What Is the Ideal Brain Criterion of Death? Nonclinical Considerations

The UDDA Revision Series

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Although the assessment of death has long been accepted as the physician’s domain, death as a concept is shared with several stakeholders, including religion, philosophy, and society as a whole. This is not to say that the physician is not part of the conceptual understanding of death, but rather that the physician cannot claim sole ownership of defining death. This claim is illustrated by the fact that the well-known Harvard criteria were written by clinicians, but writers of the Uniform Determination of Death Act and planned revisions will include policymakers, theologians, physicians, and attorneys. Furthermore, a search of the ethics literature features a robust dialog on the topic, including many pieces written by nonclinicians. Consequently, a complete understanding of the dialog around determination by neurologic criteria requires knowing both a clinician’s perspective and that of a theologian, a philosopher, and a member of the general public. While the companion piece written by Nathaniel Robbins focused on the clinician’s perspective of criteria for neurologic determination, this piece will examine the criterion from the lens of those who are not clinicians. I will defer the larger question if any neurologic criteria can garner consensus for death equivalency and instead focus on which neurologic criteria would be most widely supported.

To explore neurologic criteria from the perspective of nonclinicians, we need to first identify the 2 essential elements that are most important to the conceptualization of death. This is admittedly a grand generalization, and the viewpoints of the theologian and the philosopher cannot be assumed to be the same; however, we can make some claims for common elements regarding death:

1. The irreversible loss of life. If there is a chance for recovery, even if extremely unlikely, then it is not death. If they appeared dead temporarily but then recovered, they were not dead but were approximating death.
2. The person must have lost enough of what is considered necessary to be a living human organism. This does not necessarily mean that all elements of life are lost, but a critical threshold must be crossed.

Next, I will discuss the neurologic criterion and how each might fulfill the essential elements just described, including (1) brainstem, (2) whole-brain, and (3) brain-as-a-whole. Of these 3, the brainstem criterion would garner the least support. While it might be the simplest to clinically demonstrate as the function of the brain stem is clinically overt, the potential incompleteness of neurologic injury might elicit concern over the potential of recovery, violating the first essential element. Potential preservation of the mind or the soul’s connection to the human organism would be a concern to philosophers and theologians alike. While higher cortical functions may not be expected to be activated because of brainstem destruction, their existence, even in a quiescent state, would be arguably more akin to stasis or encapsulation in a state between life and death. In as much as philosophers endeavor to consider future states of technology and how they will affect our current paradigm, with the advent of brain-computer interface, the prospect of activating or accessing higher cortical function after loss of brainstem function is within the realm of possibility. This capability would demonstrate the reversibility of the determination and undermine the classification of death.
The whole-brain criterion refers to the loss of all neurologic functions. This might not mean every neuron but would include the majority so that all identifiable and functional neurologic systems would fail. With loss of all neurologic networks and functional systems, there would be no plausible recovery of function, fulfilling the irreversible element. The expectation would be that if an autopsy was to be performed, necrosis would be discovered, confirming the clinical diagnosis. The second element of “crossing a critical threshold” would likewise be met because all functions served by the nervous system would be lost, regardless of which ones are given the largest weight. A commonly supported, philosophically oriented argument for brain death is the loss of higher brain function supporting consciousness, which would be a subcomponent of a whole-brain criterion.3

The challenge to the whole-brain criterion is how to demonstrate complete loss of the brain with a bedside examination. A cranial nerve examination, motor examination, and apnea test do not guarantee the loss of all brain tissues, rather those that can be physically interrogated at the bedside. If even one system continues to work, as is commonly seen with neuroendocrine function, then it undermines the argument that all functions are irreversibly lost, and the nonclinician would lose trust in the claim of death equivalency (the so-called false-positive brain death test).4

The brain-as-a-whole criterion provides the strongest conceptual foundation for the validity of neurologic criteria being equivalent to cardiorespiratory criteria from the perspective of the nonclinician. Human life is more than an organic assembly of molecules designed to maintain homeostasis. For a theologian and a philosopher, existence of personhood is self-evident with biology providing a means for it to exist in the physical world. Self-awareness, fulfillment of survival needs, pursuit of recreation, experiencing emotions, and reacting to immediate threats are all essential functions that define a living human organism.3 These essential functions do not necessarily require all subsystems to be intact, as the functions of most importance are emergent properties that define “the person.” The brain-as-a-whole criterion allows that threshold to be crossed without requiring demonstration of loss of all tissues and permitting limited residual function, such as neuroendocrine function. To guarantee permanent loss of these functions, the brain as a whole would still require the loss of all brainstem functions to separate it from loss of just higher cortical functions, whose plasticity might allow for recovery.

Consider the traditions and religious rituals that people have practiced since before recorded history. Many of them are focused on the human life cycle, celebrating birth, marital union, and death. Religious concepts of the afterlife often include an explanation of the transition from the living world to the life after and how one achieves a preferred destination. Philosophical and psychological understanding of the body-mind-soul connection, animation of the physical form, and emergence of conscious awareness all lend themselves to an exploration of what the event called death means to our understanding of self and existence. Social traditions also have a significant investment in what death is, as we obtain a different legal status, transfer property and responsibilities, and carry out burial in a manner designed to respect both the person and public health. For those whose worldview does not include an existence beyond their biologic form, these traditions still may influence what they accept as death and what can garner a wide social acceptance. While the cardiorespiratory criteria have been accepted for millennia, neurologic criteria are by comparison in their infancy.

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Appendix
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References