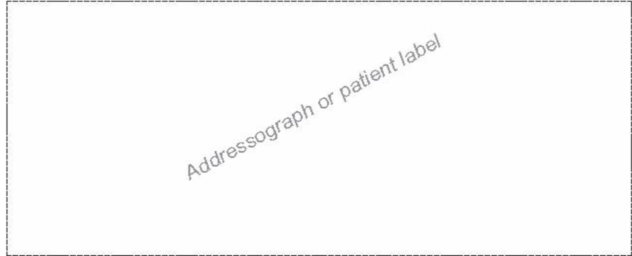
CONFIRMATION OF DEATH BY NEUROLOGICAL CRITERIA INFANT (DNC)

Infants age < 1 year and Term Newborns > 36 Weeks Gestation

See reverse for CCDT Guidelines

A separate form must be completed by each physician. For these age groups, the first and second physician's determinations, as defined by a full clinical examination including the apnea test, must be performed at 2 different points in time. For infants, there is no fixed interval regardless of the primary etiology. For term newborns, the first examination should be delayed 48 hours after birth and the interval should be ≥ 24 hrs, regardless of primary etiology.



Section One: Minimum Clinical Criteria – Infants

Clinical exam to be completed and documented in full (including apnea test) if the patient is a potential organ donor - exceptions allowed for components of exam deemed unsafe or not possible due to injury/altered anatomy. ***Any exceptions require ancillary testing***

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

b. Temperature (core) [must be ≥ 36° C] ________________________________

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

d. Apnea Testing:
   i. ABG at the start of test: pH_______________ $PaCO_2$ _______________mmHg
   ii. ABG at completion of test: pH _____________ $PaCO_2$ _______________mmHg
   Date and Time Completed ________________________

e. **Confounding factors precluding the diagnosis? ☐ Yes – Ancillary Testing required**

Section Two: Ancillary Tests

ANCILLARY TESTS CANNOT BE SUBSTITUTED FOR CLINICAL EXAM ABOVE

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:

☐ 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:_____________________________

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

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Adapted from:

A brain-based definition of death and criteria for its determination after arrest of circulation or neurologic function in Canada: a 2023 clinical practice guideline. Shemie SD, Wilson LC, Hornby L, et al. Can J Anaesth. 2023 Apr;70(4):483-557. doi: 10.1007/s12630-023-02431-4. Epub 2023 May 2. PMID: 37131020

Age Definitions

Infants: ≥ 30 days, < 1 year; Term Newborns > 36 weeks gestation, age < 60 days

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 neuroimaging evidence of an acute central nervous system (CNS) event that is consistent with the irreversible loss of neurological function. DNC cannot be declared if neuroimaging suggests infratentorial injury alone without ancillary testing. DNC 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 <36ºC 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.

   For Cardiac Arrest: Neurological assessments may be unreliable in the acute post-resuscitation phase after cardiac arrest. In cases of acute hypoxic-ischemic brain injury without evidence of devastating brain injury on neuroimaging, clinical evaluation for DNC should be delayed for 48 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. Alternatively, CPAP may be applied during the apnea test. 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 radionuclide cerebral blood flow imaging**. EEG is no longer recommended. DNC can be confirmed by ancillary testing when minimum clinical criteria cannot be completed or confounding factors cannot be corrected. Alternative ancillary tests are not preferred and require discussion with the Medical Director on a case-by-case basis. **Ancillary investigation is not recommended for infants less than two months corrected gestational age.**

Section Three: Neurological Determination of Death

The legal time of death is marked by the first determination of death. **This is defined as time of completion of last test required to fulfill death determination criteria**. 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 DNC form must be completed by each physician.**

Physicians Determining Death by Neurological Criteria

Minimum level of physician qualifications to perform DNC 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 DNC cannot be delegated.