

Running Head: Technical Report on standardized assessment after TBI

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Standardized Assessment for Persons with Traumatic Brain Injury: Technical Report

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Introduction

This technical report is one of a series of reports by the Academy of Neurologic Communication Disorders and Sciences (ANCDS) working groups on evidence-based clinical practice (EBP) in neurologic communication disorders. The EBP project was initiated in 1997, when ANCDS established committees of experts to develop EBP guidelines for the following areas: dysarthria, aphasia, dementia, apraxia, and cognitive-communication disorders associated with traumatic brain injury (TBI). The scope and mission of the EBP project are described in detail in previous publications (Golper et al., 2001; Kennedy et al., 2002; Sohlberg et al., 2003). This report was generated by the sub-committee on cognitive-communication disorders associated with TBI, and its purpose is to present for review the evidence for the use of standardized tests. Evaluation and assessment using nonstandardized tests and other approaches will be addressed in a separate report.

Definitions of Terms

Target Population

The target population members were children, adolescents, and adults with cognitively-based communication disorders associated with TBI. TBI was defined as an acquired injury to the brain due to applied force, and included closed head injury (e.g., via gravitational force) and open head injury (e.g., with penetration of the skull by a missile).

Definition of Cognitive-Communication Disorder

For the purposes of this report, the term “cognitive-communication disorders” was used, as defined by the American Speech-Language-Hearing Association (ASHA):

“Cognitive-communication disorders encompass difficulty with any aspect of communication that is affected by disruption of cognition. Communication includes listening, speaking, gesturing, reading, and writing in all domains of language

(phonologic, morphologic, syntactic, semantic, and pragmatic). Cognition includes cognitive processes and systems (e.g., attention, memory, organization, executive functions). Areas of function affected by cognitive impairments include behavioral self-regulation, social interaction, activities of daily living, learning and academic performance, and vocational performance.” (ASHA, 2004b)

Definition of Evaluation and Assessment.

Evaluation may be defined as “the act of considering or examining something in order to judge its value, quality, importance, extent or condition” (Webster, 1996). Assessment is a “judgment about something based on an understanding of the situation” (Webster, 1996).

Questions to be Answered by the Committee

1. What tests can/should the speech-language pathologist use for the evaluation and assessment of communication ability in persons with TBI?
2. What is the speech-language pathologist’s unique contribution to the interdisciplinary evaluation process?

The official position of ASHA is that “speech-language pathologists play a primary role in the assessment, diagnosis, and treatment of infants, children, adolescents, and adults with cognitive-communication disorders” (ASHA, 2004a, p. 3) due to their unique knowledge and skills in both cognition and communication across the lifespan. Thus, to provide a resource tailored to the needs of speech-language pathologists, based on our unique “skill set”, this report focuses on communication rather than cognitive function per se.

Information pertaining to the two questions above was gathered from: a survey of speech-language pathologists, test publishers and distributors, reviews of test manuals, the published literature, and published expert opinions. Findings from each source except expert

opinion are summarized below. The opinions of experts will be discussed in a subsequent report.

Methods

Survey of Speech-Language Pathologists

A survey of practicing clinicians was posted on the C-NET Listserve and on the ANCDs website. The survey text is presented in Appendix A.

Survey of Test Publishers and Distributors

The committee surveyed colleagues and the exhibitors present at the 2001 annual American Speech-Language-Hearing Association convention, and generated a list of test publishers and distributors who marketed standardized tests specifically for speech-language pathologists. The committee asked representatives from these companies to recommend tests for use specifically by speech-language pathologists evaluating communication ability in persons with TBI.

Review of Test Manuals

All standardized tests recommended by clinicians, publishers, and distributors were reviewed to determine if TBI was included in the conceptualization, purpose, or standardization of the test. The purpose of the test and its standardization sample characteristics were summarized, and subsequent publications with supplementary data were identified.

For tests that were designed for persons with TBI or included individuals with TBI in their standardization sample, a detailed analysis of test reliability and validity was completed. The definitions and criteria for reliability and validity are described in Appendix B. The definitions were taken from guidelines for evaluating psychometric properties of tests, published by Anastasi & Urbina (1997). The criteria were taken from the Agency for Healthcare Research and Quality (AHRQ) Evidence-Based Practice Program (Biddle, Watson, & Hooper, 2002; available at <http://www.ahrq.gov/clinic/epc/>).

