

AN ASSESSMENT OF BRAIN DEATH AS A MEANS OF PROCURING TRANSPLANTABLE ORGANS

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Since its inception in 1968, brain death, as a criterion for human death, has enjoyed the status of one of the few relatively “well settled” issues in bioethics. Indeed, its almost universal acceptance in law and medical practice seems to confirm this depiction. However, over the last fifteen years or so, a growing number of experts in medicine, philosophy, and religion regard brain death as an untenable criterion for human death. Given that the debate about brain death has occupied a relatively small group of professionals, few are aware that brain death fails to correspond to any coherent biological or philosophical conception of death. This is significant, for if the brain-dead are not dead, then the removal of their unpaired vital organs for transplantation is the direct cause of their deaths. The purpose of this paper is to relate the historical, biological, and philosophical underpinnings for brain death. After assessing the components of its conceptual foundation, I argue that brain death is fundamentally flawed and ought to be rejected as a criterion for death.

I. A Short History of Brain Death

The emergence of brain death stems from the issuance of two seminal reports. The first of these occurred in 1968 when an Ad Hoc Committee from the Harvard Medical

School published a report recommending the first neurological diagnostic criteria for determining death. The second occurred in 1981 when a President's Commission issued a report on the ethical and legal implications of defining death with the inclusion of a model statute to standardize death in the United States. Over the next 20 years, all states adopted, through either legislation or common law, the brain death standard.¹ Despite its prevalence, brain death continues to generate both controversy and criticism. Examining the historical development of brain death discloses many of the reasons why it remains a contentious issue.

A. The Harvard Ad Hoc Committee

In December 1967, Christiaan Barnard successfully transplanted the first human heart into a patient dying from heart failure in South Africa. Although the recipient died eighteen days later, the well-publicized event led to the advent of heart transplantation, with over a hundred attempted the following year.² Early failures were attributed to the problems of organ rejection by recipients' immune systems and organ deterioration due to the need to wait for sufficient time after cardiac arrest to ensure that the donor would not spontaneously resuscitate.³ In an effort to overcome these challenges, an ad hoc Committee was formed at the Harvard Medical School in early 1968 to consider neurological death as a means to further transplantation efforts. The Committee finished

¹ Jerry Menikoff, *Law and Bioethics: An Introduction* (Washington, DC: Georgetown University Press, 2001), 450.

² Tony Smith, "Clinical Freedom," *British Medical Journal* 295 (1987): 1583; Peter Singer, *Rethinking Life and Death* (New York: St. Martin's Press, 1994).

³ Some reports suggest that the clinical use of heart-beating cadavers as organ sources was taking place years before by some transplant surgeons. See Mita Giacomini, "A Change of Heart and a Change of Mind? Technology and the Redefinition of Death in 1968," *Social Science Medicine* 44, no. 10 (1997): 1466.

its work six months later and published its report in the *Journal of the American Medical Association* under the title: “A Definition of Irreversible Coma.”⁴ The report addressed several items, including the clinical description of irreversible coma, recommended procedures for its diagnosis, and justifications for this new criterion for diagnosing death. The most publicized aspect of the report is the Committee’s reasoning behind ‘brain death’ as a new criterion for determining death. The Harvard Committee justified the criterion on two grounds: 1) it allowed physicians to turn off ventilators on brain-dead patients without fear of legal consequences; and 2) it allowed physicians to procure vital organs from brain-dead patients for transplantations.⁵

While scant references to transplantation in the report suggest that the issue was peripheral to the Committee, earlier manuscript drafts and memos reveal that the Committee’s mission was to “advance the cause of organ transplantation.”⁶ One earlier draft states: “With increased experience and knowledge and development in the field of transplantation, there is great need for the tissues and organs of the hopelessly comatose in order to restore to health those who are still salvageable.”⁷ To better ensure public acceptance of the report, the dean of the Harvard Medical School requested that the committee “tone down” the references pertaining to the need of transplantable organs.⁸

⁴ “A Definition of Irreversible Coma: Report of the Ad Hoc Committee of the Harvard Medical School to Examine the Definition of Brain Death,” *Journal of the American Medical Association* 205 (1968).

