

GLASGOW COMA SCALE

Introduction

GCS was initially used to assess level of consciousness after head injury, and the scale is now used by first aid, EMS and doctors as being applicable to all acute medical and trauma patients. In hospitals it is also used in monitoring chronic patients in intensive care. The scale was published in 1974 by Graham Teasdale and Bryan J. Jennett, professors of neurosurgery at the University of Glasgow.

Meaning:

Glasgow Coma Scale or GCS, is a neurological scale which aims to give a reliable, objective way of recording the conscious state of a person, for initial as well as subsequent assessment. A patient is assessed against the criteria of the scale, and the resulting points give a patient score between 3 (indicating deep unconsciousness) and either 14 (original scale) or 15 (the more widely used modified or revised scale).

Elements of the scale

Glasgow Coma Scale						
	1	2	3	4	5	6
Eyes	Does not open eyes	Opens eyes in response to painful stimuli	Opens eyes in response to voice	Opens eyes spontaneously	N/A	N/A
Verbal	Makes no sounds	Incomprehensible sounds	Utters inappropriate words	Confused, disoriented	Oriented, converses normally	N/A
Motor	Makes no movements	Extension to painful stimuli (decerebrate response)	Abnormal flexion to painful stimuli (decorticate response)	Flexion / Withdrawal to painful stimuli	Localizes painful stimuli	Obeys commands

The scale comprises three tests: eye, verbal and 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), while the highest is 15 (fully awake person).

Best eye response (E)

There are 4 grades starting with the most severe:

1. No eye opening
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.)

3. Eye opening to speech. (Not to be confused with an awaking of a sleeping person; such patients receive a score of 4, not 3.)
4. Eyes opening spontaneously

Best verbal response (V)

There are 5 grades starting with the most severe:

1. No verbal response
2. Incomprehensible sounds. (Moaning but no words.)
3. Inappropriate words. (Random or exclamatory articulated speech, but no conversational exchange)
4. Confused. (The patient responds to questions coherently but there is some disorientation and confusion.)
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.)

Best motor response (M)

There are 6 grades starting with the most severe:

1. No motor response
2. Extension to pain (abduction of arm, internal rotation of shoulder, pronation of forearm, extension of wrist, *decerebrate response*)
3. Abnormal flexion to pain (adduction of arm, internal rotation of shoulder, pronation of forearm, flexion of wrist, *decorticate response*)
4. Flexion/Withdrawal to pain (flexion of elbow, supination of forearm, flexion of wrist when supra-orbital pressure applied ; pulls part of body away when nailbed pinched)
5. Localizes to pain. (Purposeful movements towards painful stimuli; e.g., hand crosses mid-line and gets above clavicle when supra-orbital pressure applied.)
6. Obeys commands. (The patient does simple things as asked.)

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 at 07:35".

Generally, brain injury is 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 Paediatric Glasgow Coma Scale, a separate yet closely related scale, was developed for assessing younger children.

REFERENCES

- Potter PA, Perry AG, Stockert PA, Hall AM. *Fundamentals of Nursing*. 10th ed. St. Louis: Elsevier; 2021. p. 1505–1509. (Neurological assessment – Glasgow Coma Scale)
- Smeltzer SC, Bare BG, Hinkle JL, Cheever KH. *Brunner & Suddarth's Textbook of Medical-Surgical Nursing*. 14th ed. Philadelphia: Wolters Kluwer; 2018. p. 1921–1925. (Assessment of consciousness – GCS)
- Bickley LS. *Bates' Guide to Physical Examination and History Taking*. 12th ed. Philadelphia: Wolters Kluwer; 2017. p. 636–638. (Level of consciousness and GCS)
- Park K. *Textbook of Preventive and Social Medicine*. 26th ed. Jabalpur: Bhanot; 2021. p. 861–863. (Head injury assessment, GCS overview)