ASSESSMENT OF STUDENTS WITH TRAUMATIC BRAIN INJURIES

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Overview

- Purpose of TBI assessment

- What is unique about assessment of students with TBI?

- School-based evaluators

- Assessment domains

- Tools and Techniques

Purpose of TBI Assessment

- Record a child's present levels of performance
  - Compare to baseline

- Evaluate the effect of the TBI on educational performance
  - Major factor in eligibility for special services

- Identify educational needs

- Progress monitoring across time

The Federal Definition of TBI

- [http://idea.ed.gov/explore/view/p/,root,regs,300,A,300%252E8,]
- An acquired injury to the brain caused by an external physical force resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. The term applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual, and motor abilities; psychosocial behavior; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma.

## TBI and Special Education Identification

- There must be documentation of adverse effect of the injury/disability on the child's ability to learn and participate in school

- This negative impact must be substantial

- Some effects of TBI are not apparent until years after the injury. A child can still qualify under the TBI category even if the injury occurred years ago.

- Students with TBI are often unidentified, or they are misidentified and determined eligible for special education services under other eligibility categories.

What is unique about assessment of students with TBI?

- Students who have sustained TBIs often demonstrate uneven patterns of strengths and weaknesses and inconsistent performance from day to day.

- Students may react unpredictably to being back in school, requiring special thoughtfulness when interpreting test results.

- Skills can change rapidly during recovery from a TBI as an injured student heals, necessitating more frequent assessment.

What is unique about assessment of students with TBI?

- **Slowed Rate of Learning**: Some injured children will develop skills, but at a slower rate than peers
- *Jack was a nine-year-old third grader when he sustained a severe TBI. Following his injury, he had difficulty keeping pace with his age-related peers in reading, spelling and math.*
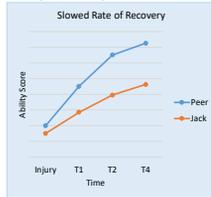
What is unique about assessment of students with TBI?

- **Late Onset Effects:** Some show early medical and neurological recovery and then "grow into" their symptoms with the passage of time
- *Maria sustained a severe brain injury in 2nd grade. She was on pace with her peers until middle school, when problems in organization and planning of schoolwork and activities (executive function deficits) became apparent*
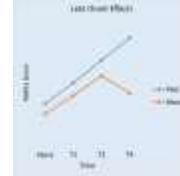
Typical School-Based Evaluators

- School Psychologist
- Speech Language Pathologist
- Occupational Therapist
- Physical Therapist
- School Nurse
- Teachers

- Gather information from the student, parents, physicians, therapists, teachers (current and past), and any other relevant sources, using a variety of assessment techniques

Assessment Domains

- Cognitive—*includes executive functions (attention, reasoning, judgment, problem solving, memory)*
- Academic
- Behavioral—*includes adaptive behavior*
- Psychosocial
- Communication—*includes speech and language*
- Sensory, perceptual—*includes vision and hearing*
- Motor abilities—*fine and gross motor*

Tools and Techniques

- File review
- Observations
- Interviews
- Checklists and rating scales
- Standardized norm-referenced tests
- Curriculum-based measures
- Functional behavioral assessment
- Computer-based neurocognitive tests

File Review

- Collection of background information
- Medical history (esp. history of previous brain injuries)
- Family history
- School history
  - Pre-injury skills and abilities

- Pre-injury psychiatric, neuropsychological and/or family problems are essential to note, as they can affect recovery and long-term outcome.

Observation

- Allows the evaluator to gather information about the child:
  - in his or her natural setting
  - across time, settings, observers, tasks
  - in comparison to self and to typical same-age peers

- Interaction with environment (teacher, peers, physical space, materials)
- Begin assignment independently or need cues?
- Need reminders to stay on task? How often?
- Become lost or confused going room to room?
- Follow directions? What type? How complex?
- Forget to do things when asked, even w/ reminder?
- Submit incomplete assignments / "careless" errors?
- Difficulty comprehending new concepts? Is frequent repetition and concrete demonstration required for new learning?

