



## **Search Strategy and Study Selection Traumatic Brain Injury Medical Treatment Guideline 2019 Revision**

This document outlines the search strategy, study selection, and search results for the Colorado Division of Workers' Compensation (Division) Traumatic Brain Injury Medical Treatment Guideline. It also describes how articles were selected for critique.

### **Overview**

Studies were primarily identified through the PubMed and Cochrane Library electronic databases with specified search terms. Additional literature was found by a hand search of literature. This involved identifying references through reviewing (a) relevant evidence statements from Cochrane and British Medical Journal clinical evidence, (b) selected guidelines and systematic reviews, (c) reference lists from other literature, and (d) tables of content from related journals. For some articles, the literature citation database Web of Science was used to find literature that cited a particular article. Suggestions of literature from various volunteer advisory bodies to the Division were solicited.

Literature searches were limited according to language (English), population (human adults) and study type. Only randomized clinical trials (RCTs) or meta-analyses were selected for review and possible use as evidence regarding treatment. Diagnostic accuracy studies were reviewed for diagnostic testing evidence. Cohort, cross-sectional, and case-control studies were reviewed for causation evidence statements. All articles sent by advisory bodies and the public were formally reviewed.

Literature was not critiqued if it was determined to be unrelated to the clinical issue, to not reflect interventions likely to occur in Colorado, or to be of such poor quality on initial review that it could not qualify for evidence nor provide meaningful input. RCTs that compared doing with not doing a particular intervention (e.g., surgery and non-operative treatment) were designated as more relevant to workers' compensation guidelines than RCTs that compared variations on technique or types of devices. Beginning with the Traumatic Brain Injury Medical Treatment Guideline revision of 2013, RCTs may have been excluded for further review if they were included in a systematic review or meta analysis that qualified as evidence.

Literature that did not meet requirements for evidence could be referenced if it furnished useful background information or described interventions that are considered generally accepted by a consensus of health care providers. This information sometimes contributed to consensus decisions by the multi-disciplinary task force drafting the guidelines.



## **Search strategy for the 2019 revision of the Traumatic Brain Injury guideline**

*Database searched:* PubMed

*Dates when the search was completed:* January 2017; February 2017; January 2018

*Literature publication dates covered by the search:* 1/2012 –12/2017

### *Search terms:*

Traumatic brain injury diagnosis  
Traumatic brain injury treatment  
Diffuse axonal injury  
Cerebrovascular trauma  
Traumatic cerebral hemorrhage  
Closed head injury  
Spinal manipulation and headache  
Biofeedback and spasticity  
Yoga and traumatic brain injury

*Database searched:* Cochrane Library

*Date when the search was completed:* February 2017

*Literature publication dates covered by the search:* 1/2012 –2/2017

### *Search terms:*

Traumatic brain injury  
Concussion  
Head injury

## **Study selection**

*Inclusion criteria:* Studies in English; human; adults; RCT, systematic reviews, or meta-analysis

*Exclusion criteria:* Article titles containing an obvious mismatch with search criteria and search terms were eliminated (e.g., pediatric population, wrong condition). Abstracts were reviewed to exclude articles based on the following criteria:

- Lack of relevancy to workers' compensation population
- Major obvious errors in study protocol (e.g., lack of control group even though study was listed as an RCT)
- Published outside of time frame
- Cadaverous study
- Animal study
- Only preliminary results reported
- Only healthy volunteers in study
- Study of conditions not covered by the guideline (e.g., tumors)



- Too technical in nature to meet the objective of the guideline (e.g., study comparing types of screws used in surgery).

## **Search results**

Number of *articles identified* by database searches: 1181

Number of *articles included* for review after exclusion criteria were applied to database search results (see criteria above): 637

Other literature was included in addition to sources identified by searches in the electronic databases. Some references were carried over from earlier versions of the guideline. Other articles were selected by hand searches of publish literature. Articles submitted by the public and from volunteer advisory bodies to the Division were also reviewed. All reviewed articles were included in the full bibliography. In total, 940 references were included in the full bibliography. (Not all of these references qualified to be cited as evidence in the guideline. See below.)

## **Studies qualifying for initial review**

Studies that qualified after the first round of exclusion were reviewed for quality and relevancy.

Remaining articles were excluded based on a “second tier” of exclusion criteria:

- Insufficient systematic review (included articles were screened for possible review)
- No RCTs included (for a systematic review)
- Superseded by a more recent review
- Narrative review (included articles were screened for possible review)
- Only healthy volunteers in the study
- Study too old (2010 or older)
- Study was included in a meta-analysis or systematic review already critiqued
- Study had  $\geq 20\%$  attrition
- Population not applicable
- Population too young or old (<18 or >70)
- Study not an RCT (i.e., protocol or pilot study)
- Sample size too small (<20 per group)
- Inconclusive small study
- Study had no dropouts
- No functional outcome
- No primary outcome
- No outcomes of interest / not relevant
- Surgeon’s preference regarding operative procedure types (the Division’s guidelines do not distinguish between operative procedures that have not shown any significant advantages or harms)
- Uninterpretable results or tables
- Study reported only “p” values
- Low quality: poorly written



- Low quality: uninformative
- Low quality: methodology fails
- Study underpowered
- Placebo response = zero
- Article unobtainable
- Article was redundant/duplicate.

Remaining studies qualified for critique using the Division's literature critique criteria. Studies assessed as "adequate" or "high quality" were used for evidence statements. Three levels ("some," "good," and "strong") were then used to describe strength of evidence for recommendations based on the amount and quality of the supporting literature. For more information regarding literature assessment and resulting evidence statements, see *Traumatic Brain Injury* on the Division's website for (a) literature critique criteria documents, which are under *Assessment Criteria for Critiques* on the website, (b) the *Evidence Summary/Table*, and (c) *Critiques* for individual articles: <https://www.colorado.gov/pacific/cdle/medical-treatment-guidelines>.