⁵ Stuart J. Youngner and Robert M. Arnold, “Philosophical Debates About the Definition of Death: Who Cares?,” *Journal of Medicine and Philosophy* 26, no. 5 (2001).

⁶ “‘Definition of Irreversible Coma,’ Manuscript Draft of 11 April, 1968,” Henry K. Beecher, *Henry K. Beecher Manuscripts*. (Boston, MA: Holmes Hall, Harvard Medical School, 1968).

⁷ *Ibid.*

Despite this effort, Henry Beecher, the chair of the Harvard Committee, confirmed the Committee's intent when he stated in a public address:

There is indeed a life-saving potential in the new definition, for, when accepted, it will lead to greater availability than formerly of essential organs in viable condition, for transplantation, and thus countless lives now inevitably lost will be saved...At whatever level we choose to call death, it is an arbitrary decision. Death of the heart? The hair still grows. Death of the brain? The heart may still beat. The need is to choose a level where the brain no longer functions. It is best to choose a level where, although the brain is dead, usefulness of other organs is still present. This we have tried to make clear in what we have called the new definition of death.⁹

The advantage this offered for transplantation technology was obvious—no longer would transplant surgeons have to wait several minutes after cardiac arrest to retrieve organs for transplantation, thereby risking organ degeneration. Rather, the new criterion increased the viability of transplantable organs because, through mechanical ventilation, donors' hearts would continue to beat. Thus, despite the absence of brain activity, vital organs were infused with oxygenated blood until the time that the organs were removed. In short, the new criterion provided a means to obtain fresher organs from heart-beating brain-dead donors without violating the Dead Donor Rule.

Despite general acceptance by the medical and legal press in the decade that followed, some ambiguities remained with respect to the meaning and application of brain death in medial practice and social policy. In light of varied sets of diagnostic

⁸ Ebert responded, "The connotation of this statement is unfortunate, for it suggests that you wish to redefine death in order to make organs readily available to persons requiring transplants. Immediately the reader thinks how this principle might be abused...Would it not be better to state the problem, and indicate that obsolete criteria for the definition of death can lead to controversy in obtaining organs for transplantation?" Henry K. Beecher, *Henry K. Beecher Manuscripts*. (Boston, MA: Holmes Hall, Harvard Medical School, 1968).

⁹ Henry K. Beecher and H. I. Dorr, "The New Definition of Death: Some Opposing Views," *International Journal of Clinical Pharmacology* 5 (1971): 120-1.

criteria and model statutes, the President's Commission in 1981 published its report, *Defining Death*, in which it proposed a conceptual basis for brain death and a model statute in an attempt to make death uniform. What was lacking in the Harvard Committee's report, the President's report attempted to clarify and amend by providing a biological, philosophical, and legal basis for standardizing the definition and criteria for death.

B. The President's Commission

Following developments in transplantation and the Harvard Ad Hoc Committee's report, President Carter appointed a Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research in 1978. Specifically, the President charged the Commission with the responsibility to "study and recommend ways in which the traditional legal standards can be updated in order to provide clear and principled guidance for determining whether such [artificially maintained] bodies are alive or dead."¹⁰

The Commission proposed that the critical issues for determining brain death as a satisfactory standard concern its consistency on three levels: 1) the tests for diagnosing brain death; 2) the clinical criterion for brain death; and 3) the definition or conception of death.¹¹ As Robert Truog explains: "Individuals who fulfill the tests must also fulfill the criterion, and those who satisfy the criterion must also satisfy the definition."¹² The

¹⁰ , *President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research. Defining Death: A Report on the Medical, Legal, and Ethical Issues in the Determination of Death* (Washington, DC: Government Printing Office, 1981), 3.

¹¹ Robert D. Truog, "Is It Time to Abandon Brain Death?," *Hasting Center Report* 27, no. 1 (1997).

definition of death is: “the permanent cessation of functioning of the organism as a whole.”¹³ The criterion is: “The permanent cessation of functioning of the entire brain.”¹⁴ The clinical testing includes:

...A battery of tests and procedures, including establishment of an etiology sufficient to account for the loss of all brain functions, diagnosing the presence of coma, documenting apnea and the absence of brain-stem reflexes, excluding reversible conditions, and showing the persistence of these findings over a sufficient period of time.¹⁵

This interrelationship must satisfy each of the three levels; otherwise, serious doubt is cast on the legitimacy of brain death as a viable criterion of death.

