Homestead Hospital
BAPTIST HEALTH SOUTH FLORIDA

POLICY NO.: HH-400-5830-800

☑ Administrative
☐ Departmental

SUBMITTED BY:	Laurel Clark, BSN, RN, CPHM, ACM	**APPROVED BY:**	Gail Gordon, MSN, RN, NEA-BC
Title:	Bioethics and Patient Rights Coordinator	**Title:**	Vice-President and Chief Nursing Officer
		Responsible Department	Bioethics
APPROVED BY:	Dr. Juan Lopetegui	**APPROVED BY:**	Dr. Janice Milligan Chair, Homestead Hospital Clinical Bioethics Committee
Title:	Medical Director, Critical Care	**Title:**	

Creation Date: 07/03
Review Date:
Revision Date: 3/23/04, 8/1/04, 5/5/05, 9/08, 6/10, 10/12

POLICY TITLE:
Brain Death Determination in Adults

SUMMARY & PURPOSE:
This policy outlines the process to be followed to determine irreversible cessation of total brain function, including the brainstem. It provides the neurological criteria of death, also termed brain death.

POLICY:
In clinical situations in which a patient is comatose with respiratory and circulatory functions maintained by artificial means of support so as to preclude that these functions have ceased, the occurrence of death shall be determined based upon irreversible cessation of total brain function, including the brainstem. This process should be medically supported and promotes maintenance of the dignity of the patient and sensitivity toward family members.

SCOPE/APPLICABILITY:
There are no exemptions to this policy.

PROCEDURES TO ENSURE COMPLIANCE:
Brain death testing should not be started on post cardiac arrest patients receiving therapeutic hypothermia until at least 72 hours after re-warming, unless confirmatory test is done.

Criteria for the Diagnosis of Brain Death:

Brain death is recognized as a legal form of death in the State of Florida through FS 382.009.
The criteria utilized, using currently accepted reasonable medical standards are outlined below:

1. Hospital staff contacts Life Alliance Organ Recovery Agency (OPO) Coordinators when the following clinical triggers - Glasgow Coma Scale (GCS) equal to or < 5 and ventilator dependent are met, and prior to certification of brain death. This information is documented on the *Release of Body/Organ Donation Autopsy* HH Form 97. The contact number is 800-255-GIVE (4483).
2. Two physicians licensed in the State of Florida shall make determination of brain death. One physician shall be the attending physician or his/her designee, and one other physician who shall be a board certified/eligible neurologist, neurosurgeon, internist, surgeon or anesthesiologist. One of these physicians should be experienced in brain death determination. Two (2) separate clinical examinations must be performed.
3. The cause of coma is known and is irreversible.
4. Other clinical problems must be excluded by treatment, when indicated, such as severe electrolyte or acid-base disturbances, endocrine causes, induced hypothermia («90 degrees F by core temperature), hypovolemia, hypoxemia, and hypotension. The patient should be free of drugs *that could mask clinical diagnosis,* or have below therapeutic levels before proceeding with clinical brain death determination, unless confirmatory tests are performed.
5. Brain Death Certification is equivalent to the pronouncement of death. Therefore, consent is not required, nor is it requested from the patient's legal decision-maker. The attending physician or his/her designee must provide patient's family with information concerning the certification process and notify them at the time of death.
6. Determination of brain death is complete when the *Criteria for the Determination* of *Brain Death in Adults* HH form # 268 is filled out in its totality. This form should always be available in all Critical Care units or printable through the intranet. The date and time recorded on the certification section of the Criteria for the Determination of Brain Death in Adult form # 268 is considered the time of patient death and is to be used for all legal matters, including the Death Certificate. *(Organ Preservation Management Orders* (Adult) D.O. # 597 is initiated when the date and time is recorded by the second examining physician).
7. OPO Coordinators must not approach families or legal decision-makers to discuss organ donation until brain death has been determined.

Clinical Criteria:

1. Coma with generalized flaccidity present with absent response to painful stimuli.
2. Brainstem reflexes.
   a. Absent oculocephalic reflexes (Doll's eyes reflex).
   b. Absent oculovestibular reflexes (Cold calorix reflex).
   c. Pupils are midpoint to dilated and light fixed.
   d. Absent corneal, gag and carinal (tracheal) reflexes.
3. Absent spontaneous respiration (apnea) - See Apnea protocol.

Note:

Toxic levels of the following drugs may interfere with the accuracy of clinical brain death evaluation and confirmatory tests are recommended:

a. Aminoglycosides
b. Tricyclic antidepressants
c. Anticholinergics
d. Antiepileptic drugs
e. Chemotherapeutic agents
f. Neuromuscular blocking drugs.

- If in addition, alcohol has been ingested, the synergic effect between alcohol and such drugs must be considered. Patients with therapeutics CNS depressant levels and alcohol levels greater than or equal to 100mg/dl should have a confirmatory test performed prior to the declaration of brain death.

