

mature to conclude that the use of estrogen-replacement therapy or selective estrogen-receptor modulators has no role in preserving cognitive function.

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BRAIN DEATH — WELL SETTLED YET STILL UNRESOLVED

IF one subject in health law and bioethics can be said to be at once well settled and persistently unresolved, it is how to determine that death has occurred. Once this determination involved simply the measurement of vital signs. It was as often performed by laypersons as by physicians. Now it is often a complex matter requiring specialized expertise and raising both conceptual and practical difficulties.

In the majority of cases, death is diagnosed on the basis of the irreversible cessation of circulatory and

respiratory functions. But beginning in the middle of the 20th century, increasingly sophisticated means were developed to sustain the life of patients with head trauma or brain hemorrhage. The result was a growing number of patients whose cardiopulmonary functions had been restored but who were profoundly and persistently unconscious and unresponsive. Once it became apparent that pharmaceutical and mechanical interventions could make it impossible to rely on traditional vital signs, such as heartbeat and respiration, in determining whether patients were still alive (albeit dying) or, as indicated by the state of their brains at autopsy, had in fact already died,^{1,2} neurologists, neurosurgeons, anesthesiologists, and other physicians developed guidelines for making neurologically based determinations.

The review by Wijdicks in this issue of the *Journal*³ of the clinical criteria and confirmatory tests for diagnosing death with the use of brain-based criteria clearly explains the currently accepted standards in this field. The current standards represent only a minor evolution from the first such guidelines promulgated by a committee at Harvard Medical School in 1968,⁴ those signed by virtually all the leading authorities on the subject in the United States in 1981,⁵ or the consensus views of the American Academy of Neurology in 1995.⁶ For at least a decade, every state has recognized such criteria as the legally acceptable means of determining death,⁷ with 31 states having adopted the Uniform Determination of Death Act that was first proposed in 1981.⁸

Yet the breadth and durability of this consensus⁹ have not kept discussions of brain death free from metaphysical, cultural, legal, and medical controversy.¹⁰ These persistent disputes have many roots. One is the confusion engendered at the outset of the medical and public discussion of the subject by the terminology used by the Harvard committee.¹¹ That group's name, the Ad Hoc Committee of the Harvard Medical School to Examine the Definition of Brain Death, introduced what continues to be a basic problem by using a term ("death") that is appropriate for organisms to describe the loss of function in an organ (the brain). Moreover, the title of the committee's report, "A Definition of Irreversible Coma," suggested that what was involved was defining death — that is, describing a concept rather than providing criteria for diagnosing a condition. It also suggested that brain death could be equated with irreversible coma, which is a condition of (limited) life, not of death, as the French indicated when they first described the state of death as one "beyond coma."¹²

The term "brain death" has become so familiar that it is not likely to be replaced by a more precise and less confusing term, such as "brain-based determination of death." Nonetheless, physicians who rely on diagnostic criteria of the sort set forth by Wijdicks ought to recognize that the language they use not

only reflects but also sows confusion. Since “brain-dead” patients show such traditional signs of life as warm, moist skin, a pulse, and breathing, it is not surprising that many people seem to think that “brain death” is a separate type of death that occurs before “real” death. This confusion is reinforced when hospital personnel state — and journalists repeat — that “life support” is being removed from such patients.¹³ The confusion even crops up in judicial decisions, as illustrated by the Pennsylvania judge who opined that “when the life-supporting measures were suspended, death ensued [although the person] was legally dead even before heroic life support procedures were discontinued.”¹⁴

More than confusion is at work here, however. Since the word “brain” usually refers to cognition, critics of the Uniform Determination of Death Act (and of the existing medical consensus) believe that the law should equate death with the loss of functions in the higher brain rather than the whole brain.^{15,16} Two philosophical positions are advanced: that permanent unconsciousness negates personhood because to be a person (as opposed to merely a human being) one must possess at least the potential for thought, and that it destroys personal identity, which depends on self-awareness and the continuity of one’s personal history. There are inherent difficulties in translating such “higher-brain” concepts into policy, to say nothing of their radical implications — namely, that patients in a persistent vegetative state, as well, perhaps, as severely demented or retarded persons, ought to be declared dead.