Central to the Commission’s report is its conceptual foundation for whole brain death (or simply, brain death), which is attributed to the influence of a group of physicians from Dartmouth. Led by James L. Bernat,¹⁶ they argued that the conception behind brain death rested on the notion that the brain is the source of integration for the organism as a whole. As such, when the brain suffers irreversible loss of its integrative functions, then the capacity for organizational function for the organism as a whole is also lost and, hence, the organism is essentially dead. Although artificial support for respiration and heart rate may give the appearance of some organizational unity, the capacity for spontaneous function is, in reality, non-existent.

¹² Ibid., 30.

¹³ James L. Bernat, Charles M. Culver, & Bernard Gert, "On the Definition and Criteria of Death," *Annals of Internal Medicine* 94 (1981).

¹⁴ Ibid.

¹⁵ Truog, *Abandon*, 30.

¹⁶ Bernat, *Criteria*.

When the President's Commission defined death as "that moment at which the body's physiological system ceases to constitute an integrated whole"¹⁷ the Commission unambiguously adopted an organism-based conception of human beings. The Commission was consciously conservative in their deliberations and chose to base them on the idea that humans have been traditionally viewed as organisms belonging to a substantial kind. This is evident in the parts to whole relation in the rationale of opting to an organism-oriented view of death. The Commission's report states:

The functioning of many organs—such as the liver, kidneys, and skin—and their integration are "vital" to individual health in the sense that if any one ceases and that function is not restored or artificially re-placed, the organism as a whole cannot long survive. All elements in the system are mutually interdependent, so that the loss of any part leads to the breakdown of the whole and, eventually, to the cessation of functions in every part.¹⁸

Desiring to maintain constancy with a more traditional view of life and death, and to avoid the perception of a radical shift in the definition of death, the Commission recognized that "the adoption of a higher brain 'definition' would depart radically from the traditional standards" implying "that the existing cardiopulmonary definition had been in error all along."¹⁹ Thus, the President's Commission was deliberate in opting away from a person-oriented view and instead chose a definition of death consistent with the idea that human beings are organisms of a substantial kind. The question of conceptual continuity between the definition and the proposed criterion depends on

¹⁷ , *President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research. Defining Death: A Report on the Medical, Legal, and Ethical Issues in the Determination of Death* (Washington, DC: Government Printing Office, 1981), 33.

¹⁸ *Ibid.*, 32.

¹⁹ *Ibid.*, 40-41.

whether brain death is consistent with the metaphysical theory that avers human beings to be essentially physical organisms.

Further elaboration reveals that the concept of brain death adopted by the President's Report rests on two related, though distinct, claims. First, the brain is the source of integration for the organism as a whole, and second, brain death is consistent with the traditional cardiopulmonary criterion.²⁰ Consistency is maintained given the fact that after an accurate brain-death diagnosis, cardiopulmonary death quickly follows despite continued intensive care. This is known as the *somatic disintegration hypothesis*.²¹ Under this hypothesis, the brain (whole brain) is the critical organ that controls or integrates other bodily systems, and when it ceases to function, the remaining bodily systems are unable to survive. Whether brain death can maintain consistency with a substance view is the question at hand. In the following section I examine the biological evidence as it relates to the metaphysical claims of a substance view of human beings.

II. Brain Death and Substantial Identity

The substance view is often employed as a means to assess the abortion debate.²² Proponents present the view as an attempt to argue that a "human being is intrinsically

²⁰ This is evidenced in the UDDA, which bifurcated the standard of death in the following 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."

²¹ J.M. Elliot, "Brain Death," *Trauma* 5 (2003): 32.

²² Patrick Lee, *Abortion and Unborn Human Life* (Washington DC: Catholic University of America Press, 1996); Patrick Lee, "The Pro-Life Argument from Substantial Identity: A Defense," *Bioethics* 18, no. 3 (2004); Francis J. Beckwith, "The Explanatory Power of the Substance View of Persons," *Christian Bioethics* 10 (2004).

valuable because of the sort of thing it is, and the human being remains that sort of thing as long as it exists.”²³ According to the substance view, a human being throughout its development and decline does not undergo any substantial changes that alter its identity until the organism as whole dies. It remains the same thing as long as it exists even when it is unable to exhibit those functions normally associated with healthy adult human beings. Hence, mere membership in the species *homo sapiens* is sufficient reason to attribute intrinsic value and rights to any human individual in recognition that it is “one of us.”

