



GUIDELINE OF THE MALAYSIAN MEDICAL COUNCIL

**BRAIN DEATH
VERSION 2/2025**

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SUMMARY

Brain Death/Death by Neurologic Criteria (BD/DNC) is defined as the complete and permanent loss of brain function characterised by an irreversible coma with loss of capacity for consciousness, brainstem reflexes, and inability to breathe independently. This may result from permanent cessation of circulation to the brain, after devastating brain injury, or both. Persistence of cellular-level neuronal and neuroendocrine activity does not preclude brain death determination. In the context of brain death determination, “permanent” refers to loss function that cannot be restored spontaneously or through intervention. The determination of BD/DNC is a clinical diagnosis. Given the implications and consequences of this diagnosis, determination of BD/DNC should establish that;

- (1) the clinical history, etiology, and neuroimaging confirm that the person has experienced an irreversible devastating brain injury leading to loss of all brain functions, and thus are compatible with BD/DNC;
- (2) There are no confounders that could make the person appear to have irreversible brain injury, when, in fact, it may not be the case. (Confounders refer to circumstances when a diagnostic test or clinical evaluation is suboptimal and require repetition over time or application of an alternative test)

The certification of BD/DNC has to be done only by specialists based on the updated guidelines.

There are ethical, human, intellectual and utilitarian reasons to recognise BD/DNC. There are aspects of the right to dignity and respect at death, the recognition of irreversible damages to the brain, the criteria for this recognition and certification, as well as ethical and economic considerations, which make diagnosis of BD/DNC a complex clinical issue.

Following the great success in cardio-pulmonary resuscitation, efficient vital system support in intensive care units and of (cadaveric) organ transplantation from brain dead donors, the diagnosis and certification of BD/DNC assumes critical importance. This guideline lays down the ethical considerations for doctors diagnosing and certifying BD/DNC.

1. INTRODUCTION

The Brain Death Committee was formed by Ministry of Health in late 1992 to make recommendations regarding brain death and prepare guidelines for use in the country. Members comprised of specialists in relevant fields and representatives of medical organisations. The committee submitted its report to the Director General of Health and the Master of the Academy of Medicine in January 1993.

The Guidelines were then circulated to all Hospitals and medical faculties then in existence. Members of the committee also gave lectures nationwide and explained the guidelines on brain death.

The concept of brain death was accepted by the medical fraternity at a consensus meeting organized by the Ministry of Health and the Academy of Medicine of Malaysia on 12th December 1993. The consensus was reviewed in 2002 and published as Consensus Statement in 2003 (1), this was further reviewed in 2024 and published as the Malaysian Consensus Statement on Brain Death 2024. In 2006, MMC itself published its own Guideline; Brain Death 2006. After 21 years, there is a need for the consensus statement to be updated to keep abreast with advancements in medicine. Hence the constitution of a review committee and publication of this updated guideline. This guideline in keeping with the principle of the Malaysian Medical Council on ethical guidance of the medical profession, emphasizes on ethical grounds, leaving the technical aspects to be addressed in the Malaysian Consensus Statement on Brain Death 2024.

2. BACKGROUND

Traditionally, death is recognized by the permanent cessation of cardiovascular and respiratory functions. Medical knowledge has advanced, enabling these vital functions to be supported and taken over by drugs and machines. Therefore, the traditional definition of death will be inappropriate in such situations, and a different method to ascertain death is required.

In general terms, death is a permanent cessation of the coordinated function of the organism as a whole. The permanent cessation will lead to the inevitable permanent loss of brain function. The brain serves as the central hub for hormonal regulation, neural activity, neurotransmitter release, and the control of cardiorespiratory and vasomotor functions. Unlike lung function, which can be supported by machines, these complex brain functions cannot be replicated artificially.

Therefore, it may be said the brain is the ultimate organ that makes the difference between life and death.

The concept of BD/DNC was developed as a clinical diagnosis for the certification of death, when there is irreversible brain damage, because the functions of the lungs and the heart can be prolonged with the advancements in mechanical ventilation and haemodynamic support in Intensive Care Units.

