Subject: DECLARATION OF BRAIN DEATH	Original Issue Date: June 5, 2003	Policy #: ASA 106
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Departments Consulted & Approved:	Reviewed & Approved by:	Approved by:
Brain Death Committee Office of Risk Management Ethics Resource Committee Fetal, Infant, Child Ethics Committee	Credentials and Privileges Advisory Committee Attending Staff Association Executive Committee	President, Attending Staff Association

PURPOSE

The purpose of this policy is to govern the process for determining brain death in the LAC+USC Medical Center.

POLICY

Death occurs when either circulatory and respiratory functions or whole brain neurological functions have ceased and will not spontaneously resume. Therefore death can be determined by either **Cardiopulmonary** or **Neurological** Criteria. Determination of death shall be limited to qualified physicians acting in conformity with the procedures set forth below.

Special Circumstances:

Occasionally, patients may be transported to the hospital who exhibit unmistakable signs of death (e.g. decapitation, rigor mortis, livido, decomposition). Such patients may be declared dead on arrival by an attending or resident physician without further cardiopulmonary or neurological evaluation.

I. DECLARATION OF DEATH BY CARDIOPULMONARY CRITERIA

PHYSICIAN QUALIFICATIONS:

Any attending physician with active staff privileges and any resident physician in a training program at LAC+USC Medical Center may declare death by cardiopulmonary criteria in accord with the procedures set forth below.

PROCEDURES

1. Declaration of death by cardiopulmonary criteria requires the determination of both **cessation** of cardiopulmonary functions and **irreversibility**.
   - A. **Cessation** of functions is determined primarily by an appropriate clinical examination and confirmed, only when necessary, by hemodynamic monitoring:
     - i. The clinical examination must demonstrate absence of responsiveness, absence of heart sounds, absence of pulse, and absence of respiratory effort.
   - B. **Irreversibility** is determined by persistent cessation of circulatory function during an appropriate period of observation.
     - i. A **five (5) minute observation** time after cessation of circulatory function establishes

irreversibilty.

2. When donation of organs after cardiac death (DCD) is planned there is a need to precisely establish the moment of circulatory cessation. In this situation confirmatory hemodynamic monitoring is **mandatory**.
    A. Absence of circulatory function can determined by:
        i. Loss of pulse pressure on arterial catheter monitoring

        or

        ii. Doppler echo study adequate to define the moment of blood flow cessation.

        or

        iii. ECG silence
            a. Note: Cardiac electrical activity may persist after blood flow has ceased, therefore ECG silence is **not necessary** for the determination of cessation of function. (For example pulse-less electrical activity and ventricular fibrillation can be identified as non-perfusing states using the objective measures of blood flow mentioned above)

3. Declaration of death must be made by a qualified physician and documented in the medical record. The documentation must include at a minimum the clinical determinants of death, the time and date of death, and the physician's signature.
    A. When the declaration of death precedes possible donation of organs, the confirmatory hemodynamic determinants and the 5 minute observation period ensuring irreversibility must also be documented.
    B. It is recognized that the actual "time of death" is rarely known with objective certainty. Therefore to standardize the process of documentation, the time of death will be defined as a time no less than 5 minutes from the time of loss of circulatory function.
4. Caveat: If organ donation after cardiac death is a consideration, the physician caring for or declaring and documenting the death of the patient must have no involvement with the recovery or use of organs for transplant.

Resources

1. Report of a national conference on donation after cardiac death. Am J Transplant: 2006; 6(2):281-291

II. DECLARATION OF DEATH BY NEUROLOGICAL CRITERIA: BRAIN DEATH DETERMINATION POLICY

Determination of brain death shall be limited to qualified physicians acting in conformity with the procedures set forth below.

PHYSICIAN QUALIFICATIONS:

1. **Attending physicians**

   For attendings in the Departments of Neurology, Neurosurgery, Nuclear Medicine, and Radiology, and for attendings granted privileges to provide intensive care in any of the Medical Center's intensive care units, the granting of this privilege will require reading this policy and the Brain Death Syllabus (Attachment 106A).

   For attendings in other clinical departments, the granting of this privilege will require the reading of this policy and the Brain Death Syllabus (Attachment 106A) and successful completion of the Competency Exam (Attachment 106B).

2. **Resident physicians**

   Residents must be licensed and deemed competent to perform the brain death examination through appropriate departmental procedures. At a minimum, all residents must read this policy and the Brain Death Syllabus (Attachment 106A) and successfully complete the Competency Exam (Attachment 106B) to be deemed competent.

3. **Physician disqualification**

   Neither the physician making the determination of brain death nor the physician making the independent confirmation may participate in procedures for the removal or transplanting of organs after death.

PROCEDURES

1. INITIATION OF EVALUATION FOR BRAIN DEATH

An evaluation for brain death may be initiated by a patient's health care team when the patient is comatose and:

a. There is a confirmed mechanism and/or degree of injury consistent with the level of coma and the injury is deemed irreversible.

b. There has been a search for and conclusive analysis of all possible confounding factors.

c. The physical examination is consistent with brain death.

2. PERIOD OF ACCOMMODATION

a. As soon as the decision is made to initiate an evaluation for brain death, a member of the patient's treatment team shall inform the patient's legally recognized health care decision maker, if any, or the patient's family or next of kin, if available, that if brain death is diagnosed and confirmed according to hospital procedure all ongoing medical interventions, including mechanical ventilation will be stopped at that time.

b. According to *Section 125.4 of the Health and Safety Code* a family may request a period of accommodation to facilitate personal, cultural or spiritual needs after the diagnosis has been made and prior to the removal of medical support. They are also entitled to a written statement of hospital policy in this regard upon request.

c. Period of accommodation statement:

Upon request, and provided that the needs of other patients and prospective patients in need of urgent care permit, ventilatory support will be maintained for a reasonably brief

period after brain death has been declared to permit those close to the patient to gather at the bedside before that support is discontinued.