A. The Substance View

The substance view proposes that each living organism (substance) possesses a nature or essence that makes its functioning and activities possible. It is the inner nature of an organism that determines and orders its “structural unity of ultimate capacities.”²⁴ The inability to actualize or immediately exercise ultimate capacities does not in and of itself signal a loss of a substance; for a substance cannot lose its ultimate capacities and continue to exist. That is to say, since a substance’s ultimate capacities are the distinguishing marks of a substantial kind, the failure to exhibit them or the loss of some underlying second-order capacity, which enables their exhibition, does not necessarily constitute a substantial change. As Beckwith explains:

A domestic feline, because it has a particular nature, has the ultimate capacity to develop the ability to purr. It may die as a kitten and never develop that ability. Regardless, it is *still* a feline as long as it exists,

²³ *Ibid.*, 33.

²⁴ J. P. Moreland, "Humanness, Personhood, and the Right to Die," *Faith and Philosophy* 12, no. 1 (1995): 101.

because it possesses a particular nature, even if it never acquires certain functions that by nature it has the capacity to develop. In contrast, a dog is not said to lack something if it cannot purr, for it is by nature not the sort of being that can have the ability to purr. A feline that lacks the ability to purr *is still a feline* because of its nature. A human being who lacks the ability to think rationally (either because she is too young or she suffers from a disability) *is still a human person* because of her nature. Consequently, a human being's lack makes sense *if and only if* she is an actual human person.²⁵

Substances, therefore, remain identical to themselves through various changes as they grow, develop, and mature due in great measure to the internal nature that directs and limits these changes. As Beckwith further explains: "The organs and parts of the organism, and their role in actualizing the intrinsic, basic capacities of the whole, acquire their purpose and function *because* of their roles in maintaining, sustaining, and perfecting the *being as a whole*."²⁶ Unlike a property-thing, whose parts are ontologically prior to the whole, a human organism in its early stages is in the process of becoming what it already essentially is. As C. Steven Evans notes: "A person who develops the capacity to choose, reflect, and to relate is therefore becoming what he or she is, essentially. A person is a being who has these capacities and characteristically actualizes them, though a person who fails to realize such capacities remains a person."²⁷

²⁵ Beckwith, *Explanatory Power*, 35.

²⁶ *Ibid.*

²⁷ C. Steven Evans, "Human Persons as Substantial Achievers," *Philosophia Reformata* 58, no. 1 (1993): 108.

B. Problems of Conceptual Continuity

It has been known for some time that remaining cellular, electrical, and supercellular functions are ignored as insignificant by brain-death defenders.²⁸ Today it is universally recognized that many brain-dead patients who satisfy all the standard clinical tests continue to exhibit integrative functions of the brain.²⁹ The manifest difficulties of reconciling brain death with the death of the organism as a whole suggest that brain death does not mark the end of integrative functioning of a human being. Indeed, many of the functions necessary for maintaining organic integration can be supplemented by medical technology. For instance, with the use of a ventilator the diaphragmic muscles can operate to provide oxygenated air allowing for the respiratory system to maintain its continued functional capacity for O₂ and CO₂ exchange.³⁰ In this sense, respiratory function has not been destroyed. Moreover, artificial maintenance of other critical functions, such as the regulation of blood pressure through vassopressors, the maintenance of body temperature, and the suspension of rapid asystole through “synthetic arginine vassopressin (ADH) and epinephrine,” suggest that the idea that brain death inevitably leads to bodily disintegration is overstated.

²⁸ Robert M. Veatch, *Transplantation Ethics* (Washington, DC: Georgetown University Press, 2000), 104-105. Veatch cites Bernat who justifies ignoring supercellular functions when he writes: “...the bedside clinical examination is not sufficiently sensitive to exclude the possibility that small nests of brain cells may have survived...and that their continued functioning, although not contributing significantly to the functioning of the organism as a whole, can be measured by laboratory techniques. Because these isolated nests of neurons no longer contribute to the functioning of the organism as a whole, their continued functioning is now irrelevant to the dead organism.” Original citation from: James L. Bernat, “How Much of the Brain Must Die on Brain Death?,” *The Journal of Clinical Ethics* 3, no. 1 (1992): 25.

