

1. Introduction and Who Guideline applies to

- 1.1 This document provides guidance on how to identify when neurological assessment should be used and what to do with any deterioration in a patient's conscious level.
- 1.2 The Glasgow Coma Score (GCS) is used to assess a patients' level of consciousness in a variety of clinical settings (NICE, 2014).
- 1.3 The "Alert Voice Pain Unresponsive" tool is the monitoring of responsiveness that is included within the Trust's Early Warning Score (EWS) and recorded electronically on Nervecentre.
- 1.4 If GCS scoring is required this should not be done instead of the AVPU monitoring tool, both should be carried out simultaneously.
- 1.5 This guideline applies to all Healthcare Professionals employed by UHL who are required to assess and record Neurological Observations and act on the observations taken to and assumes sufficient knowledge and experience to carry out these observations competently.

2. Guideline Standards and Procedures

2.1 Who Needs GCS?

GCS is mainly indicated for patients who have suffered a traumatic head injury including a fall, car accident, or blow to the head (where a wound to the head has been sustained or is suspected). It is also used in those known or suspected to have suffered a stroke or an intracranial bleed. Other circumstances where patients may require GCS monitoring include the following:

- a) Patients scoring less than A on the AVPU score
- b) Patients with new limb weakness
- c) Patients with new confusion/agitation/aggression
- d) Meningitis or other suspected infection of the brain
- e) Brain Tumor
- f) Spinal Injury (as mechanism of injury may also result in head injury)

This is not an exhaustive list and there may be other occasions where the nursing or medical team may consider GCS scoring to be appropriate.

2.2 How to carry out GCS assessment

GCS assesses responsiveness and awareness and is divided into 3 areas;

- a) Eye Opening
- b) Verbal Response
- c) Motor Response

Before commencing a GCS assessment it is important to explain to the patient/ carers what you are going to do even if their consciousness appears altered. All assessments must be recorded on the GCS Chart (appendix 1). GCS is scored in each individual area giving a total score out of 15.

a) Eye opening

4 = Eyes open spontaneously – this must be confirmed as purposeful not just that the eyelids are not fully closed

3 = Eyes open to speech – it is important to speak to the patient but not to specifically ask them to open their eyes e.g. “Hello Mrs Jones, can you hear me” not “Mrs Jones, open your eyes for me” the latter is testing motor response.

2 = Eyes open to pain only – this should be in the form of a trapezius squeeze (firm pressure with thumb and forefinger on the flesh part between the neck and collar bone – See fig 1 below)

1 = No eye opening to voice or painful stimuli

b) Verbal Response

5 = Orientated – can tell you their name, date of birth and where they are

4 = Confused – may not know where they are or what’s wrong with them

3 = Inappropriate words – speaking but not making sense

2 = Incomprehensible sounds – groaning, screaming, whimpering, no words

1 = No sound – no response despite verbal and painful stimuli. If patient has a tracheostomy then mark (T) and score 1.

c) Motor Response

6 = Obeys commands – these should be specific e.g “stick your tongue out” or “squeeze my fingers and let go” it is important if using the latter that you ensure the patient squeezes and lets go as you ask to ensure this is not a spinal reflex.

5 = Localises to painful stimuli – this should again be a trapezius squeeze or pressure applied to the supra orbital ridge above the eye, the latter is contraindicated in patients with facial injuries, those who have had maxillofacial surgery and those with glaucoma; the arm should come up above the line of the clavicle to attempt to move away painful stimuli. Sternal rub is not advised as this leaves bruising.

4 = Withdraws from pain – patient purposefully reaches towards or moves away from general area of pain but fails to specifically locate it.

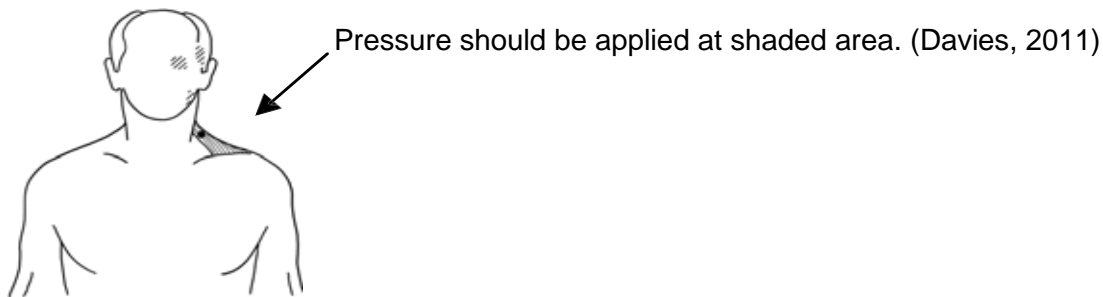
3 = Flexion to pain – patient bends the arms and there is internal rotation i.e. the knuckles of each hand rotate to face inwards.

