

Development of a Structured Interview for the American Congress of Rehabilitation Medicine

Diagnostic Criteria for Mild Traumatic Brain Injury

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INTRODUCTION

In 2023, the American Congress of Rehabilitation Medicine Brain Injury Interdisciplinary Special Interest Group (ACRM BI-ISIG) mild traumatic brain injury (TBI) Task Force published updated diagnostic criteria for mild TBI from 1993. These criteria were developed in collaboration with a panel of 32 subject matter experts in mild TBI using the Delphi method.

To facilitate consistent use of the new diagnostic criteria, the ACRM BI-ISIG Mild TBI Task Force initiated a special project in September 2023 to develop a structured interview to apply the ACRM diagnostic criteria for mild TBI in clinical and research settings.

The purpose of this presentation is to describe the development of the ACRM Structured TBI Interview and supporting documents.

METHOD

The ACRM Structured TBI Interview was developed in four phases (see Figure 1):

- (1) Initial development of a draft interview by project leads (Lange and Gillow).
- (2) Review and revision over three rounds by ACRM BI-ISIG Mild TBI Task Force.
- (3) External review by 19 subject matter experts in mild TBI.
- (4) Field testing by 11 interviewers who completed 25 diagnostic interviews.

A questionnaire was administered to participants in Phase 3 and Phase 4 to elicit feedback.

Three other supporting documents were developed to help (a) facilitate administration of the structured interview [Administration Guide] and (b) to apply the diagnostic criterion [Diagnostic Coding Form, and Diagnostic Flow Diagram].

A Short Form was also developed for use in contexts where administering a comprehensive structured interview is not feasible due to time constraints.

RESULTS

Phase 3: External Review Feedback

- The majority (78-100%) of the External Review panel ‘Agreed’ or ‘Strongly Agreed’ that:
 - Instructions were clear and easy to follow.
 - Questions were presented in a logical sequence.
 - Prompts and probes were clear and easy to understand.
 - Skip patterns and optional skip instructions were logical and easy to follow.
- 100% of External Review panel rated clarity of question wording as ‘Good’ or ‘Very Good’.
- As a research tool, 89% indicated they would use the interview to diagnose TBI.
- As a clinical tool, 47% indicated they would use the interview to diagnose a TBI.
 - However, 89% said they would use either the comprehensive or a shortened version of the structured interview.
- The most common reason for not using the comprehensive version of the interview for clinical practice was the perceived time burden.

Phase 1: Initial Development

- Development of the Structured Interview and supporting documents (e.g., Administration Guide, Diagnostic Coding Form, etc) was initially undertaken by the two project leads (Lange & Gillow).
- The interview aimed to address four of the six ACRM diagnostic criterion.
 - ✓ Plausible Mechanism of Injury
 - ✓ Clinical Signs
 - ✓ Acute Symptoms
 - ✓ Confounding Factors
- Two of the six ACRM diagnostic criterion cannot be addressed via interview.
 - ✓ Clinical and Laboratory Findings
 - ✓ Neuroimaging

Phase 2: Internal Review

- 17 members of the ACRM Mild TBI Task Force reviewed the structured interview and supporting documents.
- Professions included: neurology, neuropsychology, psychology, physiatry, neuropsychiatry, sports medicine, psychiatry, physical therapy, occupational therapy, speech-language pathology.
- 3 rounds of ‘review and revision’ were completed.
- Example revisions: (a) minimizing leading questions, (b) lower reading level, (c) restructuring layout, (d) expanding instructions, (e) rephrasing ‘sensitive’ questions, and (f) adding more prompts/probes.

Phase 3: External Review

- 19 Subject Matter Experts (SME) reviewed the structured interview and supporting documents.
- Each SME was offered USD \$300 for completing the review and providing feedback.
- Aim: recruit SMEs stratified by (a) clinicians [50%] vs researchers [50%], and (b) civilian [70%] versus military [30%].
- Review panel composition:
 - 59% clinicians vs. 41% researchers
 - 67% civilian vs. 33% military
 - Professions included: neuropsychology, neurology, physiatry, psychology, medicine, sports medicine.

Phase 4: Field Testing

- 2 ACRM Mild TBI Task Force members field tested the interview personally.
- 4 ACRM Mild TBI Task Force members supervised one-or-more members of their research team who completed field testing (i.e., Research Assistants, Associates, or Coordinators).
- 11 interviewers field tested the interview.
- 25 interviews were completed.
- (a) 3 Field Testers completed 4 interviews, (b) 2 Field Testers completed 3 interviews, (c) 1 Field Tester completed 2 interviews, and (d) 5 Field Testers completed 1 interview.

Figure 1. Four Phases of the ACRM Structured TBI Interview Development

ACCESSING THE INTERVIEW DOCUMENTS: [Option 1](#): Download from the Journal of Neurotrauma (PMID: 41293888); [Option 2](#): Email: ACRM.TBI.Interview@gmail.com

RESULTS (CONTINUED)

Phase 3: Revisions From Feedback

- Major Changes:
 - Creation of a Diagnostic Coding Form to help apply the ACRM diagnostic criteria.
 - Creation of an optional Short Form for settings where time is limited.
- Minor Changes
 - Clarifying instructions and context of use; Stylistic and grammatical edits.
 - Inclusion of additional probes; Ensuring language was consistent throughout.
 - Increased specificity of some questions; Inclusion of a pain rating scale.
 - Differentiating between observed vs. self-reported altered mental status signs.

Phase 4: Field Testing Feedback

- Administration Time: M=28 mins, SD=8.9, Range 15-40 mins.
- Shortest times (15-25 minutes) found in Field Testers with 3 or 4 administrations.
- More guidance requested how to use the Diagnostic Coding Form.
- Two significant revisions made:
 - Diagnostic Coding Form redesigned with step-by-step approach to apply criteria.
 - A ‘Diagnostic Flow Diagram’ developed to assist in a diagnostic decision.

The final documents developed following Phases 1 through 4 included: (a) Structured TBI Interview, (b) Administration Guide, (c) Diagnostic Coding Form, (d) Diagnostic Flow Diagram, and (e) a Short Form.

CONCLUSION

The goal of the ACRM Structured TBI Interview is to provide a systematic approach for employing a number of notable advancements for the diagnosis of mild TBI outlined by the ACRM diagnostic criteria.

Despite the adoption of the Veterans Affairs/Department of Defense (VA/DoD) mild TBI criteria in the military environment, both the ACRM criteria and diagnostic interview are highly relevant for use within a military context.

For example, when using the VA/DoD mild TBI criteria, it would be considered a clinical advancement for clinicians and researchers to routinely (a) apply Criterion 6 [Confounding Factors] of the ACRM criteria when attempting to establish the presence or absence of a loss of consciousness or post-traumatic amnesia, and (b) make the distinction between Clinical Signs [Criterion 2] versus Symptoms [Criterion 3] as outlined in the ACRM criteria, when attempting to establish the presence or absence of an alteration of consciousness/altered mental status.

It is important to note that the Structured Interview is (a) not a tool to assess a person’s lifetime TBI history; it is for a single injury event only, (b) not designed only to identify mild TBI; it can be used to determine if a TBI of any severity occurred, and (c) not designed only for use with the ACRM criteria; it is applicable and relevant for use with any existing TBI criteria.

One limitation that warrants mention is that there are no published psychometric data to support the clinical utility of the structured interview. Data collection is currently in progress.

DISCLAIMER

The views expressed in this presentation are those of the authors and do not necessarily represent the official policy of the Defense Health Agency, Department of War, or any other U.S. Government agency.

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