²⁹ Baruch A. Brody, “How Much of the Brain Must Be Dead?,” in *The Definition of Death: Contemporary Controversies*, ed. Stuart J. Youngner, Robert M. Arnold, and Renie Schapiro (Baltimore: The Johns Hopkins University Press, 1999), 73.

³⁰ Michael Potts, “Pro-Life Support of the Whole Brain Death Criteria: A Problem of Consistency,” in *Beyond Brain Death: The Case against Brain Based Criteria for Human Death*, ed. Michael Potts, Paul A. Byrne, and Richard G. Nilges, Philosophy and Medicine (Dordrecht, The Netherlands: Kluwer Academic Publishers, 2000), 129.

Moreover, that patients diagnosed as brain dead may still retain integrated organic functioning resides in the fact that brain-dead pregnant women are able to gestate fetuses to near full term. Mark Siegler and Daniel Wikler note that these facts contribute to the ambivalence associated with “corpses” that exhibit properties indicative of living patients. They write:

It has been known for some time that brain-dead patients, suitably maintained, can breathe, circulate blood, digest food, filter wastes, maintain body temperature, generate new functions, and fulfill other functions as well. All of this is remarkable in a “corpse.” Granted, these functions could not be maintained without artificial aid and, even so, will cease within a few weeks. However, many living patients depend on machines and will not live long; they are not thereby classified as (already) dead.³¹

Perhaps the most devastating critique of brain death is from Alan Shewmon, a pediatric neurologist, who has scrutinized Bernat’s rationale in light of the empirical evidence opposing the idea of the brain as the organ of somatic integration. Recall that the criterion rests on the idea that the brain serves as the integrator of the organism as a whole. That is, the integrated unity of the organism as a whole is sustained and directed primarily by a functioning brain. Shewmon provides some 175 documented case studies of brain dead individuals surviving for significant periods of time representing counter examples to the claim that brain death marks the end of bodily integration.³² In light of these data, Shewmon writes:

³¹ Mark Siegler and D. Wikler, "Brain Death and Live Birth," *JAMA* 248 (1989): 1101.

³² D. Alan Shewmon, "'Brainstem Death,' 'Brain Death' and Death: A Critical Re-Evaluation of the Purported Evidence," *Issues in Law and Medicine* 14, no. 2 (1998).

These data teach us several lessons: (1) "**Brain death**" does not necessarily lead to imminent cardiac arrest despite all treatment. (2) The heterogeneity of survival duration is largely explainable by non-**brain** factors. Moreover, the process of **brain** damage leading up to "**brain death**" frequently induces secondary damage to heart and lungs. Therefore, the tendency to early cardiac arrest in the majority of patients is attributable more to somatic factors than to mere absence of **brain** activity per se. (3) The first few weeks are especially precarious. But those who make it through tend to stabilize, no longer requiring sophisticated technological support. Some have even been discharged home on a ventilator. Although some personhood-consciousness reductionists might try to argue that these are not human persons, no one can seriously claim that they are not living human organisms, living human beings.³³

Shewmon's work reveals that the role of the brain, with regard to its contribution to the organism as a whole, is best described "as modulator and enhancer rather than integrator."³⁴ As such, integration may not be reducible to a single part or organ of the body. Rather, "each part of the body, especially the brain, contributes to the stability, robustness, and richness of the body's vitality and unity, but no one part or even combination of parts constitutes that vitality or unity."³⁵

The substance view is capable of accounting for the organizational unity present in medically supported brain-dead patients. The distinction between lower-order and higher-order capacities is crucial on this point. With respect to the loss of lower-order capacities, supplementation through external means makes little difference with respect to the life of the organism as a whole. Many higher-order capacities indicative of organizational life continue despite the fact that some lower-order capacities are derived through means external to the patient. Thus, brain dead patients may lack some lower-

³³ Ibid. Emphases in original.

