Cost Effectiveness of Neurological Rehabilitation

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Acute brain injury

Supported discharge
Hospital at home
Early community rehabilitation
Community reintegration
Enhanced participation
DEA – supported return to work

Multi-disciplinary multi-agency
Brain Injury Team

Integrated care planning
Long term support
Single point of contact
Join health and social service planning
Multi-agency care

ACUTE CARE
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ITU
Neurosurgery
Orthopaedics

more complex needs
less complex needs

A&E
DGH ward

Neuropsychiatric service

NEUROLOGICAL REHABILITATION INPATIENT UNIT

highly complex needs

TERTIARY UNIT (e.g. neuro-behavioural unit)

Hospital
Community

REHABILITATION MEDICINE SPECIALIST COMMUNITY SERVICES

RCP London. 2010
Specialised Rehabilitation

- Complex issues
- Variable goals, variable outcomes
- Benefits seen not always in health care independence
- Multi-professional activity
  - is one profession more effective/cost-effective than another?
- Team and individual competencies & professional boundaries
  - do they matter?
Rehabilitation

- **Effectiveness**
  - Evidence-based treatments
  - Relevant outcomes

- **Service efficacy**
  - Practice-based evidence
  - Resource utilisation

- **Cost-effectiveness**
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Measurement Problems

- Outcomes dependent on team activities & treatment algorithm
- Separating impact of one intervention
  - E.g. contribution of ITB over physical treatments?
- Longer initial hospital stays appear bad, but result in long term savings in cost of care

Are We Measuring the Right Things?

- Activities/QUALYs
- Northwick Park Dependency score (NPDS)
  - Prediction of dependency
- Northwick Park Care Needs assessment (NPCNA)
  - Detection of changes
- Retrospective analysis of 297 patients following severe TBI
- FIM vs. Barthel vs. NPDS/NPCNA
- NPDS/NPCNA detected changes associated with substantial care savings, especially in high dependency patients
- Floor effects of FIM negative

Turner-Stokes L, Paul S, Williams H. JNNP 2006
Rehabilitation Medicine Works

- Well recognised benefits for early rehabilitation\(^1\)
- Prompt response on ill effects of immobility & complications\(^1, 2\)
- Educating ‘acute staff’ of areas where rehabilitation is of major benefit\(^3\)
- Money spent on rehabilitation recovered with 5-9 fold savings\(^4\)
- Rehabilitation in all phases of health condition effective & cost-effective\(^4\)
- Community based programmes effective\(^4\)

Benefits of RM

• Reduces complications
  – e.g. physical effects of neurological injury, immobility, etc.
• Optimises patients’ physical & social functioning
• Identifies cognitive & emotional aspects of TBI
  – even in absence of physical sequelae
• Improves chances of independent living at home & return to work
• Concentrates therapy
  – More therapy input associated with shorter hospital stays & improved outcomes
• Right environment & skill mix of trained therapists

Participation in Society After Rehabilitation

- Reduction in care
- Social benefits
  - Getting out of house
  - Personal & family relations
- Independence
  - Community mobility
    - Driving
    - Use of assistive technology
- Occupational
  - Work
  - Informal/voluntary

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- **Cost-effectiveness**
UK Rehabilitation Outcomes Consortium

- Measures activity in rehabilitation units
- Developed in collaboration with Australian system
- Learning from international models
- Develop cost-effectiveness model

Costings Example
Model base rate notional bed day cost £400

5 bands of complexity

- **Complexity group**:
  - V. heavy (13-15)
  - Heavy (10-12)
  - Medium (7-9)
  - Low (4-6)
  - V low (0-3)

- **Bed day cost**: Base rate = £400

- **Variable Portion of cost**
  - 75% (= £300 in this example)

- **Banding Factor**
  - 1.9
  - 1.5
  - 1.0
  - 0.75
  - 0.5

- **Non-variable portion of cost**
  - 25% (= £100 in this example)

- **Banded cost**
  - £670
  - £520
  - £400
  - £325
  - £250

- **Costing multiplier**
  - 2.062
  - 1.600
  - 1.231
  - 1.000
  - 0.769

*Banding factor based on proportionate staff inputs for each complexity group derived from casemix analysis
Applied to the variable portion of the OBD costs.
Cost Benefits after Stroke Rehabilitation

- Direct costs of treating stroke patients
  - Spasticity vs. without spasticity

- Retrospective analysis of 232 patients treated over 1 year
  - Mean age 73 years, M:F 52:48

- Mean cost spasticity vs. No spasticity
  - $84,195 vs. $21,845 (p <0.001)

- Conclusion
  - Direct costs for 12 month stroke survivors 4x higher

Costs of Care for Adults

• Informal care costs 4 times higher than formal costs

• Informal care costs significantly higher for those with sudden onset conditions & hidden/ mixed impairments

• Healthcare costs significantly associated with
  – Sudden onset condition
  – Greater dependency in activities of daily living
  – Longer condition duration

• Greater dependency significantly associated with increased social care costs

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- **Cost-effectiveness**
Strongest Recommendations for Cost Benefits (GRADE Classification)

Basis of research evidence available (from both RCT- & non-RCT-based literature) and potential for cost-benefits, recommend:

• Early intensive rehabilitation, starting as soon as possible after onset\textsuperscript{1-4}

• Specialist programmes for all those with complex needs \textsuperscript{5, 6}

• Specialist vocational programmes for those with potential to return to work\textsuperscript{6,7}

Conclusion

• Cost-effectiveness elusive
  – Cannot compare against no treatment
  – These patients are already expensive!

• Enough evidence to show effectiveness of treatments

• Need to have right tools to demonstrate both

• But, also need better practice based efficacy standards

• Once decision made to treat, cost benefit from goal specific treatment

• Some treatments cost-effective

• Rehabilitation probably cost-effective, but more data needed
Thank You