Types of Observation Strategies

- Narrative recording
- Antecedent-Behavior-Consequence (A-B-C) data
- Interval recording (e.g., scatter plots)
- Event recording (e.g., frequency/ behavior count)
- Duration and latency recording (e.g., measuring the length of the behavior in a given setting)
- On-task/off-task (e.g., Behavioral Observation of Students in Schools—BOSS)

- INSERT EXAMPLES

Interviews

- Possible informants:
  - Parents
  - Teachers
  - Other school-based professionals
  - Medical providers
- Gain better understanding of strengths and weaknesses
- Gather information on facets that might not be easily observed or tested, such as sleep, eating habits, relationships with siblings, and medical history
- Parent interviews must include questions related to history of head injuries and background of what the child was like (cognitively, emotionally, socially) pre-injury

Interview Formats

- Unstructured
- Semi-structured
- Structured

- Norm-referenced interviews provide a score that compares a student to typical same-age peers (e.g., Survey Interview and Expanded Interview form of the Vineland Adaptive Behavior Scales, Second Edition)

Checklists and Rating Scales

- Useful for:
  - Monitoring changes as a result of intervention
  - Refining observations
  - Guiding intervention formulation

- Typically involve endorsing (checking off) whether or not a child exhibits a skill or behavior
- Quantify how often or to what degree a skill or behavior is exhibited
- Benefits: typically quick and easy

Informal Checklists and Rating Scales

- Direct Behavior Rating (DBR)—can be tailored for a specific student and behavioral goal
  - *Johnny is receiving a behavioral intervention that focuses on following classroom rules*
  - His teachers might complete a twice-daily rating on a 1-5 scale ("unacceptable" to "excellent") of how well he behaved in the classroom.

- They can also be completed by parents, related service personnel, and even by the students themselves to evaluate their self-perceptions and self-awareness.

Formal Checklists and Rating Scales

- Help determine how far the child's behaviors deviate from those of typical same-age peers. Measures useful for TBI cases:

- **Behavior and Social Skills**
- Child Behavior Checklist (CBCL)
- Behavior Assessment System for Children—Third Edition (BASC-III)
- School Social Behavior Scale Rating Form—Second Edition (SSBS)
- The Social Skills Rating System (SSRS)
- **Adaptive behavior**
- Adaptive Behavior Assessment System—Second Edition (ABAS-II)
- Scales of Independent Behavior-Revised (SIB-R)
- Vineland Adaptive Behavior Scales—Second Edition (VABS-II)
- **Executive Functioning**
- Behavior Rating Inventory of Executive Functioning (BRIEF)

Standardized Norm-Referenced Tests

- Systematic pre-planned methods of testing
- Same set of instructions for all students
- Same criteria for scoring and interpretation
- Can compare a student's knowledge and skills in a particular area to other students in the nation
- Can be administered individually or to a group
- Can measure a variety of domains

Caveats of Norm-Referenced Tests for TBI

- A global or standard score may not fully represent the student's ability.
- There are often uneven patterns of performance post-TBI.
  - Thus, in addition to the overall IQ scores, consider subdomains, such as verbal ability, nonverbal ability, processing speed, and working memory.
  - Students with TBI often have standardized test scores that are inconsistent with their daily functioning. Thus, test scores may show their potential, but not areas of difficulty in the classroom.
- IQ tests can demonstrate the knowledge of previously learned information. However, they do not address the ability to learn new information—a common area of TBI impairment

Common Standardized Cognitive Tests

- Weschler Intelligence Scale for Children—Fifth Edition (WISC-V)
- Woodcock-Johnson-IV Tests of Cognitive Abilities—Fourth Edition (WJ-IV)
- Stanford-Binet Intelligence Scales—Fifth Edition (SB-V)
- Differential Ability Scales—Second Edition (DAS-II)
- Cognitive Assessment System—Second Edition (CAS2)
- Comprehensive Test of Nonverbal Intelligence—Second Edition (CTONI -2)
- Differential Abilities Scale—Second Edition (DAS-II)
- Kaufman Assessment Battery for Children—Second Edition (KABC-II)
- Wechsler Preschool and Primary Scale of Intelligence—Third Edition (WPPSI-III)
- Wechsler Abbreviated Scale of Intelligence—Second Edition (WAIS-II)

Standardized Academic Achievement Tests

- Whereas typical classroom assessments measure a specific skill that was taught, academic achievement tests measure specific academic areas compared to typical same-age peers.
  - E.g., reading, writing, math, and oral language skills.
  - Each skill area is generally broken down into subdomains (e.g., reading fluency, word recognition, decoding, and reading comprehension).

