Stroke Early Supported Discharge: theory versus reality

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Overview: why listen?

- The need to provide stroke survivors with evidence based stroke care
- Stroke Early Supported Discharge
  - Evaluation of a complex intervention in a real world setting
  - Beyond the randomised controlled trial
- Importance of Implementation research
  - Implementation science theory
What is Implementation research?

.........and why is it important?
MRC framework

Pre-clinical
Explore relevant theory to ensure best choice of intervention and hypothesis and to predict major confounders and strategic design issues.

Phase I
Identify the components of the intervention, and the underlying mechanisms by which they will influence outcomes to provide evidence that you can predict how they relate to and interact with each other.

Phase II
Describe the constant and variable components of a replicable intervention AND a feasible protocol for comparing the intervention to an appropriate alternative.

Phase III
Definitive RCT
Compare a fully-defined intervention to an appropriate alternative using a protocol that is theoretically-defensible, reproducible and adequately controlled, in a study with appropriate statistical power.

Phase IV
Long-term Implementation
Determine whether others can reliably replicate your intervention and results in uncontrolled settings over the long term.

Continuum of increasing evidence
Complex interventions

“determine whether others can reliably replicate your intervention”
Definition

- Implementation research: study of methods to promote systematic uptake of clinical research findings and other evidence based practices into routine clinical practice, and hence to improve the quality and effectiveness of healthcare
Implementation in stroke

Randomised controlled trial → THE COCHRANE COLLABORATION® → National clinical guideline for stroke

Prepared by the Intercolligate Stroke Working Party
Fifth Edition 2016
What’s the problem?

SSNAP Acute organisational audit 2016

Chouliara, Fisher, Crosbie, Walker et al 2018
Beyond the RCT

Understanding the intervention: mechanisms of action
Does it work? (randomised controlled trial)

Facilitators and barriers to implementation: influence of context
How does it work?
Does it still work in real world conditions?

Improvement activities
How can we help make sure it survives?
Theoretical frameworks

- **Context**: Something that can impact or even block, a Mechanism. The context may be provided by the intervention, or by a broader contextual ‘backdrop’ within which the programme (intervention) operates.
- **Resources**: Required to enable a mechanism.
- **Mechanism**: The generative force that results in an Outcome. It can be manifested as a reasoning and or response to the resources or capabilities offered by or embedded in a programme (intervention).
- **Outcome**: What happened intended or unexpected.

A practical example

Implementation of Early Supported Discharge
Early Supported Discharge

Hospital

Acute  Rehab

Home

Rehab  Rehab Support  Support
Early Supported Discharge

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Clinical Trials (participants)</th>
<th>Trial results (extra independent survivors per 100 patients treated)</th>
<th>Significance</th>
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<tr>
<td>Rapid secondary prevention</td>
<td>1 (1278)</td>
<td>2</td>
<td>P=0.0001</td>
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<tr>
<td>Stroke unit</td>
<td>28 (5855)</td>
<td>5</td>
<td>P=0.0007</td>
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<td>Stroke ESD</td>
<td>14 (1957)</td>
<td>5</td>
<td>P=0.02</td>
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<td>Aspirin</td>
<td>12 (43,041)</td>
<td>1</td>
<td>P=0.008</td>
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<tr>
<td>rtPA (0-3 hrs)</td>
<td>12 (7012)</td>
<td>11</td>
<td>P=0.001</td>
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<td>Mechanical thrombectomy</td>
<td>8 (2423)</td>
<td>11</td>
<td>P=0.00001</td>
</tr>
<tr>
<td>Hemicraniectomy</td>
<td>3 (93)</td>
<td>20</td>
<td>P=0.014</td>
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</table>

2017 ESD Cochrane systematic review: 17 trials (2422), 16 trials (2359)
- ESD group: reductions in the length of hospital stay equivalent to approximately six days
- Odds ratios (OR) for the outcome of death or dependency (median 6 months; range 3 to 12) was OR 0.80 (95% CI 0.67 to 0.95, P = 0.01), which equates to five fewer adverse outcomes per 100 patients receiving ESD

Table with permission from Peter Langhorne.

Data from:
Rothwell et al 2007
SUTC 2013
ESD trialists 2012
Sandercock et al 2008
Wardlaw et al 2012
Balami et al 2015
Vahedi et al 2007
Early supported discharge (ESD) teams describe poor access to medical and nursing expertise compared with the other domiciliary services.

