

INTRODUCTION

Coma is defined as U on the AVPU scale¹ or a Glasgow Coma Score (GCS)² (**see appendix 1**) of 8 or less; however any patient presenting with a decreased level of consciousness (GCS<15) mandates further assessment and, possibly, treatment.

The patient with a decreased level of consciousness provides a major challenge for all levels of emergency care staff. Often very little information is presented, and the causes may range from diabetic collapse to factitious illness. Decreased consciousness may be caused by:

- head injury
- hypoglycaemia
- stroke
- epilepsy
- sub arachnoid haemorrhage
- overdose etc.

Alterations in pO₂ (hypoxia) and/or PCO₂ (hyper/hypocapnoea):

- inadequate airway
- inadequate ventilation or depressed respiratory drive
- persistent hyperventilation.

Inadequate perfusion:

- hypovolaemia
- cardiac arrhythmias
- distributive shock
- neurogenic shock
- raised intracranial pressure.

Altered metabolic states:

- hypoglycaemia/hyperglycaemia.

Intoxication or poisoning:

- drug overdose
- alcohol intoxication
- carbon monoxide poisoning.

Medical conditions:

- stroke
- sub arachnoid haemorrhage
- epilepsy
- meningitis
- hypo/hyperthermia.

Head injury:

- raised intracranial pressure.

HISTORY

It is important to understand, wherever possible, the cause of decreased consciousness; the scene may provide clues to assist in formulating a diagnosis:

- any environmental factors, e.g. extreme cold, possible carbon monoxide sources?
- any evidence of tablets, ampoules, pill boxes, syringes, including domiciliary oxygen (O₂), or administration devices, e.g. nebuliser machines?
- any evidence of alcohol, or medication abuse?

Remember that the patient history may give you valuable insight into the cause of the current condition. The following may be of great help in formulating your diagnosis; ask relatives or bystanders:

- is there any history of recent illness or pre-existing chronic illness e.g. diabetes, epilepsy?
- any past history of psychiatric problems?
- any preceding symptoms such as headache, fits, confusion?
- any history of trauma?

NOTE: Remember, an acute condition may be an exacerbation of a chronic condition or a 'new' illness superimposed on top of a pre-existing problem.

ASSESSMENT

The primary survey should be used to assess and detect any **TIME CRITICAL/POTENTIALLY TIME CRITICAL** problems.

Assess **ABCDs**.

NOTE: any patient with a decreased level of consciousness has a compromised airway.

Decreased Level Of Consciousness

Assess level of consciousness on AVPU scale (*see below*).

- A** Alert
- V** Responds to voice
- P** Responds to painful stimulus
- U** Unresponsive

Assess and note pupil size, equality and response to light.

Check for purposeful movement in all four limbs and note sensory function.

Assess blood glucose level and if hypoglycaemic (<4.0 mmol/l) or hypoglycaemia is clinically suspected, administer glucose 10% or glucagon (*refer to glycaemic emergencies guideline*).

Look for any significant injuries (especially to head).

If any of these features are present, correct **A and B problems then transport to nearest suitable receiving hospital**.

Provide a **Hospital Alert Message / Information call**.

Continually re-assess ABCD:

- make special note of any trend in GCS or altered neurological function
- note any trend in blood pressure
- initiate appropriate treatments en-route.

If **NON TIME CRITICAL**, perform a more thorough assessment and secondary survey. Include observations for:

- any evidence of trauma
- breath for ketones, alcohol and solvents
- evidence of needle tracks/marks
- medic alert type jewellery (bracelets or necklets) which detail the patient's primary health risk (e.g. diabetes, anaphylaxis, Addison's disease etc.) but also list a 24-hour telephone number to obtain a more detailed patient history
- warning stickers, often placed by the front door or the telephone, directing the health professional to a source of detailed information (one current scheme involves storing the patient details in a container in the fridge, as this is relatively easy to find in the house)
- patient-held warning cards, for example, those taking monoamine oxidase inhibitor (MAOI) medication.

MANAGEMENT

Follow Medical Emergencies Guideline, remembering to:

TAKE A DEFIBRILLATOR TO THE INCIDENT – many calls to unconscious patients are in fact cardiac arrests.

Start correcting:

- **AIRWAY**
- **BREATHING**
- **CIRCULATION**
- **DISABILITY** (mini neurological examination)
- administer high concentration oxygen (O₂) (*refer to oxygen protocol for administration and information*) via a non-re-breathing mask, using the stoma in laryngectomee and other neck breathing patients. High concentration O₂ should be administered routinely, whatever the oxygen saturation, except in patients with chronic obstructive pulmonary disease (COPD) (*refer to COPD guideline*).
- Obtain IV access en-route.
- Apply pulse oximetry and ECG monitoring for detection of hidden hypoxia and arrhythmias (*refer to oxygen and cardiac rhythm disturbance guideline*).

Specifically consider:

- if any suspicion of trauma, immobilise cervical spine and *refer to trauma emergencies guidelines*
- in the case of severe respiratory depression/arrest support ventilation at a rate of 12–20 breaths per minute if:
 - SpO₂ is <90% on high concentration O₂
 - respiratory rate is <10 or >30
 - expansion is inadequate
 - if the level of consciousness deteriorates or respiratory depression develops in cases where an overdose with opiate-type drugs may be a possibility, consider naloxone (*refer to naloxone drug protocol for dosages and information*). In a patient with fixed pinpoint pupils suspect opiate use/overdose
- follow **ADDITIONAL MEDICAL** guidelines as indicated by the patient's condition, e.g. *cardiac rhythm disturbance guideline*

- commence correction of A and B problems on scene, then transport to **nearest suitable receiving hospital**
- provide a **Hospital Alert Message/Information Call** as required.

Key Points – Decreased level of Consciousness

- Maintain patent airway.
- Support ventilation if required.
- Address treatable causes.
- History – obtain as much information as possible.
- Provide pre-alert.

REFERENCES

- ¹ Mackay CA, Burke DP, Burke JA, Porter KM, Bowden D, Gorman D. Association between the assessment of conscious level using the AVPU system and the Glasgow coma scale. *Pre-Hospital Immediate Care* 2000;4(1):17-9.
- ² Teasdale G, Jennett B. Assessment of Coma and Impaired Consciousness: A Practical Scale. *The Lancet* 1974;304(7872):81-84.

METHODOLOGY

Refer to methodology section.

Appendix 1 – Glasgow Coma Scale

GLASGOW COMA SCALE	
Item	Score
Eyes Opening:	
Spontaneously	4
To speech	3
To pain	2
None	1
Motor Response:	
Obeys commands	6
Localises pain	5
Withdraws from pain	4
Abnormal flexion	3
Extensor response	2
No response to pain	1
Verbal Response:	
Orientated	5
Confused	4
Inappropriate words	3
Incomprehensible sounds	2
No verbal response	1