APPENDICES

eAppendix 1. AAN Guideline Subcommittee Mission

The mission of the Guidelines Subcommittee is to develop, disseminate, and implement evidence-based systematic reviews and clinical practice guidelines related to the causation, diagnosis, treatment, and prognosis of neurologic disorders.

The Guidelines Subcommittee is committed to using the most rigorous methods available within its budget, in collaboration with other available AAN resources, to most efficiently accomplish this mission.

eAppendix 2. AAN Guideline Subcommittee Members 2021-2023

Alexander Rae-Grant, MD (Chair), John J. Halperin, MD (Vice-Chair), Matthew Bradford Bevers, MD, Lori L. Billinghurst, MD, Kelsey Cacic, MD, James Dorman, MD, Wendy S. Edlund, MD, Brittany Jade Farro, MSPAS, PA-C, Gary S. Gronseth, MD, FAAN, Le Hua, MD, Koto Ishida, MD, Mark Douglas Johnson, MD, Charles Kassardjian, MD, Mark Robert Keezer, MD, PhD, K.H. Vincent Lau, MD, Mia T. Minen, MD, Alison M. Pack, MD, Sonja Potrebic, MD, PhD, James J. Reese, Jr., MD, MPH, Sean C. Rose, Vishwanath Sagi, MD, Navdeep Sangha, MD, Nicolaos Scarmeas, MD, Niranjan N. Singh, MD, Sarah Tanveer, Benjamin D. Tolchin, MD, Shawniqua T. Williams Roberson, MD, Shuhan Zhu, MD

eAppendix 3. Questions for Each Recommendation to Determine the Cogency of the Rationale Supporting the Recommendation and the Strength of the Recommendation

Round 1 and 2 Scheme

Assuming all premises in the rationale are true, does the recommendation logically follow from the premises?

Yes

No

Abstain

Do you agree that all axiomatic premises (PRIN*) supporting the recommendation are true? (Where applicable)

Yes

No

Abstain

Do the inferred premises (INFER) logically follow from the other premises? (Where applicable)

Yes

No

Abstain

What is your judgment as to the balance between health-related benefits and health-related harms (risks/burdens) attained by compliance with the recommendation? Consider both the number of people who will be affected as well as the magnitude of the benefits and harms. Ignore cost and resource use in your assessment.

Benefits greatly outweigh harms

Benefits moderately outweigh harms

Benefits slightly outweigh harms

Benefits and harms are balanced or, harms outweigh benefits

How important are the outcomes that will be affected by the recommendation? If multiple outcomes are affected, rate the outcome with the highest importance.

Critically important

Very important

Mildly important

Not important or importance unknown

How much variation in patient preferences relative to complying with the recommendations do you expect (e.g., based on personal values, would many patients prefer not to comply with the recommendation)?

Minimal variation in preferences

Modest variation in preferences

Moderate variation in preferences

Large variation in preferences

Are the proposed interventions (including referrals, counseling discussions, etc, not just treatment interventions) discussed in the recommendation universally available?

Universally available

Usually available

Sometimes available

Not available

What is your judgment of the incremental cost (or resource use) to the patient relative to the net benefits of complying with the recommendation?

Cost is very small relative to the net benefits

Cost is small relative to the net benefits

Cost is high relative to the net benefits

Cost is very high relative to the net benefits

eAppendix 4. Revised Recommendation Voting Questions and Instructions

Round 3 through 6 Scheme

Asked once of all respondents:

The outcomes affected by these recommendations (the accurate determination of BD/DNC) are critically important.

Yes

No

Abstain

Among patients/families who accept the concept of BD/DNC, a large majority would prefer to increase the accuracy of the BD/DNC determination.

Yes

No

Abstain

Asked for all BD/DNC Determination questions, all others use prior scheme:

Assuming all premises in the rationale are true, does the recommendation logically follow from the premises?

Yes

No

Abstain

Do you agree that all axiomatic premises (PRIN*) supporting the recommendation are true? (Where applicable)

Yes

No

Abstain

Do the inferred premises (INFER) logically follow from the other premises? (Where applicable)

Yes

No

Abstain

The action described in the recommendation will increase the likelihood of an accurate determination of BD/DNC with acceptable risk.

Agree

Somewhat agree

Neutral

Disagree

Abstain

In the ICU setting, the action described in this recommendation is feasible.

Agree

Somewhat agree

Neutral

Disagree

Abstain

The incremental cost (or resource use) relative to the increased accuracy in the determination of BD/DNC provided by following the action described in this recommendation is acceptable.

