UAMS MEDICAL CENTER
UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES

UAMS MEDICAL CENTER POLICIES & PROCEDURES

Number: ML.3.01
Policy Title: Determination of Brain Death

Source: Patient Care Issues Committee
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Replaces Policy:

PURPOSE

To define brain death and set forth guidelines to assist the licensed physician in the determination of brain death in accordance with accepted medical standards.

Patients who have irreversible cessation of function of brain structures, including the brain stem have brain death. Brain death may be diagnosed in patients whose ventilation and circulation are maintained by mechanical or pharmacological means.

DEFINITIONS

Arkansas Law defines death as:

A. Irreversible cessation of circulatory and respiratory functions; or

B. Irreversible cessation of all functions of the entire brain, including the brain stem.

PROCEDURES

I. All of the following conditions must be present in order to consider the diagnosis of brain death:

A. Clinical or neuroimaging evidence of an acute CNS catastrophe that is compatible with the clinical diagnosis of brain death,

B. Exclusion of complicating medical condition (infectious, metabolic, endocrine, toxic) that may confound clinical assessment;

C. Absence of drug intoxication or poisoning; and

D. Core temperature ≥ 36 degrees C (90 degrees F).

II. All of the following conditions must be present to determine brain death has occurred:

A. Absence of brainstem reflexes, as evidenced by:
   1. Absence of pupillary response to a bright light in both eyes,
   2. Pupils fixed in a midsize or dilated position (4-9 mm).
   3. Absence of ocular movements using oculocephalic testing and oculovestibular reflex testing,
   4. Absence of corneal reflex,
   5. Absence of facial muscle movement to noxious stimuli,
   6. Absence of pharyngeal and tracheal reflexes.

B. Absence of respiratory drive during a CO2 challenge, as evidenced by a PaCO2 ≥ 60mm Hg or 20 mm Hg rise from normal baseline value;

C. Unresponsive coma of established and irreversible cause, evidenced by:
   1. No evidence of responsiveness;
   2. Absence of eye opening or eye movement to noxious stimuli,
   3. Absence of eye or limb movement spontaneously or in response to noxious stimuli (with the exception of spinally mediated reflexes produced by noxious stimuli),
   4. The cause of coma has been established by history, examination, neuroimagining and laboratory tests;
   5. Absence of CNS-depressant drug effect by history, drug screen, calculation of clearance or durg plasma levels below the therapeutic range;
   6. No recent administration or continued presence of neuromuscular blocking agents;
   7. Absence of severe electrolyte, acid-base, or endocrine disturbance,

Repeat examination is advisable after six (6) hours. However, where evidence of massive irreparable injury to the brain is present on imaging studies, this waiting period may be reduced or eliminated.

III. Confirmatory tests.

Confirmatory tests, such as EEG, cerebral angiography, nuclear scan, transcranial doppler ultrasonography, CTA, and MRI/MRA, are not required for the diagnosis of brain death, but may be considered for patients in whom specific components of the clinical testing outlined above cannot be reliably carried out.

A partial list of clinical situations in which a confirmatory test might be desirable includes:

A. Patients with severe trauma or burns in whom clinical assessment is difficult;
B. Patients with pre-existing eye or ear disease that obscures the interpretation of pupillary light reflex or oculovestibular testing;
C. Patients with toxic levels of sedative drugs, aminoglycosides, tricyclic antidepressants, anticholinergics, antiepileptic drugs, chemotherapeutic agents or neuromuscular blocking agents; or Patients with sleep apnea or severe pulmonary disease and chronic CO2 retention.

IV. An attending physician shall make or confirm the final decision that the criteria for the determination of brain death have been met.

V. Documentation.

The physician shall write a comprehensive note in the medical record documenting the time of brain death, basis for the decision, and the name of the confirming physician, if applicable.

REFERENCES

Arkansas Code Annotated § 20-17-101

Wijdicks EFM, Varelas PN, Gronseth GS, Greer DM, Evidence-based guideline update: Determining brain death in adults. Report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology, 2010; 74: 1911-1918. (http://www.neurology.org/content/74/23/1911.full.html). (Contains a sample brain death evaluation, protocol and checklist.)

The Quality Standards Subcommittee of the American Academy of Neurology. Practice parameters for determining brain death in adults (summary statement). Neurology 1995;45;1012-1014. Neurology; 2010; 74; 1917