Strikingly there is very poor access to nursing as part of Early supported discharge teams. Nursing expertise plays a key role in rehabilitation after stroke and especially in the management of common co-morbidities such as incontinence, medicine and pain management. Rehabilitation assistants (unregistered healthcare workers delivering care under supervision) are an important part of the post-acute stroke care team workforce and require not just supervision but training in stroke care.
### National Stroke Audit

#### For Early Supported Discharge and Community Rehab Teams:
Team centred results showing care ESD/CRT teams provided

See "Outline of report" for further information about this section of the report

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<td>Nottingham City ESD Team</td>
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<td>Leicester ESD Team</td>
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<td><strong>Rehabilitation goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>L1.1</td>
<td>Number of stroke patients (discharged or transferred from ESD or CRT between October 2015 and March 2016)</td>
<td>numerator denominator</td>
<td>9655</td>
<td>81</td>
<td>82</td>
<td>75</td>
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<td>Applicability for rehabilitation goals at this team</td>
<td>numerator (n)</td>
<td>8669</td>
<td>68</td>
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<tr>
<td></td>
<td>L2.2</td>
<td>d</td>
<td>%</td>
<td>9655</td>
<td>81</td>
<td>82</td>
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<td>%</td>
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<td>84</td>
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<td>If applicable, rehabilitation goals set at this team</td>
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<td>8169</td>
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<td>67</td>
<td>72</td>
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<tr>
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<td>L2.6</td>
<td>%</td>
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<td>Number of days at this team until rehabilitation goals are set</td>
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<td><strong>Modified Rankin Scale</strong></td>
<td>L3.1</td>
<td>Modified Rankin score (mRS) at discharge</td>
<td>Median</td>
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<td>L3.3</td>
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<td><strong>Length of stay</strong></td>
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<td>Length of stay at this team (including death under the care of this team)</td>
<td>Median</td>
<td>36</td>
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<td>Upper IQR</td>
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<td>Mean</td>
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<td>24.9</td>
<td>23.9</td>
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<td>Number of days from inpatient discharge to first direct contact with this team, where this is the first team following an inpatient stay</td>
<td>Median</td>
<td>1</td>
<td>2</td>
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<td>1</td>
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<td>Upper IQR</td>
<td>3</td>
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</table>
Defining core components of ESD

- **Evidence based core components**
  - Multidisciplinary co-ordinated team
  - Stroke focus: care predominantly for people with stroke and team training in stroke
  - Eligibility: Mild to moderate disability
  - Intensive: same intensity as stroke unit
  - Responsive: treatment at home within 24 hours

- **Evaluation of evidence based ESD model**
  - ESD group (n=135) Non-ESD group (n=158)
  - ESD group – shorter length of hospital stay ESD 9 days (4-18.25) vs Non ESD 11 days (5-21) *p=0.029*
  - Higher odds of being in ≥ 90 Barthel category

Large scale implementation

- **Implementation of stroke unit care**
  - Use of national audit data
  - Multivariable regression

- **Impact of stroke unit care on outcomes in a Scottish population**
  - 41,692 stroke events, 36 hospitals
  - Admission to a stroke unit: greater likelihood of discharge home with lower mortality up to 1 year
    *(Turner et al 2014 J Neurol Neurosurg Psychiatry 0:1-5)*

- **Stroke mortality and weekend working**
  - 56,666 stroke patients, 103 hospitals
  - Patients admitted on a weekend to a stroke unit with 1.5 nurses/ten beds had a higher risk of mortality compared to patients admitted to a unit with 3.0 nurses/ten beds
NIHR HS&DR What is the Impact of Stroke ESD? WISE study

Geographical location
Features of ESD service
Patient characteristics

Organisation
Team
Clinician
Patient

Does it work in real world conditions?

Time to first assessment
Amount of rehabilitation delivered
Levels of dependency (Modified Rankin)
Length of hospital stay
Summary

• Implementation research: bridges that gap between clinical trials and patient care
• Methodology to evaluate complex interventions in real world settings (beyond the RCT)
• Impact of stroke Early Supported Discharge
  – Defining core components (‘active ingredients’)
  – Understanding context: geography, service model, patient characteristics
  – Effective and sustainable models of care
• Ensure the research we do influences the care patients receive
Over to you

Whose role is it drive adoption of evidence based interventions or drive evidence based service improvement in the NHS?

Where do you think research evidence should fit with regard to the priorities and decision making criteria of commissioners and NHS provider leads?

How do you think the findings from your research could influence patient care?

Do you think your findings will influence patient care and if so when?
Implementation references


Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. Implementation science. 2009;4:50

Harvey G, Kitson A. Parihs revisited: From heuristic to integrated framework for the successful implementation of knowledge into practice. Implementation science : IS. 2016;11:33


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