

The curious case of John Doe

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Presentation

- A middle aged male patient
- He was found unconscious in hospital premises during heavy rain by the bystanders.
- Brought in unconscious state by hospital security
- There were no relatives with the patient and the identity of the patient was not known (John Doe)

Primary survey

- Cervical spine stabilized.
- Airway – Threatened
- Breathing – Gasping, Saturation 85 % on room air
 - At this point patient was intubated and was put on ventilator support → saturation was 100%
- Circulation - Pulse – 120 per minute,
Blood pressure – 90mmHg systolic
Temp- 100 F

- **Disability** – GCS - 6/15
E1M4V1
- **Exposure** – Patient was completely drenched in rain water, Abrasion over scrotal area and gluteal region, passed stools and had Malaena +

Primary Adjuncts

- IV access- Fluid resuscitation
- Blood samples- Blood group & cross matching among other tests
- Ryle's tube and Foley's catheter was put
- BSL – 200 mg/dl
- ECG – Sinus Tachycardia

General Examination

- No PICCLE
- JVP not raised
- No evidence of any peculiar smell.

Systemic Examination

RS – Crepts & Ronchi+

CVS – S₁ and S₂ normal, no murmur.

P/A – Soft, non distended with no organomegaly

CNS – GCS 6/15.

-Pupils bilateral equal & reacting to light

Fundus- Normal.

No other focal neurological deficits.

Plantars- Bilateral Extensors.

Differential

- Head Trauma
- Meningitis/encephalitis/ Septicemia
- Metabolic encephalopathy
- Poisoning / Toxic encephalopathy

The missing link - History

- Patients relative arrived after 4 hours of patients presentation.
- It was revealed that the patient was an alcoholic and was on regular follow up with psychiatry OPD for the same.
- Known Diabetic.
- Patient was missing from home since 2days.
- There was no other relevant history.
- A differential of Alcohol withdrawal was added to the list of differential diagnosis.

Investigations:

- Routine hemogram, Fever profile, RFT , LFT , Electrolytes, Blood & urine Cultures, Urine Routine sent.
- Toxic panel, ammonia and other specific investigations were not done due to non affordability issues

Workup

- CBC- Hb: 12g%
TLC- 26400/ Cumm
Platelet- 2.1lakh/Cumm
- RFT- Urea- 90
Creat- 1.32
- Electrolytes- Na: 140
K: 4.6

Mysterious Puzzle

- Positive findings were the raised INR of 2.
- Neutrophilic leukocytosis
- Urinalysis: Pus Cells -15-20 cells/hpf
- Mildly raised LFT

Workup

- **ABG** - metabolic acidosis with compensated respiratory alkalosis.
- **Lactate** - 9.79 mmol/lit. (High)
- **Xray chest** - confirmed the position of ETT and was otherwise within normal limit.
- **USG abdomen** - unremarkable.

Further Management

- CT brain was WNL
- CSF analysis- WNL
- Patient was started on Empirical antibiotics initially and stepped up after the lab reports.
- Medicine, Neurology & Psychiatry opinion were also taken.

Fortune

- Rest of the workup turned out to be within normal limits and the cultures were negative.
- Patient responded well to treatment and was extubated on day 3.
- On 5th day he was shifted to medicine ward and discharged subsequently with diagnosis of ***Septicemia with septic encephalopathy in a Diabetic with complicated UTI & alcohol withdrawal.***
- Patient was advised to F/u in Medicine & Psychiatry OPD

DISCUSSION

- Unconscious patients are challenging to manage
- As they need to be managed in a time sensitive condition, a systematic, team approach is required.
- Early physiological stability and diagnosis are necessary to optimize outcome.

Approach :

- Cervical spine stabilization.
- An initial assessment of airway, breathing, and circulation must be performed to identify and manage the most immediate threats to life.

- Even in the apparent absence of trauma, especially in older patients or patients taking anticoagulants, brain injury or trauma should still be considered (1)
- Intravenous access, oxygen therapy, cardiac monitoring.
- Blood Glucose level to be checked.