³⁴ Alan D. Shewmon, "The Brain and Somatic Integration," *Journal of Medicine and Philosophy* 26, no. 5 (2001): 471.

³⁵ Ibid., 472.

order capacities, but still retain many higher-order capacities indicative of living human beings. In this sense, the external agencies of lower-order capacities are, as Tom Tomlinson notes, “the functional equivalent of the destroyed brain stem.”³⁶ And as far as the substance view is concerned, continued organizational unity is indicative of the continued presence of the inner nature, which is constituent of living human beings.

The fundamental inconsistency in the brain-death standard concerns the insistence of internally based functions as necessary conditions for organizational unity.³⁷ However, if patients who are not brain dead are dependent on external sources for lower-order capacities (or functions), then by the same criterion they also lack the necessary conditions for organizational unity as well. Two counter examples from Truog and Fletcher highlight the problem. They include: 1) individuals who, due to spinal cord injuries, rely on mechanical ventilation for support, and 2) patients who rely on pacemakers for effective heart functioning.³⁸ Withdrawal or removal of these external agencies of support would quickly result in the lack of “integrated organic functioning,” and yet no one would consider these patients dead prior to the withdrawal.

Bartlett and Younger provide a hypothetical situation that bears further consideration. They ask us to imagine a case in which “someone has suffered neocortical (‘higher brain’) death, and is no longer conscious.”³⁹ If the patient retains the

³⁶ Tom Tomlinson, "The Conservative Use of the Brain-Death Criterion: A Critique," *Journal of Medicine and Philosophy* 9 (1984): 383.

³⁷ The bedside testing procedures for brain death focus on automated reflexes, including spontaneous breathing.

³⁸ Robert D. Truog and J. T. Fletcher, "Brain Death and the Anencephalic Newborn," *Bioethics* 4 (1990): 207.

³⁹ Stuart J. Youngner and E. T. Bartlett, "Human Death and High Technology: The Failure of the Whole Brain Formulations," *Annals of Internal Medicine* 99 (1983): 208.

capacity for temperature regulation, then according to the brain-death criterion, he would still be alive. Suppose that this same patient suffers a stroke in the area of the brain stem that controls temperature regulation; nevertheless, temperature is maintained through medical support. “Is he still functioning as a whole?” Suppose further that the patient suffers another stroke affecting his respiratory and circulatory centers. Added supportive measures are taken, such as placing him on a ventilator and regulating his blood gases. If we continue to imagine further compromises, with each function supplemented by ICU staff, at what point should we conclude that organizational unity has sufficiently ceased? The evidence suggests that integrated organic functioning remains at all stages of lower-order functional loss. According to the substance view, as long as organizational unity is present, despite the loss of lower-order capacities, the brain-dead patient retains his or her higher-order capacities for bodily integration.

Thus, under the substance view, brain-dead patients do not lose their substantial identity. They neither “become members of another species” by virtue of severe brain damage, nor are they mere aggregates of persons who were once associated with bodies.⁴⁰ The inability of a particular substance to actualize all its capacities at a given time may be due to underdevelopment, as in the case of human beings as embryos or fetuses, or due to severe brain damage, as in the case of brain-dead human beings. Nonetheless, “a substance has a set of capacities that are true of it even though they are not actualized.”⁴¹

⁴⁰ D. A. Jones, “Metaphysical Misgivings About ‘Brain Death,’” in *Beyond Brain Death: The Case against Brain Based Criteria for Human Death*, ed. Michael Potts, Paul A. Byrne, and Richard G. Nilges (Dordrecht, The Netherlands: Kluwer Academic Publishers, 2000): 108.

⁴¹ Garrett J. DeWeese and J. P. Moreland, *Philosophy Made Slightly Less Difficult* (Downers Grove: InterVarsity Press, 2005), 44-45.

Conclusion

This paper explored the historical development of brain death and its conceptual foundation. In particular, the paper investigated the criticism that brain death has never been legitimately justified as a valid criterion of death, but instead was advanced by committee in order to promote organ transplantation. An assessment of the historical, biological, and philosophical foundations in support of brain death reveals serious challenges to its coherence. If this analysis is correct, those in the pro-life movement need to reconsider their support of organ donation under the brain-death standard.