2 = Extension to pain – patient stretches arms downwards; sometimes this is mirrored in the leg movement. This can also involve inward rotation of the arms and/or legs i.e. the arms stretch and the knuckles of each hand rotate to face inwards.

1 = No motor response – no movement of limbs despite painful stimuli

Following assessment of the 3 above areas, record on the appropriate GCS observation chart and calculate the total GCS score out of 15.

Fig. 1 Trapezius Squeeze



2.3. Pupil Response

For patients having GCS assessment pupillary assessment is also required. When checking pupil size it is important to explain to the patient what you intend to do.

- a) If the patient is able ask them to open both eyes and keep them open, if they cannot do this then use one hand to hold open both eyelids.
- b) Quickly shine a pen torch (use a medical pen torch only, no other light source to be used) into the left eye, look for the size and reaction of the left pupil.
- c) Repeat this with the right eye.
- d) A pupil size guide should be available on the GCS observation chart
- e) Ensure the size of both pupils is documented, as well as recording with a “+” sign if they are reactive a “-” if un-reactive and if you are unable to open the eyes due to swelling record “c”.

2.4 In- Hospital Observation

Full EWS and AVPU to be recorded on Nervecentre and GCS, limb movements and pupil size and reactivity to be recorded on paper UHL Neurological observation chart. The GCS paper monitoring may be discontinued at medical request.

2.5 Neurological observations – guidance for nursing staff

Observations	Interval
<ul style="list-style-type: none"> • GCS/AVPU • Pupil size & reactivity • Limb movements • Temperature • Pulse • Respiratory rate • BP • SaO2 	<ul style="list-style-type: none"> • Half-hourly until GCS 15 (b: If first recorded GCS is less than 15, a doctor should determine cause and whether old or new. <p data-bbox="710 394 1235 456">For example, old strokes may result in a reduced GCS if</p> <p data-bbox="710 495 1195 557">patient is dysphasic; known cognitive impairment may result in</p> <p data-bbox="710 595 1270 622">confused speech that is normal for patient)</p> <ul style="list-style-type: none"> • Half-hourly for next 2 hours • 1 hourly for next 4 hours • 2 hourly thereafter for up to 24 hours • Revert to half-hourly and follow the original schedule if GCS drops by more than one point at any stage <p data-bbox="710 983 1230 1016">(DISCUSS WITH NURSE IN CHARGE)</p>

2.6 Any of the following examples of neurological deterioration should prompt urgent re-appraisal by the supervising doctor.

- a) Development of agitation or abnormal behavior.
- b) A sustained (that is, for at least 30 minutes) drop of 1 point in GCS score (greater weight should be given to a drop of 1 point in the motor response score of the GCS).
- c) Any drop of 3 or more points in the eye-opening or verbal response scores of the GCS, or 2 or more points in the motor response score.
- d) Development of severe or increasing headache or persisting vomiting.
- e) New or evolving neurological symptoms or signs such as pupil inequality or asymmetry of limb or facial movement.

To reduce inter-observer variability and unnecessary referrals, a second member of staff competent to perform observation should confirm deterioration before involving the supervising doctor. This confirmation should be carried out immediately. Where a confirmation cannot be performed immediately (for example, no staff member available to perform the second observation) the supervising doctor should be contacted without the confirmation being performed.

2.7 The following requires immediate medical attention

- a) An unexpected deterioration of GCS to 8 or less (as airway may be compromised)
- b) New onset where one or both pupils size 6 or above with accompanying reduction in GCS without appropriate explanation
- c) If a patient is unexpectedly found with a GCS of 5 or less or pupils are un-reactive a medical emergency (2222) call should be put out immediately.