Agree

Somewhat agree

Neutral

Disagree

Abstain

eAppendix 5. Brain Death/Death by Neurologic Criteria Checklist

Last Name	First name	DOB	MRN

PREREQUISITES FOR CLINICAL EXAMINATION	
1. Ascertainment that the patient has sustained a catastrophic, permanent brain injury caused by an identified mechanism that is known to lead to brain death/death by neurologic criteria (BD/DNC) (7a and 13a)	☐ Yes ☐ No Etiology:
2. Neuroimaging consistent with mechanism and severity of brain injury (in patients with primary posterior fossa injury, neuroimaging should demonstrate catastrophic supratentorial injury) (7c and 40)	☐ Yes ☐ No
3. Observation for permanency a) ≥48 hours after acute brain injury (particularly hypoxic ischemic brain injury) for patients ≤2-years-old (8) b) ≥24 hours after hypoxic ischemic brain injury for patients ≥2-years-old (9b) c) A sufficient amount of time after brain injury to ensure there is no potential for recovery of brain function as determined by the evaluator based on the pathophysiology of the brain injury (9a)	☐ Yes ☐ No Observation period (hours):
4. Core body temperature ≥ 36ºC (for ≥24 hours for patients whose core body temperature has been ≤35.5°C [10a and b])	☐ Yes ☐ No Value:
5. Systolic blood pressure (SBP) ≥ 100 mm Hg and mean arterial pressure (MAP) ≥ 75 mm Hg for adults/SBP and MAP ≥ 5th percentile for age in children (for patients on venoarterial ECMO: MAP ≥ 75 mm Hg for adults/MAP ≥ 5th percentile for age in children) (11b and 11c)	☐ Yes ☐ No Value:
6. Exclusion of pharmacologic paralysis (if administered or suspected) through use of train-of-four stimulator or demonstration of deep tendon reflexes (12a)	☐ Yes ☐ No ☐ Not indicated
7. Drug levels for medications that may suppress central nervous system function are therapeutic/subtherapeutic (if available), pentobarbital level is <5 mcg/mL (if the patient received phenobarbital) and at least five half-lives for all other such drugs have passed (longer if there is renal/hepatic dysfunction or if the patient is obese or was hypothermic); (12a)	☐ Yes ☐ No
8. Alcohol blood level ≤ 80 mg/dL (if clinically indicated) (12a)	☐ Yes ☐ No ☐ Not indicated
9. Toxicology screen (urine and blood) is negative (if clinically indicated) (12a)	☐ Yes ☐ No ☐ Not indicated
10. Exclusion of severe metabolic, acid-base, and endocrine derangements; (12a)	☐ Yes ☐ No
11. A reasonable attempt has been made to inform the patient's family of the plan to perform a BD/DNC examination (35a)	☐ Yes ☐ No
Prerequisite Summary (check one):	
☐ All prerequisites were met	
☐ Unable to adequately correct metabolic derangements, but all other prerequisites were met, so will complete the neurologic examinations and apnea test(s) and if they are consistent with BD/DNC, will perform ancillary testing (12b)	
☐ One or more prerequisites were not met, so the evaluation was not completed	

CLINICAL EXAM *(must be completed to fullest extent possible)*	**Yes**	**No**	**Not tested**
12. Coma with unresponsiveness to visual, auditory, and tactile stimulation (15)	☐	☐	
13. Absent motor responses, other than spinally mediated reflexes, of the head/face, neck, and extremities after application of noxious stimuli to the head/face, trunk, and limbs (16a and 16b)	☐	☐	
14. Absent pupillary responses to bright light bilaterally (17)	☐	☐	☐
15. Absent oculocephalic reflex (unless there is concern for cervical spine or skull base integrity) (18a)	☐	☐	☐
16. Absent oculovestibular reflexes bilaterally (18b)	☐	☐	☐
17. Absent corneal reflexes bilaterally (19)	☐	☐	☐
18. Absent gag reflex (20)	☐	☐	☐
19. Absent cough reflex (20)	☐	☐	☐
20. Absence of sucking and rooting reflexes (patients <6-months only) (21)	☑	☐	☐
Clinical examination results (check one):			
☐ All elements of the ☐ First ☐ Second clinical exam were completed and findings were consistent with BD/DNC or all elements of the clinical exam except the oculocephalic reflex (18c) were completed and findings were consistent with BD/DNC			

☐ A portion of the clinical exam other than the oculocephalic reflex could not be assessed safely or it was unclear whether observed limb movements were spinally mediated (note that even if a person does not have all limbs, painful stimulation can still be provided to the torso as close to the termination of the limb as possible, so this does not necessitate ancillary testing); however, the remainder of the test was performed to the fullest extent possible and responses were consistent with BD/DNC. *(Ancillary testing is required.)* (14a) Reason(s) for incomplete testing (check all that apply): ☐ Anophthalmia; ☐ Corneal trauma or transplantation; ☐ Fracture of the base of the skull or petrous temporal bone; ☐ High cervical cord injury ☐ Ophthalmic surgery that influences pupillary reactivity; ☐ Severe facial trauma; ☐ Severe pre-existing neuromuscular disorder ☐ Severe orbital or scleral edema or chemosis; ☐ Limb movements that may be spinally mediated; ☐ Other (specify):
☐ One or more elements of the clinical exam were inconsistent with BD/DNC, so the patient does NOT meet criteria for BD/DNC (14b)
Attending name, signature, date, time.

