

# Time between acquired brain injury and admission to post-acute brain injury services: differences in sociodemographic factors, and clinical, functional, and psychosocial outcomes, 1991-2020

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# Background/Overview

- **Time taken to access post-acute services** can significantly influence outcomes following acquired brain injury (ABI).
- Research indicates post-acute services may be critical in **supporting individuals post-discharge from hospital** if not ready to return home.



This research aimed to quantify any differences in demographics, service use or post-acute outcomes for individuals accessing services at different stages of their injuries.

# Experimental Design

- Retrospective whole-population cohort study
- Data linkage study



**All brain injury clients from  
15 March 1991 to 31 December 2020**

## **Primary Diagnosis**

- **Traumatic brain dysfunction**
- **Stroke**
- **Other non-traumatic brain dysfunction**
- **Non-congenital neurologic conditions**

## **Brightwater electronic clinical data**

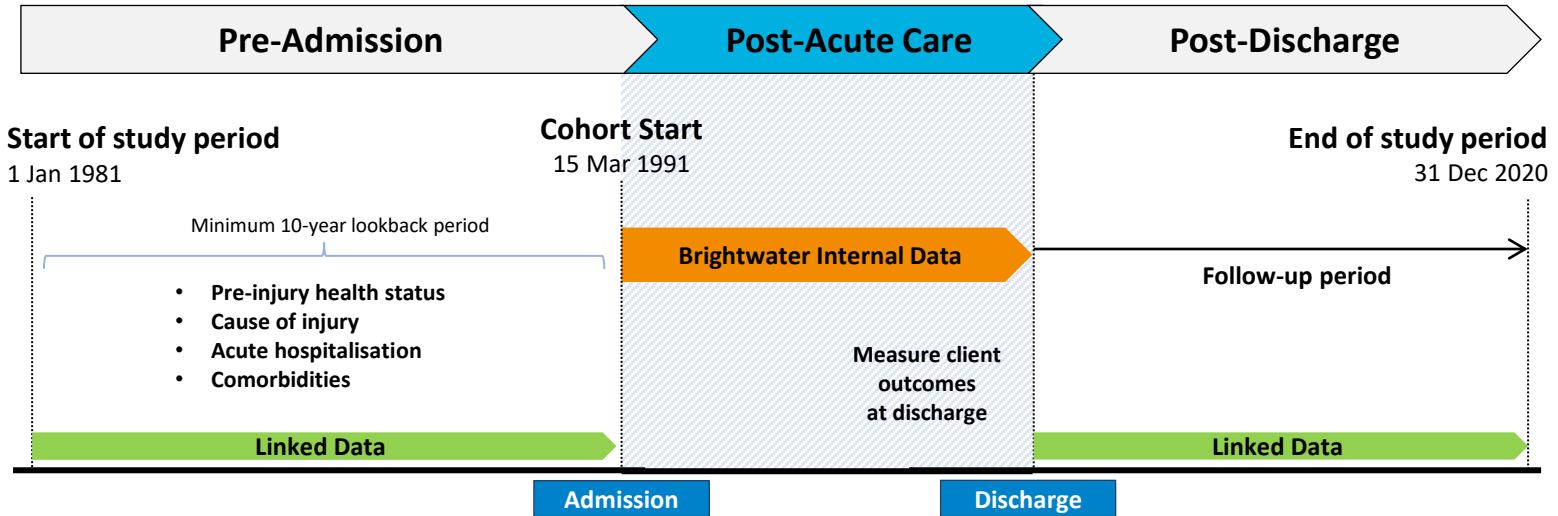
- Demographics
- Functional Independence (FIM+FAM)
- Psychosocial Function (MPAI-4)
- Quality of Life (QOLIBRI)
- Service Use

## **Linked health data collections (WADoH)**

*Probabilistically matched through WA Data Linkage System*

- Hospital Morbidity Data Collection (1981–2020)
- Emergency Department Data Collection (2002–2020)
- Mortality Register (1992–2020)

# Experimental Design



Longitudinal evaluation of complexity and outcomes across *whole recovery process*

