Glasgow Coma Scale Score in Trauma Triage: A Measurement Without Meaning

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MOVING BEYOND THE INTELLECTUAL FAILURE OF USING THE GLASGOW COMA SCALE FOR TRAUMA TRIAGE

In this issue of Annals, Hopkins et al1 show that the assessment of whether a trauma victim can follow commands is as effective as the Glasgow Coma Scale (GCS) score for out-of-hospital prediction of need for transport to a trauma center. Previous studies have shown that using the motor function subcategory score is equivalent to the total GCS score for field trauma triage.2-4 Hopkins et al now show that trauma triage decisions can further be simplified by use of the determination of motor function on command in place of the GCS score.

The study by Hopkins et al, conducted at 2 Level I trauma centers, is well powered and confirms previous research by Kupas et al.2 Both studies support revising Centers for Disease Control and Prevention guidelines for field triage of injured patients5,6 to replace the full GCS score with the assessment of ability of a trauma victim to follow commands. The GCS was introduced by Teasdale and Jennett7,8 in 1974 and 1976 as a means for serial assessment of patients with traumatic brain injury who were admitted to ICUs. A fundamental point is that the GCS was designed for use as a serial measure in the ICU. It was not designed for field trauma triage. In fact, a decade of literature provides evidence questioning the validity of the GCS when used for field trauma triage.9-11

In a 2011 editorial, Green11 noted that the GCS is “confusing, unreliable, and unnecessarily complex, and its manner of common clinical use is statistically unsound.” A 2014 randomized simulation study by Feldman et al9 reported that accuracy of GCS scoring among practicing emergency medical services (EMS) personnel was 25% without a reference chart and 57% with a reference scoring aid. This study found that EMS personnel are familiar with the GCS, but unlikely to calculate GCS score accurately in the field setting. Although not a study of EMS personnel, research with residency-trained emergency physicians shows there is poor interrater reliability for GCS score, with a reported 32% agreement for all 3 GCS score elements.10

GCS scoring is a time-consuming, multistep process. Literature shows no evidence to support that GCS score can be quickly calculated. Furthermore, communicating the GCS score can become confusing because “GCS 4-5-4” can be ambiguous in regard to which number represents eye opening, verbal response, or motor response. Even worse is the practice of summing the 3 component scores into a single number. Unless the summed score is 15 (totally normal) or 3 (totally abnormal), it is meaningless. In fact, Teasdale and Jennett,12 who were originators of the GCS, argued against summing the 3 GCS categories into a single score.

Use of GCS for trauma triage is not evidence based. It has not been compared with simple subjective clinical judgment, yet the scoring system is considered a trauma assessment standard of practice. The notion that GCS is valid for field trauma triage is perpetuated by continuing to teach the GCS, test providers on their knowledge of it, and use it in trauma research. Such activities support the dogma that the GCS is useful as a onetime, primary trauma triage tool. The reality is that injury-related assessment of human states of consciousness and brain function is complex.13,14 As Green11 stated, the “GCS is intellectually appealing in that it creates apparent order out of disorder.” He went on to state that “we want to believe that medicine can be this objective and thus we tolerate the delusion.”

Relying on the total GCS score for field trauma triage is intellectually dishonest for a specialty that purports to embrace evidence-based practice. The GCS may have historical precedent, but so do bloodletting and mercury treatments. Hopkins et al provide evidence that the simple binary measure “does patient follow commands” is as effective as GCS scoring in field trauma triage. It is time to move beyond use of the GCS for trauma triage.
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REFERENCES