Common Academic Tests

General
- Wechsler Individual Achievement Test—Third Edition (WIAT-III)
- Woodcock Johnson Test of Achievement—Third Edition (WJ-III)
- Kaufman Tests of Educational Achievement—Second Edition (KTEA-II)
- Peabody Individual Achievement Test—Third Edition (PIAT-III)

Academic-targeted
- Key Math Diagnostic Test
- Woodcock Reading Mastery Tests—Third Edition (WRMT-III)

Standardized Norm-Referenced Tests: Other Domains affected by TBI

- **Neuropsychological**
  - Children's Category Test
  - NEPSY-II—Second Edition
  - Repeatable Battery for the Assessment of Neuropsychological Status (RBANS)
- **Memory**
  - Children's Memory Scale
  - Continuous Performance Test-II
  - Logical Memory I and II
  - Wechsler Memory Scale—Fourth Edition (WMS–IV)
  - Wide Range Assessment of Memory and Learning—Second Edition (WRAML-2)
- **Executive function**
  - Behavior Rating Inventory of Executive Function (BRIEF)
  - Delis-Kaplan Executive Function System
  - Executive Control Battery
  - Stroop Color and Word Test
  - Trail Making Test—Part B
  - Wisconsin Card Sorting Test

- **Attention/concentration**
  - Delayed Gratification Task
  - Digit Span (Forward and Reversed) (Wechsler scales)
- **Language/verbal learning**
  - Boston Naming Test
  - Children's Auditory Verbal Learning Test
  - Multilingual Aphasia Examination
  - Token Test—Short Form
  - Clinical Evaluation of Language Functioning—Fifth Edition
  - Arizona Articulation Proficiency Scale—Third Edition
  - Goldman-Fristoe Test of Articulation—Third Edition
  - Stuttering Severity Instrument—Fourth Edition
  - Test of Childhood Stuttering
- **Visual perception**
  - Developmental Test of Visual Perception—Second Edition
  - Test of Visual Perceptual Skills
- **Motor skills**
  - Grooved Pegboard

Curriculum-Based Measures (CBM)

- Method for sampling student skills in key curricular areas
- Utilizes short-duration measures that assess accuracy and fluency
- Content and procedures can sample the curriculum widely or specifically
- Can be used for screening, monitoring progress, diagnosis and instructional planning, and prognosis.
- Allows teachers to work efficiently, produce accurate meaningful information to index standing and growth, and provide information to plan better instructional programs.

Curriculum-Based Measures (CBM)

- *Example:* a student might complete a reading probe in which she reads aloud from a grade-level passage for one minute. The evaluator will tally how many words the student read correctly in one minute. This process can:
  - help to identify areas of academic struggle
  - allow progress monitoring in specific subjects
  - allow for pre-injury and post-injury comparison
  - provide a low-stress assessment that is easily administered in the classroom setting.
- Such tests that are less demanding can prevent exacerbation of symptoms such as headache and fatigue in a student with TBI.

Functional Behavior Assessments (FBAs)

- The foundation of a proactive and preventative approach to behavior problems.
- Identifies the environmental conditions that predict and maintain problem behavior and use it as a basis for the development of a behavior intervention plan
- Summarizes the event, antecedent, and consequences that predict and maintain the problem behavior
- The previously discussed strategies of observations and interviews are key components of an FBA.
- Can include manipulation of variables to help evaluators recognize gradual and immediate triggers, as well as consequences of behavior.
- Data are used to develop an effective intervention plan.

Computer-Based Neurocognitive Tests

- Typically used for student athletes
  - *Example:* Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT)
- Administered pre-season to obtain a baseline of a student's level of functioning.
- If a student athlete sustains a TBI (including concussion), he or she re-takes the test and the scores are compared to baseline.
- Goal: to bring the student's score back to baseline before allowing a return to active play.
- Should only be used along with other assessment strategies and a comprehensive evaluation from a health-care provider.

Assessment Challenges and Tips

Challenges	Tips

- Student fatigue
  - both cognitive and physical
- Apathy
- Frustration with diminished skills
  - Attention, memory, processing speed
- Impulse control deficits
	- Build in breaks or administer at separate times
	- Give sufficient time to respond
	- Take time to build rapport
	- Test in a distraction-free environment