Review of the Published Literature

The committee searched for research literature related to the assessment and evaluation of communication ability after TBI, using the following databases: Medline, CINAHL, ERIC, and PsychInfo. The key word string used was: “brain or head” and “injury” and “communication or language” and “assessment or evaluation.” Articles that did not contain original data and articles in which a test was used only for the characterization of participants (i.e., the test itself was not studied) were excluded. The findings of each study were summarized.

Review of Published Expert Opinion

The committee members were asked to recommend published text sources of expert opinion regarding the evaluation and assessment of communication in persons with TBI. The committee reviewed each of the recommended texts and summarized the expert opinions.

Results

This technical report presents the results of the surveys, test manual reviews, and literature search. The review of expert opinion will be discussed in a future practice guidelines report by the writing committee.

The results of the surveys and test manual reviews are presented in a series of tables that are available for review at <http://www.ancds.duq.edu/TBIAssessmentPracticeGuidelines>.

The tables are as follows:

<i>Survey of Speech-Language Pathologists</i>	Table 1
<i>Survey of Test Publishers and Distributors</i>	Table 2
<i>Review of Test Manuals¹</i>	
<i>Initial review of recommended tests</i>	Table 3

Detailed review of tests of tests referring to TBI

Table 4

Summary of tests vs. criteria

Table 5

Review of Published Articles

Most of the data-based articles on standardized testing related to tests already reviewed by the committee. The references were added to the test tables in the writing committee's technical report. There were two exceptions. The first was a study by Turkstra (1999), who compared the performance of adolescents with and without TBI on the Clinical Evaluation of Language Fundamentals (Third Edition) (Semel, Wiig, & Secord, 1995). This test was added to the list of tests reviewed.

The second was a study by Duff, Proctor, and Haley (2002), who surveyed speech-language pathologists in North Carolina and Illinois regarding their practice patterns for individuals with mild TBI (MTBI). The survey included questions regarding the respondents' experience, caseload, and assessment. For assessment, the authors asked if clinicians were diagnosing MTBI and if so, using what instruments. Duff and colleagues then asked respondents to rank order 26 standardized tests according to frequency of use for clients with MTBI. Respondents also were asked to add tests that were not on the list, and describe any non-standardized measures used.

Duff and colleagues mailed 450 surveys to clinicians, and 203 were returned. Of those returned, 143 were completed by speech-language pathologists who had worked with individuals with MTBI in the past three years. As the remaining respondents did not have current experience with MTBI, those surveys contained demographic information only. The respondents generally were experienced clinicians, with 69% reporting more than five years' experience working with the MTBI population. Most (52%) worked in acute hospital settings, in-patient

¹ If there were multiple versions of a test, only the most recent version was selected, in accordance with the guidelines of the American Psychological Association for best practices in

rehabilitation (38%), or out-patient rehabilitation (45%). The overlapping percentages indicate that many clinicians worked in more than one setting. The standardized tests most frequently used were the Ross Information Processing Assessment (71%) (Ross, 1996), The Boston Diagnostic Aphasia Battery (53%) (Goodglass, Kaplan, & Barresi, 2000), and the Boston Naming Test (Kaplan, Goodglass, & Weintraub, 2000). As the authors noted, instruments known to be sensitive to MTBI – such as the Paced Auditory Serial Addition Test (Gronwall & Sampson, 1974) – were used by less than 10% of the respondents. Eighteen respondents (13%) stated that they used their own non-standardized or informal measures. Based on the results, Duff et al. made the following statement:

“Speech-language pathologists using assessment tools designed and standardized for disorders other than TBI should be guarded in the interpretation of results and cognizant that individuals with MTBI may present as normal according to the assessment instrument, despite apparent deficits in daily functioning...Aphasia batteries possess neither the specificity nor the sensitivity for the assessment of MTBI. These instruments do not assess the cognitive deficits that are the hallmark of TBI, and they are particularly insensitive to subtle deficits found in individuals with MTBI. By using aphasia instruments to assess MTBI, the clinician will not have clinically valid information on the individual and the extent of his/her deficits. Ultimately, this may prevent detection and administration of proper information and treatment referrals.” (Duff et al., 2002, p. 782).

Invitation to Review

Readers are invited to review the evidence presented in this report and respond to the survey available at <http://www.ancds.duq.edu/TBIAssessmentPracticeGuidelines>.