- The differential diagnosis of altered mental status and unconsciousness are huge.
- can be overwhelming in the face of an acutely ill, undifferentiated ED patient.

What Could Be Wrong With HIM

Truma: Brain laceration/injury Concussion Depressed skull fracture Head trauma Brain contusion Brain injury, massive Diffuse axonal injury/Acute brain trauma Shaken Baby Syndrome Electromagnetic, Physics, trauma, Radiation Causes Asphyxia/suffocation Drowning, fresh water Drowning, sea water Drowning/Near-drowning Heat exhaustion/prostration Heat stroke Encephalopathy/postanoxic Hypoxia Hypoxic environment Hypothermia, accidental/exposure Electrocution/lightning strike High altitude cerebral edema Decompression sickness High altitude pulmonary edema atrogenic, Self induced Disorders Water intoxication Hypothermic anesthesia Hyponatremia correction, rapid Surgical, Procedure Complication Anesthesia, general Brain surgery/Infectious Disorders (Specific Agent) Pneumonia, bacterial AIDS Meningoencephalitis Encephalitis, herpes simplex Encephalitis, secondary viral Encephalitis, viral Meningitis Bacterial Meningitis, septic/viral Meningitis, Hemophilus Meningitis, pneumococcal Meningococcal meningitis/Pneumonia/Bronchopneumonia/Pneumonia, acute lobar Pneumonia, pneumococcal Typhoid fever Meningitis, tuberculosis Amebic (Naegleria) meningoencephalitis Bacterial overwhelming sepsis Candidiasis systemic Chickenpox encephalitis, bacterial/cerebritis Encephalitis, Dawsons/inclusion body Encephalitis, Eastern equine Encephalitis, mumps Encephalitis, Murray valley Encephalitis, non-viral Encephalitis, St Louis BEnccephalitis, Western equine Gram negative (e coli) meningitis Histoplasmosis meningitis Kunjin viral encephalitis La Crosse viral encephalitis Legionella meningoencephalitis Leptospiral meningitis Leptospirosis/severe (Weil's) type Listeria meningitis Lyme meningoencephalitis Malaria, cerebral Meningitis, candida Meningitis, Coxacki viral Meningitis, echo viral Meningitis, staphylococcus aureus Mononucleosis encephalitis Plague meningitis Post-viral/infectious encephalopathy Primary bacterial peritonitis ascites Rabies syndrome Russian tick-bourne encephalitis Toxic shock syndrome Trichinella meningoencephalitis Typhus, acute/epidemic West Nile fever/encephalitis Brucellosis Legionnaires disease Listeria monocytogenes/listeriosis Meningitis, fungal Rocky mountain spotted fever Toxoplasma meningoencephalitis Creutzfeld-Jakob disease Meningitis, cryptococcal Psittacosis/ornithosis Sleeping sickness/trypansomiasis Toxoplasmosis, cerebral Encephalitis, equine, Venezuelan Encephalitis, Japanese BEnccephalitis, powassan Malaria Meningitis, coccidioidomycosis Nipah virus/encephalitis Plague, bubonic Tularemia meningitis Poliomyelitis, acute Fungus brain abscess Leptospirosis Ictohemorrhagic Infected organ, Abscesses Infections Abscess, intracranial Bacteremia/Septicemia Brain abscess Embolism, septic, cerebral Endocarditis, infective Meningoencephalitis Pneumonia, aspiration Sepsis Sepsis, overwhelming Septic shock Urosepsis/Septicemia Encephalomyelitis, acute