

Coma etiology

Toxic/metabolic causes of coma

1. electrolyte imbalance: especially hypo- or hypernatremia, hypercalcemia, renal failure with elevated BUN & creatinine, liver failure with elevated ammonia
2. endocrine: hypoglycemia, nonketotic hyperosmolar state, DKA (diabetic ketoacidosis, AKA diabetic coma), myxedema coma, Addisonian crisis (hypoadrenalism)
3. vascular: vasculitis, DIC, hypertensive encephalopathy
4. toxic: EtOH, drug overdose (including narcotics, iatrogenic polypharmacy, barbiturates), lead intoxication, carbon monoxide (CO) poisoning, cyclosporine (causes an encephalopathy that shows white-matter changes on MRI that is often reversible with discontinuation of the drug)
5. infectious/inflammatory: meningitis, encephalitis, sepsis, lupus cerebritis, neurosarcoidosis, toxic-shock syndrome
6. neoplastic: leptomeningeal carcinomatosis, rupture of neoplastic cyst
7. nutritional: Wernicke's encephalopathy, vitamin B12 deficiency
8. inherited metabolic disorders: porphyria, [lactic acidosis](#)
9. organ failure: uremia, hypoxemia, hepatic encephalopathy, Reye's syndrome, anoxic encephalopathy (e.g. post-resuscitation from cardiac arrest), CO₂ narcosis
10. epileptic: status epilepticus (including non-convulsive status), post-ictal state (especially with unobserved seizure).

Structural causes of coma

1. vascular:
 - a) bilateral cortical or subcortical infarcts (e.g. with cardioembolism due to SBE, mitral stenosis, A-fib, mural thrombus...)
 - b) occlusion of vessel supplying both cerebral hemispheres (e.g. severe bilateral carotid stenosis)
 - c) bilateral diencephalic infarcts: well described syndrome. May be due to occlusion of a thalamo-perforator supplying both medial thalamic areas or with "top-of-the-basilar" occlusion.

Initially resembles metabolic coma (including diffuse slowing on EEG), patient eventually arouses with apathy, memory loss, vertical gaze paresis
2. infectious: abscess with significant mass effect, subdural empyema, herpes simplex encephalitis

3. trauma: hemorrhagic contusions, edema, hematoma
4. neoplastic: primary or metastatic
5. herniation from mass effect: presumably brainstem compression causes dysfunction of reticular activating system or mass in one hemisphere, causing compression of the other, and resulting in bilateral hemisphere dysfunction
6. increased intracranial pressure: reduces CBF
7. acute lateral shift (midline shift) of the brain: e.g. due to hematoma (subdural or epidural)

Coma results from one or more of the following:

- dysfunction of the high brainstem (central upper pons) or midbrain
- bilateral diencephalic dysfunction
- diffuse lesions in both cerebral hemispheres (cortical or subcortical white matter)

State of unconsciousness lasting more than six hours in which a person: cannot be awakened; fails to respond normally to painful stimuli, light, or sound; lacks a normal sleep-wake cycle; and, does not initiate voluntary actions.

A person in a state of coma is described as being comatose.

Coma from supratentorial mass

see [Coma from supratentorial mass](#)

Medically induced coma see [General anesthesia](#).

Structural causes of coma

[Midline shift](#) of the brain due hematoma ([subdural hematoma](#), [epidural hematoma](#)).

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