ETHICS IN CARDIOTHORACIC SURGERY

Does Declaration of Brain Death Serve the Best Interest of Organ Donors Rather Than Merely Facilitating Organ Transplantation?

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Introduction

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> The boundaries which divide Life from Death are, at best, shadowy and vague. Who shall say where the one ends, and where the other begins?
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> —Edgar Allen Poe [1]

The concept of brain death has been contentious since its formulation in 1968, and the controversy about whether death by neurologic criteria accurately describes death of a human being has increased over the succeeding decades.

Organ transplantation was in its infancy in the 1960s when the problem of too few organs to meet the need was recognized. In response, a committee of Harvard Medical School led by anesthesiologist Henry Beecher proposed an additional definition of death, based on the concept of irreversible loss of all brain function, which has come to be known as brain death [2]. After several years of widespread discussion and debate, the idea was formulated into law in 1980, the Uniform Determination of Death Act (UDDA) [3].

The UDDA defines brain death in this way:

> An individual who has sustained either (1) irreversible cessation of circulatory and respiratory functions, or (2) irreversible cessation of all functions of the entire brain, including the brain stem, is dead. A determination of death must be made in accordance with accepted medical standards.

Interest in the ethics underlying this concept has become so strong that a recent issue of the *American Journal of Bioethics* was entirely devoted to the controversies surrounding brain death [4]. Underlying this controversy is the idea that brain death is not the same as biological death; rather, it is a legal fiction designed to serve two purposes: facilitate end-of-life care and increase organ donation. In fact, however, the historical record shows that the primary motivation for the development of the UDDA was explicitly only one of these purposes: the promotion of organ donation [5].

Because it increases organ donation, declaration of death by neurologic criteria has in the past been understood to benefit patients on transplant waiting lists but to provide no benefit to donors. Neurosurgeon Michelle Clarke and her colleagues [6] have recently argued that declaring brain death has value for the donor as well as for the recipient: it provides a clear end point for withdrawal of life support, eliminates confusing conversations with the family about futility, and thereby benefits donors and their families. This clear end point, they have argued, enables families to accept more readily the reality of their loved one's death and is the true utility of brain death declaration [6].

In contrast to this view, however, Kathleen Fenton doubts that declaration of brain death provides any benefit to families of dying patients. The concept of brain death is itself confusing to families, just as it is confusing to most health care professionals. Moreover, such a declaration is not necessary for withdrawal of life support, which is performed in large numbers of patients both with and without neurologic damage.

Discussion of end-of-life decisions with the families of patients dying of severe brain injury will take markedly different turns depending on which of these conflicting viewpoints is correct. Clarke and Fenton cross swords in this debate about the utility of the concept of brain death.

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Brain death marks a transition from biological life to legal death. As a legal and moral equivalent of death, brain death indicates a point beyond which further treatment is futile. Although the downstream effect of brain death declaration may be the opportunity to procure organs for transplantation, the true utility of this concept is creating a hard clinical end point and the preservation of an individual patient's dignity [1].

The declaration of death serves as a marker for the permanent termination of life. Until adoption of the UDDA, death was declared after irreversible cessation of cardiac and respiratory function. However, this approach has become muddied by the influx of technology. The use of ventilatory or mechanical cardiac support precludes the declaration of cardiopulmonary death because neither respiratory nor cardiac function has irreversibly ceased. The recognition that patients were barred from being declared dead due to advances in medical technology led the Ad Hoc Committee of the Harvard Medical School to "define irreversible coma as a new criterion for death" [7]. Since this report, the criteria for declaring brain death have been further refined; however, the underlying premise that a patient with whole brain death is dead remains consistent [8].

But is brain death truly equivalent to cardiopulmonary death? The legal equality of brain death to cardiopulmonary death was affirmed by the UDDA that "provides comprehensive bases for determining death in all situations" [2]. Biologically, cardiopulmonary and brain death are also equivalent. Although the absolute biological definition of death remains difficult to define, a practical definition of death is required to delineate the irreversible transition from life. Commonly, this is thought to be a point when the ability to maintain independent homeostasis ceases [9].

In a brief thought experiment, imagine a decapitated individual: they would be declared dead based on a prima facie definition; however, did they die a cardiopulmonary or brain death? Whether brain death occurred due to the lack of perfusion or there was a cardiorespiratory arrest due to a lack of brainstem input is debatable; prioritizing one function over the other is impossible. Whether a declaration of death is from cardiopulmonary or brain death criteria, without technologic support, a patient will imminently meet both criteria for death.

Moral equivalence is better explored not by the technicalities of the criteria but by whether the patient is affected by the criteria used. Despite affirmations of the legal and biological legitimacy of brain death, the application of brain death criteria over cardiopulmonary criteria must benefit the patient. Owing to the interconnectedness of brain and cardiopulmonary death, in the case of a brain-dead patient, it is possible to simply withdraw life-sustaining technologies and declare a patient dead by cardiopulmonary criteria. Such an approach, however, requires an active decision to end treatment.

By defining death as the irreversible loss of whole brain function, patients whose vital functions are artificially maintained and who would be unable to self-support cardiopulmonary function can be declared dead. This allows the cession of restorative treatment without requiring an active decision to end treatment; there is a transition from medical acumen and end-of-life decision making to simply acknowledging the futility of further treatment.

However, is there a benefit to labeling this point of medical futility "death," or should it simply be understood that further treatment is futile which removes the obligation to treat, allowing artificial support to be withdrawn, and in turn allowing the patient to progress to death by cardiopulmonary means? The criteria for futility are variable and range from the futility of specific treatments in individual patients to the irreversibility of death. The vagaries of the definition add confusion. Although brain death meets all criteria for medical futility, the reverse is not true [10]. By correctly labeling this point of medical futility "death," not only is the obligation to continue treatment eliminated, so too is the hope that extraordinary means may yet restore life. This avoids the technological imperative defaulting to maximal intervention and rendering an unsalvageable patient in a suspended state [1, 11, 12]. Such a hard clinical end point is not as powerful if further treatment is simply labeled futile. By not couching the patient's situation in complicated terminology revolving around futility, but simply calling a spade a spade and pronouncing the patient dead, the patient's true state is respected.

Acknowledging the patient's death transforms the situation. As noted, by narrowly defining death by cardiopulmonary criteria, whole brain-dead patients must rely on a decision to withdraw care. Effectively, this means that the patient still needs to die when he or she has already done so. This takes away a patient's ability to die and shifts the responsibility of death to the patient's decision makers: a patient cannot die until a decision is made to allow this to occur. Although patients may have left instructions or have a reliable surrogate decision maker, the burden of implementing these wishes is greater than acknowledging the patient's actual state. By transforming death from an individual's existential state to one requiring an outside action, the semantics of futility and hope confuse the state of death and do the patient a disservice.

In addition to enhancing clarity, changing the decision-making process, and acknowledging the patient's true