THE FOLLOWING CRITERIA MUST BE SATISFIED

CHECK BOX IF CRITERION IS SATISFIED

INITIAL EXAM

Date___________ Date___________

Time___________ Time___________

Established and sufficient cause of coma

Absence of significant levels of Central Nervous System depressant or neuromuscular blocking drugs

Core temperature greater than 32.2 celsius/90°Fahrenheit:

Systolic blood pressure > 90 mm Hg or MAP > 60 mm Hg

No purposeful movement or facial grimacing to supraorbital, sternal, or nailbed pain

Brainstem Reflexes:

a) Absent pupillary light reflex, pupils midposition (4 mm) to dilated (9 mm)

b) Absent corneal reflexes

c) Absent vestibulo-ocular reflex

d) Absent pharyngeal / tracheal reflex (Gag, cough)

e) No breathing above the ventilator set rate

Absence of Spontaneous Respiration
PaCO2 Greater than 60 torr

Post ABG’s Apnea Test

PaCO2 = _______torr

Signature

Confirmatory Studies Used:

Brain Death declared at _____ A.M./P.M. on ___________, 2____ by__________________________________

Signature / Title

SEE REVERSE FOR GUIDELINES FOR DETERMINATION OF DEATH.
THE FORM FOR DETERMINATION OF BRAIN DEATH IS TO BE USED IN ALL CASES.
PROCEDURE FOR BRAIN DEATH EXAMINATION AT HENRY FORD HOSPITAL

Brain death is herein defined by Michigan statute as the irreversible cessation of all functions of the entire brain including the brainstem. Absent cerebral function is recognized clinically as coma. Absent brainstem function is recognized clinically when brainstem reflexes and respiratory effort are irreversibly absent.

BRAIN DEATH EXAMINATION:

1. The clinical determination of brain death requires two (2) examinations by different physicians separated by the requisite time intervals. The examining physicians cannot be members of the transplant team.

2. The two (2) examinations shall be performed by two (2) different Senior Medical or Affiliate Staff Physicians: one (1) shall be the senior staff physician who is assigned primary responsibility for the patient and the second shall be a senior staff neurologist or senior staff neurosurgeon. A designated physician who is under their direct and immediate supervision (i.e. Resident) can also perform the exams. In the case of a catastrophic structural brain injury, however, a SINGLE examination followed by a confirmatory cerebral blood flow test and an apnea test is required. (See below)

3. In order to establish a diagnosis that is compatible with brain death, potentially reversible conditions such as drug intoxication, treatable metabolic disorders, hypothermia, shock, and peripheral nerve or muscle dysfunction due to disease or neuromuscular-blocking drugs, must be excluded.

4. During the period of requisite observation, the patient will have both a core temperature greater than 32.2 degrees Celsius (90 degrees F) and a systolic blood pressure generally maintained greater than 90 mmHg in adults or within the normotensive range in children. The normotensive range for children is age specific as determined by the pediatric internist.

5. The clinical examination demonstrates the patient to be in coma with no response within the cranial nerve distribution to stimulation of any part of the body.

6. The clinical examination demonstrates the absence of the following brainstem reflexes; Pupillary light reflex - Corneal reflex - Vestibulo-ocular reflex - Pharyngeal/Tracheal reflex

7. The clinical examinations of respiration will include two assessments:
   a. On the initial exam the patient should show no signs of spontaneous effort, i.e., the patient should not breathe above the ventilator.
   b. APNEA TEST: Subsequent to the requisite time interval, a formal apnea test is included in the final (i.e. second) exam. If only one (1) exam is performed, the apnea test is done with this single exam. An accepted method is ventilation with pure oxygen for ten (10) minutes before withdrawal of the ventilator, followed by passive flow of oxygen via a cannula to the endotracheal tube (This procedure allows PaCO2 to rise without hazardous hypoxia). Hypercarbia adequately stimulates respiratory effort when PaCO2 is greater than 60 mm Hg. For patients with chronic obstructive pulmonary disease, who may live with high PaCO2 levels, the accepted hypercarbia level to stimulate respiratory effort should be 20 mm Hg above the baseline PaCO2, if known. Testing of arterial blood gases should be used to confirm this level. Any observation of spontaneous respiration or hemodynamic instability shall immediately abort the test.

8. In those cases where there exists the inability to fully and validly apply the above clinical criteria due to uncertainty regarding etiology, inability to examine one (1) or both eyes due to trauma; the presence of cranial neuropathies, the presence of severe pulmonary disease with unknown baseline PaCO2 level, inability to complete the apnea test, or the presence of a normal CT or MRI of the head, a confirmatory cerebral circulation study demonstrating the absence of cerebral perfusion shall be required prior to the determination of brain death.

9. Any CONFIRMATORY TEST such as angiography, (conventional or DSA) radionuclide scintigraphy, transcranial Doppler ultrasonography or EEG which does not support the clinical diagnosis of brain death, shall supercede the clinical examination. No person shall be declared brain dead until any ancillary confirmatory test evidence unambiguously supports the clinical diagnosis.

10. The requisite time intervals which separate the two (2) clinical examinations are:
   a. For direct structural damage to the brain (e.g. subarachnoid hemorrhage, intracerebral hemorrhage, trauma, brain tumors, or malignant edema), the time interval between clinical evaluations shall be six (6) hours. In case, however, of a catastrophic structural brain damage (intracerebral hemorrhage, subarachnoid hemorrhage, gun-shot wound to the head or other catastrophic head trauma etc), only a single clinical brain examination by a senior staff neurologist or neurosurgeon or a designated physician (i.e. resident) who is under their direct and immediate supervision is required, if followed by a confirmatory cerebral blood flow test (angiography, SPECT, radionuclide scintigraphy) and a subsequent positive apnea test.
   b. For physiologic brain damage (e.g. hypoxia, post-cardiac resuscitation), the time interval between clinical examinations shall be twenty-four (24) hours. A confirmatory test is optional, unless the criteria under Section 8 are met.
   c. For children between the ages of one (1) and fifteen (15) years, the criteria for the establishment of brain death shall be the same as in the adult with a time interval of twelve (12) hours between clinical examinations. A confirmatory test is optional, unless the criteria under Section 8 are met.
   d. For children between the age of two (2) months and one (1) year, the time interval between clinical examinations shall be twenty-four (24) hours. A confirmatory test is recommended.
   e. For children between the post term ages of seven (7) days and two (2) months, the interval between clinical examinations shall be forty-eight (48) hours. In addition, two (2) EEG's done forty-eight (48) hours apart shall be obtained with both demonstrating electrocerebral silence prior to the final determination of brain death. In cases of suspected EEG false positivity, cerebral circulatory studies (e.g. conventional angiography or DSA) can supercede the EEG.
   f. If an ancillary cerebral circulatory study has been performed (i.e. conventional angiography, DSA or radionuclide scintigraphy) and demonstrates no cerebral blood flow, the time interval between confirmatory examinations shall be two (2) hours provided that the individual is over two (2) months of age. For physiologic brain damage, only conventional angiography or DSA will be considered adequate flow studies.

11. No child under seven (7) days of age shall be declared brain dead.

12. No pregnant woman shall be tested for brain death until it has been determined that the life of the fetus cannot be preserved.

13. Documentation of the brain death determination shall be made on the Brain Death Determination form.