

Queensland  
Trauma Education

**TRAUMATIC BRAIN INJURY**

# Glasgow Coma Scale Procedural skill

Facilitator resource kit



**Developed by**

Dr Frances Williamson  
Emergency Staff Specialist - Metro North Hospital and Health Service

Tracey McLean  
Simulation Educator - Clinical Skills Development Service

**Reviewed by**

Kimberly Ballinger  
Simulation Educator - Clinical Skills Development Service

Education Working Group, Statewide Trauma Clinical Network - Clinical Excellence Queensland

**Designed by**

Rebecca Launder  
Product Designer - Clinical Skills Development Service

**Queensland Trauma Education**  
**Traumatic Brain Injury - Glasgow Coma Scale: Procedural skill - Facilitator resource kit**  
**Version 1.0**

Published by the Clinical Skills Development Service  
Herston, Queensland, Australia

[csds.qld.edu.au/qte](https://csds.qld.edu.au/qte)

Phone +61 7 3646 6500

Email [CSDS-Courses@health.qld.gov.au](mailto:CSDS-Courses@health.qld.gov.au)

© Metro North Hospital and Health Service through the Clinical Skills Development Service (CSDS) 2003 - 2021.  
All rights reserved.

**Disclaimer:** The content presented in this publication is distributed by the Queensland Government as an information source only. The State of Queensland makes no statements, representations or warranties about the accuracy, completeness or reliability of any information contained in this publication. The State of Queensland disclaims all responsibility and all liability (including without limitation for liability in negligence) for all expenses, losses, damages and costs you might incur as a result of the information being inaccurate or incomplete in any way, and for any reason reliance was placed on such information.

## Queensland Trauma Education

The resources developed for Queensland Trauma Education are designed for use in any Queensland Health facility that cares for patients who have been injured as a result of trauma. Each resource can be modified by the facilitator and scaled to the learners needs as well as the environment in which the education is being delivered, from tertiary to rural and remote facilities.

## National Safety and Quality Health Service (NSQHS) Standards



## About this training resource kit

This package is designed to highlight the importance of and how to perform a structured approach Glasgow Coma Scale (GCS) in the assessment of a trauma scenario.

It is intended to provide guidance to a facilitator on the instruction of participants in the use of the Glasgow Coma Scale following trauma using case examples.

### Target audience

- Emergency department medical and nursing clinicians.
- Allied health.

### Duration

30-45 minutes (setup, skills station and case studies).

### Group size

Suited to small group participation.

### Learning objectives

By the end of this session the participant will be able to:

- Demonstrate an understanding of the elements of the Glasgow Coma Scale.
- Discuss the challenges with each part of the scale.
- Perform a GCS assessment using a structured approach.

## Facilitator guide

1. Provide associated participant resource kit to the learner.
2. Use the PowerPoint slides to discuss the elements of the Glasgow Coma Scale. Demonstrate eye, verbal and motor assessment.
3. Discuss use of 'best' examination level, locations for painful stimuli application and unequal response.
4. Participant completes an examination on a manikin / simulated patient using the procedural skill cases.
5. Facilitate group discussion using suggested questions.

## Participant resource kit

- Learning objectives
- Overview of Glasgow Coma Scale.
- Further reading.
- Supporting resources:
  - GCS: Do it this way - infographic poster.

## Supporting resources

- GCS: Do it this way - infographic poster.
- Facilitator slide deck (PPTX).

# Overview of Glasgow Coma Scale

The Glasgow Coma Scale (GCS) is a commonly utilised scoring system to objectively assess a patient's level of consciousness following a traumatic brain injury (TBI). It is a reliable tool to categorise the severity of TBI:

- Mild = GCS 13-15
- Moderate = GCS 9-12
- Severe = GCS 8 or less

## Further reading

Glasgow Coma Scale explained. Mehta Rhea, Chinthapalli Krishna (2019) *BMJ Simulation & Technology Enhanced Learning*. <https://www.bmj.com/content/365/bmj.l1296>

The Glasgow Structured Approach to Assessment of the Glasgow Coma Scale  
<https://www.glasgowcomascale.org/>

Statewide Neurological Assessment (Adult)  
[https://qheps.health.qld.gov.au/\\_\\_data/assets/pdf\\_file/0026/2416922/sw977.pdf](https://qheps.health.qld.gov.au/__data/assets/pdf_file/0026/2416922/sw977.pdf)



