from the CIRACT and THB-Rehab services respectively (risk difference 3.8%, 95% CI -5.8%, 13.4%), and 42% v 37% readmitted within 91 days post discharge (risk difference 5.7%, 95% CI -7.5%, 18.8%). There were no other significant differences in any of the other secondary outcomes between the two groups.

The mean cost as determined from the micro-cost analysis of delivering the CIRACT and the THB-Rehab service alone was £302 and £303 per patient respectively. The mean costs (including direct cost to the NHS and Personal social service) of CIRACT and THB-rehab service as determined by the CSRI were £3,744 and £3,603 respectively (mean cost difference £144, 95% CI -1,645 to 1,934); mean QALYs CIRACT 0.846; THB-rehab service 0.806. The incremental cost-effectiveness ratio (ICER), from a NHS and Personal Social Services perspective was £2,022/QALY, considered within the NICE cost-effectiveness threshold, with the probability of the intervention being cost-effective estimated at 0.909 for the £30,000 threshold.

The qualitative appraisal showed that although the CIRACT service was highly regarded by those most involved, the emergent configuration of the service working across organisational and occupational boundaries was not readily accommodated by the services currently established in the community.

Conclusion

The CIRACT service as a complex intervention does not reduce hospital length of stay and does not reduce short-term readmission rates, although it was highly regarded by those most involved compared to the standard hospital therapist employed service. The estimated ICER appears cost-effective although it is subject to much uncertainty with points spanning all four quadrants of the cost effectiveness plane such that caution should be used in interpreting this result. Micro-costing work-sampling observational methodology provides a useful method to estimate the cost of service provision. Limitations in sample size which may have excluded a

smaller reduction in length of stay and lack of blinding which may have introduced some cross contamination between the two groups must be recognised.

Commissioning of the CIRACT service is not recommended in place of the standard hospital based rehabilitation service for older people admitted to hospital as an acute medical emergency.

Reducing hospital length of stay and reducing hospital readmissions remains a priority for the NHS. Further studies, are necessary powered with larger sample sizes, cluster randomisation (to reduce bias), but more importantly including a more integrated community medical model as part of the CIRACT team. .

Word count 861

Trial registration

ISRCTN94393315. Date registered: 25th April, 2013

<http://www.controlled-trials.com/ISRCTN94393315/ciract>

Funding

This study was funded by the National Institute for Health Research (NIHR) Health Services and Delivery Research (HS&DR) programme.