Encephalopathy/secondary/toxic/sepsis Necrotizing fasciitis/mixed Brain stem encephalitis Encephalitis Meningitis Pneumonia Granulomatous, Inflammatory Disorders Hemorrhagic pancreatic, necrotizing Pancreatitis/resp distress syndrome Neoplastic Disorders Hypercalcemia of malignancy Metastatic brain disease Brain stem tumor Brain tumor Frontal lobe tumor Medulloblastoma Meningocele Parienta lobe tumor Primary CNS lymphoma Temporal lobe tumor, malignant (astrocytoma) Craniopharyngioma Glioblastoma multiforme Insulinoma/Islet cell tumor Meningioma Pontine glioma Carcinomatosis Parienta lobe tumor Primary CNS lymphoma Temporal lobe tumor, malignant (astrocytoma) Craniopharyngioma Glioblastoma multiforme Insulinoma/Islet cell tumor Meningioma Pontine glioma Allergic, Collagen, Auto-Immune Disorders Encephalitis, hemorrhagic, acute Encephalitis, post viral Encephalomyelitis, necrotizing hem. ac. Encephalomyelitis, post-infectious Stevens-Johnson syndrome Transfusion reaction, hemolytic lupus cerebritis Polyradiculitis nodosa Behcet's syndrome Hashimoto Encephalitis Metabolic, Storage Disorders Hypoglycemia, reactive diabetic Diabetic ketoacidosis/coma Hyperosmolar hyperglycemic coma, nonketone Neonatal hyperbilirubinemia Metabolic disorders Methemoglobinemia, Hereditary Porphyria, acute intermittent Glutaric aciduria/Acidemia Urea cycle/metabolic disorder Methemoglobinemia, acquired/toxic Biochemical Disorders Encephalopathy, hypoglycemic Hypoglycemia, infantile Acid/Base derangement Acidosis Hypercalcemia Hypercapnea Hypercapnia Hypernatremia Hyperosmolar Hyperglycemia Hypotension Lactic acidosis Metabolic encephalopathy Hypoxia, systemic, chronic Hypoglycemia Pontine myelinolysis, central Deficiency Disorders Dehydration and fever Dehydration Wernicke's encephalopathy Malnutrition/Starvation Pellagra/niacin deficiency Marchiafava-Bignami syndrome Congenital, Developmental Disorders Nephrogenic diabetes insipidus Hereditary, Familial, Genetic Disorders MELAS Encephalopathy Van Boogaert encephalitis Usage, Degenerative, Necrosis, Age Related Disorders Alzheimer's syndrome Dementia, Lewy-body type Multiple sclerosis Relationship, Mental, Psychiatric Disorders Conversion disorder Mania Hypoglycemia, factitious Catatonian Manic delirium Anatomic, Foreign Body, Structural Disorders Acute subdural hematoma/hemorrhage Brain compression Epidural hematoma Intracerebral hematoma/Intraventricular brain hemorrhage Subdural hematoma Tamponade, cardiac Brain stem herniation/peduncle/tonsils Fat embolism Superior vena cava syndrome Intracranial mass effect Arteriosclerotic, Vascular, Venous Disorders Cerebral vascular accident Cerebral embolism Cerebral hemorrhage Cerebral vein thrombosis/phlebitis Intracerebral hemorrhage Myocardial infarction, acute Subarachnoid hemorrhage Transient cerebral ischemia attack Cerebral infarct/Encephalomalacia Brain stem infarct Cavernous sinus thrombosis Cerebral/Venous sinus thrombophlebitis Superior sagittal sinus thrombosis Vertebrobasilar artery dissection Functional, Physiologic Variant Disorders Hyperpyrexia Sleep deprivation Vegetative, Autonomic, Endocrine