DETERMINING BRAIN DEATH
Notify Tennessee Donor Services (TDS): 615-322-2247

Prerequisites (ALL must be checked)

☐ Coma, irreversible and cause known
☐ Neuroimaging explains coma
☐ CNS depressant drug effect absent (if indicated toxicology screen; if barbiturates given, serum level <10 \( \mu \)g/mL)
☐ No evidence of residual paralytics (electrical stimulation if paralytics used)
☐ Absence of severe acid-base, electrolyte, endocrine abnormality
☐ pH is below 7.45
☐ Normothermia or mild hypothermia (core temperature >36° C)
☐ Systolic blood pressure ≥ 100mmHg
☐ No spontaneous respirations

Examination (ALL must be checked)

☐ Pupils non-reactive to bright light
☐ Corneal reflex absent
☐ Oculocephalic reflex absent (tested only if C-spine integrity ensured)
☐ Oculovestibular reflex absent
☐ No facial movement to noxious stimuli at supraorbital nerve, temporomandibular joint
☐ Gag reflex absent
☐ Cough reflex absent
☐ Absence of motor response to noxious stimuli in all 4 limbs (spinally mediated reflexes are permissible)

*Attending MUST BE PRESENT thru Apnea Testing

☐ Patient is hemodynamically stable
☐ Ventilator is adjusted to provide normocarbia (PaCO₂ 34-45 mmHg)
☐ Patient pre-oxygenated with 100% FiO₂ for >10 minutes to PaO₂ > 200 mmHg
☐ Patient well oxygenated with a PEEP of 5 cmH₂O
☐ Provide oxygen via a suction catheter to the level of the carina at 6 L/min or attach T-piece with CPAP at 5 cm mmHg
☐ Disconnect ventilator
☐ Spontaneous respirations absent
☐ Arterial blood gas drawn at 10 minutes
☐ Patient reconnected to ventilator

(Hemodynamic instability or Oxygen Desaturation)

Apnea Test Aborted

Only one of below tests required for confirmation, with exception of TCD

☐ Cerebral angiogram
☐ HMPAO SPECT
☐ EEG
☐ TCD (times two)

pCO₂ ≥ 60 mmHg, or 20 mmHg rise from normal baseline value

BRAIN DEATH

***If patient is under 18 years of age, two brain death tests must be preformed 12 hours apart by two different ICU attending physicians***
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Complete Brain Death Note in StarForm:

**PREREQUISITES: (Do Not proceed to exam if answer is YES):**

- Diagnosis compatible with brain death?
- Is the core temperature less than or equal to 34.3 degrees C (94 degrees F)?
- Is the systolic blood pressure less than or equal to 90 torr (or age appropriate blood pressure in pediatric patients)?
- Is the PaO2 less than 50 torr?
- Presence of significant sedative or neuromuscular blocking drugs?
- Are confounding conditions present? (e.g. C-spine trauma, facial trauma, locked instate, severe obesity, severe COPD, severe metabolic or endocrine derangement)?

**EXAMINATION CRITERIA: (Do Not proceed to apnea test if any answer is YES):**

- Is the patient GCS greater than 3?
- Verbal: 5 / Motor: 6 / Eye: 4
- Spontaneous movement present?
- Any response to painful stimulation, nail bed pressure - bilaterally?
- Any response to painful stimulation, supraorbital pressure?
- Any pupil reflexes present?
- Any corneal reflexes present?
- Cold caloric-induced eye movements (5 minutes between sides) present (or lateral neck rotations-induced eye movements)?
- Cough present?

**Apnea test (begin with PCO2 40 +/- 5 torr):**

- ABG pre-test:
  - pH:
  - PCO2:
  - PO2:
- ABG at end of test:
  - pH:
  - PCO2:
  - PO2:

- Was there spontaneous respiratory effort with PCO2 rise > 20 torr?, OR
- Was there spontaneous respiratory effort with PCO2 > 60 torr?

**If apnea test is indeterminate, or there are other clinical circumstances that prompt confirmatory testing, (such as transthoracic Doppler, nuclear medicine scan) indicate reason and tests ordered**

TR WS TEAM DUTIES:

1. Notify attending on call
2. Tennessee Donor Services (TDS): 615-322-2247
   TDS is to be called on all deaths and all pending deaths
3. Complete Brain Death Note in StarPanel (StarForm)
4. Medical Examiner Office: 615-743-1800
   Medical Examiner office is to be called on trauma service deaths
5. Decedent Affairs: 615-835-1497 (pager)
ANCILLARY TESTS:
- Cerebral Angiogram: Formal arteriography gold-standard, CTA and MRA with less data (WIZ Order)
- HMPAO SPECT: Tc 99mHexametazime Nuclear medicine scan (Synergy)
- EEG: Electroencephalogram, Requires neurology consult
- TCD: Transcranial Doppler (x2); Contact Vanderbilt Neurosonologist Nina N. Mitsky, RDMS (Mon-Fri 8am-5pm)

REFERENCES: