NRI
Outcome Validation Study Highlights for 2011
Patient Demographics and Characteristics

Demographics and Characteristics

The NRI Outcome Study for the period ending December 31, 2011, addressed the discharges of 18 individuals. There were 10 males and 8 females. At admission, the average age was 36 with a range of 20 to 69. The average length of stay on the NRI program was 26 weeks with a range of 2 weeks to 3 years.

Mechanism of Injury

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

Introduction

During 2011, the NRI program experienced changes within the professional staff with the addition of a new director, a neuropsychologist, who added neurocognitive assessment and cognitive rehabilitation to the services offered. Further, both speech/language and occupational therapy services experienced staffing changes with new therapists, each of whom has brought expertise and years of experience to NRI programming. 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). The objective measures are coupled with previous categorical measures that address the areas of Return to Independence, Social Role Return, Vocational Re-entry, and Self Management.

In using objective measures, the MPAI-4 has an Adjustment subscale that speaks to behavior management, and that subscale took the place of the Self-Management of Behavior category in 2009. During 2010, the Self-Management of Behavior category was re-implemented. Following is the NRI Outcome Validation Study for 2011.

Categorical Data Outcomes 2005-2010

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 2011.

	2005	2006	2007	2008	2009	2010	2011
Return to independence with minimal to moderate support <6 hrs/day	60%	45%	14%	14%	0%	13%	6%
Return to congregate living or extended supports in the home >6hrs/day	10%	0%	14%	29%	50%	17%	65%
Return to group home with 24 hr/day support	10%	33%	57%	14%	11%	37%	29%
Return to nursing home or hospital setting 24 hr/day care	20%	22%	15%	43%	39%	33%	0%

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 and supported employment increased from 2010 to 2011.

	2005	2006	2007	2008	2009	2010	2011
Return to competitive employment, school or vocational training program	0%	11%	0%	14%	0%	0%	6%
Supported employment or volunteer work	10%	11%	17%	14%	0%	13%	22%
Sheltered workshop or day activity program	20%	11%	33%	29%	11%	29%	17%
Unable to work	50%	45%	33%	0%	50%	42%	44%
Requires 24 hr/day supervision	20%	22%	17%	43%	39%	16%	11%

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 increased from 2010 to 2011 with a slight decrease in those requiring 24 hr/day supervision.

	2005	2006	2007	2008	2009	2010	2011
Return home with independence and minimal modifications to social role	0%	12%	0%	14%	28%	4%	11%
Return home to dependent care status	70%	33%	33%	14%	11%	21%	17%
Return home with <2 hrs/day paid behavioral support	10%	0%	33%	10%	0%	0%	0%
Return home with >2 hrs/day paid behavioral support	0%	0%	0%	24%	11%	4%	17%
Attend day program providing structured care 3-5 days/week	0%	33%	71%	14%	11%	8%	0%
24 hr/day Supervision	20%	22%	0%	24%	39%	63%	55%

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 an increase in their capacity to self-regulate behavior.

	2005	2006	2007	2008	2009	2010	2011
No behavioral support services required	30%	45%	66%	28%	See MPAI results	0%	11%
Weekly contact with therapist, 0-5 outbursts per week	10%	0%	17%	28%	See MPAI results	33%	44%
2 or more contacts per week with therapist, 6+ outbursts per week	20%	0%	0%	0%	See MPAI results	16%	6%
Requires daily structured behavioral program	20%	33%	0%	0%	See MPAI results	13%	6%
24 hour placement	20%	22%	17%	44%	See MPAI results	38%	33%

Objective Data Outcomes 2011

TABLE 5. BNCE and MPAI-4

2011 Results for BNCE and MPAI-4						
BNCE		**Mayo-Portland**				
			Ability	**Adjustment**	**Participation**	**Total**
Admit	20.5	**Admit**	56.5	58.3	57.9	59.1
D/C	21	**D/C**	51.4	47.4	53.5	49.4
Diff	+0.5	**Diff**	-5.1	-10.9	-4.4	-9.7
n = 4		n = 10				

Table Notes

- BNCE: in general, a total score <22 indicates the individual will struggle living alone.
- BNCE: higher scores indicate a better level of functioning.
- MPAI-4: Scores reported as t-scores (Mean=50; Standard Deviation=10). Lower scores indicate a better level of functioning.
- Differences in "n" are reflective of missing data or some patients admitted before use of BNCE.

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. With an average admission score of 20.5, results indicated that individuals in the study will struggle to live without significant support systems. From the average discharge score, the data indicates that the patients, on average, did experience positive improvement (+0.5). Of note, however, the above data is likely not the best representation of study participants as a group. For example, admission BNCE scores ranged

from mild (27) to moderate (13) and discharge scores varied widely, as well, with scores ranging from no problems to moderate deficits. Additionally, one participant's effort during discharge examination was in question, which likely deflated his overall score. In general, participants saw modest changes in functioning upon comparison of pre and post-treatment.

The Mayo-Portland data total score indicates an overall improvement of (- 9.7). Recall the lower scores are reflective of a higher level of functioning and a negative value indicates an improvement in functioning on the MPAI-4. Looking at the subscales, the Ability subscale, that measures issues such as mobility, motor/speech, attention/concentration, and memory, had a score difference of (-5.1). The Adjustment subscale measures issues such as anxiety, depression, irritability, anger, aggression, inappropriate social interaction, and impaired self awareness. This data shows a change of (-10.9). The Participation sub-scale reflects a (-4.4) difference. This subscale measures issues such as initiation without prompting, social contact, self-care, independent living skills, transportation, employment and managing money. Within each of the aforementioned areas, patients on average showed improvement as average scores upon admission reflected deficits at or above the severely impaired range with discharge data showing deficits within the mild to moderate range.

Conclusion

This is the third year that the NRI program has used objective measures for program evaluation. NRI continues to look at categorical outcomes related to independence, social role return and vocational re-entry (see Tables 1-4) as a cross reference to the objective measures. Overall, results continue to represent positive outcomes for the individuals we serve. Efforts will continue to be placed toward improving the outcomes through empirically validated measures as a part of the research base for individuals suffering from brain injury.