Disorders Cardiac arrest Syncope Syncope, vasovagal Arrhythmias Cardiogenic shock Convulsion/grand mal seizure Epilepsy Hypoglycemia, functional Increased intracranial pressure Seizure disorder Hyperthermia Hypotension Orthostatic hypotension Post-ictal status Thyrotoxicosis (Graves disease) Hypothyroidism (myxedema) Encephalopathy, hypertensive Hypertension, malignant Malignant hyperthermia Myxedema coma Adams attacks Thyrotoxic crisis Complete heart block Inappropriate ADH secretion Vertebrobasilar migraine syndrome Hypothyroidism, juvenile Narcolepsy Pickwick's syndrome Reference to Organ System Shock Cerebral edema Disseminated intravascular coagulopathy Hepatic encephalopathy Hypovolemic shock Renal Failure Acute Respiratory distress (adult) syndrome Brain disorders Respiratory failure/Pulmonary insufficiency Emphysema/COPD/Chronic lung disease Cerebral thrombotic thrombocytopenia Hepatorenal syndrome Renal Failure Chronic Uremic encephalopathy Encephalopathy Hyperviscosity syndrome Pernicious anemia Pontine lesion/disorder Thrombotic thrombocytopenia purpura Combined system disease/pernicious an. Fever Unknown Origin Reversible Posterior Encephalopathy Syndrome Pathophysiology Sepsis encephalopathy/elderly Cardiac output reduction Cerebral depressed Functions Drugs Medication/drugs Benzodiazepines Administration/Toxicity Sedative drugs Administration/Toxicity Digitalis toxicity/poisoning Hypoglycemia, diabetic treatment Insulin overdose/exogenous Insulin intoxication/overdose syndrome Salicylate intoxication/overdose Tricyclic overdose Barbiturate/sedative abuse/dependent Drug induced Hypoglycemia Oral hypoglycemic Administration/Toxicity/effect Insulin (Humulin/Novinsulin) Administration/Toxicity Isoniazid (INH/Nydrizid) Administration/Toxicity Ergot toxicity Isoniazid hepatitis Milk-alkali syndrome Poisoning (Specific Agent) Opiate overdose toxicidrome Kitchen gas/propane exposure Alcohol/Ethanol ingestion/intake Alcohol amnestic disorder Alcohol induced hypoglycemia Alcohol intoxication, acute Alcohol seizure (rum fits) Cholinergic crisis toxicidrome Delirium tremens Insecticide/organophosphate type Overdose, drug/alcohol Poisoning Snakebite (rattlesnake/pit viper type) Alcohol withdrawal Hallucinogen abuse Lead poisoning in children Smoke inhalation Heroin/morphine usage/addiction Cyanide/Hydrogen cyanide exposure/poisoning Vomiting CBW agent (Dm/Da/Dc) Weapon exposure Arsenic gas (Hydrogen arsenide) poisoning Carbon monoxide poisoning/exposure Diethylene Glycol poisoning/Ethyleneglycol [Antifreeze] ingestion Insecticide/pesticide poisoning Intentional poisonings Isopropyl alcohol ingestion/poisoning Mustard gas exposure/poisoning Nerve gas exposure Aluminum toxicity/syndrome Ammonia exposure/inhalation Hydrogen sulfide poisoning/inhalation Insecticide/chlorinated/non-ester's inh Lead poisoning Lead encephalopathy Nitrogen narcotic action Carbon disulfide inhalant/poisoning Chlorine gas poisoning/Methane gas poisoning/asphyxia Carbon dioxide gas inhalation/asphyxia Organ Poisoning (Intoxication) Neuroleptic malignant syndrome

