Brain Death / Death by Neurologic Criteria

Prerequisites, confounder exclusion, examiner qualifications, the neurologic examination, apnea testing, ancillary testing, and special considerations for BD/DNC determination in adults and children.

2023 AAN/AAP/CNS/SCCM Consensus Guideline
Pediatric and Adult BD/DNC Consensus Guideline
AAN Guidelines Subcommittee et al. · Neurology
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LEVEL — A · Must / High Confidence — B · Should / May — C · May (Lower Confidence)

1 Prerequisites — Etiology & Observation

A	**Mechanism:** must ascertain a catastrophic, permanent brain injury with an identified mechanism known to lead to BD/DNC before evaluating.
B	**Imaging:** should confirm neuroimaging is consistent with the mechanism and severity of injury.
B	**HIBI wait:** wait ≥24h after acute hypoxic-ischemic brain injury (age ≥24 months) before initiating evaluation.
B	**Rewarming wait:** if core temp was ≤35.5°C, wait ≥24h after rewarming to ≥36°C before evaluating.

2 Exclude Confounders

A	**Temperature:** core body temperature must be ≥36°C before evaluation.
A	**Blood pressure:** adults SBP ≥100 mm Hg and MAP ≥75 mm Hg (same for VV-ECMO); children SBP/MAP ≥5th percentile for age.
A	**Toxins/drugs:** negative toxicology if indicated; alcohol ≤80 mg/dL; CNS depressants subtherapeutic or ≥5 half-lives elapsed; pentobarbital <5 µg/mL.
A	**Paralysis/metabolic:** exclude pharmacologic paralysis via train-of-four; exclude/correct severe metabolic, acid-base, endocrine derangement.

3 Examiners & Number of Exams

A	**Credentialing:** attending examiners must be credentialed/trained in BD/DNC evaluation; trainees/APPs without independent privileges must be directly supervised at bedside.
A/C	**Adults:** minimum 1 examination required; a second independent exam by another clinician may be performed.
A	**Children:** 2 clinicians must each perform a separate, independent exam, ≥12h apart.
B	**Family support:** provide clear, concise, supportive communication and emotional support to families.

4 Neurologic Examination Components

A	**Coma:** no response to visual, auditory, or tactile stimulation.
A/B	**Motor:** no cerebrally mediated motor response to noxious stimuli; if a movement's origin is unclear, use ancillary testing.
A	**Cranial reflexes:** no pupillary, corneal, oculocephalic/oculovestibular, gag, or cough reflexes bilaterally; skip OCR if C-spine/skull-base concern and test OVR instead.
A	**Infants <6mo:** no sucking or rooting reflex.

5 Apnea Testing — Prerequisites & Thresholds

A	**Risk check:** confirm patient is not hypoxemic, hypotensive, or hypovolemic before starting.
A/B	**Preoxygenate:** 100% O2 for ≥10 min to PaO2 >200 mm Hg; use an invasive arterial line for serial ABGs.
A/B	**Baseline gases:** PaCO2 35–45 mm Hg and pH 7.35–7.45 before starting, unless chronically hypercarbic (target patient's known baseline).
—	**Pass threshold:** no respiratory effort with PaCO2 ≥60 mm Hg (or ≥20 mm Hg above baseline) and pH <7.30 is consistent with BD/DNC.

6 Apnea Testing — Number & Procedure

A	**Adults:** at least 1 apnea test required after the final examination.
A	**Children:** 2 apnea tests required, 1 after each of the 2 examinations.
—	**Abort criteria:** abort for hemodynamic instability or hypoxemia; any spontaneous respiratory effort fails BD/DNC criteria.
—	**Technique:** CPAP preferred in children; tracheal insufflation not recommended in children (barotrauma, CO2 washout risk).

7 Ancillary Testing — Indications & Limits

A/B	**When to use:** only when the exam or apnea test cannot be completed/interpreted — precluding injuries, unsafe apnea testing, indeterminate motor findings, or uncorrectable metabolic derangement.
A	**Not for:** must not substitute for hypothermia or high sedation, or to avoid otherwise-testable exam elements; must not perform if exam/apnea findings are inconsistent with BD/DNC.
A	**Preferred modalities:** 4-vessel catheter angiography (gold standard) or transcranial doppler (adults only, not validated in children).
B	**Avoid:** EEG, auditory evoked potentials, and somatosensory evoked potentials should not be used as ancillary tests.

8 Special Considerations

—	**ECMO:** raise PaCO2 via reduced sweep gas flow or added exogenous CO2; on VA-ECMO with native cardiac function, ABG sampling site must account for the arterial "mixing point."
B	**Skull defects:** open fontanelle, skull fracture/defect, or CSF diversion device does not preclude clinical exam or apnea testing; do not order ancillary testing solely for these findings.
A	**Conflict of interest:** clinicians involved in BD/DNC determination must not be involved in surgical organ recovery for transplantation.

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