Confirmatory tests:

Confirmatory tests are optional and their use will be based on the input of the examining physicians. These tests should be used as a confirmation of brain death in cases where the history is questionable and/or the clinical exam is not adequate. The following tests (which measure cerebral blood flow or cerebral activity) are adequate for the confirmation of brain death:

1. Cerebral angiogram
2. Electroencephalography
3. Transcranial Doppler Ultrasonography
4. Technitium brain scan
5. Somatosensory evoked potentials

Other Considerations:

Health care providers should be supportive and sensitive to the loss families are experiencing. Counseling for families or friends should be provided.

Physicians should:

1. Carefully explain how the diagnosis was made on medical criteria.
2. Confirm that there is no doubt in the findings.
3. Establish that once the diagnosis of brain death has been made, the patient is dead.
4. Discuss options for closure including giving time for relatives traveling from a distance, or consulting with a chaplain regarding any religious needs.
5. Provide after-death assistance and support coordinated with the Office of Pastoral Care Services and Social Work/Case Management department.
6. Examining physicians should provide clear documentation of brain death.

Apnea Protocol:

Prerequisites – Patient should have a core temperature greater than or equal to 97 degrees F, be euvolemic and normotensive(systolic blood pressure ≥ 100 mm Hg), with a normal PaO2 and PaCO2.

Protocol:

1. Any physician participating in the diagnosis of brain death can initiate the apnea protocol.
2. Insertion of an arterial line prior to the test may be useful.
3. Ventilator manipulation is performed to raise the PaCo2>40 mm Hg. These manipulations can be done through the physicians participating in the care of the patient.
4. The patient should be hyper-oxygenated with an FIO2 1.0 for at least 15 minutes, while still on the ventilator, prior to the apnea test, to minimize the chances of hypoxia during the apnea test.
5. Either a blood gas or trending of EtCO2/SpO2 should be used to determine the adequacy of the baseline prior to the test. SpO2 should be monitored during the apnea test.
6. The physician certifying Brain Death shall be present during ventilator removal to attest to the presence of apnea if found.
7. Place the patient on 100% FIO2 through a closed suction tracheal catheter with the tip towards the end of the tube with a continuous 6L/min O2 flow.
8. The patient is taken off the ventilator by the respiratory therapist, in the presence of the physician certifying brain death. The patient is kept off the ventilator for a variable period of time (usually 3-8 minutes) to allow the PaCO2 to rise > 60mm Hg or 20 mm Hg over baseline. During this time the patient is observed for respiratory movements.

9. Test interpretation:
    a. Positive test – implying apnea despite adequate stimulation
        i. Patient remains apneic, without respiratory movements
        ii. PaCO2 is >60 mm Hg or 20 mm Hg from baseline
    b. Negative test – implying apnea is not present
        i. Respiratory efforts noted at any time during the test
    c. Indeterminant test
        i. PaCO2 < 60 mm Hg or there is less than 20 mm Hg increase over baseline
    d. Indeterminant tests can either be repeated or another confirmatory test initialized.
    e. The apnea test should be aborted if the patient develops hypotension (systolic blood pressure < 90 mm Hg), or significant cardiac arrhythmias.

SUPPORTING/REFERENCE DOCUMENTATION:

- Florida Statute 382.009 Recognition of Brain Death under certain circumstances
- Florida Statute 765.517(3) Rights and duties at death
- Wijdicks, Eelco F.M., Varelas, Panayiotis N., Gronseth, Gary S., et al. (2010). Evidence-based guideline update: Determining brain death in adult: Report of quality standards subcommittee of the American Academy of Neurology. Neurology, 74: 1911 – 1918.
- Perman, S.M., Kirkpatrick, J.N., Reitsma, A.M., Gaieski, D.F., et al (2012). Timing of neuroprognostication in post cardiac arrest therapeutic hypothermia. Critical Care Medicine, 40 (3): 719 – 724.

RELATED POLICIES, PROCEDURES, AND ASSOCIATED FORMS:

HH Administrative Policies:

- 400-2000-799 Donation after Cardiac Death (DCD) - Nursing
- 400-2000-799-3 Mandatory Request and Reporting for Organ/ Tissue/Eye Donation Policy - Nursing

HH Procedure: 400-2000-310-02A Standards of Care of the Potential Organ Donor Determined to be Brain Dead by Neurological Criteria to Maintain Organ Viability Policy - Nursing

HH Forms available via the Intranet:

- HH 268 Criteria for Determination of Brain Death in Adults
- HH 97 Release of Body/Organ Donation/Autopsy
- HH 0445 Organ Preservation Management Orders
- HH 453 Organ Preservation Flowsheet
- HH 0693 Donation after Cardiac Death Checklist

ENFORCEMENT & SANCTIONS:

Violations of this policy will be referred to the appropriate management personnel for follow up and for applicable sanctions.