NRI
Outcome Validation Study Highlights for 2016
Patient Demographics and Characteristics

Demographics and Characteristics

The NRI Outcome Study for the period ending December 31, 2016, addressed the discharges of 15 individuals. There were 14 males and 1 female with ages at admission ranging from 23-66 years. The average length of stay (LOS) on the NRI program was 29.5 weeks with a range of 3 to 62 weeks. This LOS is much shorter than 2015 where the average was 2.2 years.

Mechanism of Injury

The etiology of the brain injuries for the discharge population in this study includes motor vehicle crashes, anoxia, cerebrovascular accidents, and physical assault. Patients sustained moderate to severe injuries resulting in significant physical, medical, cognitive, and behavioral deficits. Most showed post-injury history of aggressive behavior including aggression toward self and others, elopement issues, non-compliance issues, and impaired impulse control. Patients had a range of cognitive problems involving attention, planning, organization, problem solving, and auditory, verbal and visual memory.

Introduction

During 2016, the NRI program maintained a high census with the average number of patients being thirty patients. In May 2016, Ron Broughton (CCO) assumed an interim role as NRI Director. Currently, NRI has three full-time clinical therapists, a speech and language pathologist, an occupational therapist, an occupational therapy assistant, and a part-time physical therapy assistant. Additional staff include a recreational therapist and job coach and several student interns.

NRI patients are exposed to individual and group therapy across a variety of modalities. Individual sessions tend to focus on restoration or compensation for these deficits that pose the greatest barrier to independence and community reintegration. Group sessions serve to bolster the gains made in individual sessions by addressing similar deficits but in a group-training context. Recreational therapy, both on and off campus, is also frequently offered. For those interested in culinary activities, a cooking class meets weekly for NRI patients.

Our Transitional Living Center (TLC) continues to offer a less-restrictive environment for our patients that have had successful progress within the inpatient program. Here, patients are exposed to an appropriate level of structure with greater independence and the opportunity to initiate and complete tasks with minimal assistance such as cooking, domestic chores and budget shopping in the community. In addition, new developments are being made in offering volunteer activities for TLC patients to include volunteering at various organizations in the community.

Outcome Measures

The NRI outcome study continues to include objective outcome measures including the Brief Neuropsychological Cognitive Examination (Tonkonogy, 1997) and the Mayo-Portland Adaptability Inventory (MPAI-4) developed by Malec and Lezak (2003). To expand the utility of the MPAI-4 data, beginning with this report, we will also be analyzing the tool's subscales. The objective measures above are combined with the subjective categorical measures that have historically been collected at NRI including the areas of Return to Independence, Social Role Return, Vocational Re-entry and Self Management. Following is the NRI Outcome Validation Study for 2016.

Categorical Data Outcomes 2006-2016

TABLE 1. Return to Independence

The table below indicates that the discharge destination of clients who completed the NRI program primarily returned home with minimal to moderate supports for 2016.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Return to independence with minimal to moderate support <6 hrs/day	45%	14%	14%	0%	13%	6%	24%	35%	17%	26%	17%
Return to congregate living or extended supports in the home >6hrs/day	0%	14%	29%	50%	17%	65%	38%	19%	29%	16%	58%
Return to group home with 24 hr/day support	33%	57%	14%	11%	37%	29%	19%	19%	27%	32%	0%
Return to nursing home or hospital setting 24 hr/day care	22%	15%	43%	39%	33%	0%	19%	27%	27%	26%	25%

TABLE 2. Vocational Re-Entry

The return to meaningful life activities such as work, school, and volunteering is an important measure of completing rehabilitation. The return to competitive employment, school or vocational training program continues to trend downward and may be related to increased severity of injuries.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Return to competitive employment, school or vocational training program	11%	0%	14%	0%	0%	6%	19%	11%	10%	5%	0%
Supported employment or volunteer work	11%	17%	14%	0%	13%	22%	9%	0%	17%	26%	25%
Sheltered workshop or day activity program	11%	33%	29%	11%	29%	17%	19%	0%	23%	21%	0%
Unable to work	45%	33%	0%	50%	42%	44%	29%	79%	23%	16%	8%
Requires 24 hr/day supervision	22%	17%	43%	39%	16%	11%	24%	10%	27%	32%	58%

TABLE 3. Social Role Return

The return to pre-injury social role is a determinant in an individual maintaining his or her independence over time. Returning to pre-injury social role and responsibilities decreased from 2013 to 2015 and the trend continued into 2016. This was accompanied by an increase over the past year in those requiring 24 hr/day supervision.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Return home with independence and minimal modifications to social role	12%	0%	14%	28%	4%	11%	14%	35%	10%	16%	8%
Return home to dependent care status	33%	33%	14%	11%	21%	17%	19%	10%	13%	11%	8%
Return home with <2 hrs/day paid behavioral support	0%	33%	10%	0%	0%	0%	0%	6%	3%	5%	0%
Return home with >2 hrs/day paid behavioral support	0%	0%	24%	11%	4%	17%	24%	6%	4%	5%	8%
Attend day program providing structured care 3-5 days/week	33%	71%	14%	11%	8%	0%	10%	19%	13%	16%	0%
24 hr/day Supervision	22%	0%	24%	39%	63%	55%	33%	24%	57%	47%	75%