# Clinical and Demographic Characteristics

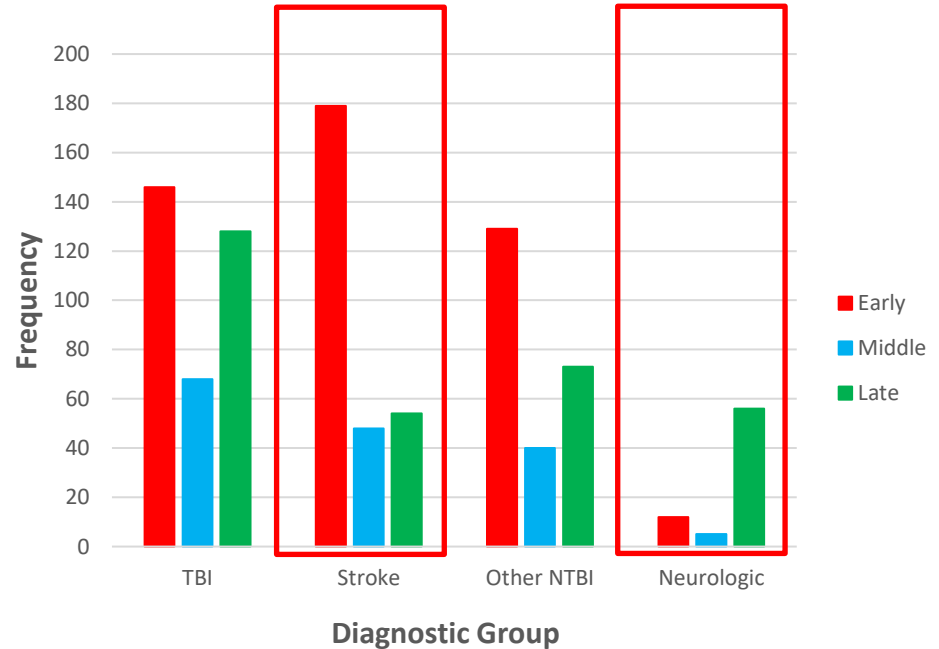
## Significant differences in diagnosis

( $p > 0.001$ ):

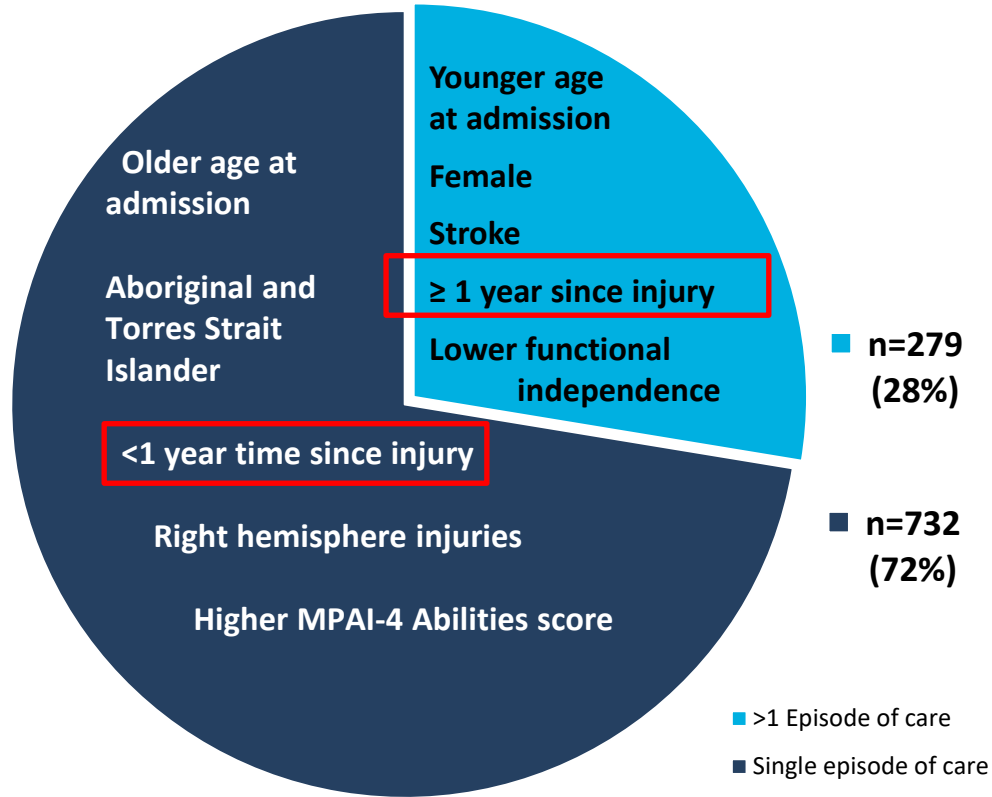
- **Stroke** group primarily in **Early** cohort
- **Neurologic** group primarily in **Late** cohort