Or to sum it up:

- **M**: Metabolic—B12 or thiamine deficiency, serotonin syndrome
- **O**: Hypoxemia (pulmonary, cardiac, anemia); high CO₂
- **V**: Vascular causes—hypertensive emergency, ischemic/hemorrhagic CVA, vasculitis, MI
- **E**: Electrolytes and endocrine
- **S**: Seizures / status epilepticus, post-ictal
- **T**: Tumor, trauma, temperature, toxins (lead, mercury, CO, toxicodromes)
- **U**: Uremia. Renal or hepatic dysfunction with hepatic encephalopathy
- **P**: Psychiatric, porphyria
- **I**: Infection
- **D**: Drugs, including withdrawal (anticholinergics, TCA's, SSRI's, BZD's, barbiturates, alcohol).

Initially look for:

- A- Alcohol, Acidosis, Ammonia, Arrhythmias
- E- Endocrine, Electrolytes, Encephalopathy
- I- Infection
- O- Oxygen, Over dose, Opiates
- U- Uremia
- T- Trauma, Temperature, Thiamine.
- I- Insulin
- P- Poisoning, Psychiatry illness.
- S- Stroke, Seizure, Syncope, ICSOL.
(3)

- **What could kill my patient immediately?**
- Cardiac arrest
- Airway obstruction
- Breathing (oxygenation) (2)

- What could kill my patient in the next 10 minutes?
- Still the ABCs
- Hypotension
- Anaphylaxis
- Hyperkalemia
- MI
- Aortic emergencies (2)

- What could kill my patient in the next few minutes?
- Hypoglycemia
- Overdose
- Intracranial hypertension and herniation (2)

- **What could kill my patient over the next few hours?**
- Sepsis
- Intracranial haemorrhage
- Alcohol Withdrawal
- Status epilepticus (presumably non-convulsive)
- Abdominal catastrophes
- Metabolic problems (DKA, HHNK, hyponatremia, thyroid disorders, adrenal disorders) (2)

INVESTIGATIONS: (4-5)

- ECG.
- CBC
- ABG
- Metabolic panel, electrolytes.
- Drug screening
- Urinalysis
- Cultures (Indicated)
- Imaging (e-FAST, CT brain plain → MRI brain)
- lumbar puncture.

AMS can be due to:

- Diffuse bilateral cortical impairment (Toxic, metabolic, etc)
OR
- Focal impairment (Reticular Activating System) (6)



- Reversible causes (Hypoglycemia, Opioid overdose)
- Specific antidote for toxicodromes
- Thiamine should be given before glucose in Alcoholics and Malnourished. (7)

- What could we be missing?
- After ruling out initial life threats, starting empiric therapy, and getting the patient to the Brain imaging, focus on running through the larger differential diagnosis.

TAKE HOME MESSAGE:

- Treat first that kills first!
- Get high-yield, easy items first: BSL, ECG.
- Maintain a wide differential.
- Keep modifying testing as differentials changes with results.
- 'Shotgun Approach' (parallel processing & Systematic team work).
- Stabilize the patient before shifting the patient out of ER.

- Re-Examine the patient and make sure nothing has changed and that the examination is consistent with Dx
- Don't become "emotionally attached" to a Dx, as the clinical picture can change and start looking like something else →
“The only typical presentation is an atypical presentation”

- Re-evaluate patient frequently and do frequent “hypothesis-testing” in your mind.

References

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- 5) Braun M , Schmidt WU , Mockel M , Romer M et al. Coma of unknown origin in the emergency department: implementation of an in-house management routine . Scand J Trauma Resusc Emerg Med 2016 ; 24 : 61
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Special thanks to Dept of Medicine,
Neurology & Psychiatry



Sr. no	Test	Parameter s	Values
1	CBC	HB	12
		TLC	26400
		DLC	85/06/03/0 6
		Platelets	212000
2	ABG	pH	7.467
		pCO2	12.5
		pO2	142.8
		HCO3-	9
		Lactate	9.79
3	RFT	Urea	99

		Creatinine	1.32
4	LFT	Bilirubin	
		Total	3.42
		Direct	0.68
		SGPT	51
		SGOT	182
		ALP	22
		Protein	6.65
		Albumin	2.65
		Globulin	4
5	Electrolyt es	Sodium	145
		Potassium	6















- **Key points**
- Unconsciousness is a time-sensitive medical emergency where early physiological stability and diagnosis are vital in optimising patient outcomes
 - An initial assessment of airway, breathing, and circulation must be performed to identify and manage the most immediate threats to life
 - All facets of care, history, examination, investigation and treatment/management should be delivered in parallel by a team working in a systematic way
 - Even in the apparent absence of trauma, especially in older patients or patients taking anticoagulants, brain injury or trauma should still be considered
 - Senior physicians must be involved early in the care of an unconscious patient, to liaise with critical care and speak with the patient's relatives or advocates, especially when decisions regarding cardiopulmonary resuscitation or ceiling of care are required

- **Table 1.**Differential diagnoses in a patient with non-traumatic coma

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- **Clinical approach**

- **General principles of initial assessment and management**

- The four core components of care, history, examination, investigation and treatment/management should occur in parallel.³⁻⁶ A systematic and structured ABCDE (airway, breathing, circulation, disability, exposure) approach should be employed by teams caring for unconscious patients (Fig 1). Supportive care and specific treatments must not be delayed.