When a period of accommodation has been requested, its exact duration will be determined in the light of existing circumstances by the attending physician of record in consultation with the authorized patient representative. It is expected that this time interval will be less than 24 hours.

In case of dispute, the final determination will be made by the medical director of the service.

3. BRAIN DEATH DETERMINATION IN ADULTS > 17 YEARS OF AGE

a. Diagnosis based on a complete clinical examination

In the event there is no contraindication to or limitation to the performance of a complete clinical brain death examination, a diagnosis of brain death may be made after:

i. *Determination* of brain death by a clinical examination the findings of which satisfy all the requirements of the Brain Death Form (Attachment C) and Syllabus (Attachment A).

ii. *Confirmation* of brain death by either

(1) a second complete clinical examination at least 2 hours later by a second qualified physician

or

(2) by an accepted objective test or study (see Attachment B) demonstrating absence of intracranial perfusion or absence of brain activity (no time interval required). The results of the study must be interpreted by a qualified attending physician, and documented as diagnostic of brain death.

iii. If death is diagnosed by 2 clinical examinations, at least one examination must be performed by a qualified attending physician. A single apnea test performed by an attending physician according to hospital policy may be accepted by the second independent examiner and noted on the brain death documentation form.

b. Diagnosis when a complete clinical examination cannot be performed

In the event that a complete clinical brain death examination cannot be performed, a diagnosis of brain death may be made only after:

i. *Determination* of brain death by an objective test or study of cerebral blood flow that shows no intracranial perfusion or a study that shows absence of brain activity. The results of the study must be interpreted by a qualified attending physician, and documented as diagnostic of brain death.

ii. *Confirmation* by a clinical examination as complete as circumstances allow adequate to confirm that there is no contraindication to the determination.

c. Time of death

The dated and timed documentation of the independent confirmation of death, whether

by objective test or examination, will be the official pronouncement of death in the medical record.

4. BRAIN DEATH DETERMINATION IN CHILDREN > 37 WEEKS GESTATION TO 17 YEARS OF AGE

a. Diagnosis based on a complete clinical examination

In the event there is no contraindication to or limitation to the performance of a complete clinical brain death examination a diagnosis of brain death may be made after:

i. *Determination* of brain death by a clinical examination the findings of which satisfy all the requirements of the Brain Death Form (Attachment C) and Syllabus (Attachment A).

ii. *Confirmation* of brain death by a second clinical examination, including a second apnea test, performed at the following time intervals based on age:

- age 37 weeks gestation to 30 days: 24 hours
- age 31 days to 17 years: 12 hours

iii. Additional confirmatory testing is not required when two complete exams and apnea tests have been performed as above. See section 5 below for indications for ancillary confirmatory testing.

iv. BOTH clinical examinations must be performed by different, qualified Attending physicians.

b. Diagnosis when a complete clinical examination is not possible

In the event that a complete clinical brain death examination cannot be performed, a diagnosis of brain death may be made only after:

i. *Determination* of brain death is made by a combination of a clinical exam, as complete as circumstances allow, that shows no contraindication to the diagnosis, followed by a study of cerebral blood flow that shows no intracranial perfusion or by a study showing absence of brain activity. The results of the study must be interpreted by a qualified attending physician and documented as diagnostic of brain death.

ii. *Confirmation* of brain death is made by a second clinical examination, performed by an independent qualified physician, as complete as circumstances allow, that also demonstrates no contraindication to the diagnosis of death. The second exam can follow the diagnostic ancillary study without time interval restriction.

c. Time of death

The dated and timed documentation of the second independent confirmatory examination will be the official pronouncement of death in the medical record.

5. BRAIN DEATH DETERMINATION IN INFANTS LESS THAN 37 WEEKS GESTATIONAL AGE

No determination of brain death will be made prior to the 37th week of gestational age.

6. CAVEAT IN THE USE OF OBJECTIVE TESTS OF BRAIN PERFUSION OR FUNCTION

Ancillary objective testing is required when

1) components of the examination or apnea test cannot be safely completed,

2) there is uncertainty about the examination,

3) a medication effect may interfere with the clinical examination or

4) there is a desire to shorten the interval between clinical examinations.

Objective tests may be used as described above to determine or confirm brain death, if and only if, the qualified attending reading the test is able to give a diagnostically definitive reading. Readings that are noted to be anything less than definitive (i.e. merely "suggestive of…") can not be used to determine or confirm brain death.

7. DOCUMENTATION

Physicians determining and confirming brain death should complete the Brain Death Documentation Form (Attachment 106C) in its entirety or document in the progress notes a clear diagnosis of brain death according to the provisions outlined in the Brain Death Documentation Form.

ATTACHMENTS

Attachment 106A: Brain Death Syllabus

Attachment 106B: Brain Death Competency Exam

Attachment 106C: Brain Death Documentation Form

REFERENCES

California Health and Safety Code: (sections 7180-7182)

An individual who has sustained irreversible cessation of all functions of the entire brain, including the brain stem, is dead. (Section 7180) (a)(2)

When an individual is pronounced dead by determining that the individual has sustained an irreversible cessation of all functions of the entire brain, including the brain stem, there shall be independent confirmation by another physician (Section 7181)

When a part of the donor is used for….transplantation…and the death of the donor is determined by determining that the individual has suffered an irreversible cessation of function of the entire brain, including the brainstem, neither the physician making the determination of the death nor the physician making the independent confirmation may participate in the procedures for removing or transplanting a part. (Section 7182)

California Health and Safety Code, Sections 7180, 7181 and 7182

REVISIONS:

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