However, making a diagnosis of BD/DNC also raises ethical questions on when and if terminating vital system support should be done. Delays may cause distress to relatives, futile of vital medical equipment and facilities.

3. RELIGIOUS PERSPECTIVES

The Malaysian Constitution guarantees freedom of religion, allowing individuals to profess, practice, and propagate their faith and a simple religious generalisation for BD/DNC is not adequate. However, it can be said that there is consensus among the major religions that BD/DNC is either accepted by decree such as via Consensus by the National Fatwa Council for Muslims, statement by the Pontifical Academy of Sciences for Catholics or by means of philosophical inference for adherents of Buddhism, Hinduism, Taoism and Sikhism. Further reference on this is made available in Appendix 1. ⁽²⁻¹¹⁾

4. CONCEPT OF BD/DNC

Brain death is also referred as death by neurological criteria (DNC) in order to promote understanding by the lay public, and scientific and legal professionals

The term BD/DNC is sometimes referred as “whole brain death” or “brainstem death.” A person who is certified to be BD/DNC is considered as dead. ⁽¹²⁻²²⁾

BD/DNC is defined as the complete loss of brain function as characterised by an irreversible coma with loss of consciousness, brainstem reflexes, and the ability to breathe independently. This may result from permanent cessation of oxygenated circulation to the brain and/or after devastating brain injury. Persistence of cellular-level neuronal and neuroendocrine activity does not preclude the determination. The term “death by neurologic criteria” describes the mode of determining death. While adopting “death by neurologic criteria,” as the more accurate terminology, it will be unwise to completely abandon the traditional terminology, hence, this document uses the combined term BD/DNC.

It follows that BD/DNC is a term that simply means that a person is recognised as dead, based on the examination of the nervous system. This method of ascertaining death is only limited to patients in the Intensive Care Units (ICUs) who are deeply unconscious and whose respiratory functions are mechanically supported by ventilators and cardiovascular function may be pharmacologically supported. It accounts for less than 1% of all deaths. The certification is only done by doctors experienced in the diagnosis, and strict guidelines are used. The reasons for the need to recognise BD/DNC can be divided into:

- Ethical
- Human
- Intellectual
- Utilitarian
- Medico-legal

4.1 Ethical

BD/DNC is a definite clinical state. Adults with BD/DNC will develop asystole within a week, regardless of what treatments are given. Magnetic resonance imaging (MRI) of the brain shows diffuse swelling with tentorial and foraminal herniations while various angiographic studies show absent blood flow. At post-mortem, there is widespread necrosis, and the brain hemispheres and brain stem are swollen and soft, with fragments of brain lodged in the spinal cord, a situation totally incompatible with life.

It is therefore a matter of good medical practice to recognise BD/DNC. In an era of rising medical cost and insurance, non-recognition either through ignorance or choice can be construed as unethical.

4.2 Human

Every human being deserves dignity and respect at the end of life, and the declaration of death should not be postponed. Continuing to ventilate a body that is brain dead and undergoing decomposition is a violation of this dignity. The heart can continue to beat for up to a week, leaving the family in profound distress as they await the inevitable. Some may be misled by the earnestness of medical staff into believing that the patient might still survive.

4.3 Medico-legal

The ability of modern technology to transiently prolong life has raised the question of ceasing that support. That decision making process is complex and requires consensus from all parties involved. That process may also benefit from legal inputs.

When there is conflict between the patient's relatives or next-of-kin, and the treating practitioners on need to terminate ventilatory support and/or medical treatment, the matter may be referred to the courts to resolve the conflict.

5. CRITERIA FOR DIAGNOSIS OF BD/DNC

In line with the aim of this document being an ethical guide and to avoid confusion, the Malaysian Consensus Statement on Brain Death 2024 being a document originating from the Ministry of Health shall be used as the technical document for the diagnosis of BD in Malaysia. The term DNC is not used in the Ministry's consensus statement, and it is hoped this expanded diagnosis is included in future revisions.

