



Glasgow Coma Scale

The Glasgow Coma Scale is a neurological scale which seems to give a reliable, objective way of recording the conscious state of a person, for initial as well as continuing assessment. A patient is assessed against the criteria of the scale, and the resulting points give the Glasgow Coma Score (or GCS). It has value in predicting ultimate outcome.

Initially used to assess level of consciousness after head injury, the scale is actually applied to different situations. The scale was published in 1974 by Graham Teasdale and Bryan J. Jennett, professors of neurosurgery at the University of Glasgow. The pair went on to author the textbook *Management of Head Injuries* (FA Davis 1981, ISBN 0-8036-5019-1), a celebrated work in the field.

GCS is used as part of several ICU scoring systems, including APACHE II, SAPS II and SOFA, as a contribution for the status of the central nervous system. A similar scale, the Rancho Los Amigos Scale is used to assess the recovery of traumatic brain injury patients.

Elements of the scale

The scale comprises three tests:

- eye,
- verbal
- motor responses.

The three values separately as well as their sum are considered. The lowest possible GCS (the sum) is 3 (deep coma or death), whilst the highest is 15 (fully awake person).

Best eye response (E)

There are 4 grades:

- 4 - Eyes opening spontaneously.
- 3 - Eye opening to speech. (Not to be confused with an awaking or a sleeping person such patients receive a score of 4, not 3.)
- 2 - Eye opening in response to pain. (Patient responds to pressure on the patient's fingernail bed; if this does not elicit a response, supraorbital and sternal pressure or rub may be used.)
- 1 - No eye opening.

Best verbal response (V)

There are 5 grades:

- 5 - Oriented. (Patient responds coherently and appropriately to questions such as the patient's name and age, where they are and why, the year, month, etc.)
- 4 - Confused. (The patient responds to questions coherently but there is some disorientation and confusion.)
- 3 - Inappropriate words. (Random or exclamatory articulated speech, but no conversational exchange.)
- 2 - Incomprehensible sounds. (Moaning but no words.)
- 1 - None.

Best motor response (M)

There are 6 grades:

- 6 - Obeys commands. (The patient does simple things as asked.)
- 5 - Localizes to pain. (Purposeful movements towards changing painful stimuli; e.g. hand crosses mid-line and gets above clavicle when supra-orbital pressure applied.)
- 4 - Withdraws from pain (pulls part of body away when pinched; normal flexion).
- 3 - Flexion in response to pain (decorticate response).
- 2 - Extension to pain (decerebrate response: adduction, internal rotation of shoulder, pronation of forearm).
- 1 - No motor response.

Interpretation

Individual elements as well as the sum of the score are important. Hence, the score is expressed in the form "GCS 9 = E2 V4 M3".

Generally, comas are classified as:

- Severe, with GCS \leq 8
- Moderate, GCS 9 - 12
- Minor, GCS \geq 13.

The GCS has limited applicability to children, especially below the age of 36 months (where the verbal performance of even a healthy child would be expected to be poor). Consequently the Pediatric Glasgow Coma Scale, a separate yet closely related scale, was developed for assessing younger children.



Pediatric Glasgow Coma Scale

The Pediatric Glasgow Coma Scale (also known as Pediatric Glasgow Coma Score or simply PGCS) is the equivalent of the Glasgow Coma Scale used to assess the mental state of adult patients. As many of the assessments for an adult patient would not be appropriate for infants, the scale was modified slightly. As with the GCS, the PGCS comprises three tests: eye, verbal and motor responses. The three values separately as well as their sum are considered. The lowest possible PGCS (the sum) is 3 (deep coma or death) whilst the highest is 15 (fully awake and aware person).

Best eye response: (E)

- 4 - Eyes opening spontaneously
- 3 - Eye opening to speech
- 2 - Eye opening to pain
- 1 - No eye opening

Best verbal response: (V)

- 5 - Infant coos or babbles (normal activity)
- 4 - Infant is irritable and continually cries
- 3 - Infant cries to pain
- 2 - Infant moans to pain
- 1 - No verbal response

Best motor responses: (M)

- 6 - Infant moves spontaneously or purposefully
- 5 - Infant withdraws from touch
- 4 - Infant withdraws from pain
- 3 - Abnormal flexion to pain for an infant (decorticate response)
- 2 - Extension to pain (decerebrate response)
- 1 - No motor response

Any combined score of less than eight represents a significant risk of mortality.