



Altered Level of Consciousness (ALOC) in Children

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1. Definition

Altered level of consciousness (ALOC) is any reduction in awareness, responsiveness, or interaction with the environment ranging from confusion and lethargy to coma.

It is a **symptom**—**not a diagnosis** and always requires urgent evaluation to identify reversible and life-threatening causes.

2. Clinical Presentation

History (AMPLE + SAMPLE)

Ask:

- Time of onset (sudden vs gradual)
 - Progression
 - Fever
 - Headache
 - Vomiting
 - Trauma
 - Seizure activity
 - Drug/toxin exposure
 - Diabetes
 - Previous neurological disease
 - Recent illness
 - Ingestion of medications
 - Immunization status
 - Birth/developmental history (young children)
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Physical Examination

Follow **ABCDE** immediately.

Assess:

Airway

- Airway patency
- Gag reflex
- Secretions

Breathing

- Respiratory rate
- Oxygen saturation
- Pattern of breathing
- Signs of respiratory failure

Circulation

- Heart rate
- Blood pressure
- Perfusion
- Capillary refill

Disability (Neurologic)

- AVPU or Pediatric GCS
- Pupils
- Muscle tone
- Reflexes
- Focal deficits
- Signs of meningism
- Seizure activity

Exposure

- Rash (meningococemia)
- Trauma
- Needle marks
- Bruising
- Signs of poisoning

Red Flag Findings

- GCS <13 or rapidly falling
 - Unequal pupils
 - Recurrent seizures
 - Focal neurological signs
 - Signs of raised ICP
 - Respiratory depression
 - Persistent hypotension
 - Petechial rash
 - Severe hypoglycemia
 - Suspected poisoning
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3. Diagnostic Approach

Step 1. Stabilize First

ABCDE

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Immediate bedside tests

- Blood glucose
- Pulse oximetry
- Temperature

Treat immediately if abnormal.

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Step 2. Consider Common Reversible Causes

Remember:

AEIOU TIPS

Letter	Cause
A	Alcohol/Acidosis
E	Epilepsy/Electrolytes
I	Infection
O	Overdose/Oxygen deficiency
U	Uremia

Letter	Cause
T	Trauma/Temperature
I	Insulin (hypoglycemia)
P	Poisoning/Psychogenic
S	Stroke/Shock

Step 3. Focused Evaluation

History

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Examination

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Laboratory tests

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Imaging (if indicated)

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Lumbar puncture (after excluding raised ICP)

4. Differential Diagnosis

Neurologic

- Seizure/postictal state
- Status epilepticus
- Meningitis
- Encephalitis
- Stroke
- Intracranial hemorrhage
- Brain tumor
- Hydrocephalus
- Raised intracranial pressure

Metabolic

- Hypoglycemia
- DKA
- Hyponatremia
- Hypernatremia
- Hypocalcemia
- Hepatic encephalopathy
- Uremia
- Inborn errors of metabolism

Infectious

- Sepsis
- Meningitis
- Encephalitis
- Cerebral malaria (endemic regions)

Respiratory

- Hypoxia
- Hypercapnia
- Severe asthma
- Respiratory failure

Cardiovascular

- Shock
- Arrhythmia
- Cardiac arrest
- Severe hypertension

Toxicologic

- Opioids
 - Benzodiazepines
 - Tricyclic antidepressants
 - Organophosphates
 - Alcohol
 - Carbon monoxide
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Endocrine

- Adrenal crisis
 - Thyroid storm (rare)
 - Myxedema (rare)
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Trauma

- Head injury
 - Non-accidental injury
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5. Investigations

Bedside (Immediately)

✓ Blood glucose

✓ Pulse oximetry

✓ ECG

Laboratory

- CBC
- Electrolytes
- Calcium
- Magnesium
- Renal function

- Liver function
 - Blood gas
 - Lactate
 - CRP
 - Blood culture (if infection suspected)
 - Toxicology screen (when indicated)
 - Ammonia (if metabolic disease suspected)
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Imaging

CT Head (urgent if)

- Trauma
- Focal neurological deficit
- Suspected hemorrhage
- Raised ICP
- Persistent coma
- Before lumbar puncture if ICP is suspected

MRI

Preferred for encephalitis, stroke, tumors, or unexplained coma (after stabilization).

Lumbar Puncture

Perform if meningitis/encephalitis suspected **and there are no contraindications.**

Contraindications include:

- Raised ICP
 - Focal neurological signs
 - Hemodynamic instability
 - Severe coagulopathy
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6. Management Algorithm

Altered Consciousness

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ABCDE

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Check glucose immediately

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Treat hypoglycemia if present

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Provide oxygen

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IV/IO access

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Treat shock

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Stop seizures if occurring

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Consider infection

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Start empiric antibiotics ± acyclovir

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Investigate cause

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Definitive treatment

Initial Management

Airway

- Position airway
 - Suction secretions
 - Intubate if GCS ≤ 8 or airway not protected
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Breathing

- High-flow oxygen
 - Ventilation if respiratory failure
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Circulation

- IV/IO access
 - Isotonic crystalloid 10–20 mL/kg for shock (reassess after each bolus)
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Disability

Correct immediately:

- Hypoglycemia
 - Seizures
 - Hypoxia
 - Electrolyte disturbances
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Suspected CNS Infection

Do **not** delay antibiotics if meningitis is suspected.