## CHECK

For factors Interfering with communication, ability to respond and other injuries



## OBSERVE

Eye opening , content of speech and movements of right and left sides



## STIMULATE

Sound: spoken or shouted request  
Physical: Pressure on finger tip, trapezius or supraorbital notch



## RATE

Assign according to highest response observed

### Eye opening

Criterion	Observed	Rating	Score
Open before stimulus	✓	Spontaneous	4
After spoken or shouted request	✓	To sound	3
After finger tip stimulus	✓	To pressure	2
No opening at any time, no interfering factor	✓	None	1
Closed by local factor	✓	Non testable	NT

### Verbal response

Criterion	Observed	Rating	Score
Correctly gives name, place and date	✓	Orientated	5
Not orientated but communication coherently	✓	Confused	4
Intelligible single words	✓	Words	3
Only moans / groans	✓	Sounds	2
No audible response, no interfering factor	✓	None	1
Factor interfering with communication	✓	Non testable	NT

### Best motor response

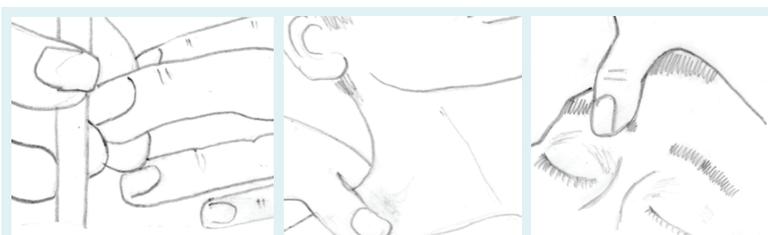
Criterion	Observed	Rating	Score
Obey 2-part request	✓	Obeys commands	6
Brings hand above clavicle to stimulus on head neck	✓	Localising	5
Bends arm at elbow rapidly but features not predominantly abnormal	✓	Normal flexion	4
Bends arm at elbow, features clearly predominantly abnormal	✓	Abnormal flexion	3
Extends arm at elbow	✓	Extension	2
No movement in arms / legs, no interfering factor	✓	None	1
Paralysed or other limiting factor	✓	Non testable	NT

### Sites For Physical Stimulation

Finger tip pressure

Trapezius Pinch

Supraorbital notch



### Features of Flexion Responses

Modified with permission from Van Der Naalt 2004  
Ned Tijdschr Geneeskd

#### Abnormal Flexion

Slow Stereotyped  
Arm across chest  
Forearm rotates  
Thumb clenched  
Leg extends



#### Normal flexion

Rapid  
Variable  
Arm away from body

# Procedural skill

## Resources required

<b>Equipment</b>	<ul style="list-style-type: none"> <li>• Manikin / simulated patient.</li> <li>• Pen torch.</li> </ul>
<b>Delivery tool</b>	Facilitator slide deck (PPTX)

## Cases

32yo male, fall from horse. No loss of consciousness. Wearing a helmet, complaining of a mild headache. Normally fit and well. No other injuries. Haemodynamically stable.

**Ask the learner to assess GCS of manikin / simulated patient.**

a) What is his GCS?

**Response:** GCS: E4V5M6=15

**For more senior participants:**

- b) Can you categorise his head injury into mild/moderate/severe?
- c) Does this patient need further investigations?
- d) What follow up and discharge information needs to be conveyed to the patient?

78yo male, fall from ladder. Brief LOC on scene for 1 minute. Initially complaining of a headache. No past medical history, no medications. No other injuries. Haemodynamically stable.

**Ask the learner to assess GCS of manikin / simulated patient.**

a) What is his GCS?

**Response:** GCS: E2V2M4 = 8

**For more senior participants:**

- b) Which element of his GCS is the most predictive for outcome?
- c) Does this patient require a CT scan?
- d) How would you manage his low GCS?

56yo female, driver in a motor vehicle crash at 100km/hr. Haemodynamically unstable HR 120 and BP 70/40, positive FAST and associated chest injury with respiratory distress and saturations 90% on an NRB.

**Ask the learner to assess GCS of manikin / simulated patient.**

a) What is her GCS?

**Response:** GCS: E3V4M6=13

**For more senior participants:**

b) How does her haemodynamic state affect her altered GCS?

c) Is her GCS reliable with a hypo-perfused and shocked state?

90yo female, fall from standing. On warfarin for atrial fibrillation. Haemodynamically stable, no other evidence of injury.