6. RECOMMENDATIONS

The Committee made the following recommendations:

- 6.1 The concept and entity of BD/DNC are recognised and accepted; and that BD/DNC means death.
- 6.2 The diagnosis of BD/DNC is a clinical diagnosis and no confirmatory test is necessary with the exception for children.
- 6.3 Two specialists who are registered as medical practitioners, and who are accredited and experienced in diagnosing brain death, are required to certify BD/DNC.
- 6.4 Doctors who are in the organ transplant recovery team and doctors whose patients/relatives are beneficiaries of organ transplantation are not allowed to certify BD/DNC. Doctors who are directly involved with discussion with relatives on organ transplantation should not certify BD/DNC.
- 6.5 Hospitals where BD/DNC is being certified shall have a coordinating body and is responsible for general policies, training and accrediting staff, counselling and overseeing the facilities available.

7. QUALIFICATIONS OF DOCTORS CERTIFYING BD/DNC

- 7.1 The hospital should have a sub-committee to identify and authorize the doctors who are qualified to certify BD/DNC.
- 7.2 Two specialists with postgraduate clinical experience and trained in BD/DNC assessment and diagnosis are required to certify BD/DNC. They should preferably be (National Specialist Register registered) anaesthesiologists, physicians, neurologists, neurosurgeons, intensivists, neonatologists, paediatric neurologists or emergency physicians, as they are usually more familiar with clinical neurological assessment.
- 7.3 In the event there is no qualified/certified doctor to diagnose BD/DNC, qualified/certified doctors from a hospital nearby can be authorized to certify BD/DNC of patients in the primary hospital.

8. QUALIFICATIONS OF HOSPITALS

BD/DNC certification must be done in areas of the hospital that have capabilities to ventilate and monitor comatose patients.

9. BD/DNC IN CHILDREN

- 9.1 The definition of BD/DNC for children is the same as adults.
- 9.2 Criteria to determine BD/DNC are generally consistent across the age spectrum for children although some variation exists among different guidelines.
- 9.3 There is insufficient evidence for determination of BD/DNC in infants less than 37 weeks corrected gestational age as some brainstem reflexes may not be completely developed.

APPENDIX 1

Religion	Discussion
Islam	<p>Jeddah Conference in 1985 discussed BD/DNC however, no conclusion was made.</p> <p>Conference in Amman in 1986, a resolution recognizing BD/DNC was passed.</p> <p>Recognition of BD/DNC was reaffirmed by the 10th Fiqh Academy Conference in Mecca in 1987.</p> <p>Singapore Islamic Council in its position statement of 1994, regarding the practice of Living Will, accepted the concept and recognition of BD/DNC.</p> <p>Indonesia Islamic Groups and Federation of Islamic Medical Association in 1996 endorsed the concepts on brain death</p> <p>97th Fatwa Committee of the National Council for Malaysian Islamic Religious Affairs which convened on 15-17 December 2011 discussed the Law of Euthanasia or Mercy Killing. They decided; where medical experts have confirmed that the patient's heart and/or brain have essentially stopped functioning and the patient is confirmed to have no hope of living and is only dependent on respiratory support, the act of stopping the respiratory support device is allowed by Islam because the patient has been certified dead by medical experts and any treatment is no longer needed.</p> <p>100th Irsyad Al-Fatwa by Mufti of the Federal Territory in 2016 has stated; after examining and respecting both views found in this issue, we think that BD/DNC is a valid death. (2,3)</p>
Hinduism	<p>Developed organically over the millennia does not have an institutional framework nor demand adherence to particular doctrines. Rather, it is a diverse umbrella or family beliefs and practices. With such diversity there is no single authority to issue a diktat.</p> <p>Nevertheless, Hindus have specific beliefs in common that influence their attitudes of death. The 3 main doctrines that are commonly significant are: the doctrines of <i>karma</i>- the principle of causality, <i>mukti</i>-release from the cycle of life in this world and <i>atma</i> (soul) - the 'inner-self' of the human person.</p> <p>Gupta in 2002 quoting the Chandogya Upanishad VI stated that the concept of 'atma' in Hinduism is that it arises from '<i>Brahman</i>' (creator) thus, it remains eternal. The body may be regarded as a vessel for the '<i>atma</i>' to perform '<i>karma</i>' to attain '<i>mukti</i>'.</p> <p>In Hindu philosophical understanding, 'death is not opposite of life – it is the opposite of birth, the two events simply mark a passage'.</p>