APNEA TEST	**Yes**	**No**
APNEA TESTING PREREQUISITES		
21. No hypoxemia, hypotension, hypovolemia (23)	☐	☐
22. pH is normal (7.35-7.45) and $PaCO_2$ is normal (35-45 mm Hg) or if the patient is known to have chronic hypercarbia, $PaCO_2$ is at baseline if baseline is known or at estimated baseline if baseline is not known (arterial blood gases [ABGs] should be taken from both the distal arterial line and the ECMO postcircuit oxygenator for patients on venoarterial ECMO) (24a-b and 26)	☐	☐
	Value:	
23. PaO_2 > 200 mm Hg (25a)	☐	☐
	Value:	
APNEA TESTING PERFORMED	☐	☐
24. Apnea duration (minutes)		
25. Post-$PaCO_2$ value (mm Hg)		
26. Post-pH value		
Final apnea testing results (check one):		
☐ Apnea confirmed – no respirations and targets reached (pH < 7.30 and final $PaCO_2 \geq$ 60 mm Hg (8.0 kPa) and ≥ 20 mm Hg (2.7 kPa) above pre-apnea test baseline (≥ 20 mm Hg (2.7 kPa) above chronic baseline for patients known to have chronic hypercarbia whose baseline is known) *(Ancillary testing is required if patient is known/suspected to have chronic hypercarbia but baseline $PaCO_2$ is not known.)* (25f)		
☐ Apnea testing is inconclusive (could not be completed and no respirations and targets not reached) due to: ☐ SBP < 100 mm Hg or MAP < 75 mm Hg or SBP/MAP < 5th percentile for age in children ☐ Progressive oxygen desaturation < 85% ☐ Cardiac arrhythmia with hemodynamic instability (25h)		
☐ Apnea testing is negative – one or more spontaneous respirations were seen; findings are not consistent with BD/DNC (25g)		
Attending name, signature, date, time.		

ANCILLARY TESTING	
27. Reason(s) for ancillary testing (27b):	☐ Inability to correct metabolic derangements ☐ Inability to complete all clinical tests (e.g., fracture of the cervical spine, skull base, orbits, face) ☐ Inability to complete apnea test due to risk of cardiopulmonary decompensation or inability to interpret $PaCO_2$ level in a patient with chronic hypoxemia for whom chronic baseline is unknown ☐ Uncertainty regarding interpretation of spinally vs. cerebrally mediated motor responses ☐ Required by hospital/state guidelines
28. Type of ancillary testing performed (29-31)	☐ Conventional 4-vessel catheter angiography (digital subtraction angiography) ☐ SPECT radionuclide perfusion scintigraphy or planar radionucleotide angiography ☐ Transcranial doppler ultrasonography (adults only)

Final ancillary testing results (check one):			
☐ Ancillary testing results are consistent with BD/DNC			
☐ Ancillary testing results are <u>not</u> consistent with BD/DNC			
☐ Ancillary testing results are inconclusive			
Date/Time of testing		Date of interpretation of results	
Attending name, signature, date, time.			

SUMMARY OF FINDINGS	
☐	**BRAIN DEATH/DEATH BY NEUROLOGIC CRITERIA DETERMINED CLINICALLY** • Prerequisites for clinical testing have been fulfilled, (Section II), and • Results of clinical exams, including apnea testing, have been fully completed and are consistent with BD/DNC (Section III, IV) Date *(YYYY-MM-DD)* and time of death (*HR:MM AM/PM):* *(Time of death is the time during the final apnea test [if more than one performed] that the ABG results are reported and demonstrate that the $Pa CO_2$ and pH levels are consistent with BD/DNC criteria [36a].)*
☐	**BRAIN DEATH/DEATH BY NEUROLOGIC CRITERIA DETERMINED WITH CLINICAL ASSESSMENT AND ANCILLARY TESTING** • Results of clinical exams, including apnea testing, where tested are consistent with BD/DNC (Section III, IV), and • Ancillary testing has been performed and results are consistent with BD/DNC (Section V) Date *(YYYY-MM-DD)* and time of death (*HR:MM AM/PM):* *(Time of death is the time an attending clinician (e.g., nuclear medicine physician or angiographer) documents in the medical record that the ancillary test results are consistent with BD/DNC [36b].)*
☐	**PATIENT DOES NOT MEET CRITERIA FOR BRAIN DEATH/DEATH BY NEUROLOGIC CRITERIA** Provide reasons:
Attending name, signature, date, time.	