



AOTA Critically Appraised Topics and Papers Series
Traumatic Brain Injury

**A product of the American Occupational Therapy Association's
Evidence-Based Literature Review Project*

CRITICALLY APPRAISED PAPER (CAP)

Focused Question

What is the evidence for the effect of interventions to address psychosocial, behavioral, and social functions on the occupational performance for persons with traumatic brain injury (TBI)?

Murrey, G. J., & Starzinski, D. (2004). An inpatient neurobehavioral rehabilitation program for persons with traumatic brain injury: Overview of and outcome data for the Minnesota Neurorehabilitation Hospital. *Brain Injury, 18*, 519–531.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

“As part of a comprehensive state coordinated service delivery plan, the Minnesota State Legislature mandated the development of a Department of Human Services operated neurobehavioral hospital for persons with [traumatic brain injury (TBI)] to address the special neurobehavioral needs of this unique population” (p. 520) that are not being met by state psychiatric facilities.

RESEARCH OBJECTIVE(S)

List study objectives.

- To review the specialized neurorehabilitation program at the Minnesota Neurorehabilitation Hospital (MNH).
- To evaluate such a program on persons with TBI and severe neurobehavioral disorders.

Describe how the research objectives address the focused question.

One objective describes the program that included occupational therapy and the other provides evidence for its effectiveness.

DESIGN TYPE:

One group, pretest posttest

Level of Evidence:

III

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *If no, explain.*

Yes Evaluation of a particular program.

No

SAMPLE SELECTION

How were subjects selected to participate? Please describe.

All patients discharged 3 years or more from the program were included.

Inclusion Criteria

Patients had to meet certain criteria to be treated at this facility. These were:

- Adult between the ages of 18 and 64
- History of TBI or qualified brain injury
- Present with significant Level I behaviors (e.g., physical and verbal threatening or aggression, inappropriate sexual behaviors, self-injurious behaviors, property destruction, or other high-risk behaviors) resulting from the traumatic or acquired brain injury
- Multiple failures in community placements and programming due to the Level I target behaviors
- Currently admitted to or at risk for admission to a state or private psychiatric facility
- Have a Rancho Los Amigos cognitive level of 4 or higher
- Be able to participate in at least 3 hours of rehabilitation services per day

Exclusion Criteria

NR

NR = Not reported.

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No All participants were evaluated 3 years

Attention

Yes

No All participants engaged in the program

Others (list and explain):

SAMPLE CHARACTERISTICS

N= 44

% Dropouts

#/ (%) Male

#/ (%) Female

Ethnicity

Disease/disability diagnosis

Check appropriate group:

<20/study group	20–50/study group <input checked="" type="checkbox"/>	51–100/study group	101–149/study group	150–200/study group
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Sample Characteristics Bias: If no, explain.

If there is more than one study group, was there a similarity between the groups?

Yes

No All patients who met criteria were treated in this facility and outcome data were sought on all participants at 3 years postdischarge.

Were the reasons for the dropouts reported?

Yes

No

INTERVENTION(S)—Included are only those interventions relevant to answering the evidence-based question

Add groups if necessary

Group 1

Brief Description	A 4-stage rehabilitation process using an individualized plan and timeline dictated by the patient’s abilities and motivation. The four stages are: (1) Emotional stabilization, which involved standardized and individualized behavioral programming, environmental management, pharmacological intervention, and individual behavioral plans and contracts established with the patient. (2) Basic skills acquisition and insight building, which involved provision of a “tool bag” of various coping strategies and behavioral/emotional regulation techniques and skills while increasing awareness and insight of the maladaptive behaviors and cognitive deficits (specific therapies are listed in the article’s appendix). (3) Skills proficiency phase, which involves giving a multitude of opportunities to apply various skills and strategies within community settings, including supportive work trials. It also involves reality-oriented psychoeducational therapies and staff feedback to increase insight into and understanding of the TBI and self-defeating behaviors. (4) Community integration or transition phase, which involves moving to a transitional unit or an in-hospital apartment trial program with higher levels of independence. A holistic milieu approach to address cognitive, psychological (spiritual), physical (medical), and behavioral needs is used.
Setting	State neurobehavioral hospital
Who Delivered?	Team lead by a behavioral neurologist/medical director. Team appeared to include occupational therapist, physical therapist, pastoral counselor, activities director, horticultural therapist, psychologist, art therapist, vocational trainer, nurses.
Frequency?	Daily from 7 a.m. to 9:30 p.m.
Duration?	NR

Intervention Biases: *Explain, if needed.*

Contamination

Yes

No

NA

Co-intervention

Yes

No

NA

Timing

Yes

No

Site

Yes

No

Use of different therapists to provide intervention

Yes “Boundaries and roles between disciplines are much more transparent within the MNH model” (pp. 522–523)

No

MEASURES AND OUTCOMES—Included are measures relevant to answering the focused question

Name of measure:

3-year postdischarge stability of community placement

Outcome(s) measured (what was measured?):

- Current living situation
- Change of residence since discharge

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Once, at the 3-year postdischarge time

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes Raters knew the participants were graduates of the MNH program and why they were being evaluated. Raters were the patient's community behavioral analyst or county case manager.

