

Procedure for Clinical Assessment of Brain Death

Step	Action
1	<p>Establish the cause of coma: Brain death is the absence of clinical brain function when the proximate cause is known and demonstrably irreversible.</p> <p><u>Prerequisites:</u></p> <ul style="list-style-type: none"> - Clinical or neuroimaging evidence of an acute CNS catastrophe that is compatible with the clinical diagnosis of brain death. - Exclusion of complicating medical conditions that may confound clinical assessment (no severe electrolyte, acid-base, or endocrine disturbance). - Rule out drug intoxication, poisoning, or neuromuscular blocking agents. - Core temperature $\geq 32^{\circ}$ (90° F).
2	<p>Establish the absence of cerebral function: Determine that the patient is comatose or unresponsive. There must be no cerebral motor response to pain in any extremity after the introduction of painful stimuli such as supraorbital pressure and nail-bed pressure stimulus.</p>
3	<p>Establish the absence of brainstem reflexes.</p> <p>Pupils: The patient must exhibit no response to bright light in both eyes. Pupils may be in middle position (4 mm) or dilated (9 mm).</p> <p>Ocular movements: Ocular movements are absent after head-turning and caloric testing.</p> <ul style="list-style-type: none"> -The oculoccephalic reflex is tested by vigorous turning of the head from middle position to 90° on both sides. (Testing is done only when there is no apparent fracture or instability of the cervical spine. Head-injured patients should be imaged to exclude potential fractures or instability.) Normal response to this test is eye deviation to the opposite side of the head-turning. - Caloric testing should be done by elevating the head to 30° during irrigation of each ear with 50 mL of cold water. Allow 1 minute after irrigation and at least 5 minutes between testing on each side. <p>Facial sensation and facial motor response: The patient must exhibit:</p> <ul style="list-style-type: none"> • No corneal reflex to touch with a throat swab, • No jaw reflex, and • No grimacing to deep pressure on the nail bed, supraorbital ridge, or temporomandibular joint <p>Pharyngeal and tracheal reflexes: There must be</p> <ul style="list-style-type: none"> • no gag response after stimulation of the posterior pharynx with a tongue blade, and no cough • no cough response or bradyarrhythmia to bronchial suctioning.

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4	<p data-bbox="251 226 662 258">Resume mechanical ventilation.</p> <ul data-bbox="251 304 1495 661" style="list-style-type: none"><li data-bbox="251 304 1495 443">- Absence of spontaneous respiratory effort with PCO_2 20 mm Hg > baseline ($PCO_2 \geq 60$ mm Hg) confirms apnea and supports the diagnosis of death. If respiratory efforts are present, the test is inconsistent with brain death and should be repeated. For children, if the rise in PCO_2 fails to reach 60 mm Hg, perform the test again for a duration of 15 minutes.<li data-bbox="251 489 1495 661">- If the blood pressure becomes unstable or significant oxygen desaturation and cardiac arrhythmias are present during testing, resume ventilation. Immediately draw an arterial blood sample. If $PCO_2 \geq 60$ mm Hg or the increase is 20 mm Hg > baseline normalized PCO_2, the apnea test is consistent with brain death. If not, the result is indeterminate. A confirmatory test may be useful.