

EVMS Journal Club
Critical Appraisal: Prognosis

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Citation: Predicting outcome after traumatic brain injury: practical prognostic models based on large cohort of international patients. MRC CRASH Trial Collaborators [BMJ](#). 2008 Feb 23;336(7641):425-9

1. Determine Relevance: *Is this article worth taking the time to read? If the answer to any of these questions is No, it may be better to read other articles first.*

Based on the conclusion of the abstract or article:

A. Will this information, if true, have a *direct* bearing on the health of your patients and is it something *they* will care about?

Yes: TBI is an injury that we will all commonly see during our careers. Estimates by the National Institute of Health Consensus Development Panel on Rehabilitation of Persons with TBI showed that 2.5-6.5 million Americans live with TBI-related disabilities, so the info we glean from this prognosis model will certainly be something that patients and their families will care about.

Having prognostic models available to help us gauge the severity of the pt's injury and their expected outcome will in turn help guide treatment plans and allow us to have honest conversations with families about expectations for recovery of their loved ones. However, it is important to note that while prognostic models may complement clinical decision-making they cannot and should not replace clinical judgment, particularly when it comes to withdrawal of care.

B. Is the problem addressed one that is *common* to your practice?

Yes: At least 1.4 million people sustain a TBI in the US each year. Of these, about 50,000 die, 235,000 are hospitalized, and 1.1 million are treated and released from an ED.

C. Will this information, if true, require you to *change* your current practice?

Yes.

2. Determine Validity: *If the answers to all three questions above are Yes, then continued assessment of the article is mandatory. Study design flaws are common; fatal flaws are arresting.*

D. Was an "inception cohort" assembled? (Did the investigators identify a specific group of people and follow them **forward** in time?)

Revision 1994: Information Mastery Working Group. Adapted from material developed at McMaster University.

Yes: They utilized the data from The Medical Research Council (MRC) CRASH (corticosteroid randomization after significant head injury) trial, which is the largest clinical trial conducted on inpatients with traumatic brain injury. The trial prospectively included patients within eight hours of the injury, used standardized definitions of variables, and achieved almost complete follow-up at six months.

E. Were the criteria for entry into the study objective and reasonable?

Yes: Adults with traumatic brain injury, who had a score on the Glasgow coma scale of 14 or less, and who were within eight hours of injury, were eligible for inclusion in the trial.

F. Was follow-up of subjects adequate (at least 70%-80%)?

Yes: Six-month follow-up obtained for 9673 of 10,008 patients (96.7%).

G. Were the patients similar to yours, in terms of age, sex, race, severity of disease, and other factors that might influence the course of the disease?

Yes: All ages, from pediatric to the elderly, were included in study. The mean age was 37. 81% of pts were male, 65% of TBI were caused by MVA and 79% of pts had a head CT done soon after injury.

One big difference is that 75% (7526 of 10,008) of the pts in the study were from low-mid income countries where access to medical care and CT scanners is far less than what is available in the US, and the general health and life expectancy of patients in low-mid income countries is less than in higher income countries.

H. Where did the subjects come from — was the referral pattern specified?

Yes: 25% of pts were from high income industrialized countries, and 75% of pts were from low-mid income non-industrialized or developing countries.

I. Were outcomes assessed objectively and blindly?

- Yes: 2 outcomes measured at 6 months out from injury:
- #1: Favorable (moderate disability—able to live independently but unable to return to school or work OR good recovery—able to return to school or work)
- #2: Unfavorable (dead, persistent vegetative state OR severe disability—able to follow commands but unable to live independently)
- Long term recovery was assessed at six months using the Glasgow Outcome Scale (GOS), which assesses disability and handicap in major areas of life. The GOS was administered by a postal questionnaire completed by the patient or a care-giver, or by telephone interview. Those collecting and processing this information were blinded to the patient's treatment (methylprednisolone vs. placebo).