## No significant differences in:

- Age at admission ( $p = 0.114$ )
- Gender ( $p = 0.114$ )
- Socioeconomic disadvantage (IRSD) ( $p = 0.78$ )
- Remoteness ( $p = 0.921$ )



# Patterns of Service Use



Clients at an **earlier stage** in their brain injury recovery (**<1 year since injury**) were more likely to have a single episode of care (OR=0.59,  $p=0.001$ ).

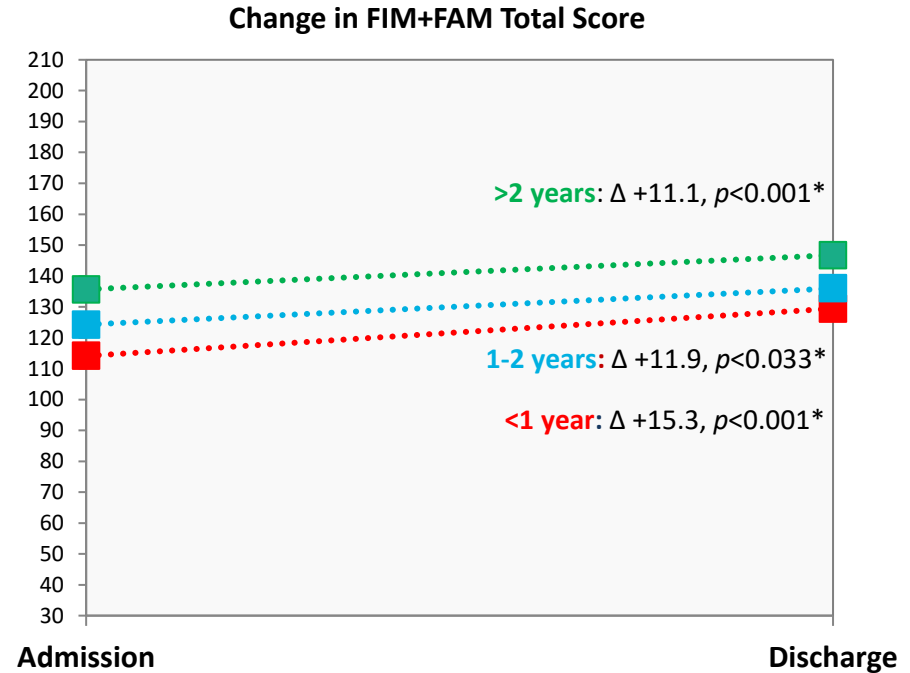
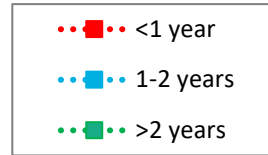
Clients at a **later stage** of brain injury recovery (**≥1 year since injury**) were more likely to have more than one episode of care.

