

Effectiveness of post-acute interdisciplinary comprehensive rehabilitation in those with acquired brain injury

INTRODUCTION

Patients with traumatic brain injury (TBI) and cerebrovascular accidents (CVA) can suffer chronic physical and cognitive deficits. Intensive post-hospital (post-acute) rehabilitation efforts have been shown to improve functional abilities following these injuries (Turner-Stokes et al., 2015). Various models of post-acute rehabilitation are used, with one relatively uncommon model being “milieu-oriented.” Within these settings, very little is known regarding patient's functional outcomes or the model's overall effectiveness. Thus, the primary aim of this study was to evaluate functional improvements in patients with TBI and CVA admitted to a milieu-oriented comprehensive post-acute rehabilitation program.

METHOD

Setting: Pate Rehabilitation is a interdisciplinary post-acute rehabilitation site for acquired brain injury and is categorized as a “milieu-oriented” program. Patients at Pate receive 6 hours of therapy a day for 5 days per week. A typical patient receives a combination of dysphagia dining, life skills, occupational therapy, physical therapy, and speech therapy. Every hour, patients rotate between therapy stations in a group of 3 or 4 peers.

Participants: Patient's who either suffered a CVA (N=83) or TBI (N=59) that admitted to and discharged from Pate Rehabilitation over an 8 month-period in 2017.

Measures: The Mayo-Portland-Adaptability (MPAI-4) subscales and total scale were used to assess functional improvement. The MPAI-4 was rated by an interdisciplinary team composed of OT, PT, SLP, and Neuropsychology. Ratings were completed during team meetings 4 days after admission and within 7 days of discharge.

Statistical Analyses: Repeated measures t-tests were used to assess functional improvement as measured by the MPAI-4 T-scores. a change of 5T is thought to represent a minimal clinically important difference, and a change of 9T is thought to represent a robust clinically important difference (Malec et al., 2017). Bonferroni corrections were used to minimize the potential of Type-I error. Effect sizes were computed using Cohen's d.

RESULTS

See **Table 1** for group demographics:

- Those with TBI tended to be Non-Hispanic Caucasian, male, and possess a high school education.
- Those with CVA were predominately Non-Hispanic Caucasian, but around 25% of the sample was African-American, with roughly an even split between males and females.

See **Table 2** for the change in MPAI-4 scores between admission and discharge:

- All t-tests reached statistical significance and survived correction for Type-I error.
- Effect sizes were large across all MPAI-4 measures.

CONCLUSIONS

- All of the improvements reached at least a minimally clinically important difference, and the majority of scores were consistent with a robust clinically important difference.
- Results suggest that on average, patients who attended a milieu-oriented program made significant functional improvements in areas related to ability, adjustment to injury, and participation.
- Future studies should examine specific factors related to improvement within a milieu-oriented setting (e.g., injury characteristics, time since injury, age at injury, cultural, etc.)
- Research comparing models of post-acute rehabilitation are needed, and comparisons across different models would further serve to investigate the effectiveness of a milieu-oriented rehabilitation model.

Table 1. Sample Characteristics

	TBI (N = 59)	CVA (N = 83)
Age, M, (SD)	38.2 (14.7)	53.4 (10.8)
Time Since Injury*	46 days	33 days
Race/Ethnicity, %		
Caucasian	78%	57%
African-American	12%	28%
Hispanic	6%	9%
Other	4%	6%
Gender, %		
Male	80%	60%
Female	20%	40%
Education, %		
< High School	10%	7%
High School/GED	55%	59%
Associates	8%	5%
Bachelors	16%	16%
Graduate	11%	13%

*Note: Time Since Injury = median # of days from injury to admission

Table 2. T-score difference by MPAI-4 scale

	MPAI-4	M-difference	p-value	d
TBI	Total	11.7	<.001	1.41
	Ability	9.73	<.001	1.39
	Participation	8.05	<.001	1.23
	Adjustment	8.37	<.001	1.27
CVA	Total	10.25	<.001	1.17
	Ability	9.1	<.001	1.3
	Participation	8.33	<.001	1.16
	Adjustment	6.97	<.001	0.82

Figure 1. Degree of functional improvement following milieu-based post-acute rehabilitation