3. Education and Training

Staff who identify education and training requirements in relation to this guideline must discuss and action these with their line manager.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Retrospective Audit of patient records from area with high use of GCS and Neuro observations	Matron for identified area	CMG Medical and Nursing Lead	yearly	CMG Medical and Nursing Lead Report to Deteriorating Adult Patient Board

5. Supporting References (maximum of 3)

National Institute for Health and Care Excellence, 2014 'Head Injury: assessment and early management' guideline 176 www.guidance.nice.org.uk/CG176

UHL Management of Head Injury in Adults following In-Patient Falls Guideline-B8/2010

Davies, Clair (2011) The Trigger Point Therapy Workbook. Second Edition, New Harbinger Publications. Davies

6. Key Words

Glasgow Coma Score, GCS

CONTACT AND REVIEW DETAILS	
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Details of Changes made during review: May 2018 - Review of V1 (approved on 17 th August 2012) – Updated into latest Trust format and in line with Trust implementation of electronic observations and National guidance	

Full name
 DOB
 Unit number
(use sticker if available)

Neurological observation chart

For adults

Date /DD/MM/YY

Time (24h clock)
 H: [] [] [] []
 M: [] [] [] []

Glasgow Scale

Best Eye Response	Eyes open spontaneously	4
	Eye opening to verbal stimuli	3
	Record 'C' if no response possible due to bilateral periorbital swelling	2
	Eye opening to pain	2
	No eye opening	1
Best Verbal Response	Orientated	5
	Confused	4
	Inappropriate words	3
	Record 'D' if dysphasic 'I' if intubated	2
	Incomprehensible sounds	2
	No verbal response	1
Best Motor Response	Obeys commands	6
	Localising pain	5
	Withdrawal from pain	4
	Abnormal flexion to pain	3
	See reverse for guidance on how to determine best motor response	2
	Abnormal extension to pain	2
	No motor response	1

Total Score

- 15 = fully conscious
- < 9 = comatose
- 3 = unresponsive

If first recorded GCS is less than 15 ask a doctor to determine cause and if old or new (e.g. both old and new strokes may result in a reduced GCS if patient is dysphasic). Any further drop in total score by 2 points or more (or at least 1 point in motor score) after initial assessment should usually prompt urgent medical review.

Limb Movements

Arms	Normal power	
	Mild weakness	
	Severe weakness	
	Record findings for RIGHT ('R') and LEFT ('L') separately if different	
	Spastic flexion	
	Extension	
	None	
Legs	Normal power	
	Mild weakness	
	Severe weakness	
		Extension
	None	

Pupils

R	Record reaction to light as "±" if normal "S" if sluggish "N" if none "C" if eye closed by swelling	Size (mm)	
		Reaction	
L		Reaction	
		Size (mm)	

Pupil size 1 • 2 ● 3 ● 4 ● 5 ● 6 ● 7 ● 8 ● mm

Neurological Observations – How Long And How Often?

Appropriateness, frequency and duration of neurological observations must be specified by medical staff.

These will depend on the nature and expected time course of the patient's illness or injury as well as on other factors, such as end-of-life care decisions.

For example, acutely intoxicated patients will require a shorter period of observation than those at risk of raised intracranial pressure from brain malignancies.

For acute head injuries (e.g. after an inpatient fall) the following minimum 8-hour schedule is advised:

- ½-hourly until GCS 15
- ½-hourly for next 2h
- 1-hourly for next 4h
- 2-hourly thereafter (i.e. usually just once more)

NB: Revert to ½-hourly should GCS falls below 15

Determining Best Motor Response

Step 1

Ask the patient to '**obey a command**' that requires a specific response, such as 'please wiggle the fingers of your **LEFT** hand'.



NB: Do not ask the patient just to squeeze your hand as a response may be mere reflex action.

If appropriate response is seen the patient's motor score is 6. If not, move on to step 2.

Step 2

Rub the superior margin of an orbit with firm pressure (or squeeze a trapezius muscle hard). Patients able to **localize pain** will respond by moving a hand above the level of the clavicles.



NB: Intoxicated patients will often require sustained painful stimuli to elicit a response. If appropriate response is seen the patient's motor score is 5. If not, move on to step 3.

Step 3

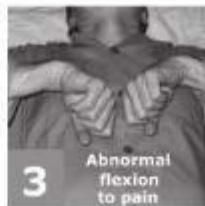
Apply firm pressure to a fingernail bed (e.g. by using a pen as shown on the right) and look for one of the responses simulated below.



NB: Rubbing the sternum is not a good way to determine best motor response as it does not distinguish between 'localizing pain' and 'abnormal flexion'. It can also leave bruise marks.



Withdrawal from pain by flexion at the elbow and external rotation at the shoulder joint.



Abnormal flexion to pain at elbow and wrist with internal rotation at the shoulder (usually both arms) and concomitant extension of the legs. This is also known as 'decorticate response'.



Abnormal extension to pain of (usually both) arms and legs. This is also known as 'decerebrate response'.

If no response is seen the patient's motor score is 1.