	<p>Krishnananda a renowned Indian philosopher goes on to say, when the span of life is finished, there is what we call the death of the body, the extrication of the 'prana' from the individual embodiment.</p> <p>'Prana' is derived from the derivative of 2 Sanskrit words <i>pra</i> which refers to before or forward and <i>aniti</i> referring to breathing. Therefore 'prana' may be surmised as forward breathing or ability to breathe.</p> <p>Inability to breathe (apnea) is the most important component for the certification of BD/DNC. Thus, it may be inferred that Hinduism has understood and accepted the concept of brain death.</p> <p>"No formal resistance to death pronouncement based on brain function criteria in Hinduism" exists.</p> <p>However, being a religion of diverse beliefs and practices the emotions and thoughts of the next of kin needs to be considered as well. (4-8)</p>
Christianity	<p>In Christianity, beliefs and views regarding BD/DNC, vary among different Christian denominations.</p> <p>Some Christian denominations emphasize the sanctity of life and believe that life begins at conception and ends at natural death. From this perspective, BD/DNC would not necessarily equate to the end of life. These believers may argue that if the heart is still beating, there is the potential for the continuation of life, and efforts should be made to sustain it.</p> <p>On the other hand, some Christian theologians and ethicists may consider BD/DNC as a valid criterion for determining death. They argue that since the brain is the seat of consciousness and the cessation of brain function results in the irreversible loss of personal identity, BD/DNC can be accepted as the end of life.</p> <p>The Catholic Church through its Statement by The Pontifical Academy of Sciences 'Why the Concept of Brain Death Is Valid as A Definition of Death' in 2007 put forth its arguments and responded to counter arguments on its acceptance of Brain Death as an equivalent of death.</p> <p>It's important to note that these perspectives on BD/DNC not universally held, and individuals may have diverse views based on their personal beliefs and interpretations of their religious teachings. (9-10)</p>
Buddhism	<p>Emphasis on impermanence and the interconnectedness of all things. Views on BD/DNC death may differ within the Buddhist community.</p> <p>In Buddhism, the concept of death is often understood as a transition or transformation rather than a definitive end. Physical death is seen as a continuation of the cycle of birth and rebirth.</p> <p>Regarding BD/DNC, some Buddhist schools of thought view it as the end of life if there is complete cessation of brain function. They consider the absence of brain activity as an indicator that the vital life force has departed and the individual has transitioned to another realm of existence.</p>

	<p>Other Buddhist schools of thought place more emphasis on the continuity of consciousness and argue that brain death alone is not sufficient to determine the end of life. They believe that subtle consciousness or mind streams continue beyond physical death and that the cessation of brain activity does not necessarily mean the end of the person's existence.</p> <p>It's important to note that these perspectives on BD/DNC not universally held, and individuals may have diverse views based on their personal beliefs and interpretations of their religious teachings. (11)</p>
Sikhism	<p>Sikhism emphasizes the importance of giving and putting others before oneself. Sikhs generally accept brain death as an indication of the departure of life from the body. In Guru Granth Sahib there is mention of the following; when the soul departs from the body, the body is useless. Which may also be inferred to the acceptance of the concept of BD/DNC. (7)</p>

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3. This guideline was first published on 14th November 2006.
4. This updated guideline was approved by the Ethics Committee on 21st April 2025 and endorsed by the Malaysian Medical Council on 17th June 2025.
5. This document will be due for review in 5 years, or earlier as necessary.