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- **Fig 1.**Systematic team approach to the unconscious patient. ABCDE = airway, breathing, circulation, disability, exposure; CT = computed tomography; CXR = chest X-ray

- **History**

- A collateral history from relatives or other witnesses, including paramedics, is vital.⁴ The patient's recent health, functional status and previous medical history may provide diagnostic clues as well as guiding decisions regarding ongoing care, such as admission to a critical care unit. Previous hospital records must be requested urgently and the next of kin contacted. Hospital pharmacists can obtain a drug history from primary-care shared records. Bystanders may have witnessed the patient collapse, while paramedics are skilled in surveying the scene for clues, such as empty drug packets, alcohol or a suicide note.

- **Examination**

- After the initial ABC assessment, the level of consciousness should be formally measured and documented using the Glasgow Coma Scale (GCS) (see Table 2). Coma is defined as having a GCS <8 or scoring U on the AVPU (Alert, responsive to Voice, responsive to Pain, Unresponsive) scale.⁷ A focused neurological examination should be undertaken. Motor responses can be purposeful, such as the patient pulling on an airway adjunct, or reflexive, including withdraw, flexion or extension responses.³ Motor response to graded stimuli should be assessed in a stepwise approach:⁸

- verbal stimulus – eg 'Can you hear me?'

- tactile stimulus – to hands or face

- noxious stimulus – intense but not causing injury, eg pressure on nailbed or supraorbital ridge.

- View this table:[In this](#)

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- **Table 2.**The Glasgow Coma Scale
- Eye movements cannot be fully assessed in an unconscious patient. If there is no concern regarding a neck injury, the doll's eyes or oculocephalic reflex can be performed. A loss of conjugate eye movement away from the direction the head is moved, with the eyes remaining in a midorbit position, suggests brain stem dysfunction. Fundoscopy should be performed; important findings include papilloedema in posterior reversible encephalopathy syndrome (PRES) or subhyaloid haemorrhage in subarachnoid haemorrhage. Pupil examination can aid diagnosis:³⁻⁵
- small pupils (<2 mm) – opioid toxicity or a pontine lesion
- midsize pupils (4–6 mm) unresponsive to light – midbrain lesion
- maximally dilated pupils (>8 mm) – drug toxicity, eg anticholinergic overdose
- mixed and dilated pupil(s) – 3rd (oculomotor) nerve lesion from uncal herniation.
- A full examination must be performed, although there are areas of specific relevance in the unconscious patient. The breath may exhibit the musty smell of hepatic encephalopathy or the garlic smell of organophosphate poisoning.^{9,10} When the breath suggests alcohol consumption, a thorough search for other causes of unconsciousness should continue. In older people, especially those taking anticoagulant medication, an intracranial bleed remains a strong possibility, even in the absence of a history of falls or external injury. However, older people often have evidence of minor injuries, such as bruises, which should alert the attending physician to more serious intracranial pathology. The presence of generalised tremor or myoclonus points towards a metabolic cause. Examination of the skin may reveal drug injection sites.
- The pattern of breathing should be assessed as well as the respiratory rate.
- Kussmaul respiration – deep, laboured breathing, indicative of severe metabolic acidosis and commonly associated with diabetic ketoacidosis.
- Shallow with an extremely depressed respiratory rate seen in opiate overdose.
- Ataxic breathing (Biot's respiration) – groups of quick, shallow inspirations followed by regular or irregular periods of apnoea, suggesting a lesion in the lower pons.¹¹
- Central neurogenic hyperventilation – breathing characterised by deep and rapid breaths at a rate of at least 25 breaths per minute indicating a lesion in the pons or midbrain.¹²
- Cheyne–Stokes breathing is seen with many underlying pathologies and is not helpful in making a firm diagnosis.

