CONFIRMATION OF NEUROLOGICAL DETERMINATION OF DEATH - ADULT (NDD)
Adults and Children Age ≥ 1 year

See reverse for CCDT Guidelines

A separate form must be completed by each physician. The first and second physician's determinations may be performed concurrently. If performed at different points in time, a full clinical examination including the apnea test must be performed, without any fixed examination interval, regardless of the primary etiology.

Section One: Minimum Clinical Criteria – Adult

a. Deep unresponsive coma with the following established etiology:
_____

b. Temperature (core) _____

c. Brainstem Reflexes
- ☐ Bilateral absence of motor responses: (excluding spinal reflexes)
- ☐ Absent cough
- ☐ Absent gag
- ☐ Bilateral absence of corneal responses
- ☐ Bilateral absence of vestibulo-ocular responses
- ☐ Bilateral absence of pupillary response to light: (pupils ≥ mid size)

d. Apnea Testing:
i. ABG at the start of test: pH_____ $PaCO_2$ _____mmHg
ii. ABG at completion of test: pH _____ $PaCO_2$ _____mmHg

e. Confounding factors precluding the diagnosis? ☐ No ☐ Yes (If Yes – see Section Two)

Section Two: Ancillary Tests performed: ☐ No ☐ Yes

Ancillary tests, to establish the absence of intracranial blood flow, should be performed when ***any*** of the Minimum Clinical Criteria cannot be completed, **or** unresolved confounding factors exist.

Reason Ancillary testing has been performed: _____

Absence of intracranial blood flow has been demonstrated by:
- ☐ Cerebral Radiocontrast 4-vessel Angiography
- ☐ Radionuclide Angiography
- ☐ Other: _____ Date and Time Performed _____

Section Three: Declaration and Documentation

This patient fulfills the criteria for neurological determination of death:

Physician: Signature: _____ Print name:_____

Time: _____ Date: _____

The time of the first determination is the legal time of death.

Adapted from:

CCDT, "Severe Brain Injury to NDD: Canadian Forum Recommendations", CMAJ 2006

Age Definitions

Adult checklist appropriate for patient ≥ 1 year of age.

Section One: Minimum Clinical Criteria

Established Etiology: Absence of clinical neurological function with a known, proximate cause that is irreversible. There must be definite clinical and/or neuroimaging evidence of an acute central nervous system (CNS) event that is consistent with the irreversible loss of neurological function. NDD may occur as a consequence of intracranial hypertension and/or primary direct brainstem injury.

Deep Unresponsive Coma: A lack of spontaneous movements and absence of movement originating in the CNS such as: cranial nerve function, CNS mediated motor response to pain in any distribution, seizures, decorticate and decerebrate responses. **Spinal reflexes**, or motor responses confined to spinal distribution, may persist.

Confounding Factors:

1. Unresuscitated shock
2. Hypothermia (core temperature <34 degrees Celsius, by central blood, rectal or esophageal/gastric measurements)
3. Severe metabolic disorders capable of causing a potentially reversible coma. If the primary etiology does not fully explain the clinical picture, and if in the treating physician's judgment the metabolic abnormality may play a role, it should be corrected or an ancillary test should be performed.
4. Peripheral nerve or muscle dysfunction or neuromuscular blockade potentially accounting for unresponsiveness, or
5. Clinically significant drug intoxications (e.g. alcohol, barbiturates, sedatives). Therapeutic levels and/or therapeutic dosing of anticonvulsants, sedatives and analgesics do not preclude the diagnosis.

   Specific to Cardiac Arrest: Neurological assessments may be unreliable in the acute post-resuscitation phase after cardiorespiratory arrest. In cases of acute hypoxic-ischemic brain injury, clinical evaluation for NDD should be delayed for 24 hours or an ancillary test could be performed.
   Examiners are cautioned to review confounding issues in the context of the primary etiology and examination. **Clinical judgment is the deciding factor**.

Apnea test:

Optimal performance requires a period of preoxygenation followed by 100% O_2 delivered via the trachea upon disconnection from mechanical ventilation. The certifying physician must continuously observe the patient for respiratory effort. **Thresholds at completion of the apnea test must be: $PaCO_2$ ≥ 60 mmHg and ≥ 20 mmHg above the pre-apnea test level and pH ≤ 7.28 as determined by arterial blood gases**. Caution must be exercised in considering the validity in cases of chronic respiratory insufficiency or dependence on hypoxic respiratory drive.

Section Two: Ancillary Tests

Demonstration of the global absence of intracranial blood flow is considered the standard for determination of death by ancillary testing. The following prerequisite conditions must be met prior to ancillary testing: i) established etiology, ii) deep unresponsive coma, iii) absence of unresuscitated shock and hypothermia. **Currently, validated techniques are 4-vessel cerebral angiogram or radionuclide cerebral blood flow imaging**. EEG is no longer recommended. NDD can be confirmed by ancillary testing when minimum clinical criteria cannot be completed or confounding factors cannot be corrected.

Section Three: Neurological Determination of Death

The legal time of death is marked by the first determination of death. Existing law states that for the purposes of post-mortem donation, the fact of death shall be determined by two physicians. The first and second physician's determinations may be performed concurrently. If performed at different points in time, a full clinical examination including the apnea test must be performed, without any fixed examination interval, regardless of the primary etiology. **A separate NDD form must be completed by each physician.**

Physicians Determining Neurological Death

Minimum level of physician qualifications to perform NDD is full and current licensure for independent medical practice in the relevant Canadian jurisdiction. This excludes physicians who are only on an educational register. The authority to perform NDD cannot be delegated.