No

Recall or memory bias *If yes, explain.*

Yes

No Nonstandardized evaluation

Others (list and explain):

Limitations (appropriateness of outcomes and measures) *If no, explain.*

Did the measures adequately measure the outcome(s)?

Yes

No

Name of measure:

Post-discharge vocational status—employment status

Outcome(s) measured (what was measured?):

Nature of employment at 3-year follow-up

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Once, at the 3-year postdischarge time

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes Raters knew the participants were graduates of the MNH program and why they were being evaluated. Raters were the patient's community behavioral analyst or county case.

No

Recall or memory bias *If yes, explain.*

Yes

No Nonstandardized evaluation

Others (list and explain):

Limitations (appropriateness of outcomes and measures) *If no, explain.*

Did the measures adequately measure the outcome(s)?

Yes

No

Name of measure:

Postdischarge psychiatric hospital or correctional facility admission frequency; postdischarge psychiatric length of stay

Outcome(s) measured (what was measured?):

Number of admissions and length of stay obtained from the statewide database on psychiatric admissions and readmissions to state psychiatric facilities, and corresponding length of stay for each admission

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Once, at the 3-year postdischarge time

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes Raters knew the participants were graduates of the MNH program and why they were being evaluated. Raters were the patient's community behavioral analyst or county case manager.

No

Recall or memory bias *If yes, explain.*

Yes

No

Others (list and explain):

Nonstandardized evaluation

Limitations (appropriateness of outcomes and measures) If no, explain.

Did the measures adequately measure the outcome(s)?

Yes

No

RESULTS

List results of outcomes relevant to answering the focused question

Include statistical significance where appropriate ($p < 0.05$) **NR**

Include effect size if reported

Pre-MNH Admission:

- 100% of participants had more than three community placement failures
- 39 (89%) had a history of 3 or more psychiatric admissions
- 38 (86%) had lengths of stay of over 150 days per admission. Mean length of stay in psychiatric admission was 263 days, with 42% of admissions over 9 months in duration
- 35 (80%) had been unemployed over 2-year period prior to MNH admission

3 Years Post-MNH Discharge:

- 13 (30%) had a psychiatric admission during the 3-year postdischarge period
- 5 (11%) had multiple admissions
- Length of stay ranged from 2 to 1521 days (mean = 225 days) per admission. If two outliers were removed, the mean was 147.5 days
- 9 (69% of 13) of the admitted patients returned to initial post-MNH discharge placement site
- 6 (18% of 34) were living independently with no or little home support
- 20 (59% of 34) were living in specialized TBI foster home settings
- 17 (50% of 34) were involved in some employment (sheltered, supportive, semi-independent, or independent)

Was this study adequately powered (large enough to show a difference)? *If no, explain.*

Yes

No

Were appropriate analytic methods used? *If no, explain.*

Yes

No Statistical analyses used.

Were statistics appropriately reported (in written or table format)? *If no, explain.*

Yes

No N/A

CONCLUSIONS

State the authors' conclusions that are applicable to answering the evidence-based question.

“Clearly the combination of the intensive and comprehensive inpatient neurobehavioral program and the specialized/appropriate community support resulted in long-term success on these various measures for the majority of the patients involved.” (p. 528)

Were the conclusions appropriate for the study design (level of evidence)? *If no, explain.*

Yes

No The participants may have been engaged in other programs during the 3-year period after discharge and before reassessment. There was no control for this threat to validity.

Were the conclusions appropriate for the statistical results? *If no, explain.*

Yes

No N/A; no statistics reported

Were the conclusions appropriate given the study limitation and biases? *If no, explain.*

Yes

No The results were not tested statistically, the measures were nonstandardized, no reliability had been established for the measures/reporters, and there was no account of the history/maturation effects during the 3 years posttreatment prior to the reevaluation.

IMPLICATIONS FOR OCCUPATIONAL THERAPY

This section provides guidance about clinical practice, program development, and other implications of the study findings as they relate to the focused question.

Because of limitations of measurement, design, and lack of statistical analysis, this study offers little specific guidance to occupational therapy other than the authors' statement that “specialized programs can produce significant results for persons with TBI who present with very poor prognoses and severe, seemingly ingrained, target behaviors” (p. 529). The sample daily schedule supplied in the appendix includes interventions that occupational therapists are skilled to offer, including activities of daily living training, individual treatment, social orientation, crafts, hobbies, cognitive rehabilitation, stress management, horticulture, individual skills therapy, client banking, cooking group, social skills group, art therapy, vocational training, biofeedback, supportive work trials, leisure activity planning, community outings; however, what the occupational therapist on the team actually did was not stated.

This work is based on the evidence-based literature review completed by Catherine Trombly, ScD, OTR/L, FAOTA.

CAP Worksheet adapted from: Critical Review Form – Quantitative Studies ©Law, M., Stewart, D., Pollack, N., Letts, L., Bosch, J., & Westmorland, M., 1998, McMaster University. Used with permission.

For more information about the Evidence-Based Literature Review Project, contact the American Occupational Therapy Association, 301-652-6611, x 2052.



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