# Functional Independence

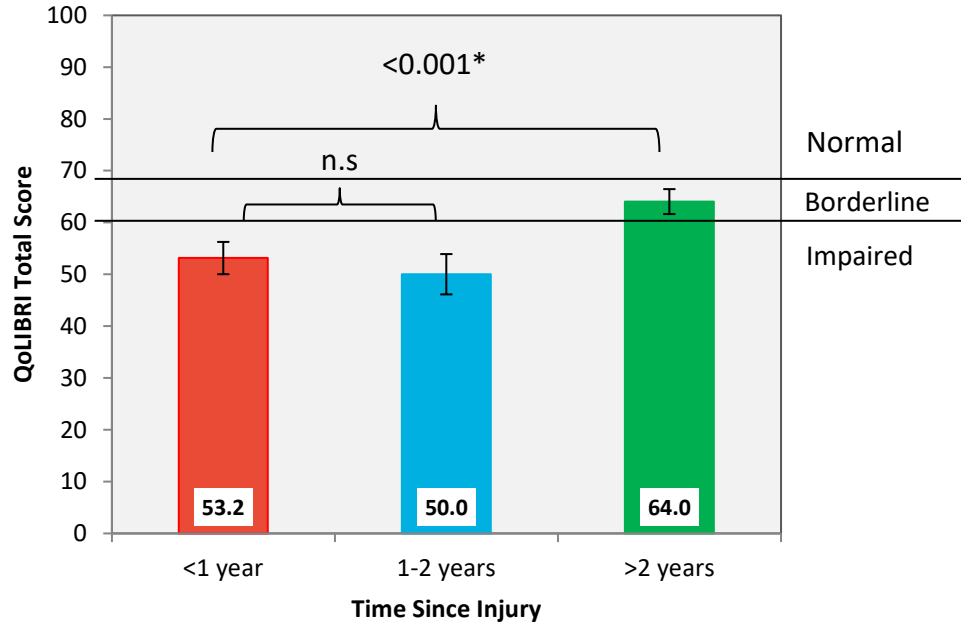
Despite the **Middle** and **Early cohorts** starting with significantly **poorer functional independence** at admission.

All groups demonstrated **significant improvement** in functional independence from admission to discharge.

The **Early** cohort demonstrated the greatest improvement and made **clinically meaningful change**.



# Quality of Life



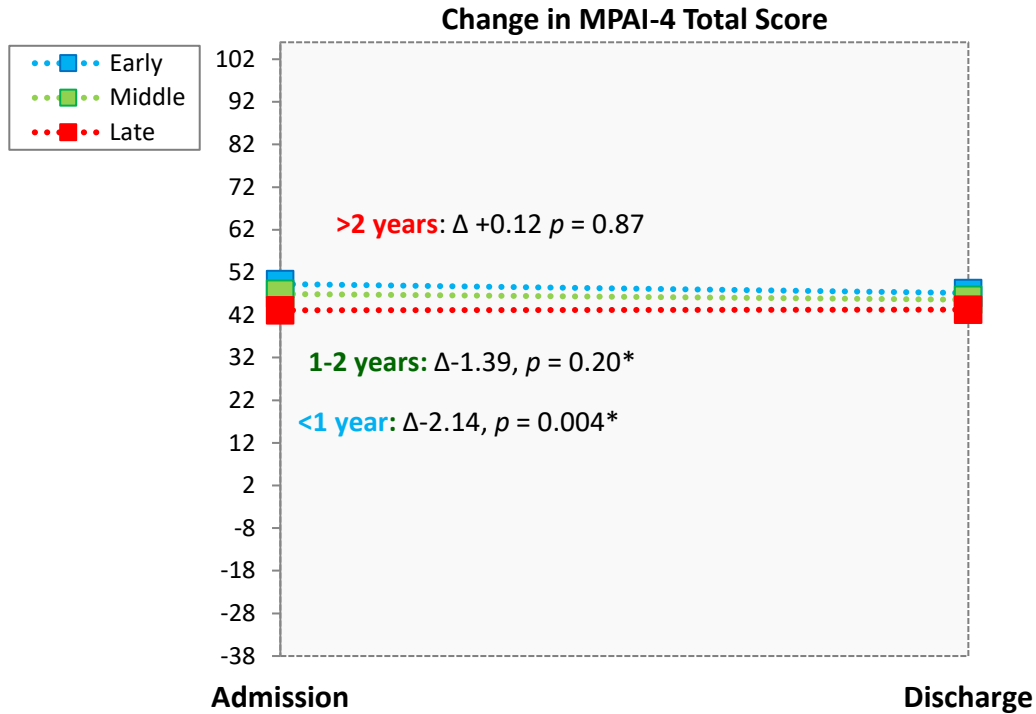
Clients in the **Late** cohort demonstrated significantly **better quality of life** than those in the earlier phases.

