

Measuring the *Complexity and Outcomes* of Brightwater clients with acquired brain injury: A whole population cohort study, 1991-2020

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Background

Staged community-based brain injury rehabilitation (SCBIR) is a novel model of post-acute rehabilitation for acquired brain injury (ABI) developed at the *Oats Street Rehabilitation Centre* in Western Australia, in which individuals complete slow-stream rehabilitation whilst living on-site at a community-based residential facility over 12-24 months.

This study evaluated change in functional independence, psychosocial functioning and goal attainment at discharge from SCBIR in large population-based cohort.

Method

- Retrospective cohort study
- N=1,011 adults aged 18-65 years with traumatic (TBI), non-traumatic brain injury (NTBI) or eligible neurologic condition
- Received SCBIR or disability support services through Brightwater Care Group from 15 Mar 1991 to 31 Dec 2020
- Outcome measures data collected at admission, review and discharge:
 - UK Functional Independence Measure and Functional Assessment Measure (FIM+FAM)
 - Mayo-Portland Adaptability Inventory (MPAI-4)
 - Goal Attainment Scale (GAS)
- Multilevel mixed-effects regression models analysed change in outcomes from admission to discharge controlling for: Age at admission, gender, Aboriginal status, marital status, remoteness area, IRSD, diagnosis group, time since injury, prior ABI, injury location, acute hospitalisation length of stay (LOS)

Results

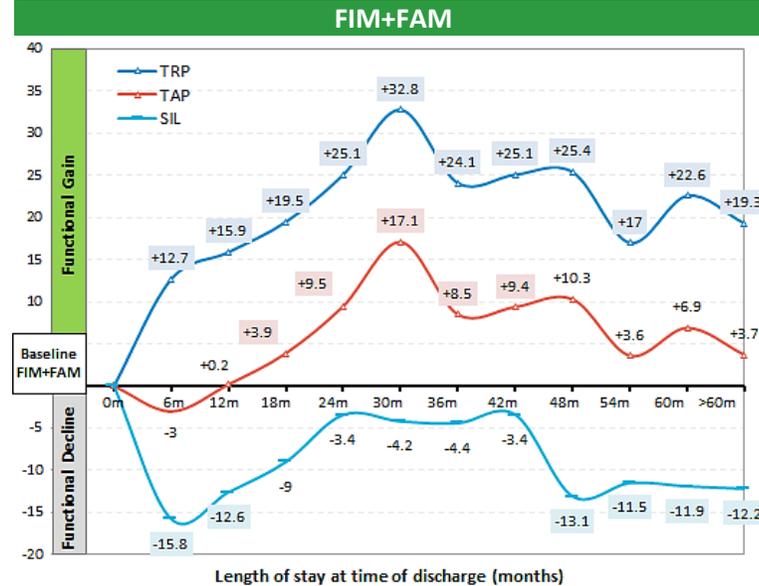


Figure 1. Mean change in FIM+FAM Total Score by Length of Stay at Discharge

Key Findings

- SCBIR clients demonstrated clinically significant functional gains at discharge, adjusted mean change = +20.3 (95% CI 17.1; 23.4), $p < 0.001$ (FIM+FAM).
- Peak functional gains of +32.3 were observed at discharge after 24-30 months LOS and clinically significant gains were observed 5 years post-admission (Figure 1).
- SCBIR clients demonstrated significantly greater functional improvement than Transition Care or Supported Independent Living clients, $p < 0.001$.
- Small improvements in psychosocial functioning were observed at discharge, with a mean reduction of -2.9T in MPAI-4 score, $p < 0.001$, but not clinically significant (Figure 2).
- Over half (52%) of SCBIR clients achieved their goals at the expected level or higher at discharge (Figure 3). Functional goals (blue) had significantly higher rates of attainment than psychosocial goals (green).

MPAI-4

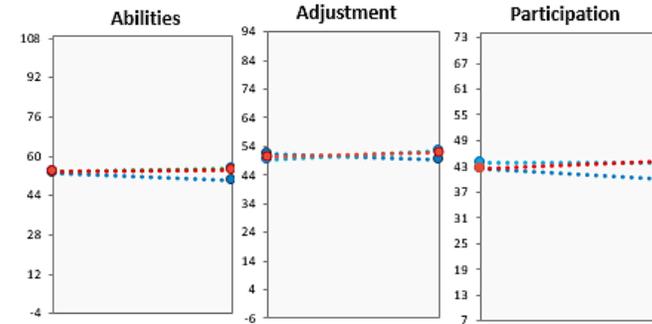


Figure 2. Mean Change in MPAI-4 Scores from Admission to Discharge

GAS

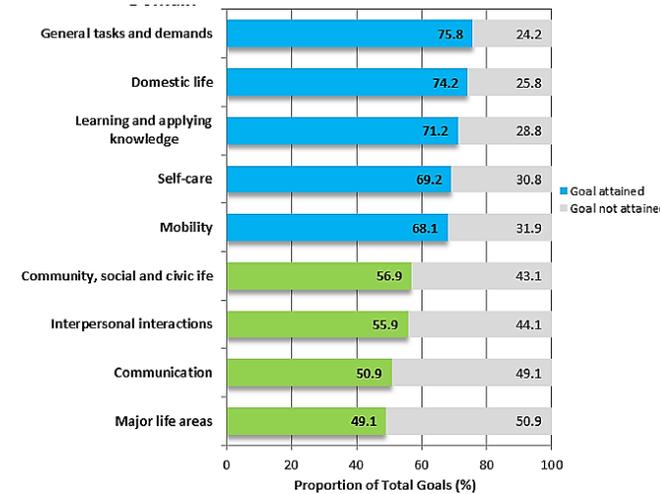


Figure 3. Goal Attainment at Discharge by Goal Domain

Discussion

- SCBIR is effective for post-acute functional rehabilitation after brain injury.
- Functional recovery is a gradual process. Individuals discharged earliest from SCBIR showed the smallest functional improvement.
- Slow stream rehabilitation models such as SCBIR may be particularly effective in promoting gradual functional recovery over time.
- Active intervention is critical after brain injury to improve functioning and prevent a natural decline in functioning.
- SCBIR can be improved to achieve clinically significant improvements in psychosocial functioning and help clients achieve psychosocial goals at discharge.

Future Research

Future research will focus on measuring long-term outcomes after discharge from SCBIR to determine whether intervention gains at discharge are sustained once the individual returns to the community.

Acknowledgements

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