**Ask the learner to assess GCS of manikin / simulated patient.**

a) What is his GCS?

**Response:** GCS: E1V1M2= 4

**For more senior participants:**

b) What imaging studies will you arrange?

c) What is the role for reversal of warfarin in this presentation? How will you do that?

# Discussion questions and notes

## Questions

### **Why do we use the Glasgow Coma Scale?**

- To standardise and give a repeatable and objective measure of a patient's clinical condition.

### **What is the difference between the Scale and Score?**

- The numerical responses of the Glasgow Coma Scale from each element (eye, verbal and motor) are added to give a composite Glasgow Coma score out of 15.

### **What was the Glasgow Coma Scale developed for?**

- For research to summarise patient groups, in brain cancer cohort.
- Can be used to aid decision for airway management given the level at which airway reflexes become unreliable.

### **How would you categorise a traumatic brain injury in relation to the GCS?**

- Mild 13-15, Moderate 9-12, Severe 3-8.

### **In trauma, which element is the most predictive for outcome?**

- The motor score is most predictive for outcome, and the individual components and composition are more important than the overall 'score'.

### **What other examination findings add to the neurological examination with the GCS?**

- Other neurological examination findings, such as pupil size and reactivity to light.
- Limb strength and equality.

### **Where should pressure for pain be applied when assessing the GCS?**

- Applying pressure for pain response should be performed by testing the response in a peripheral and central location.
- In acute spinal cord injury, a patient will not be able to respond to a peripheral stimulus and so a central stimulus must be applied.
- Bilateral peripheral stimuli can be useful to assess if there is a varied neurological injury (for example in Brown Sequard syndrome).

### **Is there an alternative acute neurological assessment to the GCS?**

- AVPU scale (Alert, Voice, Pain, Unresponsive): a shorter, quicker, albeit vague, scale used to assess conscious level—referring to the stimulus required to elicit a response of eye opening, speech, or movement.

### **Are there any situations in which the GCS becomes unreliable?**

- A GCS score relies on the skill of the observer—that is, two people might score a patient's GCS assessment differently, especially if not trained.
- The GCS can only be carried out if scores for all three elements can be completed. This means that in modern intensive care unit's clinicians cannot fully assess sedated and intubated patients. They make alterations to the scale in this scenario by noting that the patient is intubated with (t) under the verbal component.

## Other notes

- It has been recognised that the GCS may not discriminate between minimally conscious states.<sup>(1)</sup> In addition, the scale is non-parametric, such that the difference between two values, for example 12 and 13, is not proportionate to the difference between two other values, such as 3 and 4.
- Furthermore, the clinical significance of the GCS outside of trauma and neurosurgery is debatable. For instance, a patient may be clinically unwell yet score 15 (E4, V5, M6) on the GCS, such as in meningitis.<sup>(2)</sup> Research for the use of the GCS within other medical specialties is lacking.
- Over the past 40 years, the GCS has become the primary tool used to assess the level of consciousness of patients in more than 80 countries.<sup>(3)</sup> If used correctly and in the knowledge of its shortcomings, it is an invaluable adjunct in clinical assessment. As with most clinical techniques though, greater training and education is needed to ensure reliability in the scoring system.

## References

1. Teasdale G, Maas A, Lecky F, Manley G, Stocchetti N, Murray G. The Glasgow Coma Scale at 40 years: standing the test of time. *Lancet Neurol* 2014;13:844-54.
2. Laureys S, Bodart O, Gosseries O. The Glasgow Coma Scale: time for critical reappraisal. *Lancet Neurol* 2014;13:755-7.
3. Matis G, Birbilis T. The Glasgow Coma Scale - a brief review. Past, present, future. *Acta Neurol Belg* 2008;108:75-89. e.

## Share your feedback

**Please complete our survey to help make Queensland Trauma Education better.**

The survey should take no more than 5 minutes to complete.

Scan the QR code or visit this link:

<https://www.surveymonkey.com/r/3FWL3ZD>



**Queensland Trauma Education**

**Traumatic Brain Injury - Glasgow Coma Scale: Procedural skill - Facilitator resource kit**

Published by the Clinical Skills Development Service

Herston, Queensland, Australia

[csds.qld.edu.au/qte](https://csds.qld.edu.au/qte)

Phone +61 7 3646 6500

Email [CSDS-Courses@health.qld.gov.au](mailto:CSDS-Courses@health.qld.gov.au)