Those who promote these positions also confuse the question “When is a person dead?” (for which it seems important to have a uniform answer) with the question “When should a person be allowed to die?” (for which the answer ought to depend on the wishes of the patient or those authorized to decide on his or her behalf, many of whom would choose to forgo life support in cases of persistent vegetative state or other higher-brain impairment). Therefore, it is not surprising that a determination of death based on loss of higher-brain function has not replaced the prevailing consensus that requires loss of function in the brain stem as well as the neocortex and other regions of the brain.

Although no state has adopted a definition that refers exclusively to higher-brain functions, the possibility that brain death is different from ordinary death does continue to affect policy debates. Only one model statute, the Capron–Kass proposal¹⁷ (the model that was the most widely adopted before the Uniform Determination of Death Act), set forth the relation between the two standards for determining death — irreversible cessation of circulatory and respiratory functions and irreversible cessation of all functions of the brain, including the brain stem. This statute makes clear that these two standards are different

means of measuring a single phenomenon and defines the appropriate occasions for the use of one standard or the other. The statements from major medical authorities are hardly more helpful. The 1981 report to the President’s Commission from the medical consultants on the diagnosis of death⁵ is the only statement I am aware of that relates the standards for determining death according to neurologic criteria to the way in which death is most commonly diagnosed — namely, according to cardiopulmonary criteria.

This lack of clarity not only confuses the public but produces two other difficulties. First, it leads some people to conclude that they should be free to choose between the standards. Indeed, in response to the objection of some Orthodox Jews to the use of neurologic criteria in diagnosing death, a 1987 New York regulation requires hospitals to have procedures for the “reasonable accommodation” of patients’ religious or moral objections to the standards used to determine death.¹⁸ And in 1991, New Jersey enacted a statute that has separate sections recognizing “traditional cardio-respiratory criteria” and “modern neurological criteria,” and that prohibits the physician from using the latter when he or she “has reason to believe” that “a declaration [on the basis of neurologic criteria] would violate the personal religious beliefs of the individual.”¹⁹ Second, the lack of clarity gives rise to a suspicion that death is a malleable concept that can be adjusted for utilitarian purposes.²⁰ This contributes to the ambivalence of many people about organ donation.²¹

In addition to these philosophical and legal quarrels with the Uniform Determination of Death Act, the current concept of death has been challenged on medical grounds: some biologic activity, which the commentators believe constitutes important brain functions, remains in some bodies found to have suffered an “irreversible loss of all functions of the entire brain.”²² If a particular activity were so physiologically integrative that it would have to be absent before death could be declared, then measures of that activity should be included in the diagnostic criteria. Other experts on the functioning of the brain, however, have remained unconvinced that the lack of testing for various hormones amounts to a flaw in the accepted criteria.^{3,6} Moreover, if a biologic activity also persists in patients considered to be dead on the basis of cardiopulmonary criteria, its presence in patients considered to be dead on the basis of neurologic criteria would not indicate that the latter were being mistakenly classified as dead. Of course, in the long term, as more is learned about neurologic functions and especially as means are developed for the replacement or regeneration of such functions, the whole notion of irreversible loss of brain functions will need to be revisited. The Uniform Determination of Death Act permits this type of revision, because it does not legislate particular criteria or clinical

cal or laboratory tests but anticipates that “accepted medical standards” will evolve over time.

At present, physicians can confidently apply the criteria and tests for determining death as described by Wijdicks. They should, however, use great care in doing so (because so much turns on the accuracy of their determinations) and should also strive to be clear about the conceptual foundations of the definition they are implementing. Doctors should avoid terms such as “brain death” and allow families time to understand the basis of a diagnosis of death that is not self-evident when the respirator-supported body of their loved one manifests many outward signs of life. In this way, physicians can diminish the confusion of the public and health care personnel alike. There are good and sufficient reasons why the existing consensus about the determination of death has endured for more than 30 years even in the face of persistent criticism.

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