

# Brain Death and Management of a Potential Organ Donor in the Intensive Care Unit



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## KEYWORDS

• Brain death • Intensive care unit • Organ donation • Ethics • Communication

## KEY POINTS

- The concept of brain death developed with the advent of mechanical ventilation, and guidelines for determining brain death have been refined over time.
- The most current guidelines, the 2010 American Academy of Neurology practice parameters for brain death determination in adults, necessitate 3 clinical findings: irreversible coma from a known cause, brainstem areflexia, and apnea.
- Despite efforts to develop standardized guidelines, there is a large degree of practice variability, including the role of ancillary testing.
- Organ donation after brain death is a common source of transplant organs in Western countries. Early identification and notification of organ procurement organizations are essential. Management of potential organ donors must take into consideration specific pathophysiologic changes (eg, hemodynamics, hormonal production, and inflammation) for medical optimization.
- Philosophical, medicolegal, and ethical/religious debates about concerns regarding the relationship of brain death determination with organ donation, and whether or not brain death equates to death by any other definition, make communication with families key to assuaging any distrust of medical providers. The family meeting is a critical time to be compassionate and to skillfully educate the family as to what it means when their relative becomes brain dead.

## INTRODUCTION

The concept of brain death has developed remarkably over the years ([Table 1](#)). As early as the 12th century, Rabbi Moses Maimonides, an intellectual figure of medieval

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**Table 1**  
**Variation in the implementation of neurologic criteria to diagnose death in Australia, Canada, and the United Kingdom**

	<b>Australia</b>	<b>Canada</b>	<b>United Kingdom</b>
<b>Concept</b>	Brain is defined as unresponsive coma, brainstem areflexia, absence of respiratory center function, in the clinical setting in which these findings are irreversible  Brain death is determined by: clinical testing; or imaging that shows the absence of intracranial blood flow. However, no clinical or imaging tests can establish that every brain cell has died	Brain death is defined as the irreversible loss of the capacity for consciousness combined with the irreversible loss of all brainstem functions, including the capacity to breathe	When the brainstem has been damaged in such a way, and to such a degree, that its integrative functions (which include the neural control of cardiac and pulmonary function and consciousness) are irreversibly destroyed, the individual has died
<b>Cause</b>	Evidence of sufficient intracranial disease to cause whole brain death. Brain death cannot be determined when the condition causing coma and loss of all brainstem function has affected only the brainstem, and there is still blood flow to the supratentorial part of the brain	Established cause capable of causing neurologic death  There must be definite clinical or neuroimaging evidence of an acute CNS event consistent with the irreversible loss of neurologic function	There should be no doubt that the patient's condition is caused by irreversible brain damage of known cause
<b>Minimum observation period before clinical testing</b>	4 h; in cases of acute anoxic ischemic brain injury, clinical testing for brain death should be delayed for 24 h after the cardiorespiratory arrest	Any time after exclusion of confounders  In cases of acute anoxic ischemic brain injury, clinical evaluation should be delayed for 24 h after the cardiorespiratory arrest, or an ancillary test could be performed	Left to the clinician to be satisfied that the patient's condition is the result of irreversible brain damage of known cause

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