- **Investigations**
- Investigations aid diagnosis, assessment of severity and monitoring of ongoing care. Before considering any further investigations, a bedside capillary blood glucose must be performed to exclude hypoglycaemia ([Box 1](#)).
- View this table:[In this window](#)
[In a new window](#)
- **Box 1.**Initial investigations in an unconscious patient
- Urgent imaging of the brain is important and a structural pathology should always be considered if the cause of unconsciousness is not obvious from the initial rapid assessment.^{3c}
b Computed tomography (CT) of the brain is the investigation of choice to exclude common pathologies such as intracranial blood, stroke or space-occupying lesions. If the CT brain scan is normal and the diagnosis remains unclear, further imaging with a magnetic resonance scan may be required.
- If there is no contraindication, a lumbar puncture should be considered when the cause of unconsciousness remains unclear or a central nervous system infection is suspected.
- Electroencephalography (EEG) should be performed in suspected cases of non-convulsive status epilepticus. In this condition there is prolonged seizure activity but in the absence of motor signs. It is more common in older patients. Clinically, patients appear to stare into space with nystagmus-like eye movements, lip smacking or myoclonic jerks.¹³
- **Treatment and management**
- As the ABC assessment is undertaken, other team members should be:
 - taking blood tests
 - establishing intravenous access
 - connecting the patient to a cardiac monitor and oxygen saturation probe
 - commencing appropriate oxygen therapy if indicated.
- If any doubt exists, the cervical spine should be immobilised. Death will occur soonest when the airway and breathing are compromised; therefore, intubation should be considered in patients with a GCS of 8 or less, or those who cannot protect their own airway or have ineffective respiratory drive and poor oxygenation. Hypotension is initially managed with intravenous fluid resuscitation; early vasopressor support is considered when the blood pressure does not respond. In patients who remain physiologically unstable or where the cause of coma is not immediately clear or reversible, help from critical care colleagues must be sought at a very early stage.^{4,5,14}
- If raised intracranial pressure is suspected the patient should be managed in a 30° head tilt position. Unconscious patients with an acute neurological condition should be discussed with either a neurosurgeon, neurologist or stroke physician to determine further management.^{4,14} Concussion results in neurological signs and symptoms following a force injury to the brain, which may be minor, with the absence of macroscopic neural damage.³⁵
- Specific treatment depends on the underlying aetiology of the coma. 'Coma cocktails' should be avoided.³ In cases where there is clinical suspicion of toxicity, specific antidotes should be used, eg naloxone in opiate toxicity. In hypoglycaemia, intravenous glucose is the immediate treatment of choice as glucagon can take up to 15 minutes to act and is ineffective in patients with liver disease, depleted glycogen stores or malnutrition. In hypoglycaemic patients at risk of Wernicke's encephalopathy, such as those with a history of alcohol excess, intravenous thiamine should be coadministered. Although flumazenil can be considered in benzodiazepine overdose, it is contraindicated in patients with a history of seizures and can provoke seizures with concomitant tricyclic overdose.
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- **Prognosis**
- Prognosis depends on a number of factors. In one systematic review the mortality rate varied from 25–87%.¹⁴ Non-traumatic unconscious patients presenting with a stroke have the highest mortality, while those presenting with epilepsy and poisoning have the best prognosis.^{14,16,17} A Swedish study of coma patients presenting to the Emergency Department found initial inpatient mortality to be 27%, rising to 39% at 1 year.¹⁸ Patients with a lower GCS at presentation, 3–5, have a significantly higher mortality than those with a GCS of 7–10.¹⁹
- Reversible causes of coma are generally more likely when a CT scan of the brain is unremarkable and the patient has no focal neurology. Patients not responding to initial treatment and who remain comatose are likely to require critical care admission unless withdrawal of treatment and palliation of symptoms is more appropriate. Early communication with the family about the patient's prognosis and the need for resuscitation is important. It is also important to consider the patient's wishes and those of their family before making decisions about further treatment.

A

Alcohol
Acidosis (metabolic disorders)
Ammonia (hepatic encephalopathy)
Arrhythmias (any cardiac cause)

E

Endocrine
Electrolytes
Encephalopathy

I

Infection

A

Alcohol
Acidosis (metabolic disorders)
Ammonia (hepatic encephalopathy)
Arrhythmias (any cardiac cause)

E

Endocrine
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Encephalopathy

I

Infection

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Available
at: <https://first10em.com/unconscious/>.