



## Ruling out CT for Minor Head Trauma



Combinations of history and physical examination features in clinical decision rules can identify patients with minor head trauma at low risk of severe intracranial injuries, and for whom head CT may not be necessary. The findings are based on a systematic review conducted by Joshua S. Easter, MD, MSc, of the Department of Emergency Medicine, University of Virginia, and colleagues. The results are published in *JAMA*.

Computed tomography (CT) is the gold standard for rapidly identifying intracranial injuries that require prompt intervention. Patients with a moderate (GCS score, 9-12) or severe head trauma (GCS score,  $\geq 8$ ) should undergo emergency head CT to detect intracranial injuries because early interventions reduce morbidity and mortality.

However, patients with apparently minor head trauma (GCS scores of  $\geq 13$  who appear well on examination) may have severe intracranial injuries requiring prompt intervention. The role of head CT for these patients is less clear than it is for moderately or severely injured patients. Dr. Rivara et al. conducted a systematic review to assess the accuracy of symptoms and signs in adults with minor head trauma in order to identify those with severe intracranial injuries.

The research team performed a systematic search of MEDLINE (1966-2015) and the Cochrane Library to identify studies assessing the diagnosis of intracranial injuries. They focused on studies that measured the performance of findings for identifying intracranial injury with a reference standard of neuroimaging or follow-up evaluation. Fourteen studies (range, 431-7,955 patients) met inclusion criteria with patients having GCS scores between 13 and 15 and 50 percent or more older than 18 years.

The review showed that certain findings, including signs of skull fracture, GCS score of 13, two or more vomiting episodes, decrease in GCS score, and pedestrians struck by motor vehicles, may help identify patients at increased risk of severe intracranial injuries.

"Although individual signs and symptoms do not have sufficient diagnostic accuracy to rule out the presence of intracranial injury, combinations of historical and physical examination features in clinical decision rules may be more useful," the authors write. "For these rules, the absence of any findings of the rule suggests that the patient is at low risk of intracranial injury and typically does not require head CT or observation."

A related commentary, titled "Use of Clinical Prediction Rules for Guiding Use of Computed Tomography in Adults With Head Trauma", also appears in *JAMA*. Frederick P. Rivara, MD, MPH, of Harborview Injury Prevention and Research Center, University of Washington, and co-authors write: "Fortunately, a large literature on the topic of head CT scans in the care of individuals with blunt head trauma is available and can be used to

guide appropriate evaluation with the goal of identifying those who need acute intervention. As Easter and colleagues found, several large studies have been conducted in which sensitive and specific prediction rules for identifying adults with clinically important TBI [traumatic brain injury] have been developed."

These prediction rules for adults presenting to the emergency department (ED) with blunt head trauma, the authors note, can accurately determine which patients are at very low risk of clinically important TBI and thus for whom emergency CT imaging can be obviated.

**Note:** An [audio interview](#) on this topic (minor head trauma) is available on the JAMA website. Dr. Easter, who led the review team, is interviewed as is Dr. Rivara, who wrote the accompanying editorial. Michelle Mello, a Law Professor at Stanford, discusses the medical liability associated with not obtaining neuroimaging for minor head trauma.

Source: [JAMA](#)

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