This may be associated with **acceptance and understanding of changed abilities** that come with time.

All groups show borderline/impaired quality of life.



# Psychosocial Function



Clients in the **Early** cohort significantly **improved** in psychosocial function from admission to discharge, and other groups did not.

Not a clinically significant improvement.

# Patterns of Service Use

## Predictors of Death during Brightwater Care, 1991–2020 (n=83)

Predictor	Hazard ratio	Standard error	95% CI	p
Age at injury	1.3	0.6	0.4, 3.1	0.029*
IRSD disadvantaged	1.3	0.2	1.0, 1.7	0.018*
<b>Time since injury</b>				
<1 year (reference)	–	–	–	–
1–2 years	0.9	0.3	0.4, 1.8	0.706
>2 years	5.4	3.0	1.8, 16.2	0.003*
<b>Injury location</b>				
Bilateral (reference)	–	–	–	–
Left	0.6	1.0	0.2, 17.5	0.755
Right	2.4	1.4	0.8, 7.6	0.130
Prior ABI	0.3	0.7	0.01, 62.7	0.634
External cause of injury	0.5	0.2	0.3, 0.9	0.048*
Moderate/severe comorbidity (ELX)	2.0	0.5	1.2, 3.3	0.006*
<b>CIRS comorbidity domains</b>				
Vascular	3.6	0.5	2.7, 4.9	<0.001*
Genitourinary	1.5	0.1	1.3, 1.7	<0.001*

Late clients were significantly **more likely to experience death** during care than, clients who were admitted within two years of injury [HR=5.4 (95% CI: 1.8–16.2),  $p=0.003$ ].

# Conclusions and Recommendations

## Key Findings

The earlier the client is admitted to post-acute care the better their outcomes:

- Greater functional improvement
- Greater psychosocial improvement
- More likely to require only a single episode of care.

Later admissions:

- Higher QOL but borderline impaired
- Multiple episodes of care
- Lower magnitude of functional and psychosocial improvement
- More likely to experience death during care

## Implications & Recommendations

Implications for service delivery:

- Early admission appears associated with better outcomes from post-acute care.
- Individual differences in outcomes may be related to **adjustment to injury**, current research examining this as a mechanism of change to explore further.

Recommendations:

- Early access to service is important to ensure best possible outcomes
- Future research should examine predictors of early access to post-acute services

# Further Information

Troeung, L., Mann, G., Wagland, J., & Martini, A. (2022). Effects of comorbidities on post-acute outcomes in acquired brain injury: ABI-REStART 1991-2020. *Annals of Physical and Rehabilitation Medicine*. Accepted for Publication, 20 March 2022.

Mann, G., Troeung, L., Wagland, J., & Martini, A. (2021). Cohort Profile: The Acquired Brain Injury Community REhabilitation Services OuTcomes CohoRT (ABI-REStART) study, 1991-2020. *BMJ Open*, 11:e052728. <https://10.1136/bmjopen-2021-052728>

Troeung L, Mann G, & Martini A. (2021). Measuring the complexity and outcomes of Brightwater clients with an acquired brain injury: A whole-population cohort study, 1991-2020. Brightwater Care Group, Perth [ISBN-13: 978-0-9954235-9-6](#)

## In Press

Mann, G., Troeung, L., Singh, K., & Martini, A. (2022). *Ability, adjustment, and participation: Does psychosocial functioning mediate change in functional independence throughout neurorehabilitation for adults with acquired brain injury?* [In Press]. Brightwater Care Group, Perth, Australia

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Any  
Questions?

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