Appendix A. Survey for practicing speech-language pathologists.

The Academy of Neurologic Communication Disorders and Sciences (ANCDS) has formed a committee that is responsible for developing practice guidelines for treating individuals with Traumatic Brain Injury (TBI). We are specifically interested in the assessment of individuals with TBI. Our goal is to be as thorough as possible in our review of available assessment tools that SLPs use with individuals with TBI. It is our hope that you will be able to give a few minutes of your time to inform us about the assessment tools you use and why you use them.

Thank you. Your time is greatly appreciated.

Questions:

1. What is your workplace?

a) Setting – e.g., Hospital, Community private practice, Nursing home

b) Service – e.g., Inpatient - subacute, acute, long-term; Outpatient

3. Who is on your caseload?

a) Typical diagnoses:

b) Age range:

4. What tools do you use to assess communication ability in persons with TBI?

a) list each tool

b) give your main rationale for using each tool

c) list strengths and limitations of each tool

A chart is attached to help you complete this section.

5. Does your place of work utilize a site specific assessment tool? If yes, please describe the tool and the rationale for its use.

6. Would you be willing to share this site-specific assessment tool with us? Yes No

If yes, please send to: (Data collection site address)

Thank you for taking the time to respond and assist the ANCDS committee.

Appendix B. Definitions and criteria for assessment of reliability and validity.

Reliability

Inter-rater

Inter-rater reliability, also referred to as “inter-scorer” reliability, is the degree to which two independent raters agree on the score for a given task. The strict criteria for standardized tests are a simple correlation (r) between two ratings of $\geq .90$, or a Kappa $\geq .80$. The relaxed criteria are a simple correlation of $\geq .80$, or a Kappa $\geq .70$.

Internal consistency

Internal consistency, also measured as “split-half reliability” is the degree to which a test measures a single construct. The strict criterion for internal consistency is a Cronbach Alpha $\geq .90$, and the relaxed criterion is a Cronbach Alpha $\geq .80$.

Test-retest reliability

Test-retest reliability is the degree to which an individual is expected to achieve the same score when tested on two occasions. Differences from Test 1 to Test 2 may reflect recovery or degeneration, in an individual with an evolving neurological disorder, or extraneous variance in an individual with a stable neurological deficit or a neurologically normal individual. The strict criterion for test-retest reliability is a simple correlation of $\geq .90$, and the relaxed criterion is a test-retest correlation $\geq .80$.

Validity

Content/Face validity

Content validity reflects the degree to which a test is model-based, its items have graded difficulty, any source of systemic bias (e.g., cultural, racial) has been evaluated, and experts are involved in test design. Face validity refers to the test’s superficial resemblance to the skills it

purports to measure – e.g., if photographs on a test for older adults are chosen to represent their cohort knowledge, or if a test of long-term memory requires recalling a story after a period of time. Therefore, a test was considered to have met this criterion if it was based on an explicitly stated model, involved experts and a review of the literature in its development, addressed bias, and contained items with a superficial resemblance to the constructs of interest.

Construct validity

Construct validity is the extent to which test measures a theoretical construct. It is measured by analyzing developmental changes, correlating performance with that on other tests, performing a factor analysis of responses, and evaluating internal consistency, convergent validity, and discriminant validity. Therefore, a test was considered to have met this criterion if scores showed developmental changes or changes over recovery (if appropriate), had predictable relationships with other measures of similar constructs, discriminated among clinical and non-clinical samples (if this was a test purpose), and had a factor structure that supported the test purpose.

Criterion-related validity: Concurrent

Concurrent criterion-related validity is the extent to which a test correlates with scores/other measures of behavior. For example, scores on a cognitive test may correlate with Glasgow Coma Scale scores, or scores on an aphasia test may be higher in individuals with smaller strokes. Therefore, a test was considered to have met this criterion if test scores were significantly related to other indices of behavior.

Criterion-related validity: Predictive

Predictive criterion-related validity is the extent to which a test predicts any criterion or performance over time. For example, a test administered in a clinical setting may predict

subsequent work success, or a test administered in the acute stage may predict performance on other measures at one year post-injury. Therefore, a test was considered to have met this criterion if it predicted performance on other measures beyond the construct of interest. Note that predictive validity does not imply ecological validity. That is, the test may predict performance on other measures, but those measures may not reflect performance in real-life contexts.

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