Empiric therapy typically includes:

- Ceftriaxone (or cefotaxime)
- Add vancomycin where resistant pneumococci are a concern
- Add acyclovir if encephalitis (especially HSV) is suspected

7. Drug Summary Table

Drug	Indication	Pediatric Dose (Typical)
Dextrose	Hypoglycemia	D10W 5 mL/kg IV (preferred in children); adolescents may receive D25W or D50W with caution
Lorazepam	Active seizure	0.1 mg/kg IV (max 4 mg)
Diazepam	Active seizure	0.2 mg/kg IV or 0.5 mg/kg PR
Midazolam	No IV access	0.2 mg/kg IN/buccal/IM
Levetiracetam	Second-line seizure	40–60 mg/kg IV (max 4.5 g)
Ceftriaxone	Bacterial meningitis	100 mg/kg/day IV (max 4 g/day)
Vancomycin	Resistant pneumococcus risk	15 mg/kg IV every 6 hours (per local guideline)
Acyclovir	HSV encephalitis	20 mg/kg IV every 8 hours
Naloxone	Suspected opioid intoxication	0.1 mg/kg IV/IM/IN (max 2 mg initial dose)

Always follow local pediatric dosing guidelines and institutional protocols.

8. Admission Criteria

Admit **all children** with:

- Persistent altered consciousness
 - GCS <15 not rapidly normalizing
 - Seizure requiring treatment
 - Suspected CNS infection
 - Poisoning requiring observation
 - Head trauma
 - Need for IV therapy
 - Abnormal neuroimaging
 - Metabolic derangement
 - Uncertain diagnosis
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9. Referral Criteria

Urgent referral to PICU or tertiary center if:

- GCS ≤ 8
- Need for intubation
- Status epilepticus
- Raised intracranial pressure
- Hemodynamic instability
- Mechanical ventilation
- Neurosurgical emergency
- Stroke
- Severe poisoning
- Persistent unexplained coma

Consult pediatric neurology, neurosurgery, toxicology, infectious diseases, or metabolic specialists as indicated.

10. Follow-up

Depends on the underlying diagnosis.

Assess for:

- Recovery of neurological function
 - Developmental regression
 - Cognitive impairment
 - Recurrent seizures
 - Medication adverse effects
 - Need for rehabilitation or specialist follow-up
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11. Clinical Pearls

- **Treat first, diagnose second**—correct hypoxia and hypoglycemia immediately.
- Always check **blood glucose within minutes** of presentation.
- A normal CT scan does **not** exclude meningitis or encephalitis.
- Persistent altered consciousness after a seizure is **not always postictal**; consider ongoing non-convulsive status epilepticus or another cause.
- Consider toxic ingestion in any child with unexplained coma.
- In infants, altered consciousness may present as poor feeding, lethargy, or irritability rather than coma.
- Reassess neurological status frequently using AVPU or the Pediatric Glasgow Coma Scale.

12. Common Mistakes in Exams and Practice

- ✗ Delaying ABC stabilization while pursuing investigations.
- ✗ Failing to check bedside glucose immediately.
- ✗ Delaying empiric antibiotics in suspected bacterial meningitis.
- ✗ Performing lumbar puncture before excluding signs of raised intracranial pressure.
- ✗ Assuming all post-seizure drowsiness is benign.
- ✗ Missing toxic ingestion in adolescents.
- ✗ Neglecting repeated neurological examinations.

13. Key Take-Home Messages

1. Altered consciousness is a **medical emergency** until proven otherwise.
 2. Use the **ABCDE approach** for every patient.
 3. **Check blood glucose immediately** and treat hypoglycemia without delay.
 4. Stabilize the airway, breathing, and circulation before extensive investigations.
 5. Consider common reversible causes first: hypoxia, hypoglycemia, seizures, shock, and toxins.
 6. Suspect meningitis or encephalitis in children with fever and altered mental status; start empiric antimicrobial therapy promptly when indicated.
 7. CT head is reserved for specific indications and should not routinely delay treatment or lumbar puncture when safe.
 8. Any child with persistent altered consciousness or a declining GCS requires hospital admission and close monitoring.
 9. Frequent neurological reassessment is essential to detect deterioration.
 10. Early recognition and timely intervention markedly improve neurological outcomes.
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High-Yield Examination Mnemonics

Mnemonic	Purpose
ABCDE	Initial assessment and stabilization
AVPU	Rapid assessment of consciousness
Pediatric GCS	Detailed neurological assessment
AEIOU TIPS	Differential diagnosis of altered consciousness
AMPLE	Focused emergency history
SAMPLE	Comprehensive clinical history