TABLE 4. Self Management of Behavior											
The self-management of behavior is a key factor in long-term success. Individuals completing the NRI program demonstrate a decreasing capacity to self-regulate their behavior in 2016.											
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
No behavioral support services required	45%	66%	28%	See MPAI results	0%	11%	23%	4%	23%	0%	0%
Weekly contact with therapist, 0-5 outbursts per week	0%	17%	28%	See MPAI results	33%	44%	57%	24%	43%	47%	33%
2 or more contacts per week with therapist, 6+ outbursts per week	0%	0%	0%	See MPAI results	16%	6%	10%	24%	10%	0%	0%
Requires daily structured behavioral program	33%	0%	0%	See MPAI results	13%	6%	0%	24%	11%	32%	0%
24 hour placement	22%	17%	44%	See MPAI results	38%	33%	10%	24%	13%	21%	67%

Objective Measures Outcomes 2016

TABLE 5. BNCE and MPAI-4 Scores

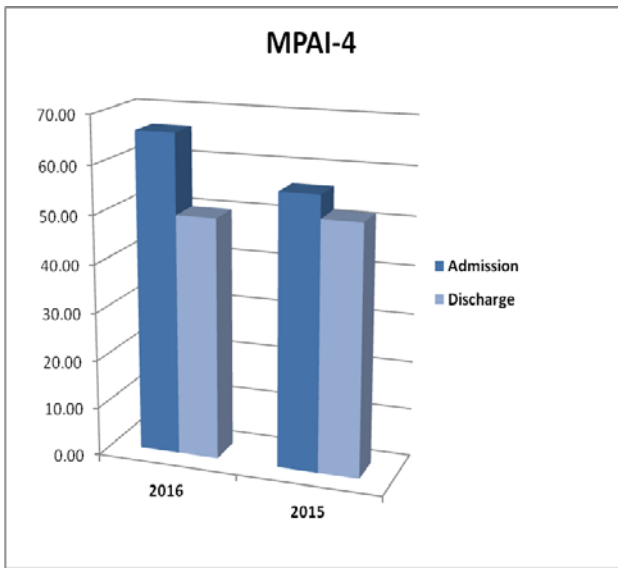
	Mayo-Portland Adaptability Inventory - 4					BNCE	
	Ability	**Adjustment**	**Participation**	**Total**	**(N =)**	**Total**	**(N =)**
Admission	63.375	62.5	62.125	66.25	**8**	18.25	**13**
Discharge	50.25	47.5	51.5	49.88	**8**	20.25	**12**
Change	13.1	15.0	10.6	16.4		2.0	
% Chance	**-21%**	**-24%**	**-17%**	**-25%**		**11%**	

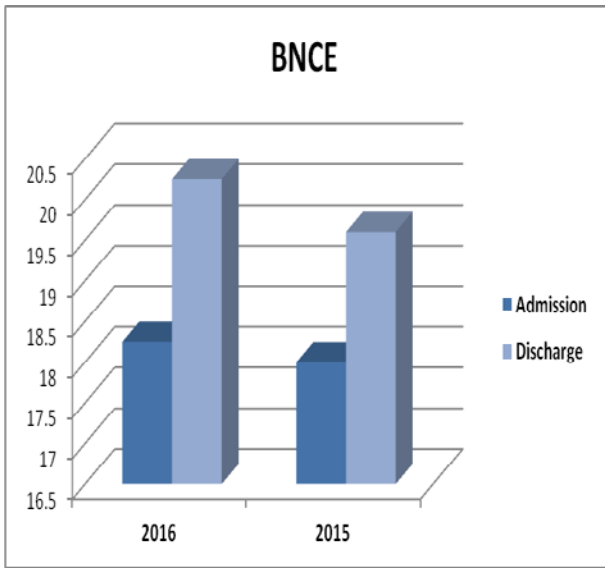
Table Notes

- MPAI-4: Scores reported as t-scores (Mean=50; Standard Deviation=10). Lower scores indicate a better level of functioning.
- MPAI-4: the following score cut-offs are relative to other persons with acquired brain injury:

> 60	suggest severe limitations
50-60	suggest moderate to severe limitations
40-50	suggests mild to moderate limitations
30-40	suggest mild limitations
< 30	represents relatively good outcomes

- BNCE: in general, a total score <22 indicates the individual may need significant support systems.
- BNCE: higher scores indicate a better level of functioning.
- The data above has (n) as less than the number of pt discharged due to missing data.





Interpretation

From the table, the BNCE data and cut-off scores reflect that the NRI patients at admission had from mild to severe deficits related to their injury. The average admission score of 18.25 denotes a moderate severity of impairment and suggests that these individuals will struggle to live without significant support systems. The average discharge score of 20.25, while still in the moderate severity range, approached the cut-off for mild severity (22 pts). The data indicates that the patients, on average, experienced an 11% improvement in cognitive functioning representing a 9.4% increase compared to 2015.

The Mayo-Portland average scores indicate significant overall improvement of our patients. Recall that lower scores are reflective of a higher level of functioning and a negative value indicates an improvement in functioning on the MPAI-4. Upon admission in 2016, patient's average score was 66.3 reflecting that, on average, patients had severe injuries with significant deficits in body structure/function, activity limitations and participation restrictions. The average NRI discharge score was 49.9. The overall scores reflected an average improvement of 16.4 points (25%) demonstrating advanced recovery to the mild to moderate category. In 2015 patients' admission and discharge scores on the MPAI-4 were 56.2 and 51.5 respectively. Compared to 2015, the patients included in this report initially had more severe deficits but managed to have significantly greater recovery at the time of discharge.

Conclusion

The NRI program has used categorical and objective measures for program evaluation for the past ten years. Taken collectively, 2016 data suggest that NRI patients admitted with more severe deficits. Despite this fact, NRI programming continues to have a positive impact on its patients.

Respectfully submitted,

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